Preprint of Chapter 13: Setting and reviewing standards for organic farming

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Abstract: One of the cornerstones of organic farming is the fact that it is governed by clear standards which are legally protected in many parts of the world, but there is concern that the current certification system does not fully safeguard the objectives and principles of the movement and encourage further improvements in sustainability. The chapter provides a brief history of organic standard development, and introduces the values and principles of organic farming that have guided this process. A section on how organic farming is regulated discusses the advantages and disadvantages of the different types of rules that are currently used to achieve common objectives, such as prohibitions or obligations to use specified inputs and practices. The final section explores whether trends in sustainability assessment could help to close the gap between ambition and rules, concluding that research can improve the evidence base, evaluate the impact of standards and gain a better understanding of the barriers that prevent new producers of converting to organic farming.

Keywords: Organic standards, organic regulations, organic principles, sustainability,

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1 Introduction

Organic farming has developed rapidly at a global scale, with both market and areas of production continuously growing (Willer and Lernoud, 2017). One of the cornerstones of this development is the fact that, unlike many other initiatives aiming to improve farming towards greater sustainability, organic farming is governed by clear standards and inspection/certification procedures, which in many parts of the world are protected by legislation.

One could describe these organic standards and regulations on farming and food production as the base of a contract, setting out the rules for an agreement between the producers, who undertake to follow the rules, and the consumers, who have a guarantee that these rules have been followed. This process between these producers and consumers is mediated by a certification body. Entry into the system both by producer and consumer is voluntary, even if the organic standard is covered by regulation. Organic standards are therefore part of a growing number of voluntary sustainability standards of food and agriculture, and they are described by Giovanucci et al (2014) as the ‘grandfather’ of such standards.

The aim of ‘sustaining the health of soils, ecosystems and people’ is part of the definition of organic agriculture (http://www.ifoam.bio/en/our-library/organic-basics) and there is a growing body of scientific literature documenting the positive sustainability impacts of organic farming (e.g. Mäder et al., 2002, Lampkin, 2007, Reganold and Wachter, 2016, Schader et al., 2012b). However, the current standards and certification procedures are based on pass/fail criteria for minimal requirements and do not actively encourage organic operators to strive for further improvements of their systems. Several important sustainability outcomes that are covered in the principles of organic agriculture (e.g. biodiversity, soil fertility, fairness) are currently not directly addressed in most organic standards. This leads to criticism that the process-oriented organic farming standards and the associated certification processes do not fully safeguard the sustainability performance of individual organic farms and the question arises as to how this should be addressed going forward.

To help address this question, the chapter provides a brief history of organic standard development, and introduces the values and principles of organic farming that have guided this process. A section on how organic farming is regulated introduces the different types of rules that are currently used to achieve common objectives, such as prohibitions or obligations to use specified inputs and practices. The outlook includes a very brief summary of trends in sustainability assessment, before exploring what contribution research can make to further organic standard development.

2 Historic development of organic standards and control systems

The ideas on which organic agriculture is based can be traced back along different lines. During the first half of the 20th century, several pioneers from a range of backgrounds (farmers, researchers and medical doctors) began to develop ‘biological’ cropping methods, based on the idea that healthy soils would be the key to producing healthy crops and thus help to improve human health. The schools of thought that have influenced today’s organic farming include biodynamic farming as taught by Rudolf Steiner, organic farming ideas of the living soil promoted by Lady Eve Balfour...
(inspired by Albert Howard and Robert McCarrison), bio-organic farming according to Müller and Rusch, the biological farming methods of Lemaire-Boucher as well as Bob Rodale’s regenerative farming (Lampkin, 2002, Vogt, 2007). Each has contributed some aspects, often in different parts of the world but mainly contributing to a common concept. There are also several other movements that have shaped organic farming, such the growing awareness of the widespread use of and impact of pesticides (e.g. Silent Spring by Rachel Carson), Schumacher’s ‘Small is beautiful’ and the ‘back-to-the-land’ and the environmental movements (see Lockeretz 2007 for a more comprehensive guide of the history of organic farming).

The first organic standards were set by the private sector. The Demeter co-operative set the first very-short private norms in 1928 in Germany as part of a contract for farmers who wanted to use the Demeter label, first registered in 1931. The Müller-Rusch movement of organic-biological agriculture in Switzerland also drafted its first tentative norms in 1946, which later led to the first Swiss organic standards. In the UK, the first Soil Association standards were published in 1967. Their structure served as an example for other standards, while the first private French standards date back to 1972. During the 1970s, groups of farmers in different parts of the US developed certification systems to assure consumers that products labelled as organic were produced according to their standards, for example California Certified Organic Farmers (CCOF established in 1973).

