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The Sustainability of Agriculture in a Northern Industrialized Country—From Controlling Nature to Rural Development

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Abstract: The concept of sustainability has been a part of theory and practice in agriculture for a long time, but the diverse roots of the concept have led to a number of different definitions of sustainable agriculture. This paper provides an overview of the policy development of sustainable agriculture in Finland by examining internal and external discourses of sustainability and the evolution in different dimensions of sustainability. We show that the debate on sustainability within European Union's Common Agricultural Policy and Finnish agri-environmental policy are reflected in attempts to implement and monitor sustainability in agriculture in Finland. However, indicators suggest a largely non-sustainable condition. This has contributed to a shift in policy objectives from sustainable agriculture to sustainable rural development, especially in the EU context. As there are commonly trade-offs between the economic, ecological and social dimensions of sustainable development, future developments in sustainable agriculture will inevitably be characterized by continuous redefinitions of problems, paradigm revisions and reassessments of actions already taken.

Keywords: sustainable agriculture; rural development; agri-environmental policy; Finnish agriculture; EU agricultural policy

1. Introduction

The concept of sustainability is not new to farming practice, agricultural science, or even to agricultural policy [1]. Many agricultural practices can be seen as ways of sustaining the productivity of arable land. The scientific debate concerning agricultural sustainability has traditionally been agro-ecologically oriented, although since the publication of the “Brundtland Report”, economic and social aspects of agricultural sustainability have gained increasing attention [2–4]. As the concept of sustainability more recently penetrated into policy-making arenas at all levels, the dominance of ecological sustainability issues has somewhat diminished [5].

The diverse roots of the concepts of sustainability have led to a number of different definitions of sustainable agriculture. One of the most comprehensive and widely accepted definitions has been given by the US Department of Agriculture. The 1990 Farm Bill defined sustainable agriculture as an integrated system of plant and animal production practices having a site-specific application that will, over the long-term, (1) satisfy human food and fiber needs, (2) enhance environmental quality and the natural resource base upon which the agriculture economy depends, (3) make the most efficient use of non-renewable resources and on-farm resources and integrate, where appropriate, natural biological cycles and controls, (4) sustain the economic viability of farm operations, and (5) enhance the quality of life for farmers and society as a whole [6].

The attempts to apply the concept of sustainable agriculture in practice bring into play different actors responsible for the planning and implementation of agricultural policies. Core challenges comprise sectoral integration of policies, changes in institutions, the range of policy instruments and tools, and the role of civil society [7]. The integration of economy and the environment in decision-making may even be seen as the most important feature of the international environmental governance build up around the idea of sustainability [8], (c.f., [9]).

A major challenge is to find working practical interpretations of the definitions of sustainable agriculture. Their extensive scope and the multidimensionality of policy processes endorsing sustainability create difficulties for practical decision-making [10] and systems and criteria for monitoring progress towards sustainability. Strict interpretations and criteria could dismiss nearly all forms of agriculture as non-sustainable. Weaker interpretations open up a variety of trade-offs, politicking and normative conflicts.

The purpose of this paper is to examine the emergence and evolution of the sustainability discourse in Finnish agricultural policy. Finland is an interesting case of northern industrialized countries: Finnish agriculture has traditionally been based on family farm practices and on carrying out both agriculture and forestry activities, but agricultural sustainability is increasingly polarized between large-scale industrial agriculture and multifunctional and small-scaled farming [11]. Thus, some dimensions of sustainability, such as the concern for environmental externalities, have advanced, whereas other dimensions, such as the economic viability of farm operations, are clearly weak. The tensions between different dimensions of sustainability and the general evolution of the discourse on sustainability also reflect the implementation of agri-environmental policy in the European Union.

Our analytical frame is based on contrasting two different paradigms of agriculture, which we call “alternative” and “conventional” agriculture, and their interaction. Then we focus on the debate on sustainability within European Union’s common agricultural policy and Finnish agri-environmental

policy as well as on attempts to implement and monitor sustainability in agriculture in Finland. The paper concludes by looking at policy challenges raised by the sustainability discussion in agriculture. The paper is based on literature and on the most relevant empirical research available on the case of Finland.

