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The case of Solidarity Purchasing Groups in the Marche Region, Italy

The article illustrates selected results of an exploratory research study on ‘GAS movement’ coordinated by the *Solidarity Economy Network* in Marche Region, Italy. The GAS experience proves to revolve substantially around food purchasing groups practice. Therefore, the research aimed at investigating the economic and eco-logical determinants characterising the world of critical food consumption. Qualitative and quantitative data have been analysed from a socio-economic and ecological point of view, providing an insight on different issues concerning the framework of the solidarity economy and possible further developments. The ecological performance of a “critical food consume” in comparison with a “conventional one” was assessed using the *Material Input Per Service unit* (MIPS) concept.

1. Introduction

In 2010-2014, a research was conducted by an equip from The Polytechnic University of Marche, The University of Macerata and The University of Camerino, and co-financed by “Banca Etica” (Ethic Bank) with the coordination of Solidarity Economy Network of Marche (REES Marche). A sample of 20 GAS (Gruppi di Acquisto Solidale, Solidarity Purchasing Groups) was examined: in particular, 182 GAS Household Members (GHM) and 20 agricultural GAS suppliers. As suggested by Tregear (2011) regarding the approach to research on these experiences that Murdoch (2000) defined as Alternative Food Networks (AFNs), this article incorporates a cross-fertilisation of ideas from different analytical perspectives, and it presents a case study adopting balance and rigour in the execution and analysis of the fieldwork. Data was collected through *ad hoc* questionnaires, in depth interviews and focus group interviews. Qualitative and quantitative data have been analysed from a sociological, psycho-sociological and economic point of view, providing an insight on different issues concerning the actual framework of the solidarity economy in the region and possible further developments.

Focus groups reveal that the GAS movement perceives a lack of network coordination and development at regional level. Moreover, GASs all agree that

REES Marche could play the role of coordinator and facilitator of this network. However, at the same time, they convey a critical view of the current effort and role of REES Marche regarding the GAS experience. They say literally, “REES does not have a control room and an operating arm”.

On this premise, the paper focuses on elements from the project’s outcomes related to the GAS market functioning, in order to investigate the issues of supply, demand and quality differentiation. The environmental impact of food purchased through GAS is also included in the investigation, as a relevant attribute contributing to the quality of food. The amount of material resources embodied in food provided by GAS and conventional chains, consumed in a week by one person is assessed and compared.

Thus, in order to place the analysis within a clear framework, the paper first provides (chapter two) an overview of the human environment that characterises the GAS reality as it emerged from the holistic research, and, secondly the functioning and peculiarities of the Italian agri-food market, which is the “world” where these GASs operate. Chapter three describes how the survey was conducted both from a socio-economic perspective and from an ecological one.

The results are presented in chapter four, considering the demand and supply side, describing the main typologies of producers and consumers within the GAS experience. The interpretation of empirical results, in chapter five, deals with the issue of the gap between the perceived food quality (consumer side) and objective food quality (supply side) in the “GAS galaxy”, given the Italian agri-food market scenario.

It is stressed that specific quantitative points of reference – both from an economic and ecological point of view – in assessing the impact of GAS networks on agri-food economy are fixed. In addition, these specific quantitative points of reference will be useful in future comparative studies related to the issue of alternative food governance.

In chapter six the conclusions highlight the critical elements of quality, prices and chain organisation which should be carefully envisaged for ensuring a sustainable development of the GAS experience, both from the socio-economic and ecological side¹.

¹ We presented a preliminary draft of the present paper at the *International Conference “Agriculture in an Urbanizing Society”* in the working group 3 “exploring *civil food networks* and their role in enabling sustainable urban food”, at the University of Wageningen, The Netherlands, in 2012. A power point presentation and an extended abstract (not citable without the author’s express permission) are still available on the website of said conference (<http://www.agricultureinurbanizingsociety.com/?cat=6>). Comments and suggestions received at this conference were essential in the drafting of the present article.

2. The socio-economic context in which GASs operate

2.1 The human environment

According to Norris (1999) regarding the key role of consumption in outlining the field of action of the “critical citizen”, we assume that the area of the solidarity economy automatically implies the concept of critical consumption. Critical consumption is intended as criticism of the existing, which tends toward the formation of new social demands potentially capable of becoming new images of the world (Orazi, 2011). Thus, although it is not obvious that this was always true, in agreement with Cembalo *et al.* (2013), we support the idea that the GAS movement emerges as an active tool in experimenting and spreading of critical consumption behavior.

Focusing on GAS members from a sociological point of view, the holistic research revealed that the members of these new realities of critical consumption are young individuals with a high level of education, the majority are female, with a middle-class social background. The GAS members (especially women) mainly perceive critical consumption as a tool with strong public and policy values and strong implication for redefining cultural and social claim. They label themselves primarily ethical oriented citizens in line with the so called “responsible citizenship”, thereby priding themselves for their high level of information access, civic pride and social commitment. In some ways, and differently by the findings about the experience of GAS in Rome (Fonte, 2013), in Marche Region the GAS members emerge as an “élite group” that does not represent the worldwide society, but rather embed the shape of a new social movement of active citizenship (Orazi and Socci, 2011).

