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Participatory Video in Agroecology Education: A Multiple-Case Study with the Green Learning Network

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ABSTRACT

A transformation of our food system necessitates a revision of how we think and communicate about agriculture. In the past few decades, increasing attention has been paid to the unique requirements of teaching sustainable agriculture in general, and agroecology specifically. Approaches such as place-based learning, experiental learning, inquiry-learning and participatory action learning have been confirmed to enhance mastery of content as well as necessary skill development among students. In development contexts, participatory video (PV) – a participatory action research and social learning tool – has been shown to empower groups who are working for effective change within their communities. Can it then also be used to further develop the competencies of agroecology students? Might it provide a venue for extending farmer to farmer exchange? Could it offer a means of co-learning for researchers and farmers?

The present study examines the application of PV to the context of learning about agroecology to determine if PV is an effective tool for learning for both farmers and students. Three PV projects in three European countries were carried out in partnership with the Green Learning Network over the course of four months in 2015 at institutions of learning that have an emphasis on agroecological education. Participants – students, farmers and teachers – collectively designed and created their own videos about topics that were relevent to some aspect of agroecology in their communities. Through the use of questionnaires and focus-group interviews, participants' experiences and perceptions were documented and analyzed.

Results show that the PV activities enhanced communication and analytical inquiry skills, and that PV was particularly effective when used as a collaborative learning tool for the exploration of values-based aspects of agroecology. Accordingly, the most valuable aspect of PV in this study was how participants deepened their understanding of agroecology by engaging in the participatory video process. Participation in the PV activities gave way to an emergant social bridge that strengthened communities over common interests and instigated connections between people who previously were strangers. The potential for the use of PV in agriculatural extension and research is great in terms of creating shared vision and building cooperative relationships between and among farmers and researchers. Further research should examine the specific needs of stakeholders in these groups to determine how PV could be of benefit to them.

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ACKNOWLEDGEMENTS

LIST OF ACRONYMS

ABR   Agriculture, Biodiversity and Rural Affairs

ASD   AgroSup Dijon, also known as Institut national supérieur des sciences agronomiques, de l'alimentation et de l'environnement in Dijon, France

GIEE   Groupements d'intérêt économique et environnemental

GLN   Green Learning Network

IBSE   Inquiry-Based Science Education

MAAF   Ministry of French Agriculture

MUHNAC   National Museum of Natural History and Science in Lisbon, Portugal

OER   Open Educational Resource

PRA   Participatory Rural Appraisal

PV   Participatory Video

UNISG   University of Gastronomic Sciences in Pollenzo, Italy

WWOOF   World Wide Opportunities on Organic Farms

1. INTRODUCTION

1.1 CONTEXT AND PROBLEM STATEMENT

To curtail the significant environmental and social damage incurred by current standard agricultural practices, alternative integrated approaches such as agroecology must be employed (Altieri 1995, Gliessman 2006). Agroecology is based on systems thinking. There is not a singular way of explicitly defining an agroecological farm; rather agroecology is characterized in practice as a holistic approach to agriculture, where input-reliance is minimized and internal cycling of energy and nutrients remains largely within the boundary of the farm (Altieri 1995). Guided by this strategy, appropriate agronomic techniques can be practiced in a variety of farming systems; it is the conceptualization of the farm as an ecosystem that sets the agroecological approach apart. Therefore, the transitionary process toward agroecology must include a reformulation of the current mainstream approach to agriculture – a linear and largely unidirectional approach in which purchased inputs are sent through the farm machine to yield commercializable outputs. The transition to agroecological farming encompasses all states along this spectrum – whether change occurs progressively or is abrupt – and therefore includes structural and formative aspects such as research and education about agriculture.

Agricultural education and extension often are attempted as a transfer of technology (Warner 2008) that rarely fosters participation in the design and adoption of innovative practices or ideas (Leeuwis and Aarts 2011). "Agroecology cannot be transferred as a technological package. It can only be facilitated by social learning. It is inherently more knowledge intensive than conventional approaches to agricultural production" (Warner 2007, p. 224). A transformation in agricultural education must therefore accommodate learning about agriculture in a new way. We cannot talk about changing the way we do agriculture without considering how we will change the ways in which we express and understand this complex human endeavor.

Furthermore, knowledge about alternative forms of agriculture (as opposed to conventional, mainstream agriculture) should be widely disseminated to allow for actors (farmers, researchers, intermediaries and other societal agents) to make balanced and informed decisions about their activities in food systems. It is not enough for such knowledge to be generated and maintained in scientific

repositories; mechanisms (including social and organizational structures) that support innovative thinking and knowledge-sharing must also be developed (Leeuwis and Aarts 2011).

It is proposed that universities need to reorient their teaching methods in a manner that enables students' innovative capacities to take root. Pretty (1995) called for new systems of learning that use genuine participatory methods, as a movement away from positivism toward the direction of pluralistic thinking and action for sustainable agriculture. Caporali (2007) echoed this sentiment over a decade later:

> University has a role to play in society to prepare a culture and professionals in agriculture to meet current expectations. New epistemological, ontological and methodological tools based on the systems paradigm...are needed...to successfully address the challenge of establishing new culture and praxis for a sustainable development in agriculture. (p. 81)

Accordingly, the following problem statement can be identified:

> *There is a need for alternative approaches to learning and research about agroecology in order to equip actors (students, growers, researchers) with the appropriate skill set to handle the challenges of learning within place-based agricultural systems.*

1.2 CURRENT THINKING ON AGROECOLOGY EDUCATION

Literature on agroecology education establishes the strengths of action-oriented, phenomenon-based learning that has a foundation in real-world case studies. While there exist several pedagogical approaches, Fleury (2010) suggests that the competencies of students be developed through situational learning or problemization, where students must draw upon their knowledge to analyze practices and confront open-ended situations. Indeed, Francis et al. (2009), Lieblein et al. (2010) and Francis, Lieblein et al. (2014) consider action learning and experiential learning through open-ended case studies to be an effective way to teach the complex subject of agroecology and provide practice in developing capacity for future responsible action (Lieblein and Francis 2007). In general, academia does not currently embrace this type of teaching because of the distant role researchers have played in recent history, resulting in a disconnect between theory and practice (Lieblein et al. 2010). Action learning and action research demand "an ability to act to deal with complex issues...[leading] to a

comprehensive understanding through a reflection process of those complex issues" (Lieblein et al. 2010, p. 719).

Similarly, Caporali (2007) argues that internal and external coherence should be sought in an optimal learning environment for agroecology, where internal coherence refers to integration across disciplines as well as between teachers and students, and external coherence refers to the contextualization of topics. Caporali refers to a model at the University of Tuscia in which certain methodological approaches are used to achieve both internal coherence – through inter- and transdisciplinarity, team-teaching, and flexible learning activities – as well as external coherence – via participatory research and learning, experiential learning, and problem-based learning. Østergaard et al. (2010) characterize this as "phenomenon-based" education, and suggest that when done well, phenomenology results in practical relevance for students, which in turn leads to responsible action.

"Skilled agroecologist[s]...will have knowledge of farming and food systems, be able to handle complexity and change, be able to link theory to real life situations, be good communicators and facilitators, [and will] be autonomous learners" (Lieblein et al. 2004, p. 152). Furthermore, they will know how to work across stakeholder groups, balance the needs of diverse stakeholders, and will act as agents of change (Lieblein et al. 2012). Key agroecological skills include "deep reflection, rich observation, creativity and moral imagination, responsible participation and action, and dialogue-based communication" (Lieblein et al. 2010, p. 727). Group work and joint learning activities provides an ideal venue for learning and practicing these skills. Furthermore, learning how to work well in group settings equips individuals with the skills necessary to participate in farmer-centered group work, which may be the "key to success" for innovation and the sustainable development of agriculture (Giroud 2015).

1.3 IN SEARCH OF A NEW TOOL

If agroecology is viewed as a strategy for rural development (Pretty 1995), then an obvious place to seek "new" methodological tools for integration into agroecology education is the development arena. Of particular interest are participatory development and communication tools which stimulate feelings of empowerment and ownership over one's agency while simultaneously encouraging the construction

of social capital. "Participatory communication has the capacity to connect human beings as they experience social change. It is a democratic process, characterized by dialogue, creative and consensual thinking, and collective action" (White 2003, p. 20). White (2003) notes that participatory communication consists of more than simple dialogue with stakeholders. Rather, it is involves engaging people in an interactive way to help them to reflect on their own situation, articulate action that would help improve their condition, improve communication skills, acquire new knowledge and contribute knowledge that may aid in decision-making.

Theoretically, a participatory communication tool would have the potential to incite action-orientation in development scenarios and among students alike. Helmfrid et al. (2008) goes so far as to argue that "any form of communication is action: each interaction becomes part of the whole process of change, a process which is reciprocal by its very nature" (p. 113). Participatory video (PV) is one such tool for participatory communication, since the process of making a video collectively provides a tangible venue in which these tasks can be performed.

Participatory video is widely used by international development organizations to achieve development priorities, including farm extension programs. In this context it is an ideal communication tool, particularly given the low literacy rates among farmers in many regions (Lunch and Lunch 2006). PV has successfully incited positive changes in food production through the generation of social and human capacity via knowledge-sharing about agricultural techniques, water management, pests and diseases, and other relevant topics (Nathaniels 2005, Gandhi et al. 2009). An explanation of the origins, theory and use of PV is available in the chapter *Background on Participatory Video*.

Despite the widespread adoption of video technology in development projects, there remains space for further exploration about how video can be used to promote change. "Recent trends show a heavy emphasis on participatory video, particularly in terms of farmer participation, but comparatively little attention has been paid to educational or learning videos as a digital resource" (Lie and Mandler 2009, p. 2). High et al. (2012) point out that "participatory video has been applied in many more ways outside of academic research and education than inside" (p. 1), and Montero (n.d.) states that more rigorous academic thought and research is needed to explore the potential for using PV specifically in higher education, highlighting "the need to rethink PV as a methodology for academia to engage fruitfully with collective dynamics of production, reception and sharing of digital video present in today's activism" (p. 1). The present research is intended to address this need by exploring the potential for

applying a proven method of agricultural development to a European educational context while emphasizing agroecological principles. Indeed, PV may offer a utility that is not currently being exploited, in the context of agroecology education and research. It may be an effective means for collaboratively creating agroecological understanding via the production of video for the purpose of personal learning as well as change advocacy. Now is a great opportunity to apply this technique, given the proliferation of video-making technology and online video-sharing capability. This study explores the qualities of this approach as described by participants in several PV projects after their experience.

In the context of this study, PV is defined both by methodological approach and by purpose. PV, as the term is used in these case studies, is a method that involves the collective production of a video in which the subjects of the video have the right to exercise complete control (either passively or actively) over the production and distribution process. It is used herein as a tool for participation in active social learning since it provides a venue for exchange and a medium for expression. Generally speaking, process-oriented PV is used to build social capital and capacity in order to bring about change within a group, whereas product-oriented PV is used for advocacy by providing the community with the means to communicate their own message.

Agroecology spans the hard and soft sciences, as it is considered to be concurrently a science, a set of practices and a social movement (Wezel et al. 2009). Therefore, there is undoubtedly a place for social science action research in the context of agroecology education and research, though Wezel et al. point out that the relevence of social science to the spread of agroecology may vary from region to region. PV is considered to be a valid methodology for social science action research, having followed developments similar to Soft Systems Methodology and Participatory Action Research (High et al. 2012). N.Q. Nathaniels details his own experience:

> In short, you could say that PV in its effects on the participants is much like opening another space for action
> research, with group and individuals skills and confidence emerging in step with repeated rounds of working,
> reflecting on and then reworking their videos. (personal communication, April 8, 2015)

Lieblein et al. (2010) describe the boundary between action learning and action research to be fluid, pointing out that the progression from "learning" to "research" suggests a focused methodology and an intention to publish (or formally share) the work in order to stimulate further discourse in the field. Reason and Bradbury (2007) offer yet another perspective:

> Action research is a participatory process that...seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of individual persons and their communities. (p. 4)

An important aspect of action research is that it can be a way of integrating knowledge creation with the facilitation of change (Helmfrid et al. 2008). Accordingly, though this study focused on examination of the use of PV primarily in action learning about agroecology, it is implied that a more structured methodology or greater attention to the finished product could be applied to the PV processes described herein in order to constitute action research.

PV is particularly applicable to the discipline of agroecology in other aspects as well. For example, it can be a "highly effective tool to engage and mobilise marginalized people and to help them implement their own forms of sustainable development based on local needs" (Lunch and Lunch 2006, p. 10). This focus on the importance of local understanding and place-based knowledge is echoed by many agroecologists (Altieri 1995, Gliessman 2006, Warner 2007, Wezel et al. 2009). Similarly, Francis, Lieblein, et al. (2014) remind us of the role that farmers' perspectives can play in learning about agroecology by bringing our awareness to the primacy of having a clear view of the way in which local conditions are connected to the national and global scales.

Moreover, Lunch (2004) suggests that PV be used in tandem with social learning approaches that are already established for agricultural development (and which may be fundamental to the success of agroecology, as will be discussed further):

> PV is a potentially strong complement to existing farmer-to-farmer and community-to-community mechanisms for exchanging information, such as story telling and local markets. The completed films can be used to promote awareness and exchange within the same community and in other communities. PV provides a channel for farmers to communicate their ideas, innovations, theories and decisions not only to each other but also to formal researchers and development agents. (p. 1)

Finally, Lunch (2004) identifies lessons learned through his own experiences facilitating PV projects in Central Asia:

> PV can be used as a means of collecting, validating and disseminating farmer-developed technologies to audiences across national boundaries, whether they are farmers, researchers or policymakers....PV films about farmer innovation and experimentation can help to bring farmers' own voices and images to the attention of policymakers in agricultural research and development (ARD). It is one way of bringing farmers' perspectives

into multi-stakeholder platforms on the subject, and can stimulate other stakeholders to open up these platforms directly to farmer researchers. In this way, farmers can gain greater influence in decision-making about the ARD agenda. (p. 4)

1.4 THE CASE FOR PV: SOCIAL LEARNING AS ONE STRATEGY FOR AGROECOLOGICAL EDUCATION

It is recognized that agroecological transformation of the food system hinges upon successful innovations in both technology and practice, and specifically necessitates capacity building among major actors to facilitate these changes in an ethical way (Levidow et al. 2013). Agroecology curriculum must therefore support the development of these capacities for innovation. In the "real" world, participation by practitioners and other stakeholders is integral to the success of innovation processes since these individuals offer unique insight into the application of new ideas, techniques and devices (Leeuwis and Aarts 2011, Giroud 2015), due to the collective action required to address issues on a landscape scale (Warner 2007). Agroecology education should prepare students for this reality by actively incorporating actors in the field (Østergaard et al. 2010; Francis, Lieblein, et al. 2014) and emphasizing the legitimacy of the farmer's perspective (Francis, Nicolaysen, et al. 2014; Girard 2014). Francis, Lieblein, et al. (2014) specifically point to the use of open-ended cases as a strategy for capacity building in the context of learning about agroecology.

Successes in sustainable agriculture have been founded in large part upon social learning (Warner 2007), a participatory approach (Warner 2008, Rosset et al. 2011), and the presence of social capital at a local level (Pretty and Hine 2001), in addition to the development of appropriate technologies that are adapted through farmer experimentation. Rosset et al. (2011) describe the necessity for a social process methodology, such as the Freirian horizontal communication methodology Campesino-a-Campesino [Farmer-to-Farmer] used by La Via Campesina, to "create a social dynamic of widespread adoption" of agroecological practices (p. 168). The farmer-centric approach has been successful in many instances around the world and farmers are being viewed as "essential players in any agricultural innovation system" (MacMillan and Benton 2014, p. 27). Chambers of Agriculture across France have declared it a priority to support farmers in a movement toward agroecology through farmer-centered working groups called Groupements d'intérêt économique et environnemental [Economic and Environmental Interest Groups], or GIEE, which are considered to be levers for the adaptation and transformation of

agriculture through the evolution of agricultural practices, as well as the capitalization of innovations (Giroud 2015, p. 16). Though bringing individuals together offers them the opportunity to learn together, Helmfrid et al. (2008) cautions that the emergence of innovative ideas and new perspectives is by no means guaranteed: "It is through the creation of a flexible framework for collaboration, by establishing a normative communication culture, and by reflecting upon the learning and communication which takes place that learning is facilitated" (p. 127).

Finally, it is important to consider the ancillary benefits that are sought through such alternative, collaborative approaches. For example, Warner (2007) defines social learning in the context of agricultural extension as: "participation by diverse stakeholders as a group in experiential research and knowledge exchange *to enhance common resource protection* [emphasis added]" (p. 3). The expectation here is that this kind of social exchange will achieve something beyond what the individual could accomplish alone. Furthermore, communication is not perceived merely as a means of conveying information; it is a social action that forms and defines societal relationships (Leeuwis and Aarts 2011). With these examples, there is a sense of the multiple components of an integrated whole – an approach that pays heed to societal, environmental and economic concerns and seeks to address them from a holistic standpoint.

Given this foundation, we can begin to build a model for successful communication about agroecology by utilizing participatory methods such as PV, providing real-world context through case studies, and involving diverse local stakeholders (particularly farmers) where an emphasis is placed on the construction of social and human capital as well as on the development of autonomous learning skills.

> Participatory methods and deliberative processes that genuinely include different actors are important in opening up the entire agroecological research cycle to greater citizens' oversight and democratic control over what knowledge is produced, for whom, how, where and with what likely effects. Various methodological approaches and processes can be used to facilitate direct participation of farmers and consumer-citizens in different stages of the R&D cycle. (Levidow et al. 2013, p. 23)

The research detailed in this paper explores the use and evaluation of one such participatory method using video at three educational institutions in the context of learning about agroecology.

1.5 Research Questions and Strategy

It is with these considerations in mind that the research question for this study was developed:

What are key functions and implications of using participatory video in agroecology education?

In order to define a boundary for inquiry, the following subquestions were posed in order to answer the main research question:

- Can PV projects enhance participants' skill sets as agroecologists, including those identified by Lieblein et al. (2012)?

- What considerations should be made when designing a PV project in the context of agroecology education and action research (e.g. methodology, role of facilitator)?

- What are some major levers and constraints for using PV as a learning (and research) tool for agroecology?

At the outset of the research process, a hypothesis was made according to information gleaned during an initial review of the literature. From this review, it appeared that the use of participatory video in agroecology education can simultaneously provide a learning opportunity to producers of the video (e.g. students, farmers) by offering a venue for exchange about issues related to agroecology and by enhancing participants' skill sets as agroecologists, while concurrently generating digital learning resources, thus providing an opportunity to extend the video material to a wider audience and contribute to the popularization of agroecological concepts that come directly from the field.

Data were collected via questionnaires and participant observation for three different cases in which participatory videos were made in coordination with members of a European organization of learning establishments called the Green Learning Network (GLN). GLN was selected as a partner for this research due to the Network's orientation toward integrating information technology into education about sustainable agriculture. Furthermore, partnership with GLN offered the opportunity to implement case studies in a variety of contexts in multiple European countries.

Each case study involved the participation of local stakeholders in the design and implementation of a participatory video activity that addressed an agroecology-related issue that is important to the local

community. In line with the principles behind PV, each group developed their own objectives regarding their PV project. The video in the first case was made to facilitate farmer engagement with an educational and research institution (a university of agricultural engineering) through a student-oriented exploratory learning assignment that examined the variety of perceptions about agroecology. The video produced in the second case was intended to strengthen and expand a university community's awareness of the school's didactic gardens in order to make better use of this educational resource and to advocate for the value of these gardens to the university administration. Two videos were made in the final case, with the intention of generating learning tools that communicate aspects of sustainable land management at a public demonstration site (botanical gardens) as part of a training session for facilitators of future workshops on urban agriculture. Case descriptions and major findings are summarized in the Results section of this paper. The Discussion section elaborates on the ways in which PV was observed to address requirements in agroecology education and provides a force field analysis of supporting and hindering forces for using PV in agroecology education which were identified throughout the course of this research.