2. Alternative and Conventional Agriculture

Basically, it can be argued that all forms of agriculture aim at sustainable production, but views as to what should be the basis of this sustainability and how strictly it should be interpreted, vary greatly. It is therefore useful to examine a set of characteristics within the contrasting paradigms. The definition of conventional agriculture is debatable but the term usually refers to the prevailing form of agriculture practiced in industrialized countries. It is considered capital-intensive, large-scale and highly mechanized, and its typical features are monoculture, the extensive use of chemical inputs, and intensive animal husbandry (e.g., [12]). The many definitions of sustainable agriculture allow plenty of scope for various alternative agricultural methods of production to declare that they each promote sustainability. Most alternative forms of agriculture have their origins in criticisms of conventional agriculture and its alleged adverse ecological and social impacts.

It is not in the scope of this paper to develop any comprehensive typology covering the various forms of alternative agriculture that emphasize sustainability (e.g., [1,13]). We suggest, however, that it is useful to identify three basic branches of alternative agriculture. The first branch represents the alternative mainstream, is based on ideas which are predominantly agro-ecological by their nature. This approach either disclaims agro-chemicals, or forcefully restricts their use and regards sustainability as stewardship of the agricultural environment and ecosystem. The current mainstream of this type of alternative agriculture is organic agriculture (sometimes also called ecological or biological agriculture). Also, natural systems' farming and low input agriculture belong to the first branch.

The second branch emphasizes the importance of taking care of the agricultural environment, but it also expresses philosophical or even metaphysical viewpoints not commonly agreed or accepted. This branch is exemplified by biodynamic farming, nature farming, and permaculture.

The third branch is not alternative in the traditional sense, because it endorses approaches that utilize sophisticated versions of the same production techniques applied in conventional farming. An integrated farming system is a soft technology version derived from practices prevailing in conventional agriculture. "Hard technology" versions in the form of precision agriculture apply the latest innovations from information and telecommunication technologies and automation technologies to farm management, cultivation and animal husbandry.

These branches of alternative agriculture emphasize partly different dimensions of the overall sustainability agenda. Our comparison between conventional and alternative agriculture is founded on ideal types which reflect a sharp distinction between an alternative and a conventional mode of production (Table 1; based on [14–17]) by combining the different branches of alternative agriculture. This leads to interpretations of the basic sustainability dimensions cited above, *i.e.*, (1) satisfaction of human food and fiber needs, (2) enhancement of environmental quality and the natural resource base upon which the agriculture economy depends, (3) efficient use of non-renewable resources and

on-farm resources and integrating, where appropriate, natural biological cycles and controls, (4) sustained economic viability of farm operations, and (5) enhancement of the quality of life for farmers and society as a whole.

There are obviously many intermediate forms and hybrid solutions that emerge from the different branches of alternative agriculture. A detailed discussion of typologies or classification methods of production modes is beyond the scope of this paper, but it should be noted that they provide a continuum of interpretations for the different elements of sustainability, including the distinction between weak and strong interpretations of sustainability. Especially the “hard technology” branch of alternative agriculture tends to accept weak sustainability, regarding natural and human-made capital as interchangeable to a certain extent.

Table 1. The paradigms of alternative and conventional agriculture.

Elements of the paradigm	Alternative agriculture	Conventional agriculture
Relationship to nature	Harmony with nature	Control over nature
Environmental quality	A holistic perception of the environment: agricultural land as part of a larger ecosystem	A narrow perception of the environment: agricultural land managed separately from the surrounding ecosystem
Resource base	An emphasis on the existing local resource base; nutrient cycles and organic material form the basis for the maintenance of the resource base	The resource base can and should be supplemented whenever necessary and economically rational by external inputs
Provision of food and fiber	Major concern for basic human needs	Economic profitability as reflected by (possibly subsidized) market prices should determine what and how much is produced
Economy of the farm	A steady state or moderate “natural” growth	Profit-driven growth at the same or higher rate than in society at large
Living conditions of farmers	Farming as social and spiritual experience; the spiritual experience as important as the economic rewards for production	Farmers as entrepreneurs able to ensure their standard of living by making sufficient profit from production
Relationship between farmers	A community with shared values and a strong sense of community and mutual assistance	A community with shared values, which nevertheless competes within markets
Role of farming in society	Farming as part and parcel of the society based on well-being, producing both food and a wide array of public goods, including landscape, maintenance of biodiversity, recreational opportunities, etc.	Farming as a necessary part of the well functioning society ensuring the food supply, offering employment and the basis for a prosperous industry that contributes to economic well-being

