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## EL FUTURO DE LA ALIMENTACIÓN Y RETOS DE LA AGRICULTURA PARA EL SIGLO XXI:

*Debates sobre quién, cómo y con qué implicaciones sociales, económicas y ecológicas alimentará el mundo.*

## THE FUTURE OF FOOD AND CHALLENGES FOR AGRICULTURE IN THE 21st CENTURY:

*Debates about who, how and with what social, economic and ecological implications we will feed the world.*

## ELIKADURAREN ETORKIZUNA ETA NEKAZARITZAREN ERRONKAK XXI. MENDERAKO:

*Mundua nork, nola eta zer-nolako inplikazio sozial, ekonomiko eta ekologikorekin elikatuko duen izango da eztabaidagaia*

### ***Where is “Local?” - Geographic Imagination and Agroecological Symbiosis***

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# Where is “Local?” - Geographic Imagination and Agroecological Symbiosis

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## Abstract

The “localness” of a particular product is a fluid concept that continues to defy objective classification. This lies in the power of the consumers’ geographic imagination and the role of place as it relates to “own” and “other.” Participatory mapping methods aid in accessing local knowledge which is essential to the development of the boundaries of the geographic imagination. This research studies a pilot case for restructuring production and consumption in Palopuro village, Finland, premised on nutrient recycling and (re)localized production and consumption. The model for this redesigned social/ecological foodshed is called ‘agroecological symbiosis’ (AES). The AES model takes inspiration from ecological mutualism to create synergies between producers and integrates the surrounding consumers in an effort to foster creation of food communities and ease the ecological strain of agricultural activities. The AES model, started through a grassroots initiative in Palopuro village, is a strategy to maintain the unique character of their village and to preserve their farming tradition in a sustainable way. In light of a dwindling population, this village has lost its train station and the local school. These fundamental changes to the fabric of the community brought to the forefront the potential danger of losing some of their unique cultural heritage. Palopuro village is adjacent to a growing urban area and the citizenry is adamant to maintain their culture and resist absorption into the encroaching city. Deliberate cooperation both with and among local farms has served toward creation of a (re)localized food and cultural community. This paper explores the cultural, social, political, ecological, and spatial changes to the agricultural landscape and Palopuro village as a result of implementation of the AES model. In addition, it serves as a basis for evaluating the strengths and weaknesses of AES and the potential for transferability and scalability of the AES model.

## Keywords

Local, alternative food chains, agroecology, geographic imagination, participatory mapping

## Introduction

“Local” is a term which is used a lot in modern discourses about food and consumption. This is a concept that seems so familiar that the true complexity of the term is often overlooked. What constitutes local is not just an objective definition, but is also related to an individual’s sense of place and their perception of the world around them. In addition to differences in the meaning of local on an individual basis, there is also discrepancy in the meaning of local in government

and policy documents, and the base biophysical limits of a natural ecosystem. Local is a blanket term which is used to relay information about distinct levels of government and governance which have quite different geographic bounds. However, distilling local simply to a spatial designation which must match administration spatial division does not fully capture the full range of what constitutes local from a social or biophysical perspective. When considering development of local food systems, programs, or initiatives the perception and lived experience of the participants and the range of efficient and effective nutrient cycling and recycling should be considered.

Over the course of the 21<sup>st</sup> century there has been an increasing promotion of “local food.” This is perhaps as a pushback against the increasingly globalized food chain. Globalized and fossil fuel-based linear food systems have brought with them negative impacts on food security, food safety, and the environment (Holloway *et al.* 2007, Whatmore 2002). The long and opaque “supply chains” which have developed under the globalized food system are described as contributing to rural de-structuring, loss of rural communities, widening metabolic rifts. (Wald 2016, Renting *et al.* 2003). An answer to ameliorating some of these ills is a turn to local and cyclical food systems. The overarching theme in the academic literature is that local is an inherently desirable location is a suitable nexus for the development of sustainable food systems. For example, Kloppenburg *et al.* (1996) create an eloquent argument for the necessity to shift away from the globalized food system into a foodshed model based on localized consumption and production. Within this call for change argument there is not a functional definition of what concretely constitutes the local. Their conceptions of local are dealing with an idealized local or theoretical local. Within the discussion of local there are dissenting voices which caution the unexamined and uncritical adoption of local as always the most suitable answer (Born and Purcell 2006). There have also been previous studies on environmental and social impacts of the act of localizing food. However, these studies have assumed a linear supply chains in setting of conventional food markets (Nicholson *et al.* 2015 and Sundkvist *et al.* 2000).