2. BACKGROUND ON PARTICIPATORY VIDEO

Practitioners and scholars tend to have varying definitions of PV, often according to the context in which it is being used and the purpose it is serving (Huber 1999). Some make a very clear distinction between PV and other types of video production for development purposes (Lie and Mandler 2009). To others, the boundaries are blurred with regard to exactly how the video is produced while the outcome of social change is a stronger determining factor (Montero n.d., N.Q. Nathaniels, personal communication, May 2015). Below are a few examples of the variety of perspectives on PV:

> Participatory Video is a set of techniques to involve a group or community in shaping and creating their own film....This process can be very empowering, enabling a group or community to take action to solve their own problems and also to communicate their needs and ideas to decision-makers and/or other groups and communities. (Lunch and Lunch 2006, p. 10)

> Participatory video is the use of video within groups for change, whether it is individual or societal. Like participatory action research, the degree of involvement that participants have in designing the goals and process varies from project to project. (Okahashi 2000, cited in Nathaniels 2005, p. 3).

Participatory video as a process is a tool for individual, group and community development....It brings about a critical awareness that forms the foundation for creativity and communication. Thus, it has the potential to bring about personal, social, political and cultural change. (White 2003, p. 64)

Indigenous knowledge and local initiatives are usually documented and disseminated by outsiders, who make their own interpretations in the process. Participatory Video (PV) provides an opportunity for rural people to document their own knowledge and experiences and to express their wants and hopes from their own perspectives. (Lunch 2004, p. 1)

In general, it is agreed that participatory video involves participants making a video themselves, focusing on an issue that is relevant to them at that time. "There is no fixed way in which PV has to be done, other than that it involves the authorship of the group itself and that it be carried out in a truly participative and democratic way" (Lunch and Lunch 2006, p.11). It deviates from traditional documentary film-making in that the story being told is actually about the filmmakers themselves (Lunch and Lunch 2006). The idea is that the story carries a particularly valid and authentic tone since layers of interpretation are stripped away.

In current literature participatory video is associated with participatory approaches such as Participatory Rural Appraisal (PRA), and its application often goes beyond participatory research and learning (Huber 1999). PV is currently used in a number of different contexts, though it has primarily been explored as a tool for international development projects. This is because it can be offered to marginalized populations as a means through which these people can find, develop and project their voice, giving them an entirely new opportunity to influence decision-makers regarding issues that affect their daily lives. In this context, it becomes a powerful tool for empowerment and transformation of local communities (White 2003).

Indeed, PV has been successfully applied to rural development and agricultural extension initiatives around the world (e.g., Nathaniels 2007, Lunch and Lunch 2006, Gandhi et al. 2009, Technical Centre for Agriculture and Rural Cooperation 2010). In these contexts, the focus is on taking advantage of PV's capacity to build relationships, bridge social and professional gaps, and instigate change from within (Technical Centre for Agriculture and Rural Cooperation 2010). For example, Digital Green, a research project in India, works to amplify the effectiveness of local extension systems by exploiting existing social networks and incorporating PV. In a trial involving 16 villages in which PV was used to disseminate agricultural information to farmers, the adoption rate of certain agricultural practices was

seven times greater than when using a traditional extension model. It was noted that this improvement is largely explained by farmers' preference to take advice from someone with a similar background rather than from an expert who is perceived as disconnected from local realities and therefore less trustworthy (Gandhi et al. 2009).

Though PV is often used to enhance participation and learning, it can also be used to achieve a variety of other objectives – from empowerment and therapeutic self-reflection to advocacy and data collection for research purposes (Huber 1999, Petit and Colin 2009, Lie and Mandler 2009). While some scholars and practitioners of PV emphasize that the process of creating a participatory video is the defining feature of the activity (Nathaniels 2007), these benefits appear to have emerged over time as PV was adopted as a viable and useful technique. In fact, the origins of PV certainly had more of a product orientation, as videos in this case were made by fishermen in remote islands with the intention of showing them to other fishermen and to decision-makers. Donald Snowden, who spearheaded this project in the 1960s, trained fishermen on the Fogo Islands off the coast of Newfoundland, Canada to use video equipment in order to document how the decline in fish populations had been affecting their livelihoods. Upon screening these videos to other fishing communities, it became clear that their experiences were commonplace, and that these communities could benefit from organizing and working together. Videos were shown to politicians who were unable to visit the sites they were making decisions about, so PV offered a way to remotely engage with, experience and understand local communities.

In the Fogo Process, as it became known, the focus was on equipping local stakeholders with the tools needed to effectively communicate their experience through a finished product. In this instance, the videos became an alternate form of communication, allowing voices to extend beyond their traditional range. PV has since evolved to have a process-orientation due to the social benefits that have been observed. White (2003) reminds us of the distinction:

> It should be pointed out that not all *participatory video* (PV) is process-oriented. That is, what people are labeling 'PV' is focused on the context for interaction, sharing and cooperation with an outcome of individual and group growth. But some PV may, from the beginning, be focused on simply involving people in a meaningful way from start to finish in producing videotapes to meet a specific communication goal. Therefore, it is important to know the purpose of involvement in the participatory process as it relates to use of video technologies. (p. 64)

In fact, much of the literature on PV makes a distinction between process- and product-oriented participatory video (e.g., Huber 1999, White 2003, Petit and Colin 2009, High et al. 2012). Process-oriented PV involves developing personal and communication skills as a means of empowering a local community, whereas product-oriented PV is about conveying a message directly from a community (i.e., to decision makers) in a form of advocacy.

Embedded within the process-product duality are further characterizations which offer a deeper examination of the features of PV. Petit and Colin (2009) identify seven typologies of PV according to factors such as the emphasis on the product or process, the use of iterative techniques, the control of production, the role of the facilitator, the format of the video, the target audience, and the longer term dynamic that is established. Specific approaches to each of these factors are dependent upon the context in which PV is being used, and in turn define the typologies listed in Box 1.

> **Box 1.** Typologies of participatory video, according to Petit and Colin (2009).
>
> 1. Activism
> 2. Therapy (including research)
> 3. Specialized training
> 4. Exchange of experiences
> 5. Diagnostics, planning and evaluation
> 6. Mediation/concertation
> 7. Communal media

The first and the last categories listed here are considered by these authors as being at the boundary of participatory video, due to the fact that the production process of videos for these purposes are more similar to typical video production techniques. It is claimed that such objectives can be achieved without necessitating a participatory approach. This does not, however, infer that a participatory approach cannot be used for these objectives; indeed the Fogo Process had a strong activism orientation.

In Lie and Mandler's (2009) analysis of the use of video in development, four major typologies are identified according to the objective and process involved. Though their analysis extends beyond pure PV to include other forms of video that are used for development purposes, their categorization does provide an alternate framework for consideration.

Table 1. Video in Development Typology (source: Lie and Mandler 2009, p.6)

I Video for awareness raising and advocacy	II Video for stakeholder engagement and action	III Video for capacity building	IV Video for reporting and data collection
(a) Video for awareness raising (b) Video for advocacy		(a) Video for rural learning (b) Video for the exchange of experience and reflection	

This typology corresponds more or less with Petit and Colin (2009), and authors in both instances acknowledge that these categories are neither rigid nor mutually exclusive; projects can simultaneously fulfill multiple objectives and provide development opportunities in several ways.

Technology has changed significantly since the 1960s, particularly with regard to access to video-making technology which many people have embedded in their cell phones. Video sharing capabilities have exploded with the use of the Internet, and participatory culture has come to dominate our interaction with media now available online (Montero n.d.). Yet despite being more widely available, this does not necessarily mean that people are more apt to use video technology to initiate change processes in their communities.

> In spite of decreasing costs and difficulty, digital video is still not used as often as it could be in many promising projects on research for development. Nor are community groups, trade organizations and NGOs necessarily accustomed to using video as an empowering tool for their members. Whilst access to visual media is fast increasing in developing countries, there is still limited availability of relevant local information to inspire and motivate people to acquire new skills, make new decisions and re-organise to benefit from markets, new technology and social opportunities. (Danish Development Research Network 2008, p. 1)

In short, though the hardware is increasingly available, proper facilitation remains the necessary component to increased use of PV in development scenarios. This applies to all scenarios, in developing countries and otherwise.

Finally, it is important to note that as with any participatory action research, caution must be taken to ensure that these types of activities are truly participatory in nature, and attention must be given to address and alleviate the potential effects of imbalanced power dynamics. For instance, a video produced by a mixed group of farmers, scientists and extension workers may end up reflecting only those technologies formally sanctioned by the local authorities – a situation that utterly defeats the purpose of the PV activity – if proper facilitation of this group is not carried out. Because of long-standing social roles, farmers may end up deferring to extension workers as information-providers and may experience difficulties speaking up to offer their true voice (Nathaniels 2007).

3. METHODS

Given the goal of this research to investigate potential use of PV in agroecology education, the methodology was designed as an exploratory study (Yin 1994). This enabled an evaluative exploration of the effect of PV in different settings in order to "describe an intervention and the real-life context in which it occurred" (Yin 1994, p. 15). The use of multiple case studies provides the potential for generalizing findings, offers the opportunity to identify common themes across cases which leads to theory generation, supports research rigor and validity due to the triangulation of evidence, and ensures the reliability of results by defining a replicable methodology (Christie et al. 2000).

To meet this goal, three different case studies were carried out at educational institutions in three European countries. Groups in each case collectively produced a participatory video about a topic that was important to the group and qualitative methods were used to collect and assess data. The projects were diverse in their duration, mission, and in the stakeholders involved. With one group, participatory videos were made over the course of days whereas in another location, the group spent more than a month on the project. The extent to which each case resembled another depended upon the objectives and goals of each participant group. It was also affected by logistical considerations including travel time and budget, participants' schedules and distance between participants. The extent of my control over the design of each case study was intentionally limited in order to maintain the participatory nature of this action research. However, this should not be seen as a detriment to the truthfulness of this research, since the nature of participatory video is to be out of the control of the facilitator; control of the project necessarily lies by definition in the hands of the participants. Stakeholders ranged from students and farmers to professors of agriculture and museum educators, and were unique to each case.

3.1 PARTICIPANT SELECTION

Participants were selected due to their affiliation with members of a project of the European Commission's Lifelong Learning Programme called the Green Learning Network (GLN). GLN is a three-year-long, multinational project that is intended to bridge the gap between research and practitioners in the Agriculture, Biodiversity and Rural Affairs (ABR) field by creating a network of educators, institutions, agricultural professionals and learners that transcends borders via collaborative

exchange through an online platform. GLN uses a pedagogical framework that is based on the Contextual Model of Learning, which addresses personal, sociocultural and physical contexts, and draws heavily from the approach of Inquiry-Based Learning (Green Learning Network 2015). Each of the GLN members that took part in this study perceived that the PV project could align with their mission and be fairly easily integrated into their work. Participants in the three different groups were identified and recruited by members of the Green Learning Network from within their local networks. Since each project had its own unique character and objectives, methods were adapted to fit the local context.

The first case study was carried out at AgroSup Dijon (ASD), a school of agronomy and agricultural engineering in France that offers a traditional university education as well as continuing education and distance learning programs. ASD also partners with local agricultural research institutions and houses the Eduter Institute, a large publisher of digital and print-based agricultural educational materials and pedagogical tools. Eduter has a history of research and development in the field of science education and educational techniques and currently orients a focus on open and distance learning processes and curricula, in line with the objectives of GLN. ASD acts as the coordinator for GLN, providing project management and financial oversight services. One member of the GLN team at ASD recommended that I work with a group of students belonging to or affiliated with Agro-Logique, a student association that promotes agroecology at ASD. Agro-Logique was targeted because the proposed project was expected to be time consuming, requiring a group of participants who had a personal interest in the advancement of agroecology and would therefore be willing to devote their time. Furthermore, these students were preparing for periodic visits to assorted farms across the country in the form of an internship program, so the opportunity to integrate PV into these visits was present. In the end, seven students and their "host" farmers agreed to participate in the PV project.

The second case study took place at the University of Gastronomic Sciences (UNISG) in Pollenzo, Italy. UNISG was founded by the international nonprofit Slow Food in 2004 and offers an interdisciplinary approach which brings perspectives from both science and the humanities to the study of food and its relationships with society, economy, culture and politics. Students gain real-world experience through study trips, which are often documented on video and hosted on the university's website Granai della Memoria. This video database project is intended to capture and preserve traditional knowledge through the collection of testimonies of farmers, workers, artisans and

entrepreneurs, particularly in rural areas, giving often overlooked voices a chance to be heard by a wide audience (University of Gastronomic Sciences 2016). This creation of digital open educational resources (OERs) that connect researchers to practitioners is one example of how UNISG's objectives align with those of GLN. The university offers students the option of selecting an agricultural track in their studies, which gives them access to didactic gardens on campus to enhance their studies through practical experience. One member of the GLN team at UNISG – a professor of agriculture – suggested that I work with individuals who are active in maintaining the garden since there was a documented need to promote and enhance participation in the gardens (Hallett et al. 2015). Therefore the participant group at UNISG was made up primarily of students following the agricultural track, but also included an assistant professor of agriculture and two farmers who were temporarily in Italy through the World Wide Opportunities on Organic Farms (WWOOF) organization. As former Peace Corps volunteers, these two individuals brought a unique perspective about PV, having had experience using the technique in development projects in Africa.

The third case study occurred at the Botanical Garden of the National Museum of Natural History and Science (MUHNAC) at the University of Lisbon in Portugal. MUHNAC's mission involves documenting the diversity of the natural world and ensuring accessibility of these collections, supporting scientific advancements through innovative R&D, and promoting scientific culture through its exhibitions which draw upon inquiry-based educational programming. Members of GLN from MUHNAC bring extensive experience with the application of Inquiry-Based Science Education (IBSE) to environmental education, and approached me to help them integrate video into upcoming workshops they were planning with urban farmers in the city of Lisbon. They were interested in training workshop facilitators how to use PV in order to give farmers the opportunity to document their experiences and collectively produce their own videos, which would be used by the museum as digital educational resources. This training session was modeled after the PV workshop I followed at Aarhus University, and was attended by six museum educators and two graduate students of the University of Lisbon who were expected to facilitate future workshops with urban farmers.

By including these three diverse groups of educators, students and stakeholders in three countries, it was possible to collect information from three distinct cultures and agricultural contexts. This provides the potential for comparing and contrasting the results of three unique experiences, and allows potential for extrapolating the results, drawing conclusions and making generalities about PV methods in a

broader application domain. The evaluation of the three cases provides information that will help to answer the key question: What are key functions and implications of using participatory video in agroecology education?

3.2 PARTICIPATORY VIDEO METHOD

The technique for carrying out the projects was derived from Insights into PV (Lunch and Lunch 2006) as well as information gleaned from a PV workshop facilitated by Nick Quist Nathaniels, which I attended at Aarhus University in Denmark in May 2015. These techniques are commonly used for farm extension in developing countries, so some modification was made to fit the present context. Effectively, the objective of this style of workshop is to reap the social rewards of the creative group process (N.Q. Nathaniels, personal communication, April 8, 2015) by encouraging participants to actively engage in relevant discussions while simultaneously providing them an opportunity to learn about video production techniques which can serve as a means of expression that is useful for communicating these ideas to an external audience. The process relies on an iterative, learn-by-doing approach where each participant gains experience with the camera and filming techniques through trial and error. According to this process, short clips are filmed in small groups and then screened back to the larger group for comments and constructive feedback. Eventually, the storyboard tool – a technique for visually mapping out the sequence of scenes to be filmed – is introduced and used to organize a short story that requires a small handful of frames, in order to help participants learn how to plan their video. Once participants feel comfortable handling the camera and creating a storyboard (a process which for many may entail transmuting preconceptions about video production), the focus is placed on negotiating as a group what they want to tell with their video and to whom, why it is important, and what role each participant should have in the creation of the video (N.Q. Nathaniels, personal communication, April 8, 2015).

3.3 DATA COLLECTION

During the course of the project, participants were asked to complete questionnaires addressing their perceptions of PV and agroecology education. Upon finishing the project, participants were given a

separate project evaluation questionnaire which asked about their experience using PV. Questions were designed following a review of the literature that was made to determine the benefits experienced through the PV process in a variety of contexts. The use of questionnaires helps to establish construct validity since it establishes a chain of evidence through a systematic approach to data acquisition (Christie et al. 2000). As part of the iterative process of action research, the questionnaires were updated or modified slightly from case to case in order to improve on data collection processes; however, the content of the questions remained largely the same. The blank questionnaires that were distributed in each case can be found in Appendices D through J.

Focus-group interviews, informal interviews and participant observation were also used to gather additional information when conditions permitted. The focus-group interview at ASD followed the format of a Creativity Session, a program developed by GLN to collectively create learning scenarios for inclusion in the online database of teaching resources. The agenda for this session as well as the deliverable produced for submission to GLN are included in Appendices B and C. Informal interviews with individuals involved with a previous assessment of communication needs at the didactic gardens at UNISG explored theoretical applications for PV. The focus-group interview at MUHNAC was informal and revolved around reflecting on lessons learned for future application in the upcoming workshop with urban farmers. Additional informal interviews occurred on-the-fly, generally during preparations for filming or while participants were editing, and field notes were taken to retain information.

3.4 METHODS OF ANALYSIS

Internal validity was examined through cross-case analysis and through the development of diagrams to demonstrate the internal consistency of findings (Christie et al. 2000). Answers provided on questionnaires were analyzed according to question type. Answers to closed-ended questions were tallied and analyzed using a combination of assigning point values and determining the frequency of answers appearing in a given rank. This combined approach was necessary since participants were allowed to provide multiple answers to a given question and often ranked multiple items in the same rank.

Answers to open-ended questions, which primarily pertained to perceived challenges of using PV in agroecology education, as well as information gleaned from interviews were coded by theme for inclusion in a force field analysis. A force field analysis is a method of assessing a given situation through identification of supporting (driving) and hindering (restraining) forces (Lewin 1951). The assumption is that any situation is the product of a state of equilibrium and that change results from an imbalance of forces. A force field analysis can be useful for pushing forward an agenda because once identified, restraining forces might be translated into actionable items by positing them as goals to be achieved. Once those goals are achieved, an imbalance of forces in the positive direction yields the desired change. The force field analysis was selected for use in this study to provide individuals who are interested in incorporating PV into agroecology curriculum with a clear picture of the forces that are commonly identified by people who have had direct experience with this tool. It is expected that each educational scenario has its own character, so a ranking of the weight of each force was intentionally omitted. Rather, the analysis is intended to provide a launching point for further investigation to individuals considering PV as an educational tool.

4. RESULTS

Three groups in three countries associated with the Green Learning Network participated in participatory video (PV) workshops over a period of five months in 2015. A description of each workshop is presented here, followed by a summary of key themes and findings across and within cases. Although much of the initial information presented here for each group could be considered a part of the Methods for this research, it is included in the Results chapter because of the ongoing adaptive management of the research and the need to continually adjust to what was learned about each group and their specific circumstances.