The tensions between the extremes (Table 1) have provided incentives to develop intermediary solutions between alternative and conventional agriculture both at the political and the practical level. These have led to the development and recognition of concepts such as multifunctional farming, ecosystem services, rural policy, and local food.

The new concepts do not aim for simple compromises between the extremes. There are also elements of reframing the perception of agriculture and shifts in the weight of the different dimension of sustainability. Thus multifunctional farming focuses on non-market goods and encourages farming to play several roles in society (e.g., [18,19]). This emphasizes the role of agriculture as a contributor to the well-being and viability of rural areas by sustaining the rural landscape and generating employment. This is in line with objectives of rural policies that seek to “reintegrate” agriculture into rural development (e.g., [20,21]). The living conditions of farmers therefore become a dominant element in the sustainability discourse. In contrast the concept of ecosystem services is used to promote the conservation of natural resources and their sustainable use by connecting the processes of ecosystems to human welfare (e.g., [22,23]). The basic policy idea is to safeguard the variety of life and, therefore, the sustainability discourse focuses in particular on the relationship to nature. Finally, local food is a concept that emphasizes production-consumption food networks, but also the role of farming in a wider societal perspective [24].

The tensions between the conventional paradigm and alternative paradigm maintain discussion over what is sustainable and what is not. Also technical and social developments challenge the interpretations and definitions of sustainability. A topical example is the use of genetically modified organisms (GMOs) and other biotechnological innovations in agricultural production (e.g., [25]). Some of the alternative paradigms of agriculture, such as organic farming, have clear exclusionary views regarding GMOs, mainly on the basis of ethical considerations. In contrast, the conventional paradigm considers them a key agricultural technique for resolving the global hunger problem.

3. The Sustainability Agenda in Finnish Agricultural Policy

The perception of sustainability is affected by different political discourses (e.g., [26]). In this section we discuss the evolution of agri-environmental discourses at supranational and national levels in the last decades and examine how the ideas and concepts of sustainability have been applied in Finland. We also pay attention to the actual implementation of sustainable agricultural practices. Before that we shortly introduce the structural changes taken place in Finnish agriculture.

The modernization of Finnish society has resulted in the somewhat late but then rapid transition of the industrial structure into a service-dominated society and also in the depopulation of rural areas. Thus, the role of farming has gradually changed in 50 years, and in pure economic terms, agriculture’s significance nowadays is rather minor as agriculture contributes one per cent to the gross domestic product and four per cent to the employment (Table 2). The number of farms has decreased drastically and, in the present context of the globalized market and the European Union’s agricultural policy, it is expected to decrease further. Meanwhile, the average farm size has more than quadrupled (*ibid.*). Nowadays seven per cent of the country’s total land area is agricultural land, and Finnish production is based mainly on animal husbandry, with dairy farming and beef production accounting for the half of

the total agricultural product. Organic farming has expanded from the early 1990s on with the current share of eight per cent of the total cultivated area [27].

Table 2. The structure of Finnish agriculture 1960–2010 (sources [28–30]).

Year	Percent of total GDP	Percent of total employment	Number of farms	Arable land (1000 ha)	Average arable land by farm (ha)	Organic farms, % of all farms
1960	10.7	28.7	331,263	2,654	8	..
1970	6.9	20.3	297,527	2,667	9	..
1980	4.3	10.8	224,721	2,563	11	..
1990	3.2	6.9	129,114	2,545	20	0.5
2000	1.4	4.0	77,896	2,187	28	6.5
2010	1.0	3.7	62,450	2,292	37	6.3

Note: Number of farms: in 1960–1980 all farms > 1 ha; 1990–2010 active farms only.