Early standards were more in the form of recommendations, rather than certification requirements, and the farmers received feedback on their practices through peers or consultants. With the growth of the organic market and increased trade, however, the relationship between consumer and producer became less personal and there was a need for a more rigorous independent quality assurance system to protect both parties as well as other members of the value chain (Schmid, 2007). The organic sector was therefore one of the first agricultural sectors to engage with and develop a system of third party inspection/certification or voluntary sustainability standards in the food sector (Giovannucci et al., 2014). In the 1980s, a system of private standard setting and third party inspection and certification evolved. Some standard owners and control bodies grew out of producer/consumer groups and several maintained a strong representation of consumers within the organisations, whilst others were more farmer-led. Most of these organisations were engaged in several other activities besides certification. Several more specialised organisations dedicated to certification also started in this period, such as Skal (Netherlands started in the early 90s) and KRAV (Sweden with the first standard agreed in 1985).

A next step for organic farming standards was their inclusion in national legislation. Among the first countries to develop national organic farming legislation were Oregon (1973) and in Europe France (1980), Austria (1983) and Denmark (1987) (Lampkin et al., 1999b, Ellsworth, 2001). The European Union introduced its first Regulation on organic production in 1991, in response to a growing consumer demand for certified organic products (EC, 1991). The main role of the legislation was to provide a legal definition of organic farming to protect both consumers and organic farmers against false and misleading organic claims. Prior to its introduction products claiming to be produced in a more natural way but without clear production standards were commonly found for example on the shelves of supermarkets in Germany (Padel and Zerger, 1994). This and other EU-wide common rules help to ensure transparency at all stages of production and processing as well as a fair competition. Organic standards were also taken up by the US Government, in the establishment of an Organic

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Food Protection Act in 1990 with the aims to establish national standards governing, assure consumers that organically produced products meet a consistent standard and thus to facilitate US wide trade in organic products. Defining in detail what organic farming meant was achieved several years later with the USDA Standards of the National Organic Programme (NOP) that took effect in 2002 (Schmid, 2007; Ellsworth, 2001).

Both the European Regulation and the NOP have influenced the development of the organic sector worldwide. Typically regulations cover rules that govern production of raw material, food processing, the control system, how reference to organic can be made in labelling, and cross-border recognition of organic status (e.g. what minimal requirements imported organic products have to fulfil (see also below). The control rules include provisions for the supervision and accreditation of control bodies, making reference to the ISO standard for product based controls (ISO 65). The development of national and international regulations for organic farming also made the business of organic certification of greater interest for commercial certification companies (Rundgren, 2002).

Like all other producers, organic producers also have to comply with the general food and feed legislations of their country, even if these requirements are not explicitly repeated in the organic rules. This is relevant for standard comparisons across different regions. For example, producers in Europe have to comply with the labour laws that protect workers’ rights. Some aspects of worker protection are therefore not specifically mentioned in the European organic standards. However, some standard owners that orient themselves towards importing products into the EU include such rules, for example the Naturland Fair standards (http://www.naturland.de/en/naturland/what-we-do/naturland-fair/criteria-standards.html).

In the EU, the official recognition of organic standards in a European Regulation also paved the way for the financial support of organic farmers and the conversion process under the Regulation (EC) 2078/92 on agri-environmental schemes (EC, 1992). This support continues to this day, with some changes in most EU member states, as part of the Rural Development Programmes. Most support schemes—with some initial exceptions like in Sweden—require organic management to be controlled according to Regulation (EC) 2092/91 by an approved control body (Lampkin et al., 1999a). This organic certification is provided under government supervision although in some cases (e.g. Denmark) the state gained the status of a professional service for regulatory compliance (Wai, 2007). In the most recent CAP reform of 2013 organic producers were further recognised by qualifying automatically for the ‘Greening’ part of the basic support payments.

Organic farming was among the first agricultural sectors to introduce voluntary standards and inspection and certification procedures, which later became part of national and international legislation. Organic standards are not static, and different areas are continuously revised frequently in light of new developments on farms, because of research on organic farming systems, general trends in the agricultural industry, and importantly, changing consumer concerns.

3 Principles of Organic Production
Organic farming is clearly value based. However, the ideas and values of organic farming originate from different movements. The core values could therefore not easily be traced back to one clear set of principles that regulators could consider when organic standards became part of national and

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international regulations. IFOAM (the International Federation of Organic Agriculture Movements) established a task force that consulted with its members on core values in the early 2000s and presented four Principles of Organic Agriculture (Box 1) that were debated and democratically accepted by IFOAM’s members in 2005 (Luttikholt, 2007, Padel et al., 2009). A comparison of the value elements of the four principles with a range of key sources outlining organic values showed that these four IFOAM Principles of Health, Ecology, Fairness and Care are a good representation of value basis of organic agriculture as described in literature (Padel et al, 2009).