My paper seeks to add to this discussion of local by situating local as lived experience that exists as both a personal perception of place and bounded extent dictated by the biophysical extent of nutrient (re)cycling. In addition, the case being examined operates as a cyclical food cycle and is not participating in the globalized food chain model. This exploration of local will be carried out in the Finnish context and specifically using a case study of a food system which is seeking to (re)localize production and consumption in conjunction creating a closed nutrient loop through recycling. This case is called agroecological symbiosis (AES) and is currently operating as a standalone case in Palopuro Village in the capitol region of Finland (Koppelmäki *et al.* 2016).

Multiple avenues of investigation are used in pursuit of the meaning of local and its role within the AES model. First, the existing narratives of local will be identified using a selection of policy documents participant observation conducted in Finland. Second, local will be viewed through the articulated perceptions of local from organic farmers, researchers and policy players. These perceptions were gathered during a series of semi-structured interviews about the organic sector and the theme of local came out of the discussion naturally and served as a catalyst for forming further research question which deal more directly with the

local concept. Finally, local will be viewed through the lens of the AES model as it has been expressed in participatory mapping exercise conducted with consumer participants in the AES model.

Type	Name	Source	Scale	Use of Local	Scope and Relevance
Government Policy Document	Food2030	Ministry of Agriculture and Forestry	National Level	Spatial measure  Economic tool	Localization as a tool to build local economies. Local as an economic advantage
Government Policy Document	Local Food – But of Course!	Ministry of Agriculture and Forestry	National Level	Spatial measure  Component of cultural heritage	Local as a spatial measure. Local as a repository for local knowledge and culture.
NGO Policy Agenda	From Uniformity to Diversity  International Panel of Experts on Sustainable Food Systems	International Panel of Experts on Sustainable Food Systems	International Level	Positive connotation and generally good, but not overtly defined	Local as a representative for alternative agricultural models  Local as a desirable, but idealized space
Grassroots organization declaration	Nyéléni Declaration 2007	Nyéléni	Supranational (Grassroots organization)	Organizational Unit	The concept of local is not tied to an administrative or specific spatial measure. It is used a unit of organization between human actors within the agricultural/social system

**Table 1:** Document used to inform the administrative conception of local

The AES model is currently only operating in one location in the Finnish countryside, but the actors involved in the model believe it has the potential to be a more generally applicable model suitable for wider adoption. To aid in determining the viability of AES as a replicable model, a thorough understanding of the role and situation of what constitutes “local” is an essential step. Without a sophisticated understanding of local in the original incarnation of AES it will be

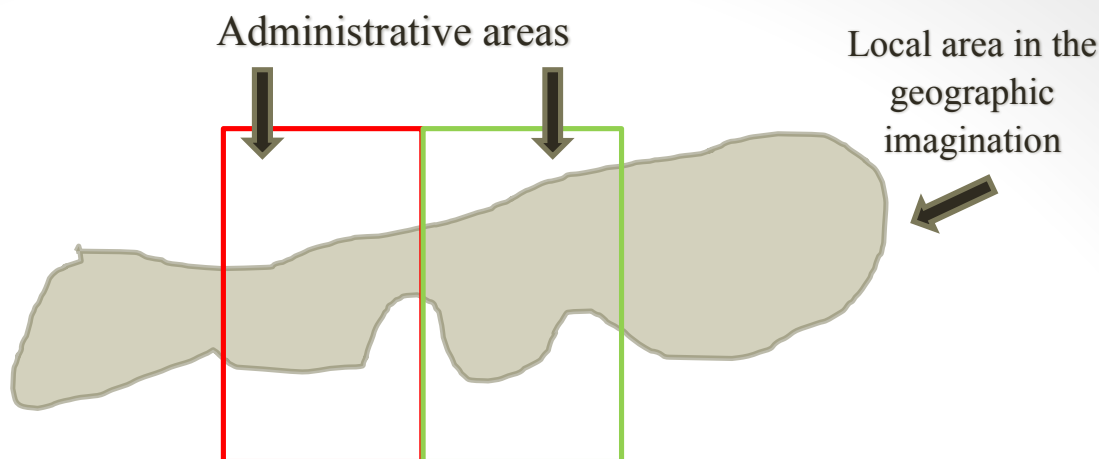
difficult to develop an assessment of the appropriate scale of local for subsequent models. It should be noted that deep examination of the complex set of variables which go into creating the perception of local are beyond the scope of this paper. At this stage of the research the perception of local is taken at face value without deep inquiry into all the variables that came together to form and influence that perception.