4.1 AGROSUP DIJON (ASD), FRANCE: PV AND CHANGING PERSPECTIVES ON AGROECOLOGY

Seven students pursuing engineering degrees from the Institut national supérieur des sciences agronomiques, de l'alimentation et de l'environnement (AgroSup Dijon, or ASD) elected to participate in this project after an invitation was extended to all members of the student association Agro-Logique,

an extracurricular organization that works to promote agroecology on campus. These individuals were asked to collaboratively develop the methodology and objective of a pilot participatory video project on the subject of agroecology. Coincidentally, the students were preparing for two-week long farm internships in various parts of France, which is part of their normal curriculum. In negotiations between participating students and a GLN representative at ASD, it was decided that the students would each work with their farm supervisors to shoot some footage, which they would then edit together to produce a single video to be later shown to a larger student audience in order to initiate a conversation about agroecology.

Since the students who elected to participate were doing so through their connection with a group oriented toward agroecology, it followed that the farmers with whom they had chosen to complete on-farm internships had similar perspectives on agriculture. Furthermore, agroecology is a relatively well-known concept in France since it has been identified by the Minister of Agriculture as the trajectory for the future of farming in France (Gramond 2015). This proved to be a point of interest among students and faculty alike since many were interested in how farmers conceive of agroecology in practice.

Students had several short windows of time between their internships and summer holidays, so the activities had to be scheduled to accommodate their needs. Furthermore, internships were spread across the country with each student's placement on a different farm, so activities took place in several ways to ensure the participatory nature of the project: among students in the group while planning content in advance, between individuals students and their farm supervisors, among students during the editing process, and finally in consulting with farm supervisors in order to get their impressions of the final video project and to verify they felt accurately portrayed. This last step was necessary in order to provide the farmer participants with an appropriate measure of control, since it was logistically impossible for farmers to participate in the editing process due to their geographic distribution and busy schedules during the spring.

Before leaving for farm visits, I facilitated a short workshop with them in which they decided on an objective for their video and a common theme to provide focus for the interviews they intended to carry out, including several key questions they would each ask their farm supervisors. They agreed that interview questions would be reviewed and negotiated with farmers in advance in order to provide farmers with the greatest opportunity for ownership over the content of the film. At this point, the stated objective was to explore the different perspectives and definitions of agroecology according to

farmers who manage a variety of farming systems. The theme of interest to the students involved forage production for livestock, so they designed questions specifically about how farmers integrate agroecological principles into feeding their livestock.

Students returned to campus two weeks later with a significant amount of footage and proceeded by presenting to each other what they had filmed. They watched the footage in a group and took turns commenting on what they thought was valuable about each testimony. This naturally evolved into a discussion about the diversity of responses and why messages varied from farmer to farmer, given his or her situation. The conversation naturally progressed into how they could organize these testimonies into a single, cohesive video. They came to a consensus fairly quickly about which clips to use, though they did find it difficult to decide whether each farmer's entire testimony should be presented one-by-one or whether each question should be posed followed by the assortment of answers. After the arrangement of clips was decided, one student took the lead with editing the video, since it was considered too difficult for multiple people to be involved with this process given the need to coordinate schedules.

As a facilitator of their project, I did not feel the need to step in often since the students naturally worked easily together. Being members (or friends of members) of Agro-Logique, an association which had previously organized several projects, they had already established a dynamic that was conducive to working in a group. Certain students automatically took leadership positions yet everyone engaged in participation. I gave them a significant level of autonomy in order to allow them an opportunity to direct their own learning and to observe how this would unfold.

Students showed the final video to the farmers who had taken part, in order to confirm their approval of the final product and to receive feedback. Farmers were generally pleased with the results, noting that the video focused mostly on personal actions in favor of agroecology rather than on agroecological practices themselves. They also commented on their desire to meet the other farmers featured in the video, something which could foreseeably be done in future iterations of the activity given sufficient planning. One farmer noted that out of all farms featured in the video, the most room for improvement of agroecological practices lies at the educational farm of the lycée agricole [agricultural high school]. In this sense, the video even became a tool for diagnostics, demonstrating the wide range of possible applications that extend beyond the intended objective for a participatory video project.

In the following weeks, a focus group workshop was held to build upon and improve the methodology that was developed and practiced by the students during this pilot project. Workshop participants included six of the students who took part in the pilot PV project, three professors from ASD and three employees of the Eduter Institute (an affiliated organization that produces educational materials for schools of agriculture in France). Two of these participants were members of the GLN consortium. The intention was to provide a working model that could be emulated by professors of agriculture at ASD as well as other institutions. Therefore, the workshop followed the Creativity Session model developed by Green Learning Network for creating learning activities that can be shared online. The workshop was focused on exploring the use of the participatory video methodology (PV) as a teaching tool for agroecology.

During the workshop, the pilot participatory video made by students was shown to the group and the students answered questions posed by other participants about their learning experience during the process of creating it. This was done in order to familiarize focus-group participants with the principles of participatory video by way of example, in order to equip them to identify the potential learning opportunities that could be offered by this tool, as well as challenges to anticipate. For example, one participant asked students which they felt was more valuable: the process of making the video or the end product. The responses of students about how the process was more beneficial helped those designing the learning activity to identify a possible strategy to enhance learning for viewers of the video. This solution involved filming the conversations that took place between students as they negotiated how to compile and edit footage – effectively a video about the making of the video.

The output of the Creativity Session was the collective development of an educational activity in which participatory video could be used to broaden and deepen students' understanding of agroecology by exposing them to various perspectives, by requiring them to reflect on their own definitions, and by engaging them in dialogue with their peers regarding these assorted viewpoints. This educational activity was based entirely upon the pilot PV project methodology that was developed and carried out by the students, and was designed according to direct feedback about their participation. Two additional components were added to the exercise in order to deepen the learning experience and support students in relating theory to practice. The first was the idea to record the discussions about how to organize footage and the second involved requiring students to conduct a comparative analysis of information gathered through farmer interviews with the literature. The report describing this activity (available in

Appendix C) was submitted to the Green Learning Network to be included in their repository of best practices. One professor participant in the focus group later submitted a similar exercise using PV for consideration by the administration to be used in future courses at ASD. His approach involves asking students to incorporate a comparative analysis into the video using a research report that was commissioned by the Ministry of French Agriculture (MAAF) which describes farmer perspectives of agroecology (Gramond 2015).

Students later voluntarily organized a screening of their video to a larger student population as an extracurricular event. Following the screening, they independently facilitated a discussion about the contents of the video and the process by which it was made. A brief questionnaire was distributed to audience members in order to assess their reaction. Three out of five respondents to a written questionnaire felt that watching the video had changed their perception (i.e., attitude, feeling, understanding) of agroecology. This was primarily because the video provided an opportunity to observe applications of agroecology in the real world. A few examples of reactions from the audience follow:

> My perception of agroecology has changed in the sense that I could learn different viewpoints of various farmers and teachers on the matter. This is important because they are major players in agroecology. I could see different opinions presented, which were often different than mine. (Audience member at ASD [translated from French])

> I had a theoretical vision of agroecology, and I found it very interesting to see different practical viewpoints be in conflict. This way, we see that agroecology is a concept that everyone defines and applies differently. (Audience member at ASD [translated from French])

> In terms of the definition of agroecology itself, nothing has changed...On the other hand, hearing the opinions of farmers has shown me that for some, agroecology means different things and that in the countryside, agroecology is a blurry concept. People choose it because the word has a positive connotation. (Audience member at ASD [translated from French])

During the discussion that was led by Agro-Logique students, audience members reported that it seemed the video was not made with the audience in mind; they commented that there was no clear introduction or conclusion to help the viewer make sense of what they were watching. It was suggested that the role of the facilitator might be to provide structure by reminding participants of such considerations. One student in the audience also suggested that watching a video of how the video was made would provide more context for the audience to understand and appreciate the content – an idea

that was echoed during the focus group workshop. Another audience member suggested that this particular approach to PV can only be useful for wide subjects that have room for discussion. An informational video containing concise answers to all questions posed would leave the audience without the need for thoughtful consideration in order to delve deeper, so this kind of participatory video was seen as useful for exploring an abstract topic to understand and dissect divergent perspectives. Furthermore, the discussion session with the audience offered additional opportunities for further exploration of the topic. As one student said, "the discussion was interesting because it touched on elements that were invisible to those of us who were invested inside the creation process. It brought an outside perspective" [translated from French].

The video that was produced in this case study is available by clicking on the link below.

Vidéo Participative - Agro-Logique

4.2 University of Gastronomic Sciences (UNISG), Italy: PV and the Case for Collaboration

The time allotted for working with the community at UNISG was limited to one week. In the interest of time, potential topics for the video project were developed in advance, in collaboration with an assistant professor of agriculture at the university who also participated in the PV project. During these preparatory exchanges, it became clear that the major problems faced by the garden were: (1) encouraging students to consistently visit, use and maintain the garden and (2) a lack of instruction available to students on-site throughout the week to support them in working alone and with confidence in the garden.

Accordingly, two themes were developed to offer students as a launching point for their PV project. The first involved creating a promotional video to showcase the garden and attract students by giving participants the opportunity to express the value they find in the garden. The second theme addressed a recommendation made by UNISG graduate students in a research study about the didactic gardens to create user-generated in-situ reference materials such as pictures and written guides for use in the garden (Hallett et al. 2015), and elaborated on it by expanding these materials to include informational videos. These options were presented to the group as possibilities, but it was made clear that they were

free to develop their own ideas, and specific decisions about the objective were left up to the participants to negotiate.

After the group was given a brief introduction to participatory video and this presentation of the optional themes, they engaged in a discussion to determine the topic, objective and content of the video they would create. During this dialogue, several issues emerged regarding the management of the gardens. Participants engaged in problem-identification and brainstormed creative solutions. The conversation diverged from the topic of the video, yet this proved to be beneficial nonetheless. Students brought up several limitations and constraints they felt impeded participation in the garden, such as hesitancy to commit to tending to the garden on a consistent basis, lack of exposure to the garden for incoming students, and lack of time in their schedule to visit the gardens.

New ideas were developed and decisions were made about how things could be done differently in the future to encourage an increased level of student activity in the gardens. For example, while discussing what message they wanted to convey in the video, it was noted that many students had no idea where to find the gardens. It was discussed briefly that the video could be used simply to demonstrate how to find the gardens, yet ultimately the group was not satisfied with this and felt they should use this opportunity to communicate something more substantial. As an alternative solution to address the issue, one student suggested that the Garden Group work with the administration to assure that the garden be included during the campus tour that takes place during orientation week.

In another instance of creative solution-finding, participants generated ideas for how to manage a perceived hesitancy among the student population to commit to managing a garden plot, such as setting up a buddy system or mentoring program where students from previous years are paired with incoming students and act as the "grandparent" who shares knowledge, skills, time and energy in a garden plot. This approach would help solve some of the problems identified, such as a lack of experienced technical knowledge on-site throughout the week and the fear of commitment to regularly working in the garden. These developments are noteworthy because even though the ideas themselves had nothing to do with participatory video, it seemed that the process of working together to collectively create a video provided a *venue* for the students to discuss the problems and potential solutions they could identify in the garden.

As the facilitator of this group, I guided the conversation by occasionally taking the time to summarize

what had been said, in order to establish decisions and move the conversation forward, and by posing penetrating questions about the objective and the perspective of the audience, in order to keep participants focused on how to communicate their message. Though most participants already knew each other well, this conversation established a dynamic for the group that endured throughout the project. One student unknowingly took on a leadership role because of the wealth of her early creative contributions; she later commented that she had not intended to be given the responsibility of decision-making to such an extent. Implications of this on the participatory process are addressed in the Discussion section of this paper.

Finally it was decided that the video would be used to raise awareness by expressing the value of the gardens, presented through personal testimonies of students who actively participate in their maintenance. They selected several individuals to explain what the garden means to them personally and how it contributes to their education by offering a means to experience first-hand what they learn about agriculture in the classroom. Such a promotional video of the gardens had not been previously created, so the group saw this as an opportunity to introduce the gardens to fellow students, future students and staff, in order to help them to develop an appreciation for (or "fall in love with," as one student put it) the gardens.

Participants collectively identified other individuals who were not present to ask to join the project and provide a testimonial, but it was at this meeting where decisions were made about the precise objective, the approach (tone, style), and the sequence of scenes. These were notated using the storyboard tool, and it was agreed that original intentions for the video would be preserved by following the plans set forth in the storyboard to the greatest extent possible. As new participants joined throughout the week, the entire context of the project including the storyboard was explained to them so that they would be well-informed about the intentions for the video. As scenes were shot, incoming participants were asked to review footage and identify which takes had their approval for use.

The footage was filmed over a period of two days and provided opportunities for unplanned learning experiences. Since scenes were shot in the gardens, natural conversations took place about the condition of the gardens, certain plants that were growing, and specific practices that needed to be carried out. People involved with filming took the opportunity of being in the gardens to pull weeds, harvest produce, tend to overgrown plants and ask questions about composting. One scene involved a professor giving a lesson in the background, and although his voice was not intended to be audible on

film, the students who were acting as "extras" declared that they had actually learned something useful from this brief staged lesson.

The process of filming the video also provided an opportunity for students to reinforce social bonds and develop ownership over the garden. After one filming session took place, students gathered for lunch and ate the vegetables they had harvested from the garden while discussing diverse topics related to the food system, such as land grabbing. All participants who responded to the project evaluation questionnaire identified that an important objective of the video was to strengthen the community around a common interest, and agreed that this goal was effectively achieved.

The video was edited in one day by two students who were very active in the entire video project, and it was discussed by these two that the process of editing is the least collaborative component of the whole process, and therefore the weakest part of the participatory process. Logistically, it would be difficult for many people to be involved with the process on a single computer, and the students mentioned how useful a collaborative video editing software program could be, if it existed. It was agreed that the storyboard is currently the best option available for maintaining the collaborative nature of the project, since in theory the editor(s) simply follow the plan. One of these students also discussed how the process could be conducive to developing group work skills, if properly facilitated. She noted that – as in other video project assignments she had done – the distribution of workload was not even, and pointed out that this cannot necessarily be seen in the final result. If one student spends significantly more time editing a video than other members of the group, it is not necessarily obvious to the viewer and this can skew the assessment by the teacher. She suggested using the storyboard technique to assign certain scenes to be edited by certain individuals, thus allowing for all members of the group to be involved in the editing process.

The participatory video produced at UNISG is hosted online and has received 1,062 independent views as of the date of writing of this paper, though it is impossible to determine exactly who these viewers were or how they reacted to the video; the comments section of the video post has been underutilized. Regardless, it is safe to say that the group succeeded at reaching their target audience of current and potential students, given the small size of the university community (290 students were enrolled in 2014) and that the video was also hosted on university-related websites. Furthermore, positive comments from the university's vice president indicate that students did in fact achieve their goal of influencing the opinion of the administration.

Ideas for the integration of PV into a learning activity at UNISG's didactic garden were developed informally with participants while the video was being produced. This included discussion of site-specific user-generated in-situ reference materials in the form of participatory videos made by students in the gardens for future students. One example involved a group assignment to make an instructional video showing an agroecological technique that is practiced in the garden, which could then be added to an online database. It was noted that one very important characteristic of such a database is that it must be well-indexed so that it is easily searchable. Another idea involved using video to document change over time, since agroecology is something that takes many cycles or seasons to observe the benefits. This would allow students to benefit from seeing a recording of the state of the garden from previous years in order to decide how to plan for the future. Video could be one method of communication for students to deliver information about the design and planning of the garden to future students. Used in tandem with written descriptions and maps, video can be used to dynamically express qualitative information about the site through both visual and auditory means. Finally, it was noted that depending on their content, any of these videos could also be used by teachers in class, at UNISG or elsewhere, as case-study material or as a point of departure for exploring a concept, or to assign to watch as homework in preparation for a lecture.

Key elements of these ideas were tested for feasibility by incorporating two additional questions into the standard questionnaire that was used in all cases (see Appendix H). Results of the feasibility study indicate that a class assignment to collectively produce an instructional video to train other students about specific agroecological techniques would be considered a valuable learning activity by the large majority of respondents. Only one student declared she would rather do a more traditional assignment such as writing a paper. However, the same sample group has a mixed opinion with regard to the usefulness of the videos produced as reference materials. When asked if they would voluntarily watch online instructional videos featuring agroecological practices, five out of six students answered affirmatively, but three of those who answered affirmatively specified that they would only watch the videos if they were professionally made. This suggests that these participants view instructional participatory videos as more useful for the makers than for the viewers.

The video that was produced in this case study is available by clicking on the link below.

UNISG Orti Didattici

4.3 NATIONAL MUSEUM OF NATURAL HISTORY AND SCIENCE (MUHNAC), PORTUGAL: PV AS AN INQUIRY METHOD

This case study differs from the others in that participants took part in the activity in order to learn how to facilitate future PV projects themselves. Administrators of the communication and education offices at MUHNAC were interested in using PV as an approach to both engage the community and produce digital resources for museum visitors about local issues. A two-phase project was developed by MUHNAC employees to integrate PV into the museum's educational approach. The first phase involved a two-day workshop in which museum employees and graduate students of the affiliated University of Lisbon learned about participatory video in the context of sustainability and agroecology through several informational presentations and then by making their own videos on the topic of sustainability at the museum's Botanical Garden.

Given the short time frame and the desire of most participants to gain exposure to technical aspects of video production, the methodology used for the PV workshop at MUHNAC closely followed the agenda of the PV workshop facilitated by Nick Quist Nathaniels at Aarhus University which spanned approximately the same duration. Nathaniels had presented this method as the ideal approach for introducing basic video production techniques to an inexperienced group, while maintaining high levels of autonomy to support engagement.

A notable addition to the pedagogical approach proposed for the PV projects at MUHNAC is that of Inquiry-Based Science Education (IBSE). This strategy is frequently used by museum educators in the Botanical Gardens to support learners in the development of autonomous learning skills. According to the a presentation given by the coordinator of the education and communication offices at MUHNAC, IBSE is a cyclical learning strategy that involves the formulation of questions, hypotheses, and investigations through exploratory exercises, while maintaining space for reflection about discoveries so that newly-acquired knowledge is applied to the learner's everyday life.

One group at MUHNAC who attempted to make an IBSE video during one of the exercises discovered that the challenge in translating this approach to participatory video lies in incorporating the viewer as an active participant in learning. They reported discussing within the group that if actors in the video are filmed carrying out an IBSE learning activity by posing questions, exploring possible answers and discussing among themselves, this may create a passive learning environment for the viewer.

Alternatively, they said, if questions are posed directly to the viewer for consideration, then the viewer never has the chance to develop problem identification skills – a fundamental component of IBSE – and an opportunity to express key content is missed. This group decided that the objective in using IBSE in a video format should therefore be to guide the viewer along the process of problem identification, investigation and reflection. This may involve leaving questions unanswered for a sufficient time period in order to allow the viewer to hypothesize and reflect on their own, or it may require the formulation of certain types of questions which cause viewers to reflect upon the content presented within the context of the their own lives. It was pointed out that documentaries sometimes use this technique to bring the viewer into an emotional relationship with the content of the film.

In the end, it was agreed that this approach would require significant planning. It was identified as plausible for a video with very specific content, for example one that identifies plants and explores the functionality of their physiology – the video made by this group involved discovering how fig trees grow based on certain observable characteristics. It was suggested that this approach might also be useful during the second phase of the MUHNAC project to provide a method by which urban farmers could express specifics about why they use certain agricultural techniques or how they decide on the design of their vegetable beds. However, it was recognized that participants would need to have a clear understanding of the IBSE approach and these considerations regarding the use of inquiry in video production in order to produce an effective video. Given the need to educate participants about IBSE and the amount of planning that would be required, time available for an inquiry-based PV project is a primary consideration.