3.1. The Evolution of Sustainable Agriculture as a Macro-Policy Objective

Historically agriculture and agricultural policies have been dominated by the sector's own view. It has included farmers' organizations, the food industry, the industry producing fertilizers, machinery *etc.*, and the agricultural administration. This “internal discourse” of sustainability has traditionally emphasized the economy of the farm and the provision of food and fiber. Other aspects of the sustainability agenda have entered only slowly (Table 3). This can also be seen at the EU level in the evolution of the Common Agricultural Policy (CAP). Overall, the integration of environmental concerns within the CAP has been a complicated process [31]. The policy, characterized in its early decades by purely productivist goals, had in practice been divorced from environmental considerations until the 1980s. The first phases of the EU agri-environmental policy in the late 1980s and early 1990s aimed at encouraging farmers to adopt environmentally friendly practices as a means of de-intensifying their production and protecting the rural environment.

The “external discourse” on the sustainability of agriculture was originally initiated by the environmental sector, including NGOs, environmental researchers and the environmental administration. In the 1990s it has expanded to include consumer interests, and also broader societal concerns such as fair trade (Table 3).

The external discourse no doubt contributed to the greening of the internal agricultural policy discourse, which was continued by the 1992 CAP reform. In line with the strengthening of the post-productivist ethos, claims for the further incorporation of environmental issues into the agricultural policy emerged [32,33]. This was illustrated by the Agenda 2000 policy reform, which became the framework for the EU agricultural policy until 2006. Agenda 2000 introduced the European model of agriculture based on “healthy and pro-environmental production practices, capable of producing high-quality products that meet the requirements of society”. A broader and more holistic notion of sustainable rural and territorial development was also introduced, within which farming was defined as the central element [34].

Table 3. The internal and external discourses and their evolution over 40 years.

	1970s	1980s	1990s	2000s
Internal discourse	Economy of the farm, production of food and fiber	Economy of the farm, production of food and fiber, weak recognition of external discourse	Budding interest in organic farming, recognition of the environmental agenda and the importance of the external discourse. [32,33]	Diversity in the discourse, agribusiness vs. family farming. Recognition and use of the rural argument and the living country-side. Dialogue with the external discourse and the emergence of Agenda 2000 [34].
External discourse	Internal discourse generally accepted, early recognition of impacts of biocides	Recognition of water pollution by nutrients, budding debate	Widening environmental agenda: concern for biodiversity and rural issues, rise of the sustainability agenda in food production [35].	Life cycle analysis, global issues, including climate change, search for novel solutions: bioenergy; biogas

An important problem for the EU and national policy-making has been to find a balance between the mandatory and universal respect for EU-wide environmental legislation and national or local voluntary policy mechanisms that are capable of responding to local concerns and local agricultural conditions [36,37]. Internal and external conflicts and discourses on sustainability (Table 3), and thus policies designed to promote sustainable agriculture, are necessarily also conditioned by national traditions in agricultural and environmental thinking, and by national particularities in the relative strength of the key agri-environmental policy actors [38,39].

Due to Finland's accession to the common agricultural market in 1995, agri-environmental policy has been linked to the adaptation of domestic agriculture to the EU policy. The dominant agri-environmental discourse became also more heterogeneous as it absorbed new issues such as biodiversity and climate change. During the first years of membership, new agri-environmental measures were also introduced [38,40,41]. The most important scheme, the Finnish agri-environmental subsidy has covered no less than 90% of the total arable area of the country. This policy measure, essentially an income support, can be seen as serving both environmental goals and the welfarist idea of equality of results between different agricultural regions and different types of farms. However, its effectiveness in terms of producing environmental benefits has increasingly been questioned. It has not, for example, resulted in any significant reduction of nutrient loads to water courses [42].