### Local as Reflected through Policy Documents

The Finnish Ministry of Agriculture and Forestry has a general food policy (Food 2030), an organic food policy, and a local food policy. This local food policy is called, “Local Food – But of Course!” and was published in May 2013. Even the title of this document indicates a lack of critical engagement with the concept of local food and falls into what Born and Purcell (2006) have termed the “local trap.” In that, local food is assumed to be more sustainable, more efficient, or better simply because it is produced in a specific geographic region. The report defines local as:

local food means locally-produced food that promotes the local economy, employment and food culture of the region concerned, has been produced and processed from raw material of that region, and is marketed and consumed in that region. In this context, region means the traditional ‘maakunta’ or a corresponding or smaller regional entity

This definition is decidedly vague and there is not specific scientific evidence presented in the policy or referenced regarding how this designation of local was made. The concept of local is more like a brand than a meaningful space of production and consumption – this is highlighted by the use of the word *lähiruokaa* to describe local food in the local food program instead of the traditionally used words *paikallinen ruoka*. When translated into English both words generally mean “local food,” but there is a marked difference in the connotations with the words in Finnish. *Lähiruokaa* had become a trendy designation for any food produced in Finland and this is the word which has been chosen by the government to describe the local food policy. There is a feeling that *lähiruokaa* has been co-opted by corporations as a marketing tool to be on trend with sustainability and subsequently the meaning has been watered down.



**Fig. 1:** Consumer perception of their local area is not always in sync with the administrative definitions, in addition, oftentimes different levels of administration use different spatial extents in their interpretation of local

### Role of Geographic Imagination in producing “local”

The subjectivity of local creates ambiguity when assigning an objective spatial meaning to local. The concept of “local” is personally and socially constructed; there are many values which need to be unpacked to fully appreciate the meaning of local within a specific context (Feagan, 2007). Geographic imagination is often used to examine the “ness” of a particular object or culture – in this case it is being used to explore the localness (Massey 1998). In short it is the collection of culture and personal values attached to a phenomenon viewed through a geographical lens. The concept of local does not mean the same thing to one person as it does to another person because on an individual level, local, which is a facet of place, is tied up in the geographic imagination. For example, if someone was born and raised in one *kunta* and their place of work is in the adjacent *kunta* and they travel there every day, then it is entirely possible that the area of both *kuntas* would constitute local in their geographic imagination. In addition, there have been numerous mergers of these *kunta* local administrative units as the population in Finland continues to shift from the countryside to urban areas.

### Locating the local in Agroecological symbiosis

Agroecological symbiosis is an extension of the theory of industrial symbiosis (IS) to the agricultural sector (Graedel & Allenby 1995). Graedel’s (1996) defined industrial ecology as a form of production in which the use of energy and material flows resemble those in natural ecosystems. However, his original conception of IS was not explicit about the influence of spatial scales which prove to be quite important when considering the biophysical limitations of nutrient (re)cycling. Hence, Chertow (2000) suggested that industrial symbiosis is an operation in which the partners of the symbiosis must be in spatial proximity, which more closely mimics the components of a natural ecosystem and allows for a localized co-evolution. Using an ecosystem as a base model cements the place based nature of the AES model as ecosystems in nature exist in a real and contiguous space. Drawing on the analogy of biological symbiosis, partner entities (e.g., companies or in the case of AES food producers and processors) in an IS benefit



from each other by turning what would ordinarily be waste into a resource (internal recycling). AES further expands on the foundation of IS as it not only is concerned with the recycling aspects, but it also actively promotes (re)localization in the food system. AES is premised on using an agroecology lens to interpret and understand the functions of agricultural systems (Francis *et al.* 2003)

In AES, the successful functioning of the system is not judged solely through the efficiency of the nutrient cycle, but also the reintegration of the producer and the consumer. In the pilot case this social component is expressed through the interaction of producers and consumers in a social space which has been created on the anchoring farm in the model. The space the farm has created goes beyond a simply a retail market which is premised on economic activity and deliberately works actively to support the promotion of local food culture and social heritage. One of the ways the farm seeks to do this through the production of food intended for local sale and consumption. This is the point where the question of what constitutes local enters the discussion of AES. Where is the intersections between the consumer perception of local and the spatial limits of the biophysical system? Without an answer to this question it is difficult to determine if the AES is serving its goal of (re)localizing the food system.