**Box 1: The four Principles of Organic Agriculture**

**Principle of Health:** Organic Agriculture should sustain and enhance the health of soil, plant, animal and human as one and indivisible.

**Principle of Ecology:** Organic Agriculture should be based on living ecological systems and cycles, work with them, emulate them and help sustain them.

**Principle of Fairness:** Organic Agriculture should build on relationships that ensure fairness with regard to the common environment and life opportunities

**Principle of Care:** Organic Agriculture should be managed in a precautionary and responsible manner to protect the health and wellbeing of current and future generations and the environment.

Source: IFOAM (2014)

The breaking down of the four principles into the underlying value elements also facilitates comparison with other documents, such as standards and regulations. This shows that several important outcomes considered important for overall farm sustainability (e.g. biodiversity, soil fertility, fairness) are not fully covered by the current legal standards (Padel et al., 2009). Nevertheless, there is good scientific evidence that organic farming delivers in many of these areas.

For example, Reganold and Wachter (2016) examined the performance of organic farming in light of four key sustainability metrics: productivity, environmental impact, economic viability and social wellbeing. They concluded that organic farming systems are (when compared with mainstream farming) more profitable despite lower yields. They are also more environmentally friendly and deliver equally or more nutritious foods that contain less (or no) pesticide residues and contaminants, and there is evidence indicating that organic agricultural systems deliver greater ecosystem services and social benefits (Reganold and Wachter, 2016). However, the lack of explicit coverage of certain outcomes in the standards has led to criticism that a process-oriented assessment approach does not fully safeguard the sustainability performance of an individual farm, first expressed by Buck et al. (1991) in relation to organic vegetable production in California.

Articles that state principles and objectives of organic farming were introduced in the EU regulation as part of the total revision (EC, 2007). Recitals and articles refers to all four IFOAM principles, but are less far reaching in relation to some values such as fairness and biodiversity. The stating of objectives and principles explicitly in one place in the EU Regulations has contributed to developing a common understanding of the core concept of organic farming. However, there is uncertainty as to whether the statements are legally binding and whether and how the principles and objectives should be considered in the interpretation of any more detailed rules. For example, the principles


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state that organic livestock production should be ‘land-based’, but the detailed rules require only a limited part of the feed to be produced on the farm itself, or in the same region and the term region is not clearly defined. This enables some organic livestock production to develop independently from crop production (Padel et al., 2013).

Standards and regulations should clearly state principles and values of organic farming on which they are based. Values are per se in need of interpretation. It is therefore equally important to consider the decision-making structures and processes of any standard owner or regulator as part of the principles of organic farming. Standards should be based on consultation with all affected stakeholders-from the farmer to the consumer-and the processes should facilitate a coherent interpretation of the objectives and principles in implementation in more detailed rules (Padel et al., 2009, Padel et al., 2007).

4 How is organic production regulated?

The overall aim of any standard or regulation is to maintain and enhance the quality of a product and to provide guarantees to the consumer. Producers signing up to organic farming therefore make a commitment to follow a standard and good standards also give guidance to producers on how organic principles can be applied to the different enterprises on the farm. This provides a guarantee to consumers that the rules have been followed, e.g. that non-permitted fertilisers and pesticides have not been applied. Certification bodies effectively act as mediators between producers and consumers by verifying that rules have been adhered to.

It is important to be clear about that any producer entering into organic farming does so voluntarily and that the responsibility that the rules are followed lies, in the first instance, with the producer, who also agrees that his/her farm is scrutinised by an inspection through control body. Organic farming is thus different from food legislation that all producers must adhere to, even when the organic standard is part of national/international law. Producers can withdraw from organic production, and one of the reasons quoted for withdrawals or re-conversions is the administrative burden arising from certification (Koesling et al., 2012, Kuhnert et al., 2013). Also the consumers can withdraw their custom at any time, and may do so if they no longer agree with the rules. Thus, in setting organic standards or regulations, the interests of the primary-producers, processors and consumers need to be considered, and a compromise found. Gershuny (2016)-in her personal memoirs about her role in developing the USDA standards-highlighted that the aim of making organic standards very ‘pure’ can have many unintended consequences, in particular damaging the farmers willingness to convert to organic production because the rules become so complicated that they are impossible to follow.

Current organic standards can be divided into two main groups:

- Legally binding regulations that protect the term organic (e.g. EU Organic Regulations, USDA programme) with the overarching FAO Codex Alimentarius guidelines acting as a global guidance document. When selling in a country where the term ‘organic’ is legally protected it can only be used when the rules valid in the country have been followed and operators are inspected, else an operator can be taken to court, although cases are rare. In the EU also the terms ‘biological’ and ‘ecological’ are protected by the Regulation.