From a psycho-sociological perspective, the focus groups have produced interesting information about some essential features inherent to the “solidarity economy” foundations. The GAS experience emerges as a very diversified reality centred in the food economy. GAS members and producers have asked for coordination in order to make their relationship more systematic and systemic. Their mutual liaison remains very unstable. There is an abstract belief in the social function of the state of minority active citizenship as a factor of social change. However, a relevant set of organisation and communication skills is needed in order to affect the social reality (Pojaghi, 2011).

From a social-psychological perspective, at the self-perception level (Myers, 2012), the attribute of critical consumer was revealed in the GAS member. In fact, 61 percent of men and 74.5 percent of women surveyed affirm to believe that critical consumption is their main reason for joining the GAS experience (Orazi and Socci, 2011). Accordingly, the presence of many elements useful for potentially developing a critical consumption network have

been observed at a relational level both among Gas members and between GAS members and farmers (Belletti *et al.*, 2012)². However, as pointed out by Moscovici (1976), the social minority influence can evolve from a potential to an effective and concrete one, if and only consistency and coherence in the minority group is provided.

The minority group must be perceived from the outside as a whole in its goals and philosophy. On the contrary, we found a strong heterogeneity among the GAS present in the region and the lack of coordination among them and with their suppliers. This obviously can negatively affect their role and impact in the territorial development. The good news is that they (both GAS members and their farmer suppliers) are aware of what the next step is. Namely, improving inter-group coordination, networking and consolidation of critical consumption leveraging on a regional systemic approach to the issue of sustainability.

The above comments do not support the “panacea” representation of GAS experience proposed by Brunori *et al.* (2012). On the contrary, we adhere to the idea that to survive, democracy needs domestic criticism, even if radical, to enable innovative assumptions and meanings (Agamben *et al.*, 2010). Quoting Cembalo *et al.* (2010), we agree on the assumption that innovation in the food chain “means creating a new sustainable agri-food system while taking the institutional element into account”.

Focusing on the suppliers, the sociological analysis established the worth and ethics in the relationship with GAS members is a fundamental condition in the analysed producer profile segment, nevertheless several “obstacles” need to be considered. Firstly, the conception of the network as a relational system was shown to be practiced in part, but not always considered a priority. Secondly, the question of market organisation was sometimes lived as personal hard work rather than a goal to be achieved together with a participatory approach and shared aims. From this point of view, for this great effort borne by suppliers, GASs are similar to a ‘community-supported agriculture’ (CSA) configuration (White, 2013) which usually operates by initiative of one or more farming entrepreneurs (Grasseni *et al.*, 2013). Thirdly, there is ambivalence in the upstream and downstream links especially with the Public institutions and the GAS network (Giovagnoli, 2011).

² This reference regards a draft paper presented at the International Conference “Towards a Sustainable Bio-economy: Economic Issues and Policy Challenges” in the working group “Agriculture in Italy”, at the University of Trento, Italy, in 2012. It was written in Italian and it is to be considered an interpretation of the research on GAS networks in Marche Region with respect to the concepts of sustainability and bio-economy. Comments and suggestions received at this conference were essential in the drafting of the present article.

2.2 *The Italian agri-food markets*

The minority active citizenship, underlying GAS experience, works in a background where one of the main elements of crisis is the issue of farm labour income. A major factor in the complex system of negative externalities generated by the industrial system applied to agriculture is the technological treadmill (Cochrane, 1979)³. The obvious means to reduce unit production cost in agriculture would be to increase land productivity, but the demand for food is inelastic, especially in mature markets like those of developed countries; in such cases a supply increment results in reduced total revenue. Moreover, in the short run the returns to scale of the land factor tend to decrease progressively, approaching zero, due to diminishing land fertility (Pfeiffer, 2003).

Competing on price, on increasingly open, hence ever more competitive agricultural markets, would entail exploiting productivity margins that are no longer there. Therefore, given the inelastic nature of the food demand function to which is added an agri-food supply chain of a monopsonistic nature (from the farmers' point of view) and the exhausted returns to scale, the pressure on agricultural prices is generally high. Thus, transversally at national and international level, although with different weighting depending on the specific empirical cases considered, the Farm Family Labour Opportunity Cost (FFLOC) is not repaid according to a logic of efficiency or equity.

In Italy, the part-time structure is a central element for the farm household income sustainability. Although this part-time structure is tending to collapse due to socio-demographic phenomena such as the reduction in the farm household size. Alongside this is the ever increasing problem of liquidity and the lack of access to credit and financial services to cover variable costs. The second fundamental element supporting farm households is public policy providing protection and subsidies. However it is well known that these resources are increasingly constrained and constantly diminishing.

The farm labour problem emerges in some data. Thus, looking to agriculture as a whole, in the period 2005-2014, in the EU-28 the real income of agricultural workers grew by 34.6% while Italy grew only by 0.3% (Eurostat, 2015). In 2000-2009, farm employment in the EU-27 declined by 24.9%, whereas the real income generated per agricultural worker grew by 5.3%; over the same period, Italy lost 15.9% of agricultural workers but incomes fell by 35.8% (Eurostat, 2010).