The AES model began organically as a cooperation between the producers and the local community in Palopuro Village in Finland. After the producer, processor, and consumer cooperation were already underway, actors in Palopuro approached the University of Helsinki and described the systems they were developing. It was the actors in the village that sought the collaboration with academic researchers to name and create a model from the agricultural system they had independently devised. From the academic perspective, the intention is to develop the model further and create parameters to measure success of the model from both the biophysical and social perspective. If the model proves to be effective there is hope that this model will be reproducible and scalable in contexts outside of the Finnish countryside. It is hypothesized the AES could stand a step toward true agricultural sustainability. Developing the metrics to determine the spatial scale of the biophysical system is a goal of our overarching research project. However, the details of the biophysical (re)cycling in the AES and the scientific steps to develop those metrics are beyond the scope of this paper.

Place-based agriculture is not a new concept and has been explored in the literature through the lens of urban-rural food systems (Marsden and Sonnio 2012). Awareness of place is a needed as a component of developing a (re)localized production and consumption system. Everything that is grown in the world has a physical location, a discrete space where it comes into being. In addition, everything that is consumed in the world is also rooted to an actual act which takes places in a physical space. Even as ease of transportation has created a smaller seeming world; technology still has not created a provision to provide wireless calories. The AES model seeks to bring the production and consumption into closer proximity as a strategy to facilitate nutrient (re)cycling. This reintroduction of the producer and consumer is also a step toward transformation to sustainable agricultural systems and healing the metabolic rift perpetrated under the globalized, industrial agricultural model (See Marx 1867, Foster 1999,

McClintock 2010, and Moore 2011 for a further discussion of metabolic rift in the context of agricultural systems).

AES is situated as a pushback against the globalized food chain and a way to operate successfully outside of the industrial agricultural model. Not seeking to work within the globalized food chain, but to create cyclical systems on a scale which is appropriate to the biophysical constraints and the social boundaries of the consumer geographic imagination. In the AES model, a defined local as an integral facet in the ability to determine the potential of scalability and the key factor in determining the appropriate customer bases for an AES system. It should be noted that AES as a model is focused more on creating opportunities to produce and consume food locally and in seeking for a definition of local it is not a strict spatial measure, but a place based measure of what bound of the local system around each AES model. This means that what is local in the AES model operating in Palopuro might not be the same scale for local in another geographic setting. We are attempting to determine the extent of local in the Palopuro AES model to determine an effective set of ways to catalogue the extent of local in other geographic contexts. In a successful AES system, the extent of local should be treated as tool to exercise the principles of an ecology modeled agricultural system.

## Research Questions

The base research question is: What is the “local” in local food? This question is explored in the context of Finland and the articulated goals for increased local food in the Finnish Food Policy. Essentially, the government lays a heavy emphasis on the need for local food and is generally very positive about the development of local food enterprises. The geographic extent of local is set to the regional level and remains quite flexible. However, in designing viable agricultural systems which promote the production and distribution of “local food” the consider of what constitutes a product as local is two-fold and does not always neatly align with the administrative regions. One must take into consideration both the biophysical boundaries of self-sustaining agricultural system and the geographic imagination of the consumers. Thus, to create a product which is truly local and viable it must fall within the boundaries of the biophysical extent and the consumer’s perception of the local region. As perception is exercised on an individual level it is almost impossible to find a space which will satisfy the geographic imagination of each individual consumer. However, based on the preliminary findings there appear to be commonly shared ways in which local is perceived as spatial extent. By spatial extent, I mean the geographic regional or portion of the landscape which is included in an individual’s lived experience of their local space. This paper will explore the concept of local from three main perspectives. First, through a review of the pertinent policy documents. Second, the reflection on what local means from interviews conducted with organic farmers, policy actors, and researchers in the organic sector. Finally, through participatory mapping conducted with consumers involved in two different short chain systems.