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Private standards of symbol holders (e.g. Demeter, Soil Association, Bioland) for which the IFOAM basic norms act as a global reference point. In this case the right to use the symbol or trademark depends on following the specific rules.

Organic regulations and standards apply equally to all areas of organic production and also to food processing and labelling. They contain mainly two different types of rules:

- Rules for primary producers and food processing operators that seek to be certified for producing according to the agreed standards, and
- Rules for labelling that govern how the organic status of products can be communicated to the buyer.

Regulations also contain rules for inspection or control bodies (both public and private) and rules for authorities and organisations that approve, accredit and supervise certification bodies public and private (ITF, 2006, Padel, 2010).

The following sections focus on the rules and standards for organic production at the farm level and explore how the organic standards translate the principles, aims and objectives into rules that can be audited through inspection and certification process.

At present, four main types of rules are used, alone or in combination which will be discussed with some examples below. In essence these are:

- Prohibitions of specific inputs (e.g. synthetic nitrogen fertiliser, herbicides)
- Restrictions of the use of some external inputs that cannot be fully removed (e.g. copper as a plant protection agent)
- Preference for the use of inputs from organic origin (e.g. using only feed materials that originate from other organic farms)
- Obligations to use certain ‘good practices’ (e.g. practising a diversified crop rotation) (Padel et al., 2013).

Tables 1 illustrates how these different instruments have been used in the EU Regulation of organic farming of 2007 and relates this to the objectives and principles as they stated in early articles of the same Regulation. In the monitoring of sustainability of farming systems and of animal welfare the measurement of desirable outcomes (e.g. greenhouse gas balance, animal welfare score) is used as a way to assess achievement, but this approach of stating desirable outcomes is so far not widely used in organic standards. These different types of rules are also a reflection of how organic farming is understood, as way of farming that uses only ‘organic(ally) approved non-synthetic materials’ or as a farming system that uses the ‘best agronomic practices’. Gershuny (2016) referred to this as the ‘material or practice’ conundrum.


Source: Based on Padel et al (2013) adapted

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4.1 Prohibitions and restrictions

This is an important type of organic rules, common to all standards, and organic farming is often misconceived as being only about the non-use of synthetic chemicals in agriculture. The best known example is probably the ban on synthetic nitrogen fertiliser. Another example of a clearly stated prohibition in organic farming is the use of GMOs or the prohibition of using battery cages in organic chicken farming in Europe. Prohibitions are either included in the form of stating the prohibition or restriction directly (e.g. this input shall not be used) or as stating a positive list of inputs that can be used (e.g. organic farmer can only use the following inputs for fertilisation). Both approaches can be found in the different organic regulations.

The EU Regulation mainly uses positive lists and this can create de-facto prohibitions that are in place, but not explicitly stated. For example, the ban on using herbicides is not stated as a clear prohibitions, but as the obligation that only permitted substances can be used for crop protection that are specified in one of the Annexes. The ban on herbicides exists because no herbicide is included in the substances in the Annex. To communicate the benefits organic farming for biodiversity because of not using herbicides might be easier if the ban was clearly stated. Nevertheless, it might be an advantage for developing/ using natural phytotoxic ingredients for weed control under special site conditions (Giepen, 2017). Alongside clear prohibitions there are also strong restrictions on several other inputs, e.g. most pesticides and many soluble fertilisers, although there are some permitted exemptions. The revised EU regulation of 2007 states criteria for inclusion of substances (see Article 16) and established an expert group to provide advice on substances to be included (EC, 2007). For more details on the expert group including all reports on recommendations see https://ec.europa.eu/agriculture/organic/eu-policy/expert-advice_en.

Prohibitions and restrictions on the use of inputs or specific practices or the listings of permitted inputs are usually easy to audit and control, compared with the overall sustainability and environmental impact of a farming system. Prohibitions on certain inputs are also easy to communicate to consumers, and indeed if consumers are asked what they understand organic farming to mean, a frequent answer will be ‘no fertiliser, no pesticides’ (e.g. Zanoli, 2004). However, just replacing one damaging input with another more benign one is often not sufficient to make organic farming system function well. In many cases there is a need to redesign the system, e.g. introduce crop rotations with fertility building crops rather than trying to just replace non-permitted fertiliser with organically accepted ones, such as livestock manure. This has been expressed in the efficiency – substitution – redesign framework (MacRae et al., 1990, Hill, 1985) where farmers might start with adopting more efficient use of inputs, then substitute certain inputs with other more benign ones, and finally adopt a system redesign/management approach to reduce the need for inputs in the first place.