Shifting the focus to organic farming, to date in Europe this has been growing in terms of farmed land and market share, indeed retail market data even

³ The technological treadmill consists on the effect of industrial innovation in agriculture whereby the price-taker farmer is forced by the market to make continuous technological investments to minimise production costs.

demonstrate double-digit increments for most produce types (Bteich *et al.*, 2011). However, the agricultural income generated, in particular the Family Farm Income (FFI), often does not depend on price at the farm but on other factors, first and foremost agricultural subsidies. In addition, the income generated by organic production is not always greater than the one obtained from conventional farming: it is often similar, sometimes lower (de Bont *et al.*, 2005).

Thus, in the EU agricultural employment is rapidly declining; at the same time the concentration of production resulting from the exit from the market of part of the farms and from the reduction of the amounts produced in the main agricultural markets over the last five years (after the decoupling of subsidies from production) has barely increased incomes. In contrast, the organic market is in excellent health and increasing amounts of European land are being converted to organic farming. Although organic farmers do not increase their income, they do however increase the converted acreage stimulated by subsidies.

As known, the GAS experience is closely related to the adoption and preference for both organic farming and short food supply chains. Therefore, the basic assumption of many studies is that thanks to these preferences, GASs positively influence the agricultural income. Thus, referring to this basic assumption, although from completely different scientific approaches, two empirical confirmations arrive from the case of GAS in Tuscany (Brunori *et al.*, 2011) and the case study of GAS in Sicily (Migliore *et al.*, 2014). The approach to the matter proposed by the first of the two cited articles is sociological and qualitative while the second article offers a quantitative and econometric empirical checking.

However, in essence, the two studies converge on a clear optimistic vision about the positive influence on farm income provided by the GAS movement. Therefore, with respect to these studies, our criticism, hopefully constructive, refers to the not so clear and disaggregated perspective on farm income identification. Specifically with regard to the farm family labor opportunity cost as a crucial pillar in defining whether the farm income improvement guaranteed by the GAS movement is incisive and effective or not. Hence, we tried to improve this lack of focus on farm self-employment of labour by proposing an assessment of the GAS network incidence on the remuneration of farm household labor (see paragraph 4.1).

3. Methodology

3.1 The GAS food market exploratory investigation

The heterogeneous Italian experience of GAS is here reduced to the theoretical context (Renting *et al.*, 2003) that defines short food supply chains (SF-

SCs) as organisations aimed at purchasing food outside the mass retail model. According to this theoretical reference “short” is the critical element shared by a range of networks that reflect and embody the attempt of citizen groups to bypass conventional mass food production and sale. Another term, more general, meaning an organisation alternative to the agro-industrial model is AFN. Here, SFSC and AFN will be used as synonyms.

The analysis of the GAS market was conducted through the elaboration, test and administration of three particular face-to-face qualitative and quantitative questionnaires within an exploratory structure aimed at investigating the three basic elements constituting the “GAS food supply chain”. Thus, one interview was performed with GAS household members (consumers), another with the GAS coordinators (GAS as auto-managed food retailers) and still another with the agricultural producers (GAS food suppliers). Although definite figures are difficult to obtain, given their often atomistic origin and evolution, at the moment of the research planning the total number of GAS registered by REES at a regional level was 25. Among these, 20 GASs agreed to be embraced in this study serving a population of 1,765 GAS household members, from which a quota-sample of 182 GAS household members were recruited.

On the consumer side, following a descriptive analysis of the food expenditure of the GAS household members sample, a Principal Component Analysis (PCA) was conducted on the percentage of household expenditure within the GAS net for each product category compared with the household’s overall food shopping for each product category. The aim was to explore the simultaneous household replacement capacity of non-GAS distribution with GAS distribution.

On the supply side, firstly, three different types of direct food GAS suppliers were identified and farmers interviewed were asked to define the role of GAS in relation to their overall market. Secondly, an exploratory assessment of farm family labor opportunity cost generated by the SFSC in Marche will be presented. This assessment was realized by reconstructing the income statement within a *convenience sample* of ten conventional farms specialized in horticulture, a very sensitive field in the GAS mind. These farms are located in the Musone Valley⁴ (Province of Ancona) a territory where the rural and urban dimensions are very closed and integrated.

3.2 The ecological assessment

The investigation on the GAS food market and food quality system has been integrated with an ecological assessment aiming to estimate the environ-

⁴ Musone is a river located in the province of Ancona, Marche, Italy.

mental impact of a diet provided mainly through a GAS food chain, in comparison with a conventional one. The evaluation was carried out using the MIPS (Material Input Per Service unit) concept (Schmidt-Bleek, 1994, 2008)

MIPS stands for Material Input Per Service unit and is a measure of the environmental pressure due to goods production and consumption, based on the accounting of material resources used in the life cycle of products and services. It provides a quantitative measure of the “ecological rucksack”, or also called “material footprint”, that is the invisible amount of materials (and energy carriers) that are removed from their original place to obtain the final product or service (Lettenmeier *et al.*, 2009). It considers all the life cycle phases, and all the backwards processes linked with the object under study (as they could be potentially infinitive, a system boundary has to be previously established). The material input includes the following categories of resources: abiotic raw materials, biotic raw materials, water, air, earth movements in agriculture and silviculture, erosion.