## Methods

This paper is based on interpretative qualitative work carried out in Finland between 2013 and 2017. The base observations in this paper were built over the



course of three projects centered around organic agriculture, alternative supply chains, and rural agricultural development. The methods employed over these projects include semi-structured interviews, participant observation, semi-structured surveys, and participatory mapping.

The interviews quoted in this paper came out of a research project which addressed the interplay between state power and the EU in the administration of organic agricultural policy. While the overarching topic might seem far away from the topics covered herein, the interviews for this project inadvertently highlighted the subject of local. Over the course of the interviews, a strong discourse emerged on the role of locality as a consideration of food procurement. The participants in these interviews were Finnish organic farmers, policy actors at the regional and national level, and organic researchers. I used snowball sampling and did not have specific geographic bounds within Finland for the location of my informants. Thus, these interviews come from all parts of Finland. The farmers were largely located in rural areas, while the policy actors and researchers were from urban areas. This research revealed local as important topic and lead to the second project.

Given what was learned about the conception of local in the first interview project, for the second interview project I chose to focus on the role of alternative supply chains and urban gardening in the (re)localization of food production, processing, and procurement. In this research, I more directly approached the local question through a participatory mapping exercise, asking respondents to demonstrate by marking on a blank map of Finland what they considered to be the extent of local food. The respondents in this participatory mapping exercise were participants in a Helsinki based community support agriculture (CSA) project. The participants were chosen at random from a group who volunteered to perform manual labor at the CSA fields. Interviews were also conducted with participants, but the results of those interviews are not reported in this project. This pilot participatory mapping project has led to the current project in Palopuro Village.

In this third iteration of investigation into “local” the participatory mapping exercise has been paired with a semi-structured survey. This survey integrates questions about where respondents have lived, currently live, and where they consider their home to be. Respondents are drawn from consumer who are participating in social activities being held at the social space which has been created on one of the farms participating in the AES model. In addition to the participatory mapping activity, multiple participant observations and non-interview conversations were conducted at the same site in 2016. These activities coupled with the previous research projects served to inform the development of the survey and participatory mapping activity. At present this paper is formally reporting the preliminary results of the most recent survey and participatory mapping research in Palopuro village. However, the prior projects and the knowledge gained does play a role in the development of my conclusions.

### Initial Data Analysis

The results reported herein from the interview data and the participatory mapping are in the preliminary stages of analysis and deconstruction. There are reoccurring narratives in the interviews and overarching trends in the participatory mapping activities which have emerged from this initial analysis.

These preliminary results will inform continued fieldwork. It should be noted that the interviews were not conducted with the AES concept in mind and the discussion of local in the interviews represents a more general exploration into the idea of local. The theme of local food in the interviews was surprising and not anticipated. When the theme emerged in the early interviews, it was more deliberately explored in later interviews. Forthcoming fieldwork will be focused specifically on the question of local and will be conducted with the producer and consumer population participating in the AES model in Palopuro.

### *Locating personal narratives of local*

In the interviews a clear division was established between Finnish produced food and food which is produced outside of Finland. In almost all cases, when a preference was indicated, it was for food produced in Finland. The desire for Finnish food and one line of reasoning for this is illustrated in the following:

When I go to the grocery store and buy eggs – we have here in one shops there is many, many eggs produced. So, there is our local eggs and organic eggs and free hen eggs and eggs are that are. But I always buy that local because I know he is almost my neighbor who produced those eggs, but these are not organics. But I know him I saw the man almost every day when I go to the shop and he delivers the eggs to the shops. But that is difficult – I usually I buy organic every time, but it also has to be from Finland because I know Finnish farmers so much. (Interviewee 17 2013)

It should be noted that when asked to consider between a local conventionally grown product and a foreign organic product there was a preference for the Finnish conventional product. There was a marked divide between food which is produced domestically and food which came from other countries. There were multiple reasons given for why Finnish food was preferred, including possible nationalistic motivations as described below:

I try to buy organic and if that is not available I buy at least Finnish produce. If I have a choice between an organically produced carrot, but that is produced in Spain and a conventionally produced carrot that is produced in Finland. I choose the Finnish one even if it is conventional because it is also a bit of patriotism involved I guess. Support the local farmers and so on. (Interviewee 57 2014)

In addition, there was an articulated desire to support local entrepreneurs. This entrepreneur indicated that they were interested in other entrepreneurs and they extended that idea that small farms better support his value of supporting entrepreneurs.