Upon completion of the video projects at MUHNAC, participants were asked to reflect upon their experience in a focus group interview in order to apply lessons learned to the second phase of the project. This conversation provided the parameters for a planned learning activity with a group of urban farmers from Lisbon. The group agreed that several options for topics should be carefully selected in advance in order to orient the group towards subjects that are manageable in the given time period. This would minimize the amount of discussion time devoted to determining a topic for the video, leaving more time to get deeper into the subject. This is particularly important because of the limited time that will be available to work with the urban farmers during the second phase. It was also noted that one of the videos produced during the workshop would have been substantially more valuable as an educational resource if the topic had been very specific; this would have allowed for an opportunity to

thoroughly explain the subject in detail. Therefore, it was agreed that the topics offered should be relatively precise rather than open.

The need for access to quality technology for the upcoming workshop was pointed out by the group who had experienced difficulties with editing due to the file format of the video camera they had used. They noted that this is particularly important in order to support the IBSE approach which may require greater flexibility with regard to creative approaches (this correlation is further explained in the Discussion section of this paper). Participants also commented on the importance of diversity within the group, in order to gain multiple perspectives. Finally, participants agreed that a tour through all urban gardens at the beginning of the workshop would help orient participants and give them a clear understanding of what they have to work with in terms of potential filming locations, while also providing each participant with exposure to the gardens and an opportunity to share their work.

Final videos that were produced in this case study are available by clicking on the links below.

Group 1: Recicla!

Group 2: Sustainable Water Practices at the Botanic Garden in Lisbon

4.4 KEY THEMES AND OBSERVATIONS: SIMILARITIES ACROSS GLN CASE STUDIES

Though diverse in specific objectives across groups and locations, the three experiences provided several key themes that were identified and which provide insight into the use of PV in agroecology education. The following data encompass the most significant findings across cases as well as within cases, according to questionnaire responses, interviews and participant observation. Results that were commonly shared in all groups are presented first, followed by results that were specific to each case. This separation helps to identify themes that might be extracted for building a generalization or theory about the use of PV in agroecology education while simultaneously acknowledging the influence of the unique aspects of each case.

According to questionnaire responses in all cases, agroecology education demands certain components that are above and beyond conventional agricultural education. Participants identified that the most important of these involves building learning bridges between different stakeholders. This was

followed by the need to produce training content for students and to empower individuals to be agents of change. GLN members who chose to participate overwhelmingly identified the need to empower or give voice to individuals and build learning bridges between stakeholders as the key aspects of agroecology education. In addition to the options offered on the questionnaire, one GLN member also pointed out the need to develop environments where people are supported in creative expression. See Appendix K for a case-by-case presentation of questionnaire results.

Across groups, PV was considered by participants to be a good tool for expressing content specifically about agroecology; only one student answered in the negative but clarified by asserting that "PV can be very good for any topic" and that agroecology requires practical, experiential learning whereas "PV is especially useful to make abstract topics more understandable." All participants expressed some level of interest in further use of PV; 17 out of 26 respondents identified as being interested in using it as a tool in future work involving teaching, learning or sharing ideas about agroecology, and the remaining 9 respondents were open to this possibility. Teachers led the group of interested participants: 8 out of 11 educators said they would like to incorporate it into future teaching activities.

Even though the exact ways in which PV was considered to be potentially useful in the context of transitioning toward agroecology were diverse across case studies, nearly all participants in every case agreed that the PV activity successfully strengthened the community of participants around a common interest. Communication skills were most commonly identified as the skill acquired by participants during the PV activity.

The primary perceived challenge to using PV in agroecology education across all cases was the amount of time that is required to carry out a PV project. Teachers and educators were specifically concerned about the amount of time spent working independently that such a project could entail. Other commonly perceived challenges (in two cases out of three) were getting the final video into the right hands to effect change, the issue of exhaustiveness of content which involves the need to focus on single issues and reduce subject complexity into order to "fit" it into a reasonably concise video, and access to (quality) video equipment, software and training.

4.5 Differences Among GLN Groups

PV projects in this study fell into two main categories: research/exploratory and advocacy/activism. There was also heterogeneity among time intervals allotted to each group to complete the projects, which allowed for consideration of the effect of project duration on the outcome. The research project spanned a couple of months whereas the advocacy projects lasted a few days. Objectives were also varied across projects. Potential objectives were offered at the outset of each project according to the GLN members' conceptualization of how PV could be utilized in their networks. This gave participants an idea of what the project might be able to accomplish, providing a launching point from which they could collectively determine their own specific objective during the initial stages of the project. The objective statements of each group are listed in Table 2.

Table 2. Objective statements collectively developed by participants during early stages of each PV project.

ASD	UNISG	MUHNAC Group 1	MUHNAC Group 2
explore diverse perspectives on agroecology in the context of methods of forage production	raise awareness to increase student involvement by promoting the value of working in the garden	raise awareness to Botanical Garden public about the possibility of recycling used maps	convey message to public that water in Botanical Garden will be used in a sustainable way

Within groups, variability of the importance and potential ascribed to PV was perceived according to a participant groups' role within the institution. For example, teachers at ASD were generally focused on what PV could do for students in a technical sense: as a means of documenting professional ways of working in real-life scenarios and by giving students knowledge of video as a medium of communication. On the other hand, students at the same institution tended to focus on how PV could help them to learn about ways to work in their future, to feel empowered as change makers, and to formalize their interaction with farmers.

A key finding at ASD was that PV was largely considered to be more useful for the makers of the videos than for the viewers, though an external audience was only directly questioned at ASD and in none of the other cases in the assessment of this impression. Regardless, this sentiment was expressed by many participants and was a frequent topic of discussion during focus-group sessions and informal

interviews alike. The question "who is the video actually made for?"was posed during all stages of the project by individuals who were trying to understand the concept of PV. At ASD where audience feedback was received in a focus-group interview, it was clear that thoughtful consideration of the target audience by producers of the video made a significant difference with regard to how the video is interpreted and received. As one ASD student noted afterwards:

> They appreciated our work but did not understand what the point of the work was. They did not find that the video was viewable to the public...I think that to understand that it is a participatory video, one has to participate in it on their own. It's not possible to understand what it is while watching the final product, except if the final product includes the filming of the creation process. [translated from French]

In this exploratory project at ASD, the process of making the video was a beneficial learning opportunity for the makers but this outcome could not be translated easily to the general public without providing some kind of contextualization, such as inclusion of the video-making process within the final video as this student suggested.

At UNISG, it was made clear that group dynamics, accountability and ownership play a role in individuals' levels of engagement, which in turn defines participation and the overall success of a PV project. Consequently, it was observed that poor group dynamics negatively affected the perception of PV within the group of makers (measured by participants' desire to use PV in future activities and perceived usefulness of PV in agroecology education), even though a high quality video was produced that was effectively used for change advocacy. At UNISG, it was established during the initial meeting that the storyboard tool would be strictly adhered to in order to maintain the integrity of the collective vision for the video. This decision was made in large part to address schedule conflicts that inhibited all participants from filming together. Yet in the end, the bulk of filming and editing was done by only a few people who felt burdened with an overload of work and considered this a breakdown in the participatory nature of the project. Participants who observed low levels of collaboration were less likely to experience the full transformative value of PV and would therefore be less inclined toward considering PV as a useful tool. This dovetails with another key observation which was that the trade-off for attempting to create a product-oriented video in a participatory manner is that other benefits of the participatory process may not be realized to their fullest potential.

Finally, at MUHNAC, Inquiry-Based Science Education was explored as a potentially relevant strategy for PV, given that it equips students to take ownership over their own learning, but logistical problems

were experienced in implementation. It was observed that IBSE practices could be utilized during the process of planning and making a video to drive research into a topic, but it was much harder to conceive of and develop a video that incorporated elements of inquiry-based learning into the final product. In other words, the group struggled to produce a video that would encourage the viewer to practice inquiry learning themselves, since information flow in video format is by nature unidirectional.

5. DISCUSSION

Each section of this chapter addresses a subquestion or component of the main research question as indicated in the text. Collectively, these analyses work to answer the research question in its entirety. The validity of methods chosen for this study is discussed in the final section.

5.1 DIFFERENT APPROACHES TO ADDRESS DIFFERENT ASPECTS OF AGROECOLOGY

Agroecology is a multi-faceted subject and is considered to different extents as a science, as a set of practices and as a social movement according to cultural and geographic differences (Wezel et al. 2009). PV is particularly well-suited to these divergent conceptualizations of agroecology because participants can make videos that fit their views of agroecology without compromising the integrity of the PV process. Projects might emphasize either the process or the product depending on the prevailing perception of agroecology in a given context, but ultimately participants are not required to pick among these threads as all aspects of agroecology can be naturally incorporated using a dynamic method like PV. A deeper examination of these ideas in the context of this research helps to answer the main research question: What are key functions and implications of using participatory video in agroecology education?

The learning activity developed in the focus group workshop at ASD provides an example of how PV can be used in consideration of agroecology as a social movement while leaving space for an analytical framework. The activity addresses a transition to agroecology primarily as a social-cultural transformation, since it uses participatory video as a tool to establish collective parameters of a values-based movement that is under constant evolution. Agroecological decision-making is based on a more

complex array of factors and attitude than a simple cost-benefit based, economic type of assessment; these values need to be clarified and understood. By asking farmers to put these values into words, students are given an opportunity to calibrate their own capacity for agroecological decision-making. As Rosset et al. (2011) conclude in their analysis of the agroecological transition in Cuba, "key to success is absolute respect for local culture and customs in each locality...the process should emphasize recovering, valuing, recognizing and promoting local knowledge, and complementing but not overwhelming it with knowledge from the outside" (p. 185). The exercise asks students to compare how farmers describe agroecology to their own preconceptions and to the literature. This provides an opportunity for learning on multiple levels: the student explores the array of perspectives and definitions of agroecology while simultaneously developing their own analytical skills.

If looking at agroecology as a science, the incorporation of Inquiry-Based Science Education (IBSE) principles fits well into the development of learning activities for this field. There are several commonalities between IBSE and approaches to agroecology education that are described in the literature. For example, the pursuit of lifelong learning is integral in both cases. "There is value in explicitly embedding (*scientific*) information literacy development activities into IBSE" (Green Learning Network 2015, p.33) since information literacy is considered to be at the core of lifelong learning and essential for student-centered pedagogies. Inquiry-based approaches to learning encourage students to develop the skills to apply the scientific method to a situation and to be responsible stewards of information through how they source and manage their research. Furthermore, the iterative process of IBSE closely resembles Kolb's Experiential Learning Model, which is proposed as a foundational element of agroecology education (Francis, Lieblein, et al. 2014).

The basic practices and principles of IBSE were introduced to participants of the PV project at MUHNAC during a presentation made by a member of GLN. Several valuable questions were posed for consideration by participants to help them think about how they might apply the IBSE approach to the production of their videos:

- How can I think to make this video communicate better with the public?
- How will I engage the people who see this video?
- How can I provoke their curiosity?
- How can we film things that will orient the public for the hypothesis they could create?
- How can we leave some questions for the public to be excited to answer for themselves?

Although these questions may indeed be useful for creating an engaging video product, it was observed

at MUHNAC that the convergence of an inquiry-oriented video with a participatory video is logistically quite difficult without sufficient time for extensive consideration and planning. Participants struggled to find a way in which to create a video that would simultaneously reflect their experiences while also leading viewers to engage in their own inquiry.

One way in which IBSE could be integrated into the PV process is through a project in which the video-making process acts as a venue to practice inquiry. In this scenario, it is the video-makers who are incited to perform inquiry, not the audience. For example, there could be value in intentionally applying the seven pillars of information literacy – identify, scope, plan, gather, evaluate, manage, present (Green Learning Network 2015) – to the process of creating a video in a group. The video about recycling maps at the Botanic Garden is an example of how inquiry-learning skills were developed in the process of making a participatory video: participants knew they had to present a concept related to sustainability at the Garden through a video, but they were unfamiliar with sustainability issues in the Garden, so they engaged in a process of inquiry by asking key stakeholders around the campus for information. Through this process, they identified an issue, posed questions about how to solve it, developed a working solution and presented it all in a short video clip. This series of actions was unplanned and evolved organically, so future research is needed to develop a concrete methodology for this kind of approach.

5.2 PARTICIPANTS' PERSPECTIVES ON PV IN AGROECOLOGY

Participants in three locations in this study agreed that agroecology education must diverge from standard methods used in conventional agricultural education, echoing opinions found throughout the literature. By comparing the specialized needs involved in teaching and learning about agroecology to the benefits identified by participants that PV could offer, we can assess whether PV can actually address any of these needs and thus begin to determine whether it can be a useful tool in agroecology education. This comparison was used to answer the first subquestion of the research question: Can PV projects enhance participants' skill sets as agroecologists, including those identified by Lieblein et al. (2012)?

Questionnaires were designed to acknowledge the multi-functionality of PV, in order to determine

participants' view of which aspect(s) of PV might be specifically relevent in the context of agroecology education. The point of the questionnaires was to determine if benefits that are experienced when using PV in development contexts would also be perceived by respondents as applicable to the development and exchange of knowledge about agroecology.

Possible benefits offered by PV that could relate to learning about agroecology were identified through a review and analysis of the literature, which helped to establish construct validity. These benefits can be organized according to function, as in Table 3. Certain other benefits, in addition to those listed on the questionnaire, were identified by participants via an open-ended question and are indicated by *.

Table 3. Functional categorization of possible benefits of PV in the context of agroecology education.

| Objective | Benefit | Corresponding typology in literature[1] | |
		Petit and Colin (2009)	Lie and Mandler (2009)
Advocacy / Activism	Communicate to decision-makers	1	I(b)
	Generate open-source digital media for wider public	1	I(a)
Instructional / Training	Document professional ways of working in real-life scenarios	3, 5	IV
	Produce training content for students	3	III(a), IV
	Produce training content for lifelong learners	3	III(a), IV
	*Visual documentation of progress/rotation year after year on a single plot	-	-
Exploratory / Research	Opportunity to put into words things that might otherwise go unspoken	5	III(b), IV
	Enable farmers to formulate research needs	5	IV
	*Identify key successes/testimonials for establishing models to adapt/adopt	-	-
	*Identification of core problems/issues with current methods and of solutions	-	-
Personal Development	Empower participants to be change-makers	1	II
	Give students knowledge of video as a medium of communication	3	III(a)
	Opportunity to develop group work skills	6	III(a)
	*Help students to critically think about how to solve social issues	-	-
	*Offer proper environment where people can express creativity	-	-
	*Opportunity for students to learn to communicate succinctly	-	-
Social Capital Construction	Legitimize/formalize student interaction with farmer/professional	4	II
	Build learning bridges between different stakeholders	4	III(b)

[1] See Box 1 and Table 1 in *Background on Participatory Video* for corresponding typologies.
* Indicates benefits suggested by questionnaire respondents via an open-ended question.

Each objective listed in Table 3 is arguably integral to agroecology education and the spread of agroecology in some way. For example, Pretty and Hine (2001) focus on the need to build social capital in rural areas. Lieblein et al. (2004) emphasize that agroecologists should have knowledge of farming systems by exposure to professionals working in real-life scenarios as well as practice in good communication and group skills. Participants in this study identified that they believe the most important among these objectives involves building learning bridges between stakeholders, a component of social capital construction. The way in which each objective contributes to a movement toward agroecology is briefly described in Box 2.

It is important to note that the objectives defined here are not necessarily comprehensive, nor are they exclusive of one another. While video projects carried out during this study were identified as primarily having advocacy/activism and exploratory/research objectives, other benefits were certainly experienced by participants according to their questionnaire responses. For example, students at ASD made a video with an exploratory/research objective, yet they emphasized that is was during the conversation about the video where the most learning took place. During this exchange, both personal and group skill development took place, even though this was not the primary objective of the project. The following quotes from ASD project evaluations demonstrate the multiple levels of learning that took place during those important conversations:

> I think the participatory video permits learning on a topic on the basis that the person who has to learn (a

Box 2. How each objective supports an agroecology agenda

Advocacy / Activism
The case for agroecology must be made to a wider audience for its adoption and integration into the mainstream. This audience is primarily composed of individuals in positions of power, but also includes other decision-makers, such as farmers and consumers.

Instructional / Training
Through the creation of instructional content, specific agroecological techniques and practices are documented. This provides resources for students and lifelong learners who want exposure to such content. In the sense that agroecology is a set of practices, it is important to produce informational resources that demonstrate these practices in a variety of contexts.

Exploratory / Research
Agroecological understanding evolves over time which requires inquiry and investigation. Researchers seek to understand how agroecology is practiced in the field in order to identify research needs, and practitioners rely upon scientific advancements as well as peer advice in order to improve practices (Warner 2007).

Personal Development
The capacity of a community is enhanced through the development of individuals' personal skills. Certain core competencies are required for agroecologists, such as participation, reflection and dialogue (Lieblein et al. 2012). In particular, agroecologists should be able to work across stakeholder groups, which requires good communication skills.

Social Capital Construction
Since it is an transdisciplinary approach, agroecology requires the participation of individuals from a variety of backgrounds. Despite occasionally divergent interests, it is important that these groups are accustomed to engaging with one another in order to reap the benefits of exchange. This is particularly true of exchange between farmers and researchers, who can be said to embody the gap that exists between theory and practice.

student for example) is an actor in the interview of professionals, but also in the reflections concerning the construction of the video. The participatory video, in my opinion, can hardly be better than a documentary as a learning tool for the spectator who views the final version. The interesting aspect is thus to be a part of this project, and actively create it. (ASD participant [translated from French])

To construct the video, it is important to first of all classify the order of questions which are going to be asked to farmers and rank them to try to be concise and clear in the final video. The act of analyzing and ranking is what seems essential to me as an engineer....It is by discussing with other students while constructing the video (order of questions, which questions are off-topic, etc) that everything was clarified in my head. (ASD participant [translated from French])

This conversation among students was composed of alternating processes: observation of raw footage of farmers discussing agroecology, dialogue to formulate shared understandings about content, and reflection upon how new insights may transform one's own perceptions. This process took place in the space between exploration and personal development, and thus cannot be relegated to the achievement of one single objective. This iterative process which draws upon the important actions of observation, dialogue and reflection is a cornerstone of agroecology education (Lieblein et al. 2012).

According to questionnaire responses (which were tabulated and are included in Appendix K), the need to build learning bridges is the primary way in which agroecology education deviates from traditional agricultural education. Other important differences identified via questionnaire are the production of training content for students and empowerment of individuals to be agents of change. Participants generally perceived that PV could fulfill the latter two of these three needs. However, results indicate that PV was not widely considered to be useful in building learning bridges. This result is surprising given that the literature assigns PV the quality of transcending social and cultural boundaries, offering the opportunity for information exchange across barriers. As Nathaniels (2007) argues, PV "may be better seen as a process of exchange and learning through being exposed to the realities of others" (p. 29). There are several possible explanations for this result. Questionnaires were distributed in the midst of the project and only measured participants' perception at that given moment before full benefits could be realized. Another explanation for this could involve poor translation. In Italy and in Portugal where research was carried out in English, building learning bridges was frequently cited in the top three benefits that could be offered by PV. However, in France where research was conducted in French, its ranking was much lower. An indication that the colloquial term may not have translated well was given when one survey respondent noted that they did not understand this phrase.

It is worth noting that questionnaire respondents at ASD generally perceived PV's strengths to fall under the Instructional/Training category, whereas MUHNAC saw PV primarily as an instructional tool and secondarily useful for advocacy. This indicates that when participants at both of these institutions responded to the questionnaire, their conceptualization of the utility of PV was oriented towards the video as the end product. On the other hand, UNISG respondents indicated that they saw PV as a useful tool for personal development, particularly because it was considered as a way to empower participants to be agents of change. One way to interpret this difference is by recognizing that most people's association with video production places the end product above all else. Even individuals who are actively engaged in a participatory video project may have a hard time dissociating from this ingrained perception (N.Q. Nathaniels, personal communication, April 2015). Yet several respondents at UNISG were already familiar with the transformative power of PV having worked with it or other forms of participatory action research in the past.