The calculation of MIPS consists on the ratio between the Material Input (MI), which is the sum of all the material inputs used in the good life cycle and the Service Unit (S), i.e. the benefit provided by this product. The calculation has a modular reasoning, and uses pre-calculated MI factors for elementary processes (materials, fossil fuels, transport services) available in the literature (Lettenmeier *et al.*, 2009).

The MIPS results are structured in the six categories of resources mentioned above, which cannot be summed up together, with the exception of the abiotic (i.e. the non renewable resources: mineral raw materials, fossil energy carriers, soil excavations) and the biotic (i.e. biomass from cultivated and uncultivated land). The addition of abiotic and biotic constitutes the MIPS based indicator Total Material Requirement (TMR).

In the case of food, the supply chain is analysed through the three steps of vegetal productions, animal production and food processing. In addition, the agricultural inputs’ production and delivery is encompassed, as well as all the transport phases within the supply chain.

Two different paradigms of food chains were modelled in order to compare the material footprint of a weekly diet for one person: a conventional one, including all foodstuffs and agricultural products from conventional agriculture, industrial processing and department stores retailing system; a GAS paradigm, in which food is predominantly organic and produced in the closeness⁵ (Mancini *et al.*, 2011). The main features of the two paradigms are in Table 1.

⁵ Due to the lack of data for the MIPS calculation, some foodstuffs (Parmesan cheese and milk) are organic and others (oranges and orange juice) are conventional in both paradigms. Therefore, the difference between conventional and gas paradigms’ material footprint is underestimated.

A previous survey assessed the MI of 37 foodstuffs and agricultural products, both in conventional and organic agriculture (Mancini, 2013). These figures were then used in the calculation of diets' impact. We assumed the same diet composition in both paradigms, referring to the recommendation of Italian Ministry of Health (for a salubrious nutrition and food habits)⁶. The composed diet provides 14,000 kilocalories in a week.

Tab. 1. Food chains' paradigms main features

	Conventional	GAS
Agricultural practice	Conventional and industrialised	Organic
Distance for agricultural inputs' provision (km)	150	100
Average distance covered by food (from farm to retailing) (km)	700	from 20 to 50
Stakeholders in the supply chain	Inputs producers and retailers, farmers, processors, wholesalers, retailers, consumers	Inputs producers and retailers, farmers, GAS organisers, consumers
Food demand	Large variety of products, included exotic, out of season fruit and vegetables, processed, convenience, and functional food	Bigger shares of fresh fruit and vegetables, other basic foodstuffs (e.g. pasta, wine, oil, honey, etc...), organic
Purchasing trip	car	Walking
Distance run by car for shopping (round trip, km)	30	-

Source: our processing

4. The results

4.1 The supply side: producer typologies in GAS network

The types of farmers supplying the GAS are identified as the following:

- Supplier A, having GAS as the main selling channel;

⁶ These recommendations available in the website <http://www.piramidealimentare.it/> (last time accessed 08/03/2015).

- Supplier B, providing only the surpluses from his other market channels to GAS;
- Supplier C, using GAS together and complementarily with other SFSC (e.g. farm outlet for direct selling, direct selling to school refectories, etc.).

Supplier A is the rarest of the three, selling to GAS as the main, sometimes only, retail channel. The producer price is substantially above the average price for similar products commercialised outside the GAS. The consumer price level paid to supplier A by the GAS household members is uncertain. It will be higher, equal or lower than that one paid on average outside the GAS as a function of two factors: the difference in perceived value (quality perception) and the difference in processing and distribution costs related to the different retailing chain, the result seems to be ambiguous and contingent.

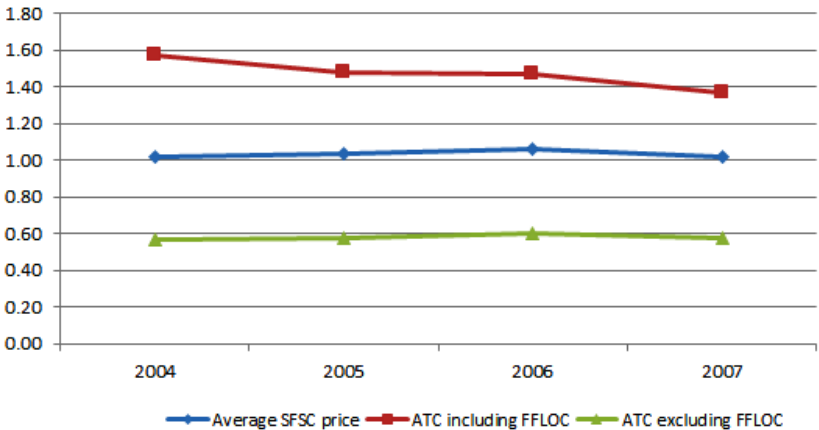
Thus, with regard to the price of produce purchased through GASs, the research shows that 14.1% of those interviewed stated that prices are on average higher than market prices; 28.8% that they are on average lower; and 55.7% that they are similar. The cause of the perceived lower prices paid through the GAS compared with conventional retail channels is the shorter chain according to 63% of interviewees and bulk purchase by the GAS according to 30%. The cause of the perceived higher prices paid through the GAS compared with conventional retail channels is the greater quality guaranteed by the GAS according to 37% of interviewees and the greater quality guarantee implicit in the relationship established with the producer according to 35% of interviewees.