Overall, the focus on input prohibitions and restrictions represents a means to an end, rather than the end in itself, although there are clear risks if ends and means get confused (Lampkin et al., 2017). How organic farming is understood-as either using only permitted organic inputs or as using good husbandry practices to achieve the desired outcomes- is part of this debate (Gershunny, 2016). Prohibiting certain inputs says nothing about what organic management involves instead and why certain technologies and practices are preferred over others (Lampkin et al, 2017). For example, instead of relying on using synthetic nitrogen fertiliser, organic farms use biological nitrogen fixation

through legumes. On a cropping farm this implies the need to include legumes in the crop rotations. This is why the standards also contain obligation rules (see below).

4.2 Use of inputs from organic farming systems

In addition to the restriction of external inputs, many organic standards also include rules specifying that certain agricultural inputs must be sourced from other organic farms. This applies in particular to seeds and feedstuff. The rule makes organic farming less dependent on inputs from the non-organic sector and therefore less vulnerable to contamination (e.g. with GMOs). Like prohibitions and restrictions such rules are potentially easy to verify in the inspection and certification process. However, because of a lack of availability of organically produced inputs in regions with small organic sectors, derogations have been built into the rules, which allow farmers to revert to the use of non-organic inputs under certain circumstances. In the external evaluation of the EU regulation Padel et al (2013) concluded that this system of exceptional rules, established to allow regional differences in climate, stage of sector development and specific husbandry practices to be taken into account, seems to be inadequate. Across member states these rules have been interpreted very differently creating potentially unfair competition. Also, the need to apply for and grant derogations also creates additional administrative demands for both the operators (farmers, growers, food processors) and the control bodies. Despite the aim to reduce the sector’s reliance on non-organic inputs, there are several cases where timetables for step-wise reductions of the permitted percentages were not kept and limited or no progress has been made. Whether there is progress in achieving a lower reliance on non-organic inputs is difficult to monitor. Padel et al (2013) found that there is insufficient data available on the scale of non-organic feed use in organic agriculture and the current availability of organic feed to carry out a quantitative analysis of the coverage and uptake of this rule. There is a general consensus among many organic producer organisations, processors and traders, that organic protein crop production (at EU level) is insufficient to meet the demand for the monogastric livestock. If transition to 100% organic diets cannot be realised using European organic supply chains, the standard demand is likely to lead to increased reliance on extra EU-imports in the short and medium term. This would contradict the aim of land-based livestock sector and the local/regional sourcing of feed. Alternative protein supplies are already being developed to help address this, including methods to produce methionine via enzymatic fermentation based on organic raw materials, or the use of insect larvae or algae as protein source for feed. Whilst these new techniques seem to be promising, they are not ready for broad practical use yet (Padel et al., 2013). One of the topics of discussion, as part of the process of revision of organic rules in Europe since 2014, has been the question how the use of regional feed can be defined. Any definition has to be acceptable to both the producers, who have to meet it, and to the control bodies that have to verify it. Any solution based on a specific distance that the feed can travel is unlikely to be working in the inspection and certification process.

4.3 Obligations for good practice

As already stated, simply not using synthetic inputs and doing nothing else (organic farming by default) is likely to lead to failures in terms of productivity, financial and environmental sustainability. As a result many areas are regulated by the expression of obligations to use certain practices. This makes good sense if there is a clear connection between the ‘good practice’ and the principles or objective that is intended through implementation of the rule. This can be illustrated using the example of the rule for use of a multi-annual crop rotation (See also Chapter 5).
principle aim that the rule wants to encourage is for a producer to grow legumes, for biological N fixation and to achieve greater diversity of cropping and with that greater resilience. Whilst crop rotations are a perfectly good practice for mixed and arable farms, a blanket statement of the obligation to use a crop rotation does not work on farms that consist mainly of permanent crops or pastures and for farms that use systems of multi-and intercropping (such crop mixtures or agro-forestry). Such farms achieve diversity in space with several different species grown at the same time (including legumes), rather than over time as would be the case with the crop rotation. Indeed, ploughing up permanent grassland to introduce a rotation would have negative effects for biodiversity and in reality control bodies know not to enforce this rule where it is not appropriate. This example illustrates that care needs to be taken when stating good practice obligation that the conditions under which they have to apply are also clearly stated, i.e. practicing crop rotation only applies to arable and horticultural land but not to permanent cropping systems. Specialised organic operators, such as horticultural, vine, pig and poultry producers, can find good practice obligations particularly challenging. Several attempts have been made in Europe to develop specific rules for organic production in glass houses, but this has not yet been considered in the drafting of the EU regulation.