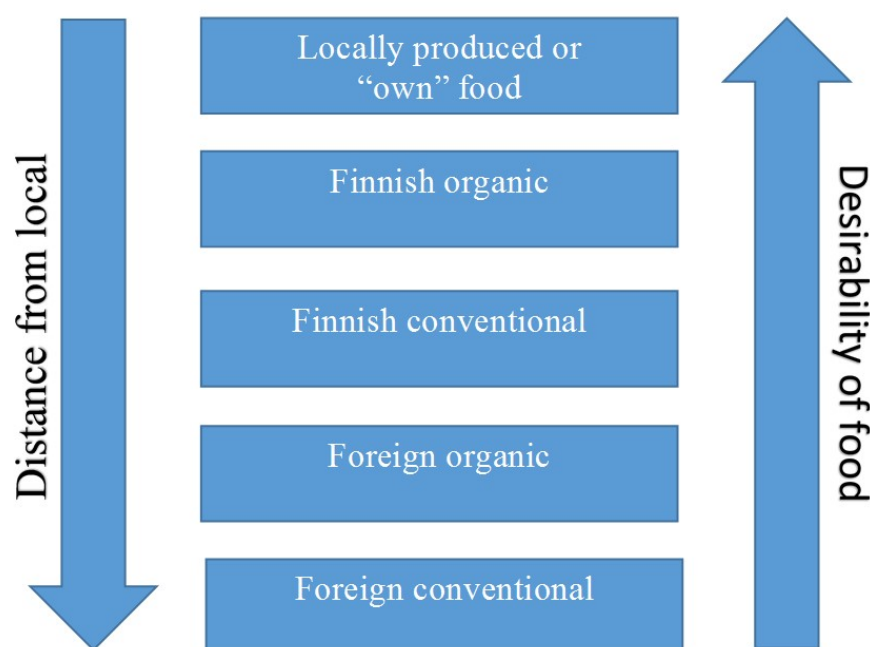
If I am an entrepreneur so I think of all the others who are having these small businesses like me. I would rather buy from a small entrepreneur than a big one. And maybe that is also part of the idea when you choose the product in the supermarket, you try to support the local and the small. If it comes from abroad, it is probably from a big farm. That is at

least the idea I have, I don't know if it is really true or not.  
(Interviewee 62 2014)

In addition to the patriotic or political motivations, support for local food was also linked to a simple lifestyle and a distancing from the complicated globalized food chain. One of the cornerstones of tradition Finnish food culture lies in gathering food from the forests. Finland has a wide variety of berries, mushrooms, and other forest products which grown widely and are allow to be gathered freely for own's use on all land. Perhaps this tradition has served to create a connection with food that has transcended the more recent industrialization and urbanization of the Finnish population.

"I like to use local products and I – because I eat myself in a simple way. I usually, for myself, and for my family, I buy basic raw materials. It means potatoes, carrots, berries I am growing myself or picking up in the forest. Mushrooms I am picking up. I am also fishing because I am living nearby lake." (Interviewee 52 2014)

The interview responses also showed that there was informal hierarchy of food desirability shared by the respondents. It is interesting to note that this hierarchy is not based solely on spatial measures as it is not possible to determine the discrete distance of the producer in each of the categories from the consumer. Local food is the most desirable and can be assumed to be in the closest spatial proximity. However, once you step outside of the personally perceived "local" there are considerations which transcend the spatial. Thus, the overall hierarchy is both spatial and scalar.



**Fig. 1:** The correlation which came out in the interview between desirability of a food item and where it was produced. This graphic is produced as a preliminary impression of the expression of the desirability of the generalized categories of food local, organic, conventional, and foreign. These ideas will be further explored more specifically and deliberately in forthcoming interviews with participants in the AES model.