Supplier B sells to GAS, at a discount, any excess produce that he cannot place through conventional retail channels. This is the farmer who, despite sometimes holding an organic certification, competes in a quality market where the tendency is towards perfect competition involving competition on production costs. The case of this supplier demonstrates that even the quality market cannot escape the problem of excess production typical of price competition. For the type B supplier it is the GAS that sets the price. The case is theoretically similar to the one where the buyer is a mass retailer. Demand concentration (of retailers, in this case the GAS) in a market characterised by the horizontal competition of sellers results in monopsony. By promoting a strongly competitive market, the GAS therefore becomes one of the forces exerting pressure on production costs, stimulating productivist behaviour in farming. Selling to the GAS as another market channel, reducing losses due to overproduction is to be viewed as a useful short run buffer because it minimises sunk costs. Things are different in the long run. Both mass retailer chains and GAS can be channels through which excess produce can be sold below cost in the short run; in the long run they are the competitive force driving quality producers to compete on cost, resulting in lower quality standards.

Finally, type C is the supplier for which the GAS is merely another SFSC channel. This producer already has a number of SFSC customers and the pricing applied is the same in every SFSC served. For this type of supplier, GAS is a virtuous income stabiliser because it broadens and diversifies the sales network. However, the point of income stabilisation deserves some attention.

Figure 1 highlights the problem of family farm income within SFSC. The farms represented use only family farm labour; the farm family labour opportunity cost considered in the analysis is derived from the national regulation on minimum wages for agricultural workers. Despite being in a case of SFSC, the target price in long run – equal to Average Total Cost (ATC) both in perfect and monopolistic competition – is far from being achieved. The SFSC product-mix price does not entirely meet the farm family labour opportunity cost. Thus, the incentive to create a SFSC is not realised by the farmer, according to Giovagnoli’s analysis of GAS suppliers (see paragraph 2.1) and differently from what was stated by Gorton *et al.* (2013). Indeed, these authors affirm that in some cases, particularly in Italy, the involvement in quality schemes has led farmers to receive a significantly higher share of the final retail price.

Fig. 1. Product-mix price and incidence of FFLOC on ATC (euros per kilogram)



Source: processing on research data-base

4.2 The demand side: the consumers’ typologies

On the consumer side of the GAS experience in Marche, 83 percent of the GAS household members interviewed predominantly buy food through the

GAS. In addition, more than 70% of the GAS household members who said they would welcome a broader product range – while about 50% of the sample – asked for diversification of the food supply. The most immediate finding obtained from these answers is that GASs are above all (though not only) the expression of a specific social need: the creation of a self-managed relational context where food can be bought outside mass retailer chains.

The GASs considered in this work, the GASs of Marche, involve on average 70 households (range min-max 12-190 households), with 50% of them consisting of 33 to 95 households. The sample has a mean family size approaching three members⁷. According to the questionnaire directly administered to GAS household members the families' food shopping through their GAS is on average 130 € per month, accounting for ca. 20% of the average food expenditure of Italian households (ISTAT, 2011)⁸. However, it is interesting to note that 25% of the GAS household members interviewed said their food bill is 200 to 500 € per month, meaning that a non-negligible quota of the sample purchase their food predominantly through the GAS. This is confirmed by 53% of the GAS household members interviewed, who stated that the GAS is the main channel for their food purchases.

In addition, further information on the food purchase made by the 182 households from Marche through a GAS was provided by a PCA conducted on the percentage of the family expenditure within the GAS network for each product category compared with the families' overall food shopping. The PCA aimed at exploring the family replacement capacity of conventional distribution with GAS distribution. Using Bartlett's sphericity test with a significance level $\alpha = 0.050$ without axis rotation, PCA highlighted that about 63% of the variance is accounted for by a vectorial space consisting of two main components resulting from the correlation of seven product categories (Table 1 and 2).

The questionnaire listed 19 categories, 12 of which were progressively excluded by the component extraction; some of them, e.g. meat, fruit and vegetables, are quite important in the Italian diet and are the principal food categories in the GAS work too. The exclusion of these variables from the correlation test indicates that GASs are still a long way from being a complete and systemic food supply channel. Meaning that if a GAS involves great effort in organizing,

⁷ It must be stressed that little data was available for this study: indeed, before this work there was virtually no quantitative data regarding GAS-related good production and consumption. We therefore compared our data to that reported in one of the few papers on the topic, Carbone's nationwide study of GASs (Carbone *et al.*, 2007), another exploratory work. Carbone found that Italian GASs involve on average 15-30 households each spending a mean of 100 € per month.