4.4 Defining outcomes of organic production in the rules

Another option to regulate organic farming would be to state the outcomes that an organic operator has to achieve to qualify for organic status, in-line with the principles of organic production. This could potentially apply to all areas where organic agriculture states aspirations, such as protection of soil health, biodiversity, a balanced systems etc. (see also section on principles above). However, including such outcomes in the standards and certification requires well established and widely accepted metrics, indicators and thresholds, and a good understanding of how these can be verified as part of the certification system. The example of residue thresholds shown in Box 2 illustrates some of the issues faced in following this approach. However, this is not to say that monitoring for residues and contaminants can and should not be one of the instruments used in the inspection system.

**Box 2: Proposal for setting residue and contaminant thresholds for organic products in the proposal for the revision of the EU Regulation since 2014**

In the proposal for a revision of the EU regulation, the European Commission proposed to introduce a de-certification threshold for non-allowed products and substances. The proposal states that ‘the level above which the product cannot be sold as organic will be established taking in account the baby food directive [0.010 mg/kg]’. In early 2017, the proposal to reject organic products if residues of prohibited substances have been found has not been agreed and remains one of the major areas of controversy in the on-going negotiations.

IFOAM-EU has expressed great concern with this position and argued, whilst organic production aims to be free of pollutants and substances not allowed in organic production such as GMOs, pesticides and fertilizers, and regulates this by using rules that prohibit using these substances, organic producers operate in a contaminated world, so contamination can frequently occur by accident. By focusing on threshold levels as a key organic certification tool, rather than inspecting for input use, the standards would move away from the process-based approach that has prevailed so
far. There is also a danger that organic food producers would have to pay for additional laboratory testing and be subject to the risk of contamination by conventional neighbours

Source: IFOAM-EU (2014).

5 Where next with organic standard development?

5.1 Aligning organic rules with sustainability assessment of farming and food production?

At present, there is no internationally accepted consensus on how to make agriculture more sustainable and to measure the sustainability of food production. The various sustainability assessment approaches take diverging perspectives on the notion of ‘sustainability’, concerning what should be assessed, where the system boundaries are drawn and how it should be measured. There are various tools and initiatives emerging aimed at measuring the sustainability of farming and food, including in organic farming, but these are separate from organic certification and standards. Some of these efforts focus only on one environmental impact category (e.g. climate change) while others cover all dimensions of sustainability. Attempts can be broadly grouped into those driven by gaining a better scientific understanding and/or developing policy advice, initiatives that aim to better communicate sustainability in the market place (including as part of CSR reporting of food businesses) and initiatives aimed at improving practices on farms and in the food sector. Assessments include both broad assessments, aimed at a ‘quick and dirty’ assessment of a wide range of sustainability outcomes in a more shallow way, and deep approaches that look in detail at one or more specific sustainability outcomes, such as greenhouse gas emissions or biodiversity. One of the main barriers for wider utilisation of the various sustainability assessment tools is cost. Generally a broad and shallow approach is cheaper to carry out as it requires less time and/or data to complete whereas a deep approach is much more time and data hungry and therefore generally more expensive, especially if including multiple objectives (Schader et al., 2012a). The FAO has published Guidelines for Sustainability Assessment of Food and Agriculture systems (SAFA) which specify the procedure, principles and minimum requirements for a sustainability impact assessment (FAO, 2012). These SAFA Guidelines provide for the first time provide one common language for the assessment of sustainability in agriculture.

Initiatives specifically seeking to evaluate sustainability of organic farming systems and include studies of individual product assessments using Life Cycle Assessment (LCA) (e.g. (Tuomisto et al., 2012, Hietala et al., 2015) or assessments balancing different sustainability metrics (Reganold and Wachter, 2016). There are also tools aimed at communication with market partners (see for example http://www.fibl.org/en/themes/sustainability-assessment/smart-en.html) or communication platforms, such as Nature and More (http://www.natureandmore.com) aiming to communicate the commitment and effort that individual growers make towards the planet and its people. There are also some tools that are aimed at awareness raising and advice at the farm level, for example RISE (Hani et al., 2003) or the Public goods tool of ORC (Gerrard et al., 2011) (for comparisons of tools see also Schader et al., 2012a, de Olde et al., 2016).

IFOAM, the international umbrella organisations of the organic movement, has also engaged in this field. The ‘Sustainable Organic Agriculture Action Network (SOAAN)’ of IFOAM was set up for
developing a program that positions organic agriculture and its related supply chains as a holistic, sustainable approach to the production of food and fibre for all of human society.[http://www.ifoam.org/growing_organic/Best_Practice_Program/SOAAN_Structure.php](http://www.ifoam.org/growing_organic/Best_Practice_Program/SOAAN_Structure.php). This has now lead to the publication of two relevant documents, the Organic 3.0 guide (Arbenz et al., 2017) and a Best Practice Guideline for Agriculture & Value Chains (SOAAN, 2013) that are intended to broaden the scope of organic beyond defining it purely by its standards and certification procedures (see Box). However, the documents are less clear on what measures can be used to reach an outcome-based system of organic farming that aims for continuous improvement.