Interestingly, by examining project evaluations which were conducted after the PV project was complete, it becomes obvious that participants did indeed experience this socially transformative power of PV, even if they did not indicate a conscious recognition of this characteristic of PV through the first questionnaire. Many respondents reported having achieved various aspects of social capital construction during the course of the project. For example, almost all participants felt that the project had successfully strengthened the community around a common interest. This highlights the subtleties of some of the benefits that PV has to offer. Participants might experience the benefit without recognizing its value overtly.

5.3 Considerations About Process- and Product-Orientation

The distinction between the two main categories of videos made during these case studies (advocacy/activism and research/exploratory) parallels the process-product distinction made in the literature. Purpose plays a defining role in participatory video projects (White 2003). During these case studies, the purpose of the project greatly influenced choices for methodology. It is therefore presented here as a primary topic when answering the second subquestion of this research: What considerations should be made when designing a PV project in the context of agroecology education and action research?

At ASD, the intention was to create a learning activity that supported the construction of learning bridges so that information could be shared between farmers and students; therefore, focus was placed on the process of making the video during which time students had opportunities for exploration, exchange and reflection. Their feedback confirmed that this also helped them to develop their critical analysis skills, which they deemed as the most important skill to acquire for their future work in agriculture. At UNISG and MUHNAC, the processes were abbreviated, in part due to scheduling but also because objectives were to create messages to reach external audiences. This required less discourse and conversations generally revolved around the creativity, problem-solving and decision-making that was required in order to produce the final products.

Figure 1. Conceptual diagram of functional categories for PV in agroecology education
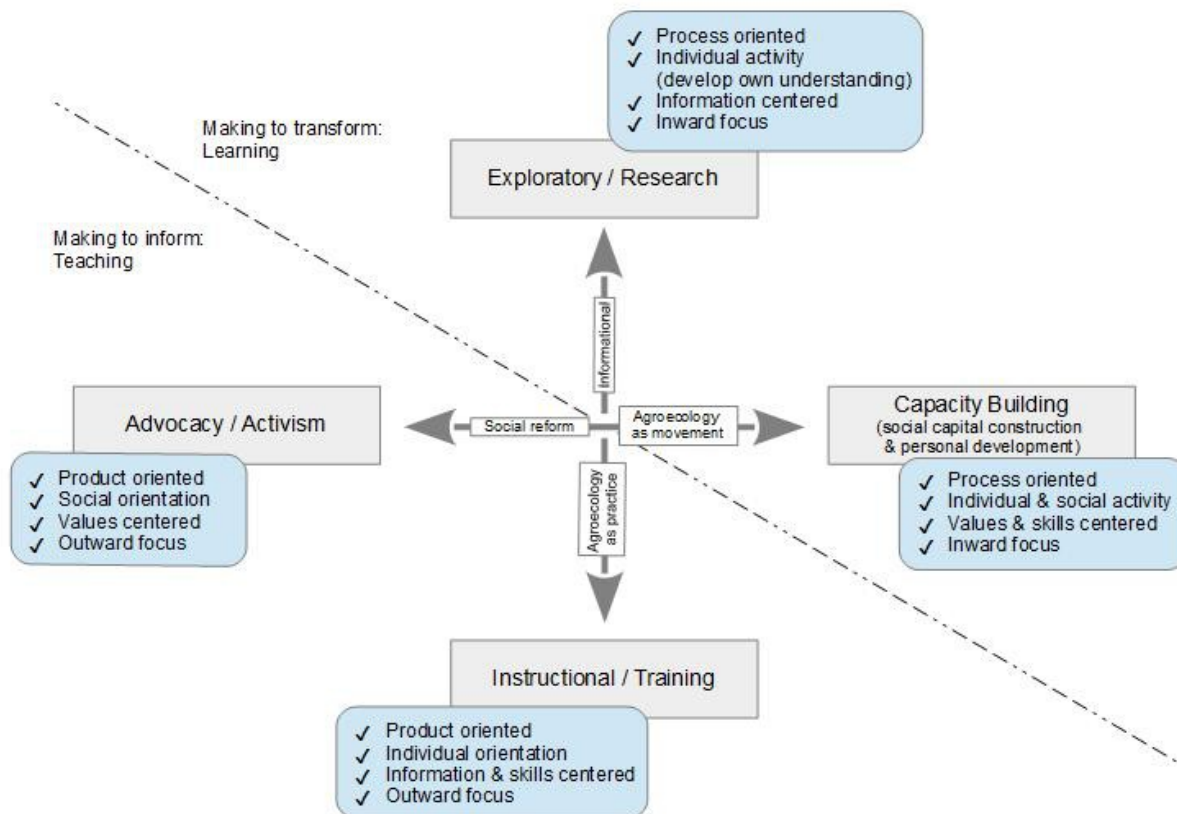
Another way to consider the process-product duality is: PV to inform (product-oriented) and PV to transform (process-oriented). Again, this delineation should not be considered exclusionary; projects were observed to straddle this boundary. The framework simply provides another layer of analysis, as

demonstrated in Figure 1. This diagram also shows how the functional categories[1] from Table 3 relate.

In the context of using PV for reflection and analysis – in line with research or exploratory usage – Lunch and Lunch (2006) emphasize that "the best results occur when we focus on the process, not the product" (p. 39). At ASD where the focus was certainly placed more heavily on the process than on the product, it was observed that a research/exploratory (process-oriented) video project did not create a sufficient, stand-alone product that could be used out of context as an educational resource (for example, hosted online):

> [The audience] appreciated our work but did not understand what the point of the work was....I think that to understand that it is a participatory video, one has to participate in it oneself. It's not possible to understand what it is while watching the final product, except if the final product includes the filming of the creation process. (ASD participant [translated from French])

This stands in contradiction with the original hypothesis which suggested that PV could fulfill dual purposes in all cases. Even so, a process-oriented video was acknowledged by an instructor as having the potential to be used as a launching point for discussion in a classroom setting. Indeed, videos from the Granai della Memoria[2] are currently used in such a manner at UNISG (A. Costa, personal communication, June 2015).

Yet the hypothesis still holds true in other cases; participants in advocacy/activism (product-oriented) video projects at UNISG and MUHNAC acknowledged benefiting from the development of personal skills and from an opportunity to identify issues that are relevant to the group by means of the video project, in addition to creating video products that they felt effectively conveyed their messages. This is because – regardless of purpose – PV creates a venue for exchange about issues, giving individuals a chance to better think about and articulate their situation. This was directly observed at UNISG, where the conversation evolved into creative problem solving of the identified issues of low commitment levels and lack of on-site technical expertise.

This suggests that the fundamental characteristic of PV is to transform (participants), but a secondary

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1The categories Personal Development and Social Capital Construction were merged to form Capacity Building, in line with the associated typologies in Lie and Mandler (2009): III(a) and III(b). See Table 1 in *Background on Participatory Video*.

2Videos hosted on this database are primarily produced for assessment rather than as an exploratory social learning activity; as such, they have a product-orientation and are therefore more conducive to presentation without the need for contextualization.

effect of informing (an audience) might also be achieved depending on the orientation of the project. The potential dual purpose is developmental, in that participants experience some kind of transformation during the process and may use that to inform others. The transformation takes place first and lends a grounded and living authenticity to the message when it is refined into a means for advocacy: a message coming directly from the field. As one participant at ASD noted:

> My perception of agroecology is now much clearer and tied to reality. By discussing with farmers this helps us to not stay in a form of idealism, and instead helps us understand how agroecology can concretely be put in place. (ASD participant [translated from French])

This sentiment was echoed by a member of the audience who acknowledged experiencing a change of perception about agroecology as a result of having watched the video:

> I previously had a theoretical view of agroecology, and I found it very interesting to be confronted with "practical" points of view. We therefore see that agroecology is a concept that everyone defines and applies differently. I find that it consists of a collection of agricultural practices that are based in a desire to manage one's farm as a global system. (ASD audience member [translated from French])

Apparently, despite the ASD project's process-orientation and feedback from audience members who commented that the video needed to be contextualized, this video still achieved the dual purpose of transforming and informing – at least for some. This is likely due to the fact that the video was shown as a launching point for a conversation about agroecology with the makers of the video, during which audience members were invited to ask questions and participate in discussion.

Given that participants in every case acknowledged PV's effect on strengthening a sense of community and improvement of communication skills, it can be said that the base purpose of transformation was achieved in all cases to some degree, and will likely be achieved in all PV activities that are effectively carried out. True participatory research characteristically results in learning and better social cohesion, and PV can certainly be considered as one form of participatory research (High et al. 2012). This suggests that regardless of the orientation or objective of a PV project, personal and/or social development (capacity building) is experienced in the process. For example, participants at UNISG responded in the following ways to a question about whether the process of making the video or the final product had more significance: "the process, it motivated [me] and gave me many ideas on how to promote the gardens in the future" and "the process of making the video, because [it] is the moment of the personal growth." Initially these responses were surprising since the project at UNISG was

identified by participants as heavily product-oriented, with the objective of widespread viewership in order to effect change among the university community and administration. Yet viewed within the context of the dual developmental effect of PV described here, it makes more sense.

This is perhaps the most important finding of this research because it answers directly to the research question: an important function of PV in agroecology education can be personal and group capacity building. Regardless of the specific topic or the amount of knowledge exchanged, participants stand to improve their interpersonal skills by participating in a collective project. This observation is in line with feedback received via project evaluations. Nearly all respondents in every case identified that the PV activity successfully strengthened the community of participants around a common interest, and communication skills were most commonly identified as the skill acquired by participants during the PV activity. As was observed by participants at MUHNAC during the focus group interview, the greater the diversity among participants, the more powerful this feature of PV can be. Therefore, participant groups should be selected to represent diverse perspectives and assorted backgrounds in order to offer the greater potential for challenges and rewards. This lies at the core of the successful application of PV as a social learning tool for the advancement of agroecology: using the process to build and reinforce learning bridges through enhanced communication.

Though product-oriented activities do provide opportunities for capacity building, the potential for in-depth learning about the topic (i.e., agroecology and associated practices) was observed to be lower in the product-oriented projects than in the process-oriented project at ASD. It appeared this was directly due to attention being focused more heavily on the technical details of video production. Makers of product-oriented videos were also more concerned with creating a short and concise video in order to retain the attention of the viewer. In these cases, presentation took precedence over richness of content. Furthermore, it seemed that video makers with a message to convey already have a certain knowledge of the subject matter. Knowledge may be exchanged while collaborating with others in seeking the ideal way in which to frame and convey a message, but little room remains for in-depth exploration of the topic in a product-oriented video.

This highlights another of the most important findings of this research: participants generally considered the PV process to be more useful for the makers than the viewers. My hypothesis that these videos would fulfill the dual purpose of transforming and informing did not take into consideration the need for a structured approach to creating a video that would effectively accommodate or guide the

viewer through a video made for the purpose of exploring a topic.

The conclusion to be drawn from this is that PV can be most effectively used in agroecology education for process-oriented objectives. Videos that maintain an inward focus will more likely increase participants' understanding of the material while also building capacity. However, when these videos are contextualized, they may also be an important resource for an external audience and could play an important role in informing others of the discoveries made through the exploratory PV process. The degree to which each objective is sought can vary according to the local situation and the desired effects. It is simply recommended to keep these considerations in mind while developing learning goals for the PV project. Whether or not the dual purpose is achieved (transform and inform) has to do with the objectives set from the beginning. Considerations should include identification of the target audience of the video (whether that be an external audience or simply the video-makers themselves), level of attention paid to the development of a coherent message, and how the video will be presented and utilized.

5.4 ROLE OF THE FACILITATOR

An examination of my personal experience as the facilitator of PV projects that were carried out in the context of learning about agroecology will help to further answer the second research subquestion which addresses methodological choices. Fleury (2010) posits that a shift in teaching culture and strategies must occur, particularly with regard to education about sustainable development, agriculture and natural resource management. Teachers must be willing to continuously question their own assumptions and maintain an open space to allow for mistakes to become a tool for learning. In this new mode of learning, the role of the teacher necessarily evolves from informer to facilitator (Gailleton and Moronval 2013). Facilitators of PV must be equally willing to relinquish control, allowing participants to learn independently through some amount of trial and error. Lunch and Lunch (2006) advise facilitators that it is a show of trust to hand over control of the video equipment and filming activities, a gesture that will often be reciprocated by the community putting its trust back into the facilitator. Ultimately, no external person can or should control the PV process. Its outcomes (both the product and the processes) are by definition owned by the community making the video. Instead, the facilitator is there to hold space and provide a venue in which groups can collaboratively create.

With these considerations derived from the literature in mind, I approached my role as facilitator of these PV projects with a generally hands-off attitude. One intention of this open methodology was to give participants leeway to design an approach that they felt was conducive to their own learning. I saw my function as the provider of the information necessary to help participants conceptually understand PV. Secondarily, I considered myself as coordinator of schedules and logistics. This would occasionally mean that I needed to interject when conversations diverged, in order to keep progress on track. Finally, I also acted as the external audience, asking probing questions from the sidelines to help bring participants' awareness back to the outside perspective when they had become too entrenched.

Overall, I offered myself as a resource for support. This worked well in contexts where participants were used to working autonomously, but proved to be a point of difficulty for those who were less used to being in control of their own learning. At ASD, students reported feeling frustrated at having too little guidance about what was expected of them in this activity. Such a sentiment is to be expected from students who are suddenly given the responsibility to create their own learning activity, particularly if it presents the first opportunity for reflection on how one learns. A professor who participated in the focus-group workshop later explained that the tendency in French educational structures is towards a top-down orientation where teachers are the providers of information, and that he frequently encounters students who are uncertain about how to take control of their own learning. Whether or not this is a strictly cultural consideration, it is important for the facilitator of a PV project to be sensitive to the current capacities of participants. The facilitator's job then is to help participants to manage the balance between frustration and self-improvement, perhaps by providing guided reflection activities to help students along the process. I discovered there is a delicate balance between pushing participants to challenge themselves while not overwhelming them to the point of frustration.

5.5 FORCE FIELD ANALYSIS

Characteristics of the participatory video process and how they relate to agroecology education were assessed in a structured manner by the creation of a force field analysis (Figure 2) in order to answer the third subquestion of this research: What are some major levers and constraints for using PV as a learning (and research) tool for agroecology?

Figure 2. Force field analysis for the integration of PV into agroecology education.

(Supporting) →	Forces ← (Restraining)
Widespread access to basic technology	Expense of high quality technology, which makes editing easier and finished product more polished
Free and democratic use of online/shared space including forums for exchange	Infrastructure/logistics that impede group work and/or site access
Investment in lifelong learning skills, inquiry learning	Time it takes to produce
Diversity of viewpoints ensures sufficient content for multiple projects and repeated analysis (with multiple stakeholder groups)	Diverse stakeholders needed, may not be available
Multi-sensory (visual, audio) format offers rich experience	Access to IT knowledge; imbalance in technological skills across stakeholder groups
Engaging: personal accountability for tangible/visible outcome	Defining leadership in project: participants must have some group work skills from beginning
Opportunity to develop skills needed to be an agroecologist (e.g. reflection, communication skills)*	Dialogue (therefore time, communication skills, personal engagement) needed in order for process to be valuable
Opens up space for constructive criticism by peers	Power dynamics can impede/interfere with design and communication of message, effective incorporation of different points of view, and partiality or interests of certain stakeholders
Holistic learning approach (creative and analytical)	Ensuring concurrent learning takes place (balance between farm experience and development of project management & communication skills)
Venue for practicing succinct communication	Cultural differences in approach to learning
Editing process requires analytical skill development that is useful for agricultural engineers	Preserving participatory nature during editing
Creates and legitimizes a creative space in a scientific field	Lack of human resources/facilitators trained in both PV methods and agroecology
Mechanism for establishing collective values of a movement*	Benefits of agroecology may take seasons to be visible
Method of concretizing theoretical knowledge*	Evaluation of progress requires clearly defined (pedagogical) goal from beginning
Terminology: widespread familiarity with the term "agroecology" in certain contexts broadens pool of participants, enhancing diversity of perspectives	Language barriers (both spoken language and technical terms)
Empowers community by addressing local conditions/situations; gives individuals a voice	Validation of concepts developed during autonomous work
Broad nature of PV can incorporate multiple aspects of agroecology, integrating head and heart*	Topic complexity: need to focus on single issues in order to complete in timely manner; product-oriented project may over-simplify an inherently complex topic in order to communicate to wider audience
Establishes key successes/testimonials identified as important for a movement toward agroecology*	Quality and reliability of information presented is dependent upon participants' knowledge at time of shooting; perceived quality and reliability of information presented may render final product uncredible as learning resource
Decision-makers can be influenced by content of a participatory video	Connecting with decision-makers: getting video into the right hands for desired effect
	Maintaining morale: expectations about final product may exceed what is possible
	Video-making may be uninteresting for some

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Forces were identified by participants through interviews and open-ended questions in both the questionnaire and the evaluation survey, as well as through my own observations (which are demarcated by *). The intention was to identify major conditions that support the integration of PV into agroecology curricula as well as the challenges that impede its adoption. Forces include aspects of the situational context as well as characteristics of both the PV method and learning about agroecology.

A quick glance at the analysis indicates that restraining forces outnumber supporting forces not only in number but also in detail. No conclusions should be immediately made about whether the forces opposing PV are too great; these forces are not weighted to reflect their perceived magnitude. An interesting follow-up to this research would be to present participants with this analysis and gather impressions to determine a collective interpretation of weighted forces. Furthermore, it is important to note that a significant number of the restraining forces listed here were derived from an open-ended question on the questionnaire which specifically asked respondents to identify potential challenges they could perceive to integrating PV into agroecology education. There was no open-ended question to specifically address perceived supporting forces. Rather, respondents were invited to fill in blank spaces at the end of a list of benefits that was derived from the literature. Since there was no dedicated question, respondents were not compelled to provide their insight on this matter, thus there was an inherent bias in the collection of data toward the identification of restraining forces.

Key topics from the analysis which arose in every case are described in more detail below:

ACCESS TO TECHNOLOGY

Compared to what Donald Snowden experienced in his work at Fogo in the 1960s, participatory video has come a long way, thanks to advances in technology that allow for most people to have access to some sort of video camera recording device through their cell phone. Basic video editing software programs are available for free, and global distribution of a video can take a matter of seconds with the Internet. All of these things support a greater, wider, freer exchange of ideas via video. Participatory culture can be further enhanced through the utilization of the comment space provided on most video-hosting websites (Montero n.d.).

Lie and Mandler (2009) point out that there appears to be a general misconception about the quality of video-recording technology that is required for the successful use of PV in development. The same can be said for using PV in an educational setting. Indeed, students at ASD filmed their entire video using

their own cell phones. While some audio issues arose as a result of poor microphone quality and windy conditions, the final video retained its value.

Participants at MUHNAC did however emphasize the need for quality equipment in order to achieve their objective. One group in particular wanted to create a polished final product and so obtained a high-quality camera to film. However, they experienced significant frustration from the free editing software they tried to use because it could not handle the large file-size delivered by the high-definition camera. The alternative was an expensive, professional editing program that carried a steep learning curve. In the end, they felt the limitations of the editing process inhibited their creative capacity since they had to throw many of their ideas away just to get a final video done in time. These technical considerations are context dependent and should certainly be addressed to the greatest extent possible in advance of initiating a project, in order to avoid frustrating and alientating participants. This point dovetails with the idea of maintaining morale and managing participants expectations of what can be accomplished in the project. This could simply mean preparing participants for the reality of the limitations of technology and providing them with ideas for how to plan for difficulties and adapt.