In the 2000s, sustainable development and its three basic dimensions (economic, ecological, and social sustainability) have largely been accepted both in the internal and external discourses. This does not, however, mean that a consensus has emerged. As noted above, the new concepts that have entered the scene do not put equal weight on all dimensions of sustainable development. Furthermore, there is also a legacy of the past in the form of problems such as excessive leaching of nutrients to water courses. In the 2000s, the dominant internal discourse has gradually begun to adopt more economic and particularly social arguments concerning sustainability that appear to justify some sacrifices in the ecological dimension. The external discourse has also diversified, including a strongly health driven

demand for “ecological” agricultural products, a concern over global fairness in trade and an agenda to sustain biodiversity, often framed in terms of safeguarding ecosystem services.

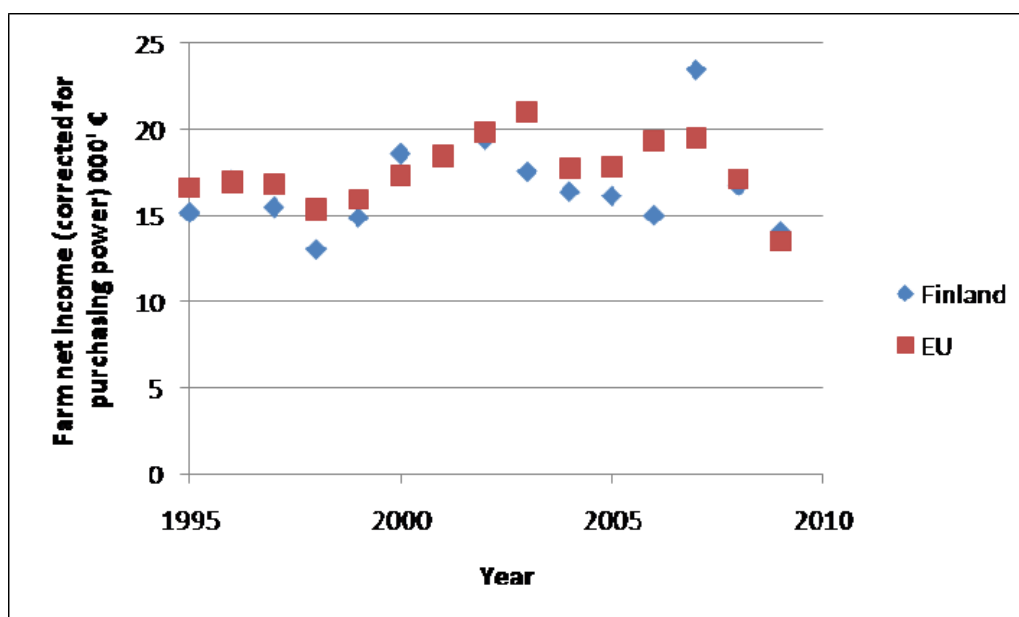
3.2. Monitoring and Implementing Sustainable Agriculture

The dimensions of sustainable agriculture have to be translated into operational criteria and indicators that can be monitored to demonstrate progress towards sustainability. In the early 2000’s, The Strategy for Renewable Natural Resources in Finland (until 2010) interestingly delegated this responsibility to the implementation of sectoral and theme-specific strategies and programs and to the regular administrative monitoring that was part of the performance guidance linked to the operational and financial planning of the Ministry of Agriculture and Forestry [43]. In addition, a proposal was made for a full set of agri-environmental and rural development indicators [44]. The idea was that indicators could be used in the monitoring of the strategic goals and that they could also provide a basis for decisions concerning agriculture.

A comparison of the strategy for renewable natural resources [43], the proposed indicators [44] and the general definition of sustainable agriculture suggests that by and large there has been enough information to allow the monitoring of the dimensions of sustainable agriculture. There has been a strong emphasis on the ecological aspects of agriculture, and there have been a number of related indicators available, for which it has been possible to obtain useful time-series [44]. There have also been several detailed indicators for the farm level economy, income changes, the continuation of farming, and indicative information on human, social and cultural capital in rural areas.