**Box 3: Organic 3.0 - for truly sustainable farming & consumption**

With Organic 3.0 IFOAM wants to respond to the many challenges and opportunities and develop farming systems that are ecologically sound, economically viable, socially just, culturally diverse and transparently accountable.

The overall goal of Organic 3.0 is to enable a widespread uptake of truly sustainable farming systems and markets based on organic principles and imbued with a culture of innovation, of progressive improvement towards best practice, of transparent integrity, of inclusive collaboration, of holistic systems, and of true value pricing.

Organic agriculture is a lighthouse for truly sustainable agriculture and agricultural production systems. Organic 3.0 expands the participation options, and positions organic as a modern, innovative farming system that holistically integrates local and regional context including its ecology, economy, society, culture and accountability. Regeneration of resources, responsibility in production, sufficiency in consumption, and the ethical and spiritual development of human values, practices and habits are concepts that guide the building of a new organic culture that can drive societal development.

The core of Organic 3.0 is the living relationships between consumers and producers, which includes the stories of products and production and the multiple benefits of Organic agriculture. At its heart, Organic 3.0 is not prescriptive but descriptive: instead of enforcing a set of minimum rules to achieve a final static result, this model is outcome-based and continuously adaptable to local context.

Organic 3.0 is still grounded upon clearly defined minimum requirements such as the ones maintained by many government regulations and private schemes around the world, and in the objectives of the IFOAM Standards Requirements. However it also expands outward from these base requirements: it calls for a culture of continuous improvement through private- and stakeholder-driven initiatives towards best practices based on local priorities, and as described in the Best Practices Guidelines of IFOAM – Organics International.

*Source: Arbenz et al (2017)*

Current organic standards address only a small part of wider sustainability aims, even though these wider aspects can be indirectly addressed if the rules are followed. For examples, organic rules contain only a small number of direct provisions to enhance biodiversity, but increases in biodiversity on organic farms-compared to non-organic farming systems- is a well proven outcome that has been confirmed in the scientific literature (e.g. Reganold and Wachter, 2016).
As yet there is no commonly agreed standard for organic/ecological agriculture that covers all aspects of sustainability and one of the reasons is clearly that the conditions under which organic farming is practiced around the world varies considerable. Organic standard setters have been developing new elements in the standards in response to concerns of organic stakeholders (e.g. social or ethical standards, environmental standards) and in some cases these are also used to differentiate product in the market place (see e.g. Zander and Hamm, 2010, Zander et al., 2010). Arbenz et al (2017) call for continuous improvement of the system and for further development, beyond certified organic and Rahman et al (2016) show very clearly the important roles that research must play in achieving these aims. In contrast, Seufert et al. (2017) argue for a change in the regulations by placing more emphasis on environmental best practice in line with the original aims of the pioneers that had a holistic understanding of systems and how to achieve environmental improvements. Interestingly, Seufert et al (2017) do not support the route of stating environmental outcomes and thresholds in organic standards and recommend stating accepted good environmental practises instead. There should be sound evidence that confirms ‘good practices’ to be effective in delivering the desired sustainability outcomes (i.e. biodiversity loss, land degradation, climate change and water-use) and not lead to negative outcomes in other important areas sustainability.

6 Summary and outlook

One of the cornerstones of organic farming is the fact that it is governed by clear standards of production. Organic today is one of the most recognised food labels, and the basic meaning of it understood by many consumers around the world (Seufert et al., 2017). The term ‘Organic’ is legally protected in many parts of the world and is understood as a farming system that prohibits the use of artificial synthetic inputs that may endanger health and the environment. This has allowed markets to grow globally at rate above other food markets (Willer and Lernoud, 2017). However, there is also a widely held view that organic is more than just certification and that there is a gap between certified organic (as defined by the current regulations, standards and certification procedures) and the ideas and principles of organic farming (see for example Lampkin et al., 2017, Seufert et al., 2017, Rahmann et al., 2016, Arbenz et al., 2017). The current certification system operates on a pass/fail system and does not encourage further development regarding the sustainability of the farms. Despite the administrative effort for both producers and control bodies to carry out organic inspection and certification on an annual basis, the control system contributes very little to building an evidence base to substantiate related claims.