ENGAGEMENT AND OWNERSHIP

High levels of participation were observed in all cases and participants commented on how remarkably engaged their fellow participants were. This is particularly notable because of the voluntary nature of two of the projects, which also coincided with the busiest time of year for students. Groups at every location took personal time to work on the PV projects, even sacrificing lunch breaks to ensure they were satisfied with their work. It was noted by one participant that once an individual initiates work on a video project, they strive to do their best to contribute to a quality product. This shows a certain level of personal accountability which can be expected, perhaps due to the highly tangible, visible output. From his own personal experience, PV practitioner N. Q. Nathaniels noted that the PV approach proposed by Lunch and Lunch (2006) works particularly well to "demystify video and empower people to engage, thus starting to reap other group and social rewards" (personal communication, April 1, 2015).

That said, leadership within the group can influence power dynamics and the overall participatory nature of the project. As with any PV project, power dynamics within the group must be taken into consideration, as these can interfere with how the message is designed and communicated (Lunch and

Lunch 2006). This point was also noted by questionnaire respondents across projects who identified that potential difficulties lie in effectively incorporating different points of view and in managing the biases of certain stakeholders.

At UNISG, one individual unintentionally took on a large portion of responsibility, leading to a break-down in the balance of participation because her peers started regarding her as the director of the video. An important distinction at UNISG was the fluidity of participants. Since project activities occurred during the week before exam period, several students could only commit for short periods of time. A few core participants were present throughout the week, but they struggled to find the time and energy to move the project forward alone. As with any exciting and new activity, ideas were brought up throughout the week, particularly by students who joined late. In anticipation of the problems and delays that could arise because of this, student decided early on to hold firmly to the storyboard that was used to design the video, which was collaboratively made by participants who attended the initial workshop. This meant that a distinction was made between types of participants – those who contributed to developing the message and the approach to communicating it, and those who simply partook in helping to deliver the final result. It seemed that without spending the time to establish roles and develop each individual's ownership over the project, participants were willing to defer to someone who naturally took charge. Although a significant opportunity exists to use participatory video to develop group working skills, this experience suggests that simply engaging in a PV project will not necessarily deliver these results. Rather, schedules should be coordinated to ensure maximum participation by all core participants. In addition, a structured activity that supports participants in dialogue while they develop their storyboard could help to ensure that each participant has an opportunity to incorporate their ideas and thus feels connected in some concrete way to the project.

INFLUENCE OF TIME ON STRUCTURE AND OUTCOME OF PV ACTIVITY

Though many participants cited the time required for a PV project as a restraining force, it should not be misconstrued as time wasted. Time taken to create a video must be compared with the time needed to convey a message or achieve another PV-related objective in alternative ways. Lie and Mandler (2009) describe how videos in fact expedite communication and abbreviate processes that would normally take too long to see. For example, it was discussed at UNISG that in the context of agroecology, video might be a useful tool to document natural processes in order to observe the results of certain agricultural techniques over the long term, given sufficient time allocated to a project.

Therefore time should be considered as an asset to be invested in the context of a PV project.

The difference between minimal and excessive structure was observed to be a function of the time allotted to project, and in turn, the amount of structure provided was observed to have an influence on the outcome of a project. The luxury of time at ASD allowed me to provide minimal structure, giving participants full control over the design of their project. This approach is most in line with traditional PV, and certainly benefits the development and delivery of a genuine message through collaborative means.

Where time was short, important decisions were made without sufficient time for dialogue and reflection. Short-term projects may benefit from having a predetermined objective (as at UNISG) in order to keep conversations on task to get the whole project done in a timely manner, but this comes at a cost in terms of authenticity. It was observed at UNISG that predetermining topic options did not necessarily detract from the transformative aspect of the activity; participants still reported feeling an enhanced sense of community and development of their communication and group work skills. They also engaged in problem-identification at the didactic gardens and discussion of potential solutions still emerged. However, more time allotted to the PV project would have meant that group work dynamics could have been better established, and those conversations could have gone into greater depth and greater ownership over the video could have developed. Deeper levels of participation by the variety of participants at UNISG throughout the entire process would have provided a more grounded message in the final product that would have better reflected the unified voice of a wider participant base.

In comparison, the short-term project at MUHNAC was less rigidly defined, but participants reported feeling pressed for time and overwhelmed by possibilities, which created a franctic environment that is not conducive to creativity. Regardless, transformation was still experienced by participants to some degree on the personal and the group level. Importantly, issues that emerged "from the field" may not have been realized had options been predetermined, as with the inquiry process that resulted in the video about recycling maps. This demonstrates the trade-off that is made by using preconceived topics in an attempt to reduce the time allocated to a PV project. In any case, as with any inquiry-based learning activity, the facilitator or teacher should develop a clear learning objective for the project before work begins, particularly if the need for assessment is present.

Within social learning structures, the presence of a diversity of perspectives offers the potential for richness of content. Tisenkopfs et al. (2015) refer to a shift from the "monoculture of scientific knowledge" to an "ecology of knowledge" in their study on the exchange of knowledge at the boundaries between stakeholder groups.

> The network model advocates active social learning (Wenger 2000; Leeuwis and Aarts 2011), which stresses that knowledge is contextually grounded and acquired in interaction and negotiation between actors. To achieve learning and innovation in hybrid networks, actors have to align their diverse attitudes, motivations and values into a shared knowledge pool and collective or concerted action. This is of particular relevance regarding the highly contested concept and practices of sustainable agriculture (Koutsouris 2008; Hermans et al 2010). (Tisenkopfs et al. 2015, p. 15)

Though in certain contexts, it may be difficult to find diverse participants, the rewards are great. However, seeking diversity of participants also brings its share of challenges. Individuals may have different approaches to learning, some may be more technologically competent, and logistical constraints may affect how others are able to participate. All of these instances were observed in the duration of this study. For example, the farmers who took part in the project at ASD were very interested in being more involved but they lived in dispersed regions of the country and several did not tend to utilize the Internet or new communication technologies. Moreover, much of the project took place during the busiest months for farmers. Regardless, the limited time that they were able to offer was invaluable to the success of this project and their participation was fundamental to the students' shared learning. Students were able to find ways to work around the challenges in order to ensure that these voices were heard.

5.6 ASSESSMENT OF METHODOLOGICAL CHOICES AND LIMITATIONS OF RESULTS

The reliability of the research presented in this paper is addressed through the development of workshop agendas and a collection of case studies (Yin 1994) which, along with questionnaires, could be used to replicate this study. However – as with any qualitative research involving action research using cases – the specific outcome of the video projects relied upon the unique personalities of the individuals involved, so an exact replication is outside of the realm of possibilities. In an exploratory

study, the objective is to establish a causal relationship in an explanatory fashion (Yin 1994). Possible explanations for observations were provided to the greatest extent possible given the data acquired during the study period, though it is assumed that alternative interpretations may exist.

As a participatory researcher attempting to independently carry out multiple case projects in different countries over a period of four months, I realize in retrospect that I did not budget sufficient time for the evaluation of video projects. Evaluation questionnaires were primarily left with participants at the end of the project, and I entrusted that they would send them along upon completing them. As a result, the response rate for evaluation questionnaires was significantly lower than the response rate for the other questionnaires. In order to learn more about the overall effectiveness of using PV in agroecology education and action research, future studies will need to develop alternative strategies for measuring whether the project adequately achieved its dual purpose of transforming and informing. This will require time allocated during the project to thoughtful reflection by participants after completion of the project.

Individual and group reflection activities could help to illuminate aspects of PV that were not brought to light during this study. In the case where time was available for reflection at ASD, participants acknowledged the value in this process. Evaluations serve a dual purpose of allowing the researcher to learn about how participants viewed the process while simultaneously providing a venue for reflection upon one's own learning. Reflection puts emphasis on the process of learning as opposed to teaching, and encourages the individual to focus on self-development rather than to be a custodian of knowledge (Pretty 1995). Lieblein et al. (2004) also recommend reflection sessions in order to build competency for autonomous learning. Such an approach would tie loose ends and provide a greater learning opportunity for participants involved in this participatory action research.

In addition, construct validity could have been further improved by providing draft case study reports to key informants for review, as well as offering the force field analysis for collaborative discussion about the weight of each force. Given the geographic dispersion of participants and the time allocated to this study, such follow-up activities were not feasible though the results would add richness to this analysis.

Additional recommendations were made throughout the Discussion for correlated areas of research that emerged during the course of study. Nevertheless, the results obtained indicate that there lies great

promise in social capital development during the process of collectively making a video in the context of agroecology. This suggests that PV can be used to establish a foundation for informing change within a group of engaged individuals, whether they are citizens, students, teachers, farmers or researchers.

6. CONCLUSION

6.1 SUMMARY OF ANSWERS TO RESEARCH QUESTIONS

According to this research, PV appears to be useful particularly as a collaborative learning tool for the exploration of specific, values-based aspects of agroecology and for the development of communication and inquiry skills in the context of enhancing agroecological understanding. In this regard, it falls under the purview of Inquiry-Based Science Education, since it is a student-centered information literacy development activity which features many of the elements of effective IBSE practice, as defined by GLN.

PV was found to be particularly valueable in the way it provides a venue for discussion across varied groups about personal interests and values related to agroecology. Participants overwhelmingly reported feeling an enhanced sense of community as a result of their engagement in the PV projects. An emergent property of the video activities was that PV acted as a social bridge to unify individuals through shared values and understandings. This cohesive force of PV was evident in every case, and it was observed that participants could even experience this force of unity through peripheral interaction with one another, as was the case with the farmers in France who indicated that they would like to meet each other to explore topics raised in the video in more depth. The video format allows for personal expression on a certain intimate level that cannot be achieved through the written word, and this may appeal to individuals in the development of their value systems.

The process of collectively reviewing and summarizing captured footage offered a structured opportunity to reflect and reinforce learning in the cases where group dynamics were strong and full collaboration endured to the end. It was observed that group dynamics play an important role in preserving the participatory nature of the project and that the editing process represented the weakest point in this regard. The technological limitations of video editing software meant that the final edits

were actually made by one or two individuals. Therefore, adherence to a storyboard – a product of extensive collaborative deliberation – was deemed useful by participants in order to keep the message intact.

Other structural and technical conditions influenced how the PV activities took place and these circumstances should be identified in advance of any proposed PV project. For example, the amount of time available for the project is a major determining factor for what kind of video can be produced, and an accurate assessment of the possibilities with regard to time is necessary in order to manage participants' expectations and maintain morale. Additionally, limited access to high-quality recording and editing equipment was judged by participants as repressive of their creative capacities – though it could be argued that creativity might alternatively be ignited under conditions of limited resources. Clarity from the outset about the capabilities of technological equipment used for a PV activity will help participants to realistically plan and manage their projects. Finally, it was observed that diversity of participants supports a richer exchange and all efforts should be made when designing a PV activity to ensure that multiple viewpoints can be incorporated.

PV may be an effective means for joint creation of agroecological understanding for personal learning or a method of change advocacy. Both achievements were observed during the course of this research. However, it appears that an attempt to satisfy both objectives simultaneously will lessen the impact of each. Therefore, it is advised that goals be clearly defined in advance and PV projects be designed with orientation toward that goal.

Certain specific decisions made early on can therefore influence the overall success of a PV project. These include making a clear distinction about whether the project will have a process- or product-orientation, establishing expectations for group dynamics that take into consideration the varying technical and leadership skills that exist within the group of participants, and determining who is the intended audience and how the activity will be evaluated. By establishing these elements from the beginning, the facilitator can know what role to play in order to best support the group. For example, if the video will eventually be shown to a wider audience, the facilitator can play an important role by acting as an outside perspective in order to help guide participants with regard to what the video should include in order for the final product to be comprehensable to someone unfamiliar with the content and process by which the video was made. It was suggested by participants during the course of this research that contextualization of a process-oriented video could also occur through the creation of a

video *about* the participatory video-making process. This would require that an outside party – perhaps the facilitator – would film discussions that occurred in the process of collaboratively making the participatory video. In this way, a process-oriented video project could still aspire to effectively reach a larger external audience, showing that process-orientation and change advocacy as a mission do not necessarily have to be mutually exclusive components of a successful PV project.

In summary, it is clear that participants must enter into the project with a good understanding of the process and objective of PV, and that an expected learning outcome should be determined and communicated in advance in order to provide a framework for the activity. Finally, it should be noted that PV by its very nature is an open-ended process, since the work is by definition driven by the will of the participants. PV therefore remains to a large degree an exploratory activity rather than one that can be entirely pre-structured. It is essentially up to the facilitator to maintain this balance.

6.2 POTENTIAL RELATED APPLICATIONS

It is assumed that other contexts outside of those explored in this study could be suitable for the integration of PV as a means to share information and values about agroecology. For example, PV might prove useful within farmer groups who are already organized in some collective that serves to mutually support each other in their movement toward practicing more sustainable agriculture. Examples of such groups are the GIEE in France (Giroud 2015) and Stable Schools in Denmark (Vaarst et al. 2007). PV could be integrated into the programs for these groups as a means to coalesce a shared understanding and to explore values behind their practices. Given that these groups generally have short intensive meetings spaced out over a long period of time, this would give participants the opportunity to work intensely together and then take space for individual reflection. The case at ASD showed that this type of schedule was well suited for contemplation and questioning of one's own preconceptions. These groups are generally organized by some kind of facilitator who could easily be trained in PV methods, and if the group decides to orient their video to be accessible to external audiences, they could also use it as a platform to share their visions and values with fellow farmers. Farmers are often more prone to listening to the advice of their peers, viewing them as reliable sources of information since they have similar life experiences (BenYishay and Mobarak 2014), so this could be a valuable process in the spread of agroecological ideals.

Another context in which PV could be useful as a means of capturing and expressing agroecological ideas might be in the identification and development of research priorities by universities and research institutions. The success and utility of research outcomes is contingent upon working social relationships between researchers and farmers. Lyon et al. (2010) point out that understanding social organizational structures is the key to balancing power dynamics and eliciting the transformative engagement needed for effective research. As this study has shown, PV appears to successfully enhance personal and group capacity while also strengthening communities around commonly shared interests. Clearly more research is needed to explore whether PV could logistically be incorporated in such scenarios.

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8. APPENDICES

APPENDIX A: VIDEO PROJECT PROPOSAL FOR PARTICIPANT RECRUITMENT

Project Proposal
Jenna Smith
Candidate for MSc in Agroecology
April 2015

Title: Participatory video as a social learning tool in the transition to agroecology

Summary:
As a component of my research for a Master thesis in Agroecology, I propose to conduct several projects to develop participatory videos at various locations around Europe over the next five months. The video projects are intended to provide qualitative information for assessing the usefulness of participatory video (PV) to assist learning for a transition to agroecology. The projects will be carried out with the support of the Green Learning Network, and participants will be identified through their affiliation with the Network or its partners. Feedback from participants will be collected for analysis, and major findings and conclusions will be discussed in a thesis which will be produced by the end of September 2015.

Definitions:
Agroecology - can be viewed as a science, a practice and/or a movement. In effect, it is an approach to agriculture that is respectful to the environment, and consists of a collection of practices that rely on ecological processes and the valuation of (agro)biodiversity.

Transition to agroecology - a comprehensive approach that involves the improvement of farming practices as well as an evolution of paradigm, for farmers and society at large.

Participatory video - a method of enhancing participation and learning, in which stakeholders co-construct a video about an issue that is relevant to them. It provides a forum for exchange, allowing stakeholders to document their own insights and eventually share this with others during screenings of the video. It differs from documentary video in that the subjects of the film are also the creators.

Context:
It is widely recognized that the environmental and social effects of industrial agriculture are not sustainable. Agroecology has been proposed as an alternative approach that has the potential to feed a growing population while minimizing damage to the environment and supporting farmers' livelihoods. A transition to agroecology involves learning to cultivate desirable services rendered by the ecosystem. This requires the development of

specific practices and techniques, as well as shift in paradigm from a simplified view of an agroecosystem to one that accounts for its complexity on multiple scales. Accordingly, there has been a call to action (e.g. by the Ministry of Agriculture in France) to develop methods for teaching to produce in an agroecological way.

Objective:

The purpose of this project is to develop case studies of the use of participatory video as a social learning tool to facilitate a transition to agroecology. The cases will be evaluated through interviews with participants (stakeholders and facilitators) following the collective production of a video.

Participants:

What makes PV useful is that it provides a venue for exchange about topics that are directly relevant to the stakeholders involved. Given that the objective is to foster learning about agroecology, an ideal stakeholder group would consist of individuals with diverse backgrounds and experiences with agroecology. Previous work with PV has indicated that small group sizes are more practical for the actual production of the video, so it is suggested that working groups be limited to 10 participants. Regardless of the composition of the group, a facilitator (e.g. teacher or advisor) should be involved in order to support the interactions between stakeholders and maintain group dynamics. The facilitator plays a key role, but should not be perceived as an instructor or director of the group.

Examples could be:
- a group of students working with a farmer and an entomologist, accompanied (facilitated) by a teacher, to examine the impact of hedgerows on biodiversity in the farmer's field
- a group of farmers practicing conventional, organic and/or conservation agriculture working with a technical research team, facilitated by an adviser from the Chamber of Agriculture, to explore methods of direct seeding

Profiles of potential participants (some individuals may fit more than one profile):

Students - In a broad sense, this includes all persons seeking to learn in a structured environment. This could include individuals enrolled in high school, university or continuing education and training programs.

For students, the benefits of participating in a PV project may be:
Enhanced learning opportunities, higher motivation level, deeper engagement with material, hands-on learning experience, skill development for group work, opportunity to tailor one's own learning and/or develop ownership over learning...

Farmers - Individuals maintaining an agroecosystem on any scale and at any stage of transition to agroecology. This could include conventional and organic farmers, as well as those practicing conservation agriculture, ecological agriculture, biodynamic farming, urban farming or any number of other approaches.

For farmers, the benefits of participating in a PV project may be:

> Opportunity to engage with peers and/or experts about details of topic of interest, a venue for identifying and formulating questions and issues regarding their land, chance to share own experience, opportunity to play role in identifying research needs and priorities, opportunity to seek solutions to problems experienced on the farm...

Researchers - Individuals employed at a research institution who have a certain level of expertise in a given field and have access to current scientific knowledge.

For researchers, the benefits of participating in a PV project may be:

> Exposure to real-world scenarios, chance to contextualize laboratory-based research, opportunity to receive feedback about research needs of end-users, opportunity to engage with peers and others about details of topic of interest...

Advisers - Individuals engaged in a teaching or technical advisory role. These people can act as the facilitator of the PV project, working to enable stakeholder groups to engage in dialogue over the topic of interest.

For advisers, the benefits of participating in PV project may be:

> Experience with an alternative learning tool, opportunity to receive information from stakeholders about the issues that matter to them...

Timeframe:

Creation of a participatory video may take from 2 days to 2 weeks, depending on the objectives defined by the group. If the group decides that production of a high quality video is an important objective (e.g. for use as an open educational resource), then the timeframe will be longer. If community building has been defined as an objective, then this may also take some time. If the desired outcome is simply that learning takes place within the group, then the quality of the final video is less important and the process may go more quickly.

Procedure:

While the actual procedure for making the video is flexible, it is recommended that the facilitator begins with an introduction to the technical equipment (allowing each participant an opportunity to familiarize themselves with how to operate the video camera), followed by an explanation of the process of creating a storyboard and a dialogue among participants as they collectively set their objective, develop ideas for their video and design a storyboard. This process can happen in one day or over the course of several meetings.

Once the storyboard has been created, filming for the video can take place. This might include participants interviewing one another, having a conversation, acting out a skit, describing diagrams or drawings, filming practices or evidence from the field, or any number of other creative ways for expressing ideas. Again, this process can happen in one day or over the course of several meetings, depending on the objective set by the group.