⁸ Average food expenditure of Italian families in 2009: 461 € per month (ISTAT, 2011).

for example, fruit and vegetable supply, it is not able to organise and catalyse the food chain of other important diet segments such as meat or cereals.

Hence, the PCA results seem to indicate that the two latent variables identified may be considered as many degrees of substitution of conventional food retail channels by GAS. F1 could be defined as the “highest substitution capability of GAS”. All seven real variables considered are sufficiently correlated with F1 and positive; F1 includes cereals (pasta, rice, flours and other cereal derivatives), two typical local products (extra virgin olive oil and honey), and typically fair-trade products (sugar, coffee, tea and other non-alcoholic beverages).

Tab. 2. Eigenvalues

	F1	F2	F3	F4	F5	F6	F7
Eigenvalue	3.376	1.011	0.878	0.532	0.476	0.389	0.339
% of variance	48.225	14.449	12.539	7.597	6.798	5.551	4.841
% Cumulative	48.225	62.675	75.213	82.810	89.607	95.159	100.000

Source: processing on research data-base

Tab. 3. Component Matrix

Real variables	F1	F2
Pasta	0.691	0.517
Rice	0.770	0.138
Flours and other cereals derivatives	0.684	0.558
Extra virgin olive oil	0.627	-0.169
Coffee, tea & other non-alcoholic beverages	0.726	-0.387
Sugar	0.669	-0.389
Honey	0.685	-0.290

Source: processing on research data-base

The F1 brings out the core issue of the high opportunity cost of food provision perceived by the ‘critical consumer’ engaged in a self-organized local food network (Tregear, 2011). Indeed, the F1 suggests that the simultaneous growth in GAS purchasing of different product categories is related to products requiring little organizational capacity in terms of distribution and intermediaries. i.e. i) storable no perishable products, requiring less frequent

restocking; ii) typical local products that are easily purchased in farms found close to towns; and iii) products easily bought from fair trade outlets.

The F2 data show a positive correlation between real variables “pasta” and “flours and other cereal derivatives”. So F2 may be considered as the “GAS elementary substitution capability”. Cereals are the most traditional staple diet, the easiest to find and stock. Therefore, if GASs became suppliers of such produce, a greater rate of substitution to the detriment of conventional retail channels would pose no problems.

Thus, also on this specific task – to provide an effective and complete description of the GAS member at a multidimensional level – a comparison with the Sicily case study could again prove useful. In particular, here we refer to the explorative analysis conducted by Migliore *et al.* (2012) and Cembalo *et al.* (2013). A common element that seems to emerge, even though the investigations were independent of each other, is the presence of heterogeneity regarding the social, political, economic and organizational skills of the GAS members.

In this regard, the Sicilian case brings to light multiple individual profiles such as political, pragmatics, ideological consumers. Similarly, the GAS movement in Marche Region can be represented as a “galaxy” that is complex, plural and characterized by a great heterogeneity in motivations, incentives and self-perception of the members (Belletti *et al.*, 2012). Moreover, another interesting study on the characterization of GAS members was conducted by Carrera (2009) in Venice and Bari. This study also brings to light this recurrent heterogeneity in defining the GAS member profile. In particular, the author distinguishes two very different profiles: the “health enthusiast” and the “dis-senter citizen” as the two main features.

4.3 The material footprint of diets from GAS and conventional food chains

Table 4 summarises the resource exploitation linked to the paradigms under investigation. The indicator Total Material Requirement (TMR) is the sum of abiotic and biotic categories of resources (see par. 3.2). Differences between conventional (P1) and GAS (P2) paradigms are underestimated, because for some foodstuffs we used the same MI. P2 system demonstrates to reduce the environmental impact of food, especially in terms of air (-71 percent), abiotic (-58 percent) and water (-53 percent). P2 is instead more demanding in terms of biotic resources, which consist in renewable material use, i.e. biomass, due the lower yields of organic crops and the lower productivity in terms of output/input of organic crops. GAS food chain shows a 10% of potential reduction of TMR, which is the sum of the material resource consumption (abiotic and biotic resources).

Tab. 4. Material footprint of nutrition in P1 and P2 (kg/week*person)

	Abiotic	Biotic	Water	Air	Erosion	Moved Soil	TMR
P1	38,9	119,8	9500	50,6	31,3	12514	158,8
P2	16,4	126,4	4423	14,4	27,4	11004	142,8
% difference	-57,87	5,48	-53,45	-71,51	-12,72	-12,06	-10,06

Source: processing on research data-base

5. Interpretation of the results

5.1 The GAS market functioning

The agri-food market served by a GAS can be described by contrasting it to the monopolistic competition market model. As known, monopolistic competition is the model where competition hinges on product differentiation, hence quality, as opposed to product standardisation-homogenisation, as envisaged by the theory of perfect competition. In a monopolistic competition regime the market's existence depends on the ability of supply to "create" its own demand, developing goods with characteristics that can confer a relative monopoly power in the niche, although their market niche may be quite small. This kind of market allows for not only the notion of quality, but also communication as a quality guarantee on which to build, consolidate and expand a relational market. Communication, relationships and quality assurance are key elements in the creation of monopolistic competition markets, characterised as such by product differentiation and at the same time by highly elastic demand curves and a high levels of competition among adjacent niches⁹.