Standard setting is a balancing process that has to consider the views of various stakeholders, most notably farmers, food businesses and consumers, but also regulators and control institutions. The development of organic standards so far has focused mainly on areas that are easy to codify (Lockie et al., 2006, van der Grijp, 2006), such as inputs or practises are prohibited or required. With growing market demand, there is a danger that globally organic standards will be defined by the common denominators. Seufert et al. (2017) argue that standard setting process has been mainly consumer-driven and highlight the danger in orienting standards towards one stakeholder group, which may lead to other stakeholders (e.g. producers) to feeling under-represented. If organic standards priorities consumer needs over those of consumers, there is a danger that they become very difficult to comply with, and discourage those that might want to convert to organic. As a

result, demand is likely to grow faster than supply, as is already the case in several parts of the developed world (Willer and Lernoud, 2017).

The challenge for the future is developing organic standards in balanced way meeting the needs of all stakeholders by encourage organic production to become overall more sustainable and provide evidence of the wider benefits of organic farming, whilst maintaining the clarity of rules and keeping them practical for producers and verifiable by control bodies so that more producers can benefit from the opportunities that organic farming offers.

6.1 Contribution of research to support the development of organic standards

There is a need to continue with the provision of evidence on the impact of organic principles and practices, included in areas that are at present not clearly codified in organic standards. The Sustainable Organic Agriculture Action Network group of IFOAM (SOAAN) has taken a first step in publishing best practise guidelines (SOAAN, 2013) but there is only a limited amount of scientific evidence on how these practices contribute to the sustainability outcomes that the organic principles aim to achieve. Related to this is the need to continue developing simple indicators that are robust but not-too-time-consuming to implement and which could therefore become part of organic certification in future. One example that illustrates the case of bringing together the knowledge of researchers with that of control bodies is the AssureWel (http://www.assurewel.org/aboutassurewel) project that aims to develop a practical system of welfare outcome assessment for the major farm animal species, which can be used in farm assurance schemes. Similar efforts are needed to develop certification indicators for environmental practices adopted frequently on organic farms. Rahmann et al (2016) challenge the research community as part of Organic 3.0 to contribute to the development of more integral system indicators for standards and certification that avoid overregulation whilst encouraging participation from farmers of multiple scales and values. This highlights the need to consider the transaction costs that the organic farmers and consumers have to pay for the inspection and certification (e.g. costs for time of inspection and samples that are analysed) and to minimise the administrative burden of the control system. There is also a need to account more clearly for the externalities of organic farming compared with other farming systems.

There is also need to evaluate the impact of the current standards and thus inform their revisions, although the political process is not always strictly evidence based. The trust in the organic claim depends on simple and clearly structured standards and regulations that can be easily understood and followed by farmers, consumers and others involved in organic supply chains. Whilst European Regulation (EC) 834/2007 contributed to the transparency of the legislative framework by clearly setting out the objectives and principles of organic production, the fact that many more detailed implementing rules are set out in a separate (Regulation (EC) 889/2008) still requires an operator to consult a high number of articles when interpreting particular issues (Sanders et al., 2013).

Finally, there is a need to better understand the barriers that prevent more farmers from converting to organic production, including the impact of organic farming on farm profitability. There is some evidence that organic farming is more profitable. Crowder and Reganold (2015) carried out a meta-analysis of the profitability of 55 crops in five continents and found that, if the premiums that producers receive for their organic status are considered, organic agriculture was significantly more


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profitable than conventional agriculture. However, in many organic communities profit is frequently associated with corporate agriculture and farmers that want to stay profitable are accused of converting for the wrong reasons, although economic sustainability is clearly one of the pillars of sustainability, frequently mentioned by farmers. Studies have also shown that the administrative burden of organic certification may be a barrier for entry (Kuhnert et al., 2013).

6.2 Where to look for further information

Primary information about organic standards and regulations comes in the first instance from the documents themselves, which can be accessed either through collections of legislation such as Eurolex or through the control bodies.


The IFOAM Norms or Standards Requirements are also called the Common Objectives and Requirements of Organic Standards (COROS). These were developed as a joint venture of the IFOAM Organic Guarantee System (OGS) and the GOMA Project (Global Organic Market Access) undertaken by FAO, IFOAM and UNCTAD. The main purpose of COROS is international equivalence assessments of organic standards and technical regulations and provides the basis for assessing equivalence of standards for inclusion in the IFOAM Family of Standards. All documents can be accessed via http://www.ifoam.bio/en.

Systematic comparisons of organic standards are more limited: a comparison of the European Regulation with several private and other governmental standards as part of the Organic Revision Project can be found at http://www.organic-revision.org/, see also Padel et al, (2009). A new comparison of how organic ideas have been codified in eight different regulations around the globe was published by Seufert et al. (2017).

7 References


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