The results of the monitoring are ambiguous. For example, the farm net income in Finland has varied during the past 15 years without any distinct trend, generally following the EU average (Figure 1). However, Finnish subsidies to agriculture are among the highest in the whole EU and the average subsidy level has increased nearly by about 80% during the same period [45]. This clearly does not suggest strong economic sustainability.

Figure 1. Farm net income in Finland and EU average. Data from: [45].



The development in the environmental dimension suggests that sustainable agriculture has not yet been achieved. Reduced use of fertilizers has been documented but as illustrated by Table 4, agriculture clearly remains the single most important discharger of nutrients (phosphorus and nitrogen) into water courses.

Table 4. Main sources of eutrophication in Finland in 2011 (P and N, tones per year and %) [46].

Source	Phosphorus Tones/a	Phosphorus Share (%)	Nitrogen Tones/a	Nitrogen Share (%)
Point sources (industry, communities)	329	8.2	13,989	20.1
Scattered settlements	355	8.9	2,500	3.6
Forestry	231	5.8	3,253	4.7
Agriculture	2,750	68.7	39,500	56.8
Other	139	3.4	1,553	2.3
Airborne pollution	200	5.0	8,800	12.6
Total	4,004	100	69,595	100

The social dimension is difficult to capture, but the number of active farms has been regarded as one indicator. It shows a steady decline during the past decades (Table 2). Also the number of farmers has declined and their average age has increased [47]. This does not suggest that social sustainability has been achieved.

On the basis of the available indicators, it is fair to conclude that agriculture in Finland is not sustainable in its present form and that there are only weak signals of progress in some dimensions (Table 5). If the indicators were to direct decision making, one could expect an active search for novel solutions that could radically change agricultural policy. At the EU level such a search is going on with the Commission arguing that “the CAP can contribute more to developing intelligent, sustainable and inclusive growth. The CAP must also take greater account of the wealth and diversity of agriculture in the EU’s 27 Member States” [48].

It is, however, obvious that specific decisions cannot be based on particular indicators, for two main reasons. First, any actual decision is more complex than even an ambitiously comprehensive set of indicators can cover. This means that indicators can at most highlight an issue but not provide normative piece of evidence in favor of a particular decision. Second, indicators document history, and the developments they describe are dependent on a broad array of circumstances and events beyond those that can be controlled in any individual decision. Therefore they cannot be used in a simple way for individual decisions affecting future developments, as this would imply extrapolation based on incomplete coverage of the relevant cause-effect relationships. For instance, as noted above, trends in the number of farms and their income structure show that the present farming is not sustainable in an economic sense in Finland. However, it appears that “political sustainability” calls for a maintenance of subsidies as their dismantling would cause a number of unexpected side effects.

Table 5. Indicators of sustainability in agriculture with comments on their development (c.f., Table 1).

Elements of the definition of sustainable agriculture	Indicators proposed by [44]	Comments on development
Relationship to nature	- Use of natural resources - Genetic diversity - Diversity of wild species and landscapes	- Loss of agricultural biodiversity has been one of the key characteristics of Finnish biodiversity. - Between 1980 and 2010 farmland bird populations declined by 40% [49]. - About 18% of Finland's threatened species are dependent on agricultural biotopes [49]. - Agriculture is the single most significant polluter of water courses in Finland.
Environmental quality	- Pesticide use and risk - Nutrient emissions into water - Emissions of greenhouse gases and ammonia - Groundwater quality	- In 2010 about 68% of the total phosphorus load and 53% of the nitrogen load was caused by agricultural production. The former goal to reduce the total loads from 1995 to 2005 by 50% was not achieved. - The use of pesticides increased from the 1950s to 1980 fivefold; the use in 2010 was about 70% of the peak level [49]. - Agriculture produces 8% of all greenhouse gas emissions in Finland, but between 1990 and 2010 the emissions have declined 11% [50].
The resource base	Soil quality	- Soil quality has remained fairly stable since the 1980s, but positive developments have been noted e.g., declining heavy metal contents [51].
Provision of food and fiber	- Regional structure of agricultural production - Use of rural products and services	- Finnish agriculture has generally aimed to produce food and fiber for basic needs. - Production of energy-crops has increased, but only a small share of the bioenergy potential of field crop production is utilized [52].
The economy of the farm	- Income changes in agriculture - Rural entrepreneurship	- Elaborate systems of subsidies have developed since the 1950s, leading to ever increasing public spending and temporary overproduction of goods (e.g., butter, eggs, milk, and grain). - Farms are now diversified through entrepreneurship; also new entrepreneurship (e.g., heat entrepreneurship) gradually evolving [11].
The living conditions of the farmer	- Continuation of farming - Rural infrastructure and services	- Views of the future by farmers are produced occasionally; according to a survey, only 56% of farmers aged 50 and over know who will take care of the farm in the future [53].
The relationship between farmers	- Human resources in rural communities	- The number of farms has been declining steadily from more than 330,000 in 1960 to about 62,500 in 2010.
The role of farming in society	- Regional development and the welfare of rural areas - Consumer awareness - Quality management and assurance	- The number of people earning their livelihood in agriculture is declining and the age structure is unfavorable. - The share of part-time farms is increasing. - Consumers have a favorable view of Finnish agricultural produce.