The supplier's ability to exploit the mark-up in his niche is confined to his ability to differentiate, communicate and guarantee a given quality level to a consumer who can enter and leave the niche at will according to his needs and preferences, since he can count on differentiated but highly replaceable goods especially in the food market. However, the mark-up level – i.e. the difference between price and marginal cost – will depend on the producer's ability to differentiate his offer and to resolve a central problem: the information asymmetry separating demand and supply with regard to the distinctive characteristics of the good being exchanged. Quality labels and certificates are among the most widely used methods to compensate for information asymmetry in food mar-

⁹ Elastic demand curves from the perspective of the individual seller, but generally rigid if the food market is viewed as a whole, from outside.

kets. Nevertheless, food safety (along with quality certification and environmental impact of production) remains a credence attribute (Poulton and Lyne, 2009).

5.2 *The price and quality relationship*

With reference to produce, all quality certification options are found in the GAS basket, with a predominance of organic label: organic, biodynamic, macrobiotic, fair trade; conventional foods as long as locally produced. Therefore, aiming for a better understanding of agri-food critical consumption in GAS practice we can also consider some data related to the quality-price perception by using data on organic markets at a national level (Belletti, 2011).

In order to examine the factors underpinning the hidden effect of competition on quality-price relations, let us consider a typically competitive agricultural market: wheat for pasta production. In this market, the high level of competition stresses the risk of quality sliding downwards to commoditization. In 2010, the producer price of organic durum wheat in conventional retailers was 27.3%, greater than the price of the standard product though the price of organic pasta was 105% more than the conventional product (ISMEA, 2011)¹⁰. In this example retailers take +78% on the price of organic pasta compared with the price of conventional pasta for a quality level for which they are not responsible, since the spread resides in the raw materials production technique.

The relationship between the price at the farm of organic and standard produce reflects, at least theoretically, the relationship between the respective production costs, whereas the relationship between consumer prices reflects the difference in consumer's maximum willingness to pay, which may therefore be viewed as a measure of consumer-perceived quality.

Given the typically competitive cereal markets, the organic durum wheat market just described may thus be interpreted as an example of product treadmill (Boehlje, 1999) and squeezes on agriculture dynamics, which also affects quality markets. Despite being a certified organic product wheat is a commodity and as such is an easy victim of competition, which drives prices down to the cost level. At the same time on the retail market the organic product is perceived as being strongly differentiated from the standard product, so much so that its value is more than double.

This behaviour is here interpreted as an example of price discrimination in a monopolistic consumer retail market. On this hypothesis the two qual-

¹⁰ Producer price of organic durum wheat 27.5 € per 100 kg, producer price of conventional durum wheat 21.6 € per 100 kg, consumer price of organic durum wheat semolina pasta 2.38 € per kg, consumer price of conventional durum wheat semolina pasta 1.18 € per kg.

ity alternatives – the standard product and the organic substitute – conceal a quality level that is much more similar than that perceived by the consumer. Thus, the respective consumer price could reflect the ability of the monopolist (or the cartel) to subtract to the consumer a quota of the consumer surplus by exploiting maximum willingness to pay.

Concerning the “environmental quality” of food, in our analysis the material requirement reduction’s potential of GAS food chains was estimated in a comprehensive 10 percent, while better performances are obtained in terms of water consumption and air (emission), which are reduced by 53 and 71%, respectively.

This outcome can be read on the light of the nature of the MIPS indicator, which calculates the eco-efficiency of products in terms of ratio between inputs and outputs, and its use in the estimation of the food environmental impact. While in the industrial processes there is always a direct proportionality between the total material input entering in a production process and the environmental impact, in the case of agricultural processes, instead, two different trends bias the resulting MIPS. The mechanisation and intensification of agricultural practices normally lead to increase the material input, due to the largest amount of materials and energy resources used for the production. At the same time, higher yields (that can be obtained through the intensification of the techniques) decrease the MIPS value, splitting the material requirements over a bigger amount of outputs. Therefore, this assessment acknowledges the eco-efficiency in the use of resources as the main element featuring the “environmental friendliness” of goods.

Concentrating on the TMR results of this survey, the ten percent reduction of this indicator can be split in the two elements of abiotic, which is reduced by 57% in the GAS system, and the biotic component, which instead shows an increase of 5.4%⁸. Considering that the biotic category includes the biomass (e.g., the amounts of seed, the fodders used in the breeding, the biomass exported through the harvesting) it stands to reason that the biotic category of MIPS is affected by the agricultural phase. Besides, the abiotic one includes a range of resources used in the various phases of the supply chains (e.g. agrochemicals and fuels in agriculture, fuels in the processing phases and for the transports along the chain).