Local appears to be an important concept in Finland, and the procurement of local food was often described as a priority, even surpassing the desire for organic food. For example, one individual expressed this desire for local in this way:

Perhaps not only organic, but we could say organic and local food. I think the local food is a little bit stronger. Has been a little but stronger here and especially Finnish food. Use origin Finnish raw materials and so on.” (Interviewee 36 2014)

The focus on local food as more desirable than simply organic food is further reinforced by another respondent:

I would personally prefer local and organic then again I would prefer local rather than organic that comes from anywhere. If I have local conventionally produced mutton meat sheep meat so I would prefer that to buy from the local producer than the New Zealand organic. (Interviewee 5 2013)

This categorization of desirability is important because it highlights the role of organic when it enters the globalized food chain. When participating in the globalized food chain organic food is at as much risk as conventional food as being not food from somewhere, but food from anywhere, food from nowhere (McMichael 2009, Campbell 2009). The preliminary results from these interviews formed the basis for the development of participatory mapping exercises which will be further discussed in the next section.

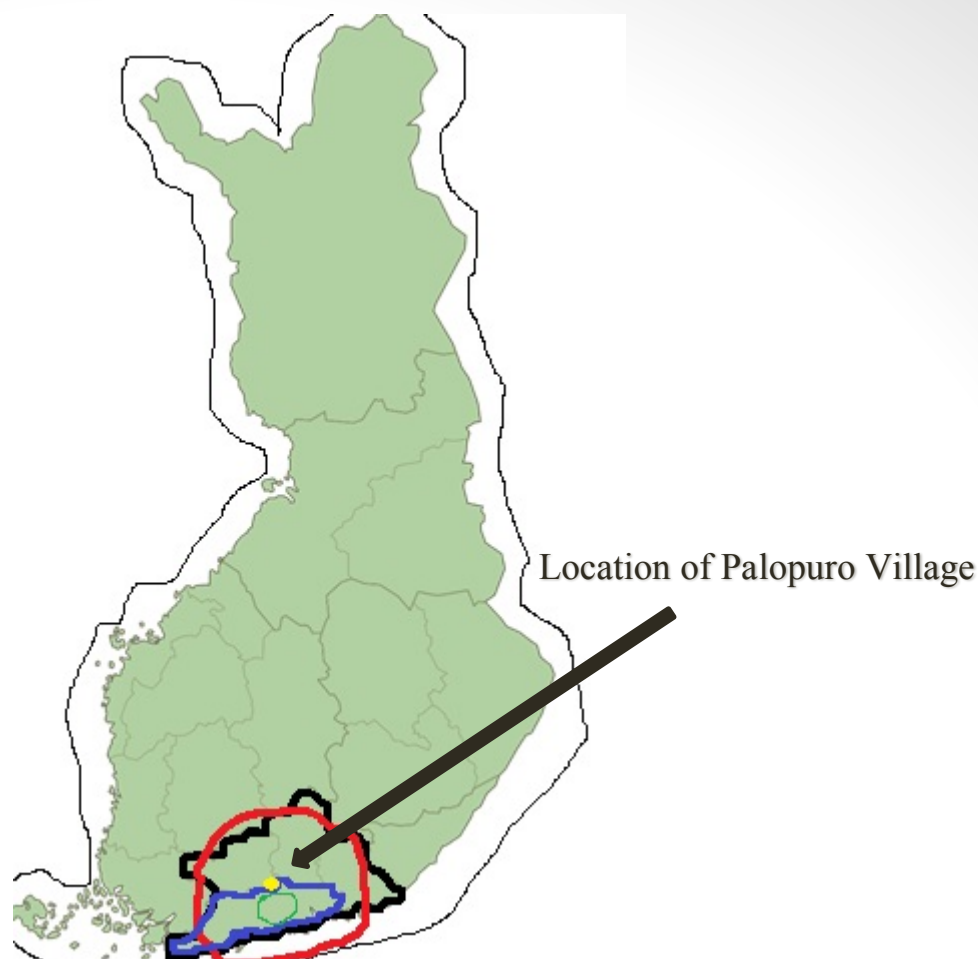
Category	Description	Number of Maps
1	The entirety of Finland is marked as the local area.	4
2	Multiple administrative areas around and including the respondents' home region is marked. All markings follow the official administrative boundaries	5
3	<b>Multiple administrative areas including the respondents' home are marked, but they do not follow the official administrative divisions</b>	<b>11</b>
4	The respondents home region is marked following the official administrative region	2
5	Less than one administrative region is marked corresponding with the area the respondent lives	4
6	There is no correlation to the stated home area of the respondent.	4
7	The respondent made no markings on the map. It should be noted that this only occurred in the Palopuro participatory	6

	mapping perhaps because it was part of a larger survey and not a stand-alone exercise	
8	Maps were categorized in different categories by the researchers so there was no correlation between the researchers' interpretation of the maps	8

**Table 2:** This table includes all the categories which were observed in the preliminary participatory mapping activities. Perhaps in further iterations of the research the categories will be summarized, but presently the full breath better supports the argument regarding the myriad of geographic imaginations of personal local areas.