Editing for the video should be done with representatives from each stakeholder group, if possible, in order to preserve intact the intended message. For a higher quality video, the support of an experienced technician should be sought.

If the group decides that their objective includes sharing the video with a wider audience, they may want to organize a screening of the video. This can be a launch point for a discussion with the community about issues brought up in the video.

After completion of a participatory video project, participants will be interviewed or asked to complete a questionnaire that evaluates their experience.

Deadline:
Given the need to synthesize projects and analyze interview results, it is proposed that all projects and related activities be completed by the end of July 2015.

Contact:
This project is being developed by Jenna Smith, through her affiliation with the Green Learning Network and its coordinator at AgroSup Dijon, Hélène Coché. Please direct inquiries to:

Jenna Smith
jenna.smith@educagri.fr
Mobile: +33 (0) 6 86 77 59 32

Heure	Activité	Détails	Description	Materiaux
12h00	Introduction à Creativity Session	L'objectif de GLN et Creativity Session, planning pour l'atelier	Facilitators describe how Creativity Sessions work, introduce GLN, describe thesis project & research questions, objective of workshop	Copy of agenda, GLN brochure, Thesis Proposal, PPT describing Thesis Project, Research Questions and objective statement, Participation Sheet (to be signed by all attendees)
12h05	Introduction à la vidéo participative	Définition: Processus ou produit; Typologies : formation, activisme, recherche…	Introduction to idea of PV, including current uses and possible main objectives/typologies (e.g. training, advocacy, research). Discuss in the context of Enseigner à produire autrement. Emphasis on evolution of term 'participatory' as technology has evolved to make video more accessible (Room for Questions?)	PPT from Petit and Colin, Quick Sheet
12h15	L'approche VP et les outils	Outils pour apprendre et collaborer : montage "in-camera", storyboard, plan de montage, règles de composition.	Explain method of PV workshops and introduction to tools to support asset for amateurs (in-camera editing, storyboard), to assist in collaboration (editing scheme) and to improve end quality (rules of composition).	
12h20	Video exemplaire: Activisme	Atelier de formation de vidéo : Produit prêt sur le processus…	Show video from Danish workshop ('Coffee Break") as an example of what can be created in 1/2 day using storyboard	Coffee Break video
12h30	Video exemplaire: Education	Créé pendant un demi-jour après un jour de formation de vidéo, en utilisant un storyboard. Le produit (et le processus) sont valables; Créé pendant plusieurs semaines sans formation de vidéo, en utilisant un plan de montage	Show Agro-Logique's video and discuss the process as well as the possibilities for learning that the projection of the video to different audiences could have (context, possible audiences)	Agro-Logique's video on hard drive or camera with HDMI
12h50	Brainstorm les objectifs	Identifier les façons dans lesquelles on peut utiliser la VP pour la transition vers agroécologie; identifier les enjeux des agriculteurs. Par exemple, pour créer des liens entre professionnels et étudiants, formuler les besoins de recherche.	Short collective brainstorming; identify possible objectives for PV in transition to agroecology (e.g. network building, empowerment of participants, identification of issues, formulation of research needs)	Flip board or White Board
12h55	Découvrir la vidéo exercice 1	Dans les petits groupes, réaliser un petit film (en utilisant le montage "in-camera") pour exprimer ce qu'il faut dans l'éducation de l'agroécologie	In groups of 4-5, people take turns filming each other and asking each other about what they think is needed in agroecology education (enseigner à produire autrement)	Camera(s), Rights of Use Authorization forms
13h10	Découvrir la vidéo exercice 2	Regarder les vidéos pour discuter les aspects techniques; L'importance du cycle de feedback (commentaires)	Screen a few videos collectively and discuss basic technical aspects; explain that the iterative process of receiving feedback in group on technical aspects of video / filming is a rapid way to improve skills	HDMI connection or computer with SD card reader
13h20	Réflexion	Noter des idées sur comment on peut utiliser la VP dans l'éducation de l'agroécologie : Penser aux objectifs / typologies; valeur ajouté par VP et caractéristiques de scénario (ex. quoi? comment? où? quand? pour combien de temps? quelle taille de groupe? rôle d'accompagnateur?)	Individually make notes about how PV could be used in agroecology education. Consider objectives/typology, value added by use of PV, and specifics including who participates and how, where (field? classroom?), when (first year? second? summer?), for how long (all semester? internship?), group size, role of facilitator.	Black note and pens
13h25	Partager idées	2 minutes chacun pour présenter les éléments clefs du Réflexion. Écrire les mots clés sur les post-its JAUNES	In groups of 4-5 (or in front of whole group depending on number of people in workshop), each person takes 2 minutes to share key elements of their Reflection time and writes a keyword that represents each key element on a yellow post-it.	Yellow post-its and pens
13h35	Ranger et élaborer les idées	Organiser les post-its jaunes par thème, écrire les thèmes sur les post-its post-its BLEU; Les valeurs / avantages peuvent être écrits sur les post-its VERT; Les contraintes peuvent être écrits sur les post-its ROSE	Collectively cluster/organize yellow post-its (key elements) into topics, which are written on blue post-its that are placed above associated cluster. Any value/benefit identified by certain components should be written on green post-it and placed next to associated element. Any limitations that come up should be written on pink post-its and placed next to associated element.	Blue post-its; Green post-its; Pink post-its
13h45	Créer / définir scénario	Écrire ensemble une courte description (20 mots) du scénario; Résumer les conditions requises pour la réussite de cette idée.	Define idea by writing a short description (20 words) and prepare brief outline indicating the basic components of activity that are needed to make this idea "work".	Large paper and markers
13h55	Présentations (si le groupe est assez grand de la couper en deux)	Présentations des scénarios: Questions et réponses.	Each team presents its work to the other team (3" each); Short Q&A session (2" each).	Video camera to film presentations
14h00	Feedback	Formulaire pour l'évaluation	Thank participants, ask them to fill out feedback forms and suggest that anyone is welcome to participate in creating an Editing Sheet in the following days for a video that could be made about the workshop	Feedback Forms

WORKING GROUP ACTION – FEEDBACK FORM

Green Learning Network

DATE: 19/05/2015		**NUMBER OF PARTICIPANTS**: 13	
INSTITUTION RESPONSIBLE FOR THE ACTION: Agrosup Dijon		PERSON RESPONSIBLE FOR THE ACTION: JENNA SMITH	
LOCATION: Dijon		**TYPE OF ACTIVITY**: CREATIVITY SESSION	
NAME	PROFESSION & SPECIALTY	TEL. NUMBER	E-MAIL ADDRESS
Available upon request	Project manager	Available upon request	Available upon request
Hélène Coché	Project manager	Available upon request	Available upon request
Available upon request	Professor in animal production science		Available upon request
Available upon request	Associate Professor, researcher in agro-ecology		Available upon request
Available upon request	Professor, researcher in agro-ecology	Available upon request	Available upon request
Available upon request	Student		Available upon request
Available upon request	Project manager	Available upon request	Available upon request
Available upon request	Student		Available upon request
Available upon request	Student		Available upon request
Available upon request	Student		Available upon request
Available upon request	Student		Available upon request
Available upon request	Student		Available upon request
Jenna Smith	Trainee, master student in agroecology	Available upon request	Available upon request

SMALL REPORT
The objective of the creativity session was to produce a learning scenario that uses participatory video to deepen understanding about agro-ecology. The idea was to try and define agro-ecology by considering different perspectives.   The target group is a small group of students (5/6).   A teacher/trainer is in charge of the group for organization and facilitation: he/she checks that each step is respected and goals achieved but does not interfere with the orientations chosen by the group. The students largely work autonomously.   Average length of the activity: 6 hours.   Preparation: 2 hours   Shooting: 1 hour

Editing: 2 hours
Discussion: 1 hour

The whole process of preparation is filmed by the facilitator ("making-of") so that the students will also be able to react to the process itself.

The activity step by step:
1- Short definition/explanation of participatory video.
2- Identify students' vision of agro-ecology (using post-it notes)
   (try to make a synthesis)
3- Carry out the video
   The group collectively defines the target group: people to interview (farmers in this case) and questions to be asked (Questions should be open questions so that people can speak freely…)
   The objective of the interviews is to gather representations, opinions, definitions on agroecology and transition towards a greener agriculture.
   The group creates a story board which is used to plan the filming (the composition of the shot, sequence of scenes) in order to make editing easier and faster
   Shooting
   The group collectively participates in the editing of the video
4- The group watches the video and compares the results with the representations they had at the beginning.
   This work could be enriched by a comparison of the results with existing and established references: introduction to the notion of agroecology as it is presented today (the notion is not as vague as it seems to be, there are common principles (Altieri) :

   http://www.chlorofil.fr/enseigner-a-produire-autrement/enjeux-et-debats-sur-lagroecologie/principes-communs.html

   even though there are several concepts :

   http://www.chlorofil.fr/enseigner-a-produire-autrement/enjeux-et-debats-sur-lagroecologie/approche-societale-de-lagroecologie.html

APPENDIX D: PARTICIPANT QUESTIONNAIRE AT ASD

Formulaire de rétroaction

1. Êtes-vous intéressé à utiliser la vidéo participative comme outil dans votre futur travail dans l'enseignement, l'apprentissage et / ou pour partager des idées sur l'agroécologie?

   oui   peut-être   pas intéressé

2. Quels avantages pensez-vous que la Vidéo Participative pourrait offrir à la transition vers l'agriculture agroécologique?

   Classez les avantages que vous acceptez (1 est le plus haut)
   Marquez "x" à côté de ceux que vous n'acceptez pas

__ Documenter les façons professionnelles de travailler dans les scénarios de la vie réelle
__ Produire du matériel de la formation pour les étudiants
__ Produire du matériel de la formation pour les apprenants en formation continue
__ Générer les médias numériques open-source pour le grand public
__ Permettre aux agriculteurs de formuler des besoins de recherche
__ Communiquer aux décideurs
__ Habiliter les participants à être des agents du changement
__ Donner aux étudiants les connaissances de la vidéo comme un moyen de communication
__ Légitimer / officialiser l'interaction des étudiants avec des agriculteurs / professionnelles
__ Construction des ponts d'apprentissages entre les différentes parties prenantes
__ Autre: _____

3. Lesquels des avantages énumérés sont particulièrement importants en ce qui concerne l'éducation de l'agroécologie (par opposition à l'agriculture conventionnelle)?

   Marquez "✓" à côté des éléments qui sont particulièrement importantes pour l'éducation de l'agroécologie

__ Documenter les façons professionnelles de travailler dans les scénarios de la vie réelle
__ Produire du matériel de la formation pour les étudiants
__ Produire du matériel de la formation pour les apprenants en formation continue
__ Générer les médias numériques open-source pour le grand public
__ Permettre aux agriculteurs de formuler des besoins de recherche
__ Communiquer aux décideurs
__ Habiliter les participants à être des agents du changement
__ Donner aux étudiants les connaissances de la vidéo comme un moyen de communication
__ Légitimer / officialiser l'interaction des étudiants avec des agriculteurs / professionnelles
__ Construction des ponts d'apprentissages entre les différentes parties prenantes
__ Autre: _____

4. Quels obstacles ou défis potentiels pouvez-vous identifier en utilisant la vidéo participative comme un outil pédagogique pour enseigner l'agroécologie?

APPENDIX E: AUDIENCE QUESTIONNAIRE AT ASD

Est-ce que votre perception (l'attitude, le sentiment, la compréhension) de l'agroécologie a changé à la suite de cet évènement? *(Choisissez un):* OUI NON

Si vous avez répondu OUI, comment votre perception est-elle différente maintenant?

Si vous avez répondu NON, décrivez en quelques mots ce que «l'agroécologie» est pour vous.

APPENDIX F: FARMER QUESTIONNAIRE AT ASD

Est-ce que vous êtes d'accord avec le produit final?

Est-ce que vous voulez ajouter ou supprimer quelquechose?

Qu'est-ce que vous pensez des commentaires des autres agriculteurs?

Est-ce que vous vous intéressez à faire la connaissance des autres agriculteurs qui sont dans la vidéo?

APPENDIX G: PROJECT EVALUATION QUESTIONNAIRE AT ASD

Évaluation du projet de vidéo participative
Merci d'avoir participé à ce projet! Ma recherche s'appuie sur votre participation et de vos réponses aux questions suivantes. J'apprécie que vous passiez le temps de répondre à chaque question. S'il vous plaît, soyez aussi honnête que possible. Toutes les réponses resteront anonymes, sauf si vous me donnez la permission écrite de vous citer. Si vous avez des questions ou si quelque chose n'est pas clair, n'hésitez pas à me demander!

Instructions:
S'il vous plaît, répondre à chaque question au mieux de votre capacité. Certaines questions comportent deux parties; assurez-vous de répondre à toutes les deux. Les premières questions sont générales et deviennent progressivement plus spécifiques, donc il vaut mieux de lire tout le questionnaire avant de commencer. Vous êtes invités à fournir des exemples précis pour illustrer votre réponse. Si vous avez besoin de plus d'espace, vous pouvez joindre des feuilles.

SECTION 1 : GÉNÉRAL
1. Si votre participation à ce projet a augmenté votre compréhension de l'agriculture agroécologique, s'il vous plaît, expliquez comment. Si elle n'a pas augmenté votre compréhension, s'il vous plaît, suggérez ce qu'on aurait pu faire dans ce projet pour vous aider à apprendre davantage sur l'agriculture agroécologique.

2. À votre avis, est-ce que la vidéo participative est un bon outil pour exprimer le contenu <u>spécifiquement à propos de l'agroécologie</u>? *(Choisissez un):*   OUI   NON

    Si vous avez répondu OUI, de quelle manière pensez-vous que l'approche participative vidéo facilite l'apprentissage de l'agroécologie?

    Si vous avez répondu NON, quel aspect de l'approche participative vidéo rend-il difficile de se renseigner sur l'agroécologie?

3. Est-ce votre perception (l'attitude, le sentiment, la conscience) de l'agroécologie a changé à la suite de ce projet? *(Choisissez un):*   OUI   NON

    Si vous avez répondu OUI, comment est votre perception différente maintenant?

    Si vous avez répondu NON, décrire en quelques mots ce que «l'agroécologie» est pour vous.

4. Qu'avez-vous trouvé valable dans cet exercice quant à votre développement personnel?

    Classez (mettez en séquence) les choses que vous avez appris que vous croyez pourrait être utile dans votre futur travail dans l'agriculture et le système alimentaire. (1 = la plus utile, 2 = la deuxième chose la plus utile ...) Vous pouvez laisser le champ vide pour les choses que vous n'avez pas trouvé utiles dans cet exercice. Si vous ne trouvez aucun de ces éléments utiles, vous pouvez sauter cette question.

    ___ Apprendre comment travailler en groupe
    ___ Acquisition des compétences techniques (ex. la production vidéo)
    ___ Accroitre des compétences de communication / formuler un message clair et concis
    ___ Développement des compétences analytiques / identification des problèmes critiques
    ___ Autre: _____

S'il vous plaît, expliquez comment la chose que vous avez identifié comme «la plus utile» ci-dessus vous aidera dans le cadre de votre futur travail dans l'agriculture et / ou le système alimentaire.

SECTION 2 : PROJECT VIDÉO

5. Quel est, d'après vous, l'objectif principal de votre projet vidéo?

S'il vous plaît, marquez ✓ à côté des objectifs qui étaient les plus importants pour vous au cours du projet:

    ___ Démonstration des pratiques et des principes agroécologiques
    ___ Plaidoyer d'un enjeu qui est important pour le groupe
    ___ Renforcer la communauté autour d'un intérêt commun
    ___ Identification de problème ou de besoin de recherche
    ___ Développement des idées pour des techniques innovantes ou de nouvelles façons de faire les choses

_____ Partager des idées au sein du groupe vidéo de décisions
_____ Propre personne / croissance personnelle et l'apprentissage
_____ Autre (expliquer, s'il vous plaît): _____

Est-ce vous vous sentez que vous avez atteint cet objectif? *(Choisissez un):*   OUI   NON

6. Quel est le public cible pour votre vidéo?

7. À votre avis, lequel avait plus d'importance : le processus de création de la vidéo ou le produit final? Pourquoi?

8. Identifiez les problèmes que vous avez rencontrés au cours du projet. *(Faites une liste en commençant par la plus importante.)* Si vous avez résolu ces problèmes, comment avez-vous le fait?

9. Quelles recommandations avez-vous pour les projets de vidéo participative agroécologique dans l'avenir?

SECTION 3 : PROJECTION DE LA VIDÉO
(Si vous n'avez pas montré votre vidéo au public, vous pouvez passer directement à la section 4)

10. Avez-vous pu montrer la vidéo à l'audience visée (voir question 6)?   OUI   NON
    Si vous avez répondu NON, qui était dans l'audience?

11. À votre avis, quelle a été la réaction du public à la vidéo?

12. Comment est-ce que la projection de la vidéo au grand public contribue à votre propre connaissance/compréhension?

13. Comment avez-vous préparé et exécuté la projection de la vidéo afin d'engager le public et mener une discussion?

14. Avez-vous trouvé la discussion sur la vidéo intéressante?   OUI   NON
Si OUI, de quelle manière? Si NON, qu'est-ce qu'on aurait pu faire pour susciter une conversation stimulante?

SECTION 4 : QUESTIONS DÉMOGRAPHIQUES

Nom * _____

Occupation_____

Age_____ Sexe_____

Niveau d'éducation_____

Adresse mail * _____
Note: je ne demande que ces informations au cas où j'ai besoin de vous contacter pour mieux comprendre votre réponse. Toutes les réponses resteront confidentielles, sauf si vous me donnez la permission écrite de vous citer.

Votre connaissance préalable de l'agroécologie, avant de faire ce projet:
___ Aucune
___ J'ai entendu le terme, mais je ne savais pas ce que cela signifiait
___ J'étais familier(ère) avec les principes de base de l'agroécologie
___ Je parlais à l'aise sur les pratiques et les techniques agroécologiques spécifiques
___ J'avais vaste connaissance théorique de l'agroécologie, mais je ne l'ai jamais pratiqué
___ J'avais expérimenté avec les pratiques agroécologiques, mais jamais sur une échelle commerciale
___ Je pratique l'agriculture agroécologique commerciale

Vous pouvez fournir des informations supplémentaires à propos de votre expérience précédente avec l'agroécologie, si vous désirez (par exemple, les programmes d'études, les stages, l'expériences pratiques, les formations ...):

Merci pour vos commentaires!

FEEDBACK FORM
Participatory Video in Agroecology Education

Thank you for taking part in this project! My research relies on your participation and on your answers to the following questions. I appreciate that you spend the time to thoroughly answer each question. Please be as honest as possible. If you have any questions or if something is unclear, please ask!

Name*_____

Occupation_____

Age_____   Gender_____

Level of education_____

Email address*_____
Note: I only ask for this information in case I need to contact you for clarification of your answer. All responses will remain confidential unless you provide me with written permission to quote you.

1. **Which of the following are *particularly important* with regard to education about agroecology (as opposed to learning about conventional farming)?**
   Mark ✓ next to items that are especially important for agroecology education

   ___ document professional ways of working in real-life scenarios
   ___ produce training content for students
   ___ produce training content for life-long learners
   ___ give students knowledge of different mediums of communication
   ___ develop group-work skills
   ___ learn how to communicate to decision-makers
   ___ empower individuals to be change makers
   ___ generate open-source digital reference material for wider public
   ___ legitimize/formalize student interaction with farmer/professional
   ___ put into words things that might otherwise go unspoken
   ___ support farmers in formulating research needs
   ___ build learning bridges between different stakeholders
   ___ other: _____

2. **What benefits do you think <u>participatory video</u>* could offer the transition from industrial or conventional agriculture to agroecological farming?**
   *<u>Participatory video</u> is a method of enhancing participation and learning where stakeholders collaboratively create a video about an issue or topic that is relevant to them. It provides a forum for exchange, allowing participants to document their own insights and eventually share with others during screenings of the video.