Therefore, while the gain of eco-efficiency in the abiotic category showed by the GAS chain is imputable to several factors (mainly the avoiding of agrochemicals, the reduction of distances in the raw materials provision and in the food distribution, the absence of greenhouse cultivations) the loss of eco-efficiency inherent to the biotic category is referable only to the agricultural phase: in particular to the lower yields gained by the organic practice and the substitution of chemical inputs (e.g. fertilisers) with vegetal and animal biomass (e.g. green manure and false sowing practices).

6. Conclusions

As stated by Pojaghi (2011) and reported in chapter 2.1 of the present paper, that of GAS is an early, sometimes abstract and unstable, minority active citizenship experience seeking a relevant set of organisation and communication skills in order to affect the social reality towards a change. Meeting these needs, the GAS experience in Marche leads to the following consideration on three basic food market elements closely interlinked: quality, prices and market organisation.

Regarding quality, it can be argued that market competitive behaviour and ecological balance are two key elements according to which GAS should ignore label as a guarantee of differentiation, and this is true the more extensive are the areas in which the label works (as EU organic farming). In competitive markets quality labels risk being just another source of the regulatory treadmill (Ward, 1993). Rather, GAS networks should focus their energy on strengthening trust and reputation as key institutional pillars guarantying quality within a decentralised food market organisational problem.

As for prices, two key elements have emerged from the study. Firstly, the shortening of food supply chain is not always able to solve the problem of agricultural income. Secondly, the institutional pillars – part-time structure of farm household income and EU income support policy – thanks to which the partial compensation of farm family labour was sustainable to date, are substantially collapsing. Thus, SFSC seems to be a necessary condition to face the ecological dimension of agricultural sustainability issue but is not sufficient to solve the economic problem of farm households. As a result, the GAS household members should shift their focus from the prices to price construction, becoming aware that farm family labour is one of the real variables among those least embodied in agricultural prices. A producer-consumer shared farm income statement could be a useful tool to confront the farmer income problem so as to strengthen trust and reputation related to the transaction fulfilment.

Finally, regarding market organisation, the GAS movement should veer towards a system of self-certification for food (Schifani and Migliore, 2011), maybe at a regional level and with the support of territory institutions (Universities *in primis*), founded on taking into account two key elements of agri-food chain suitability in the short and in the long run. The first, at a strictly agronomical level, is the local climate and habitat. The second, at a wide ecological level, is the entire agri-food supply chain structure. Given that in the Marche case study the GAS consumer is making a balanced replacement of mass retailer chain starting with cereals, the basis of the worldwide diet, the crucial role of the agricultural input step (typically very long in cereal derivatives) within supply chains, at an ecological and economical level should be

highlighted. In a situation where farm incomes are squeezed from above by production costs and from below by prices, the alternative provided by “Low External-Input Technology” (Tripp, 2006) agricultural models deserves investigation. Reducing external farm inputs makes it possible, at least in principle, to exert a virtuous influence on prices by differentiating farm produce from conventional produce, and on costs by the reduction in input use. It can thus be stated that the central problem to sustainable Italian (and not only) agriculture in the long run remains that of addressing family farm income. Agricultural income sustainability is fundamental for preserving the farm household and therefore the positive effects this has on the environment and efficiency, low external-input technology farms being generally small and managed at household level. In agriculture, economies of scale (long run) rarely happen¹¹. Empirical evidence often demonstrates an inverse relationship between productivity and farm size, first of all due to organisational and management problems that give rise to diseconomies of scale (Ellis, 2003). This is compounded by typically rigid land markets, due to a variety of causes, which in substance prevent any strong increase in production scale (Ellis, 1992). Notably, the world’s most efficient rural and agricultural microfinance systems are those supporting subsistence farming with sale of excess produce on local markets (Belletti and Leksinaj, 2011a). In contrast, microcredit systems applied to farms producing for the commodities markets are often less sound and efficient (Belletti and Leksinaj, 2011b). These reflections are offered to highlight those different successful experiences in economically sustainable agri-food markets all seem to point to a low external-input technology type farm household structure oriented at multi-culture rather than monoculture; the latter characterise inefficient agro-industrial mass systems that are inexorably dependent on public subsidies.

To conclude, regarding the relationship between critical consumption and the efficiency of said in terms of fairness and ecology, this study indicates that there is a diffusion across the Marche territory of families in the GAS movement able to reach a relatively effective threshold of food “GAS substitution”, although incomplete, of conventional food chains.

In other words, the members of each GAS cannot be characterized by their effectiveness in substituting conventional channels on the basis of their po-

¹¹ In agriculture (unlike industry) specialisation and reduction of idle time associated with greater production scale is often undermined by the intrinsic environmental variability of farming. The idle time of the production process can rarely and unpredictably be limited in farming. Similarly, only in some circumstances does the mechanisation associated with production scale increases find suitable conditions to make the production process more efficient and to reduce mean total costs.

litical, ideological or social profiles, or in the sense of “critical consumption”. Consequently, it would be interesting to study the possible hidden attributes able to illustrate the real causes behind the effectiveness of GAS in representing an alternative.

We believe that those hidden causes could be found in the psychological attitudes of the single individual, as well as in family groups facing changes in habits rather than in the broader abstract concept of the function of the GAS movement as such. It is as if the importance of civil movement such as GAS is limited to the mere existence of said.

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