## Participatory Mapping Data

To date, two pilot participatory mapping activities have been completed with participants in two short food chains. These participants were asked to physically draw the extent of what they consider to be their own local area. These results were then categorized independently by myself and a research assistant. We developed categories separately, grouped the maps into the categories, and compared our results. Without any prior discussion, we had five categories that were fundamentally the same. While we used different words in our category titles, they were expressing the same type of group and contained many of the same maps. In addition, there were two categories which did not match up. There were 44 maps total and the researchers categorized 81 percent of the maps in the same categories without prior conversation. In the below graphic the red outline is a visualization of the most common way that local was expressed. Which is, multiple administrative areas including the respondents' home area, but not following any predefined administrative boundaries. This is perhaps an indication that the administrative boundaries might not be the most appropriate to use when creating a conception of local in a functioning AES.



**Fig. 2:** Each outline represents a different personal perception of the extent of the area that is local from each of the categories discovered in the analysis except for categories 6, 7, and 8.

## Preliminary Conclusions

AES is an endogenous form of rural (re)development. To achieve a successful AES model as outlined by the founders of AES, it is necessary for the farming to meaningful engage with the local from both a biophysical and social perspective. The biophysical limits of a local system can be quantified through examination of the nutrient cycles and the effective limits of self-contained system. However, the social perception of what constitutes local is a much more nuanced. The interviews revealed a narrative which associated spatial measures with food procurement and desirability. In addition, themes of organic and conventional were often tied to the consideration about food choice. In this there seemed to be a preference for own food – in the sense that food from the “local” region is considered as distinct and different from food outside the “local.” This local was readily identified by respondents in the participatory mapping activities. These preliminary results show that there are definable categories which correspond to the individual conception of what constitutes local. It will be interesting to see if these same categories hold when a larger sample size is utilized. It was evident from the participatory mapping that the personal perceptions of local often do not match with administrative definitions.



## Next Steps for this research

This paper reports preliminary finds from an ongoing research project. The next steps are further analysis of the existing interview and participatory mapping materials. These results will be triangulated with extensive in-situ observation in Palopuro village, additional semi-structured interviews with participants in the AES model including producers, processor, and consumers. In collaboration with the nutrient cycling focused researchers we will work to find intersection between the biophysical and social cycles within the AES model and look toward developing metrics to determine the extent of local. These further research actions will be carried out in 2017, 2018, and 2019. A long-range goal of this research is finding suitable partner locations to establish additional working AES models.

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## Nazioarteko Hizketaldia

**ELIKADURAREN ETORKIZUNA ETA NEKAZARITZAREN ERRONKAK XXI. MENDERAKO:**

***Mundua nork, nola eta zer-nolako inplikazio sozial, ekonomiko eta ekologikorekin elikatuko duen izango da eztabaidagaia***

2017ko apirilaren 24 / 26. Europa Biltzar Jauregia. Vitoria-Gasteiz. Araba. Euskal Herria. Europa.

## International Colloquium

**THE FUTURE OF FOOD AND CHALLENGES FOR AGRICULTURE IN THE 21st CENTURY:**

***Debates about who, how and with what social, economic and ecological implications we will feed the world.***

April 24th - 26th. Europa Congress Palace. Vitoria Gasteiz. Álava. Basque Country/Europe

## Coloquio Internacional

**EL FUTURO DE LA ALIMENTACIÓN Y RETOS DE LA AGRICULTURA PARA EL SIGLO XXI:**

***Debates sobre quién, cómo y con qué implicaciones sociales, económicas y ecológicas alimentará el mundo.***

24 / 26 de Abril, 2017. Palacio de Congresos Europa. Vitoria-Gasteiz. Álava. País Vasco. Europa.

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