Please rank according to your opinion. (1 = highest, 2 = next highest….) You may leave spaces blank for any items you do not agree with.

       ___ document professional ways of working in real-life scenarios
       ___ produce training content for students
       ___ produce training content for life-long learners
       ___ give students knowledge of video as a medium of communication
       ___ opportunity to develop group work skills
       ___ communicate to decision-makers
       ___ empower participants to be change makers
       ___ generate open-source digital reference material for wider public
       ___ legitimize/formalize student interaction with farmer/professional
       ___ opportunity to put into words things that might otherwise go unspoken
       ___ enable farmers to formulate research needs
       ___ build learning bridges between different stakeholders
       ___ other: _____

3. **Are you interested in using participatory video as a tool in your future work in teaching, learning and / or sharing ideas about agroecology?**

   (Choose one):   YES   POSSIBLY   NOT INTERESTED

   If you answered "NOT INTERESTED" please provide the major reason(s) why:

4. **If a database of short instructional videos showing agroecological principles and techniques practiced in the Didactic Garden were available online, would you watch the videos?**
   a) Absolutely, it would be great to have audio-visual reference materials, even if they are amateur (not professional).
   b) I would watch them, but only if they were professionally made. A low-quality video is not trustworthy.
   c) I would only watch them if I had to as part of an assignment, otherwise I would rather watch something else.
   d) Sounds boring, I wouldn't watch them even if my grade depended on it.

5. **I think a group assignment to create a short instructional video to train others about a certain agroecological principle or technique in the Didactic Garden would be:**
   a) A great opportunity to learn and share knowledge.
   b) A manageable assignment, but not very valuable to my own learning.
   c) Videos take too much effort to make. I would rather do something more traditional.
   d) Ugh, no more video-making! I wouldn't do it, even if it meant getting a bad grade.

6. **What potential obstacles or challenges can you identify in using participatory video as an educational tool to teach agroecology?**

   Please make a list, starting with the biggest challenge first.

INTRODUCTORY QUESTIONNAIRE (distributed before PV activity)

Name*_____

Occupation_____

Age_____   Gender_____

Level of education_____

*Note: All responses will remain confidential.

Which of the listed items are *particularly* important with regard to education of agroecology and / or sustainable agriculture (as opposed to conventional farming)?
> *Mark ✓ next to items that are especially important for agroecology education*

>> ___ document professional ways of working in real-life scenarios
>> ___ produce training content for students
>> ___ produce training content for life-long learners
>> ___ give students knowledge of video as a medium of communication
>> ___ develop group-work skills
>> ___ learn how to communicate to decision-makers
>> ___ empower individuals to be change makers
>> ___ generate open-source digital media for wider public
>> ___ legitimize/formalize student interaction with farmer/professional
>> ___ put into words things that might otherwise go unspoken
>> ___ support farmers in formulating research needs
>> ___ build learning bridges between different stakeholders
>> ___ other: _____

FEEDBACK FORM (distributed after PV activity)
Participatory Video in Agroecology Education

Thank you for taking part in this project! My research relies on your participation and on your answers to the following questions. I appreciate that you spend the time to thoroughly answer each question. Please be as honest as possible. If you have any questions or if something is unclear, please ask!

Name*_____

Occupation_____

Age_____   Gender_____

Level of education_____

Email address*_____

Note: I only ask for this information in case I need to contact you for clarification of your answer. All responses will remain confidential unless you provide me with written permission to quote you.

- **What benefits do you think participatory video could offer the transition from industrial or conventional agriculture to agroecological farming?**

  Please rank according to your opinion. (1 = highest, 2 = next highest….) You may leave spaces blank for any items you do not agree with.

  ___ document professional ways of working in real-life scenarios
  ___ produce training content for students
  ___ produce training content for life-long learners
  ___ give students knowledge of video as a medium of communication
  ___ opportunity to develop group work skills
  ___ communicate to decision-makers
  ___ empower participants to be change makers
  ___ generate open-source digital media for wider public
  ___ legitimize/formalize student interaction with farmer/professional
  ___ opportunity to put into words things that might otherwise go unspoken
  ___ enable farmers to formulate research needs
  ___ build learning bridges between different stakeholders
  ___ other: _____

2. **Are you interested in using participatory video as a tool in your future work in teaching, learning and / or sharing ideas about agroecology / urban agriculture?**

   (Choose one):   YES   POSSIBLY   NOT INTERESTED

   If you answered "NOT INTERESTED" please provide the major reason(s) why:

3. **What potential obstacles or challenges can you identify in using participatory video as an educational tool to teach agroecology / urban agriculture?**

   Please make a list, starting with the biggest challenge first.

Evaluation of Participatory Video Project

Thank you for taking part in this project! My research relies on your participation and on your answers to the following questions. I appreciate that you spend the time to thoroughly answer each question. Please be as honest as possible. All responses will remain anonymous unless you provide me with written permission to quote you. If you have any questions or if something is unclear, please ask!

Instructions:
Please respond to each question to the best of your ability. Some questions contain two parts; please make sure to answer both. The first questions are general and become progressively more specific, so please read through the entire questionnaire before beginning. You are welcome to provide specific examples to illustrate your response. If you need more space, you can also write on the back of the form.

SECTION 1 : GENERAL

1. If participating in this project has increased your understanding of agroecological farming, please explain how. If it has *not* increased your understanding, please suggest what could have been done in this project to help you learn about agroecological farming.

2. In your opinion, is participatory video a good tool for expressing content <u>specifically about agroecology</u>? *(Choose one)*:   YES   NO
   If you answered YES, in what way do you think the participatory video approach facilitates learning about agroecology?
   If you answered NO, what aspect of the participatory video approach makes it difficult to learn about agroecology?

3. Has your perception (attitude, feeling, awareness) of agroecology changed as a result of this project?   *(Choose one)*:   YES   NO
   If you answered YES, how is your perception different now?
   If you answered NO, please describe in a few words what 'agroecology' is to you.

4. What did you find valuable about this exercise in terms of your own personal development?
Rank the things you learned that you believe could be useful in your future work in agriculture and the food system. (1 = most useful, 2 = next most useful...) You may leave spaces blank for any items you did not find valuable in this exercise. If you did not find any of these items useful, then you may skip this question.

    ___ learning to work in a group
    ___ acquiring technical skills (video production)
    ___ practicing communication skills / formulating clear and concise message
    ___ developing critical analytical skills / identifying issues
    ___ other: _____

Please explain how the thing you identified as 'most useful' above will help you in relation to your future work in agriculture and / or the food system.

SECTION 2 : VIDEO PROJECT

5. What do you consider to be the main objective(s) of your video project?
Please mark ✓ next to the objectives that were most important to you during the project:

    ___ demonstration of agroecological practices and principles
    ___ advocacy of an issue that was important to the group
    ___ strengthen community around a common interest
    ___ identification of problem or research need
    ___ development of ideas for innovative techniques or new ways of doing things
    ___ share ideas within video-making group
    ___ own individual/personal growth and learning
    ___ other (please explain): _____

Do you feel you achieved this objective?   *(Choose one)*:   YES   NO

6. Who was the target audience for your video?

7. In your opinion, which had more significance: the process of making the video or the final product? Why?

8. Identify any problems you encountered during the project. *(Make a list starting with the most important.)* If you were able to solve these problems, how did you overcome them?

9. What recommendations do you have for future agroecological participatory video projects?

SECTION 3 : SHOWING THE VIDEO
(If you did not screen your video to the public, you may skip ahead to Section 4)

10. Were you able to show the video to your target audience (see Question 6)?   YES   NO
       If you answered NO, who was in the audience?

11. In your opinion, what was the reaction of the audience to the video?

12. How did showing the video to a wider audience contribute to your own knowledge?

13. How did you prepare for and run the video screening in order to engage the audience and lead a discussion?

14. Did you find the discussion about the video to be thought-provoking?   YES   NO
       If YES, how so? If NO, what could have been done to elicit a stimulating conversation?

SECTION 4 : DEMOGRAPHIC QUESTIONS

Name*_____

Occupation_____

Age_____   Gender_____

Level of education_____

Email address*_____
Note: I only ask for this information in case I need to contact you for clarification of your answer. All responses will remain confidential unless you provide me with written permission to quote you.

Prior knowledge of agroecology:
___ None
___ I've heard the term but didn't know what it meant
___ I was familiar with the basic principles of agroecology
___ I was comfortable speaking about specific agroecological practices and techniques
___ I had extensive theoretical knowledge of agroecology, though I've never practiced
___ I had experimented with agroecological practices, but never on a commercial scale
___ I have practiced agroecological farming commercially

You may provide additional information about your previous experience with agroecology, if desired
(e.g. courses of study, internships, practical experience, trainings…) :

Thank you for your feedback!

ASD

Questionnaires were distributed to all participants in the focus-group workshop. Items identified by respondents as being particularly important with regard to teaching agroecology (as opposed to teaching conventional agriculture were: empowering participants to be agents of change, documenting professional ways of working in real-life scenarios, producing training content for students and building learning bridges between different stakeholders (Table 1).

Table 1. Questionnaire responses from participants at ASD. Participants were allowed to select more than one item.

Which of the following are particularly important with regard to education about agroecology (as opposed to conventional farming)?	Teacher $n=3$	Eduter / GLN $n=2$	Student $n=5$	Total $n=10$
document professional ways of working in real-life scenarios	1	1	**4**	6
produce training content for students	**3**	0	3	6
produce training content for life-long learners	2	0	3	5
give students knowledge of different mediums of communication	1	0	0	1
learn how to communicate to decision-makers	0	0	2	2
empower individuals to be change makers	1	**2**	**4**	7
generate open-source digital reference material for wider public	0	1	1	2
legitimize / formalize student interaction with farmer/professional	1	0	2	3
support farmers in formulating research needs	1	1	2	4
build learning bridges between different stakeholders	1	1	**4**	6
other	0	0	0	0

It is interesting to note that students in this group placed more emphasis on the empowerment of change-agents and on building learning bridges for successful agroecology education, whereas educators concentrated on more technical aspects such as the production of training content. This evokes the analysis of Wezel et al. (2009) regarding agroecology as a science, a set of practices and a social movement.

Participants were also asked to rank which of the items listed could be best fulfilled by using the participatory video methodology. Within this group, it is believed that PV primarily offers the following to agroecology: documenting professional ways of working in real-life scenarios, producing training content for students, and empowering participants to be change makers (Table 2). Therefore, within this group, three of the four most important aspects of teaching for agroecology (documenting professional ways of working in real-life scenarios, producing training content for students, and empowering participants to be change-agents) were perceived as potentially satisfied by using the participatory video methodology as a component of the educational program.

Table 2. Questionnaire responses from participants at ASD (n=10) using the Rank/Frequency approach (middle columns) and the Points approach (right column). Participants were asked to rank the items according to PV's ability to satisfy the item described in the context of a transition to agroecology. Multiple items could be given the same rank. Data from the top 4 ranks is also included because of the discrepancy between results using the Rank/Frequency and Points approaches.

What benefits do you think PV could offer the transition from conventional agriculture to agroecological farming?	Number of citations			Points (out of 11)
	in rank 1	in top 3 ranks	in top 4 ranks	
document professional ways of working in real-life scenarios	7	8	8	*9.8*
produce training content for students	3	5	6	**7.2**
produce training content for life-long learners	2	3	4	5.5
give students knowledge of video as a medium of communication	2	3	3	6.1
learn how to communicate to decision-makers	0	1	1	3.6

empower participants to be change makers	1	4	**7**	**7.0**
generate open-source digital reference material for wider public	1	1	3	4.5
legitimize/formalize student interaction with farmer/professional	0	2	5	5.1
support farmers in formulating research needs	2	**5**	5	6.1
build learning bridges between different stakeholders	1	3	3	5.5
other	0	0	0	0.0
TOTAL CITATIONS	19	35	45	

Students who took part in the pilot PV project were also asked to complete separate project evaluation questionnaires. Key items from these evaluations are included in the Results and Discussion sections of this paper.

UNISG
Once the video project was finished, questionnaires were sent to all participants via email. This questionnaire contained the same standard questions as in other cases, but also included two additional questions pertaining to the feasibility of specific uses of PV at the didactic gardens. The results of feasibility study are included in the Results section of this paper. It is important to note that at UNISG, the majority of responses (60 percent) were from students, since these were the primary participants in the PV project. All respondents had either personal experience with the participatory video process or had the opportunity to discuss it in the context of agricultural education with those who did. Participants at UNISG identified the production of training content as integral to agroecology education (Table 3). According to this group, other priorities for teaching agroecology include giving students knowledge of different mediums of communication and supporting them in developing group work skills.

Table 3. Questionnaire responses from participants at UNISG. Participants were allowed to select more than one item.

Which of the following are particularly important with regard to education about agroecology (as opposed to conventional farming)?	WWOOF *n=2*	Teacher *n=2*	Students *n=6*	Total *n=10*
document professional ways of working in real-life scenarios	0	0	4	4
produce training content for students	**2**	1	**5**	**8**
produce training content for life-long learners	**2**	1	4	7
give students knowledge of different mediums of communication	1	1	4	6
develop group work skills	1	1	4	6
learn how to communicate to decision-makers	1	1	3	5
empower individuals to be change makers	1	0	3	4
generate open-source digital reference material for wider public	1	1	3	5
legitimize / formalize student interaction with farmer/professional	1	0	3	4
put into words things that might otherwise go unspoken	0	0	2	2
support farmers in formulating research needs	0	0	1	1
build learning bridges between different stakeholders	**2**	1	2	5
other	1	0	1	2

Ways in which PV was identified by this group to potentially contribute to a transition to agroecology were by empowering participants to be agents of change, developing group work skills, and communicating to decision makers (Table 4).

Table 4. Questionnaire responses from participants at UNISG (n=10) using the Rank/Frequency approach (middle columns) and the Points approach (right column). Participants were asked to rank the items according to PV's ability to satisfy the item described in the context of a transition to agroecology. Multiple items could be given the same rank.

What benefits do you think PV could offer the transition from conventional agriculture to agroecological farming?	Number of citations		Points (out of 13)
	in rank 1	in top 3 ranks	
document professional ways of working in real-life scenarios	3	5	8
produce training content for students	2	3	6.9
produce training content for life-long learners	3	3	6.7
give students knowledge of video as a medium of communication	2	3	7.6
develop group work skills	3	*6*	**9.2**
learn how to communicate to decision-makers	2	4	**8.5**
empower participants to be change makers	**4**	*6*	***10.2***
generate open-source digital reference material for wider public	1	2	6.6
legitimize/formalize student interaction with farmer/professional	1	3	7.4
put into words things that might otherwise go unspoken	1	3	6.5
support farmers in formulating research needs	2	2	3.5
build learning bridges between different stakeholders	3	5	7.5
other	1	2	2.5
TOTAL CITATIONS	28	47	

By comparing identified needs in agroecology education with the perceived benefits of using PV, we can conclude that respondents in this case indicate that PV is useful as a learning tool which contributes to agroecology education primarily through its capacity to support students in developing group work skills. The majority of respondents at UNISG were students, and all respondents directly participated in the PV project in which the group dynamic became a focal point, so this result is to be expected.

Respondents indicated that certain other criteria for agroecology education are somewhat fulfilled by the use of PV. For example, the production of training content -- which was identified as very important to agroecology education -- was perceived as achievable with PV, though to a lesser degree than PV's capacity to empower participants to be agents of change and communicate to decision makers. The group's perception of PV as a tool for social reform is understandable, given their intention of using the video project as a means of advocating for the gardens. However useful PV might be for achieving these ends, building capacity for social reform was perceived by this group as only a moderately important aspect of agroecology education. This suggests a disconnect in respondents' conceptualization of PV as a tool for transformative social change in the context of learning about agroecology.

Participants who maintained an active role in the entirety of the PV project were also asked to complete separate project evaluation questionnaires. Specific feedback from these evaluations is included in the Results and Discussion sections of this paper.

MUHNAC
All participants were provided with questionnaires and project evaluation forms to collect information about their perspectives of agroecology education and the potential role of PV. Several respondents mentioned that they did not feel comfortable answering specifically about agroecology since the focus of this workshop was rather on sustainability at the Botanic Garden and only included a brief introduction to agroecology in one presentation. In these cases, respondents were instructed to replace the word "agroecology" with the words "sustainable practices at the Botanic Garden."

Results indicate that this group identifies the following as particularly important for agroecology (or sustainability) education: building learning bridges between different stakeholders, learning how to communicate with decision makers, empowering individuals to be change makers, and putting into words things that might otherwise go unspoken (Table 5).

Table 5. Questionnaire responses from participants at MUHNAC. Participants were allowed to select more than one item.

Which of the following are particularly important with regard to education about agroecology (as opposed to conventional farming)?	Grad students *n=2*	Museum staff *n=7*	Total *n=9*
document professional ways of working in real-life scenarios	2	2	4
produce training content for students	**2**	1	**3**
produce training content for life-long learners	**0**	3	3
give students knowledge of different mediums of communication	2	1	3
develop group work skills	2	3	5
learn how to communicate to decision-makers	2	4	6
empower individuals to be change makers	0	6	6
generate open-source digital reference material for wider public	2	1	3
legitimize / formalize student interaction with farmer/professional	0	4	4
put into words things that might otherwise go unspoken	1	5	6
support farmers in formulating research needs	2	3	5
build learning bridges between different stakeholders	**1**	6	7
other	0	0	0

According to this group, the potential value of PV in a movement toward agroecology (or sustainability) lies in its capacity to document professional ways of working in real-life scenarios, to communicate to decision-makers, to legitimize or formalize student interactions with farmers and professionals, and to empower participants to be agents of change (Table 6).

Table 6. Questionnaire responses from participants at MUHNAC (n=7) using the Rank/Frequency approach (middle columns) and the Points approach (right column). Participants were asked to rank the items according to PV's ability to satisfy the item described in the context of a transition to agroecology. Multiple items could be given the same rank. Data from the top 2 ranks is included to provide greater detail since information about the top 3 ranks is not sufficiently precise.

What benefits do you think PV could offer the transition from conventional agriculture to agroecological farming?	Number of citations in rank 1	in top 2 ranks	in top 3 ranks	Points (out of 13)
document professional ways of working in real-life scenarios	**5**	6	6	**12.1**
produce training content for students	1	2	4	7.3
produce training content for life-long learners	0	2	3	7.7
give students knowledge of video as a medium of communication	1	4	4	10.4
develop group work skills	2	3	6	10.6
learn how to communicate to decision-makers	3	**6**	6	**11.0**
empower participants to be change makers	3	**5**	6	10.6
generate open-source digital reference material for wider public	2	3	5	10.0
legitimize/formalize student interaction with farmer/professional	0	4	6	**11.4**
put into words things that might otherwise go unspoken	2	4	5	9.7
support farmers in formulating research needs	4	4	4	8.3
build learning bridges between different stakeholders	2	4	6	10.3
other	0	0	0	0.0
TOTAL CITATIONS	25	47	61	

By comparing answers to these questions, it appears that respondents at MUHNAC consider that learning how to communicate to decision makers and empowering individuals to be agents of change are important for agroecology education and also achievable through the PV method. This suggests that the group conceives of PV not only as a mechanism for advocacy but also considers that a PV project

offers participants an opportunity to build capacity for advocacy work. This makes sense because the video projects in this case were oriented toward the production of a video that contains a message for a wider audience, but the end product was not the only focus of workshop activities. As future facilitators of PV projects themselves, participants at MUHNAC were also engaged in considering the transformative power of participatory video.