This leads to an aim of maintaining as much as possible of the present agriculture and the systems of production, including subsidies. One can, therefore, argue that sustainability has primarily become a political argument, which has been captured by strong actors to favor their own material interests. This is reflected in interviews with farming experts in Finland [54] and is in line with the findings by Berger *et al.* [55], who provide examples of how issues of power and influence frame the policies and discourses on ecological modernization and sustainable development.

The view that the agricultural sustainability agenda has been captured by powerful interests does not, however, provide the complete picture. The sustainability discourse has inspired niche innovations in alternative agriculture and contributed to the growing demand for organic food. Organic farming has also continued to increase in Europe and reached 7.7 Mha in EU as a whole in 2008 [56] and areas have increased by 6.5% per year on average in the EU-27 in the period 2000–2008 [57]. In Finland the demand for organic food exceeds the domestic supply and is now noted positively by MTK, the main farmers' organization in Finland [58].

These observations suggest that there are serious attempts to achieve radical change towards more sustainable agriculture. Yet, at the same time they show that it is a slow and far from a straightforward process. An increasing number of studies have focused on the complexities and difficulties in transitions to sustainability and revealed the importance of path dependencies, niche innovations and multiple levels and actors [59,60]. The agricultural sector has certain advantages over other sectors in that the number of potential innovators is very large. But to release this potential, strong external impulses supporting and also forcing reorientation are likely to be necessary for a substantially more sustainable agriculture. One should note that transformations can also take a less sustainable course, especially in the face of external market driven pressures such as increasing demand for meat. The analyses of possible scenarios for the Common Agricultural Policy and the response in Finland have shown that both more and less sustainable development paths are possible, and that there are commonly trade-offs between the economic, ecological and social dimensions of sustainable development [61].

4. Discussion: Future Challenges for Agricultural Sustainability

Despite its somewhat loosely defined content, sustainable agriculture will continue to be a desirable policy goal. This is because the concept is positively value-laden among the public and can be used for the purposes of many interest groups and stakeholders, ranging from farmers to environmentalists. However, despite the shared pre-understanding of the importance of sustainable agriculture as a concept, the views of stakeholders differ widely, whenever actual practices or even principles of agricultural sustainability have to be set out in operational terms (Table 3). One can even argue that the conceptual vagueness of sustainable agriculture is precisely what makes it such a desirable policy goal [62].

The key question is whether the concept of sustainable agriculture provides useful policy guidance. The empirical evidence we presented indicates that it can provide a framework or checklist for identifying issues and developments. In this sense, it can support the discourse on ecological modernization of agriculture by raising aspects that have to be dealt with in policies by actors and stakeholders. As a normative comprehensive concept, however, it encounters serious difficulties. Sustainable agriculture and sustainable agricultural policies cannot be specified once and for all and the operational criteria will change with changing external conditions. The environmental dimension

can be addressed with demands on the reduction of negative externalities, but history offers little guidance on the economic and social dimensions as to what can and will be regarded as sustainable agriculture in the future. The different branches of alternative agriculture discussed above also differ widely from one another in the economic and social dimension although they agree on the need to reduce negative externalities.

It can be claimed that sustainable agriculture has become a rhetorical paradigm. It is a paradigm in the sense that the concept is embodied in many official texts, including the justifications for legislation, as well as in strategic documents and in various other policies, plans and programs. The use of the sustainability concept is rhetorical in the sense that it is presented as virtually conflict-free. However, there is also evidence that the rhetorical use of the concept has lost part of its lure. In a recent report on future alternatives of the Finnish agricultural policy [63], the sustainability issue plays a minor role. The main policy focus is set on competitiveness of Finnish agriculture, which, in turn, is defined to depend on the adaptation of high-tech innovations and the latest know-how. Such development is seen as the most desirable and technological advancements are considered to guarantee both ecological and socio-economic sustainability.

Sustainable agriculture is rhetorically used by stakeholders that may have opposing interests. The confrontation between the internal and internal sustainability discourse (Table 3) has been a key driving force behind the development of the Finnish agri-environmental policy. Although the agricultural sector has been compelled to take a defensive position over the last two decades on agri-environmental issues, including ecological sustainability, it has successfully emphasized the importance of agriculture for the economic and social viability of rural areas—and thus the importance of the economic and social aspects of sustainability. The basic reasoning behind the arguments of the agricultural sector has changed more slowly than their rhetorical expression. The same applies to the environmental sector: Criticisms of the adverse environmental effects of agriculture, especially nutrient leakage and biodiversity losses, have been rephrased in terms of a sustainability discourse.

When it comes to practical policy-making, Rio+20 attempted to revive the sustainability agenda. An active dialogue between the internal and external sustainability discourses to new synthesis may be the key to progress in agriculture. Despite the underlying confrontation between the agricultural and environmental sectors, the integration of the two sectoral policies has increased in recent years thanks to the agri-environmental programs based on the EU regulation, though the traditional conflicts of interest have not entirely disappeared [64,65]. Both the agricultural sector and the environmental sector are increasingly interested in agri-environmental issues, and are contributing to the development of “sustainable” agriculture. However, the multidimensionality of sustainable agriculture (Table 5) suggests that more than two sectors need to cooperate in order to achieve transformative change. For example, food policy may become an important contributor by stressing sustainability aspects that traditional agricultural and environmental discourses have partly neglected [66]. When more sectors and topics enter the scene, policy coherence becomes a major issue and transformations to sustainable agriculture may depend on the successful alignment of several policies at different levels of governance.

5. Conclusions

We have shown that the sustainability discourse has evolved in Finnish agricultural policy from a dominant assumption that agriculture is sustainable by default to more critical appraisals. The tensions between different dimensions of sustainability have become evident, but it has also become apparent that practically all indicators demonstrate that current agriculture is non-sustainable. In this Finland is no exception in the EU. At the EU level, the pressures can be seen in the processes reforming the CAP, but also in a shift in attention from sustainable agriculture to sustainable rural development. This development has already taken place and will probably lead to an increasing emphasis on the economic and social dimensions of sustainability, possibly at the expense of the ecological dimension. CAP reforms naturally open up opportunities to promote sustainable agriculture in Finland and in the EU as a whole.

The ideological core of the EU-level reforms does not stem from a strong concern about agricultural sustainability. It rather responds to pressures mainly related to the WTO negotiations, the enlargement of the EU, and problems with the EU's agricultural budget. The reforms do, nevertheless, address issues which are highly relevant from the perspective of agricultural and rural sustainability. The implementation of the Common Agricultural Policy only provides a platform for agricultural policies. It is up to national agricultural policy-makers and other central stakeholders to utilize the measures provided by the CAP and other policies to achieve sustainability. Key actors and interest groups play a pivotal role in the future endorsement of sustainable agriculture over a wide range of policy areas. This means that future developments in sustainable agriculture will inevitably be characterized by continuous redefinitions of problems, paradigm revisions and reassessments of actions already taken.

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Conflict of Interest

The authors declare no conflict of interest.

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