



Data-enabled Business Models and Market Linkages Enhancing Value Creation and Distribution in Mediterranean Fruit and Vegetable Supply Chains (MED-LINKS)

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Lead Beneficiary	Deliverable Author(S)
Heliopolis university for sustainable development (HUSD)	Eng. Hager Fouad, MSc. Ahmed Ghannouchi and Dr. Shadi Hashem
Beneficiaries	Deliverable Co-Author(s)
Centre International de Hautes Etudes Agronomiques Méditerranéennes– Institut Agronomique Méditerranéen de Montpellier (CIHEAM-IAMM) University of Cassino and Southern Lazio (UNICAS)	Reem Elkhechen Marcello De Rosa
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List of tables:

Table 1. Criteria of certifications/schemes assessment.	12
Table 2. Characteristics of standards	13

List of figures:

Figure 1. Identified environmental standards.	14
Figure 2. Identified socio-economic standards.	15
Figure 3. Identified cultural, and food and safety standards.....	16
Figure 4. Identified standards in Egypt.....	17
Figure 5. Identified standards in France.....	21
Figure 6. Identified schemes in Greece.....	23
Figure 7. Identified standards in Italy.....	25
Figure 8. Identified standards in Morocco.....	28

Abbreviations:

AB	Agriculture biologique
AOP	Appellation d’Origine Protégée
CIHEAM-IAMM	Centre International de Hautes Etudes Agronomiques Mediterraneennes– Institut Agronomique Mediterranéen de Montpellier
EOL	Economy of love
EOSC	Export-oriented supply chain
GPP	Green public procurement
HU	Heliopolis University for sustainable development
PGS	Participatory Guarantee System
SDGs	Sustainable development goals
SFSC	Short food supply chain
TSG	Traditional speciality guaranteed
UNFSS	United Nation Forum on Sustainable Standards
VSS	Voluntary sustainability standard
WP	Work package

Table of content:

DOCUMENT CONTROL SHEET	3
VERSIONING AND CONTRIBUTION HISTORY	3
Table of content:	5
Executive Summary	6
1. Introduction	8
2. VSS and supply chains: Bridge the gap towards sustainable food systems	10
3. Methodology:	12
4. Findings:	13
4.1. VSS in Egypt.....	16
4.2. VSS in France:	19
4.3. VSS in Greece:	22
4.4. VSS in Italy:	23
4.5. VSS in Morocco:.....	26
4.6. Green Public Procurement (GPP):	30
4.6.1. GPP in Italy:	31
4.6.2. GPP in France:	31
4.6.3. GPP in Greece:.....	32
4.6.4. GPP in Morocco and Egypt:	32
5. Conclusion:	33
6. Deliverable contribution to SDGs	34
References:	35

Executive Summary

In general, private voluntary sustainability standards and certification systems are innovative market-based approaches that aim to further sustainable production and business practices. With no universally agreed definition or references for sustainability standards available, a plethora of different schemes developed in the last decade or two. Here we present an overview of all standards we could identify that are somewhat relevant in the partner countries (Egypt, Italy, France, Greece, Morocco), and mechanisms to select some for further analysis for their appropriateness to the fruit and vegetable value chains in the partner countries, both for the local market and export oriented. The comparison shows that standards focussed on Short Food Supply Chains (SFSC) are far more divers and adapted to local requirements. Standards within Export oriented Supply Chain are often focussed on one dimension of sustainability (ecological, social, (cultural), or economic), whereas some more localised Participatory Guarantee (PGS) Systems choose a more holistic approach. The results suggest that the field of Voluntary Sustainability Standards is highly dynamic, and while areas of fair-trading standards and organic agriculture have entered a maturation phase (with a few leading standards serving as dominant benchmarks), other areas (like agroecological, cultural or socio-economic approaches) are still quite experimental and open to innovation.

The main contributions to Sustainable Development Goals (SDGs) of the activities performed and the results obtained are outlined at the end of the report.

Task 2.1 – “Review and analysis of existing sustainability standards and schemes within the three Supply Chain Systems”

The following report presents the most popular sustainability standards and schemes implemented in the supply chain systems for the fruits and vegetable sector. The analysis was applied separately to each country’s partners (Egypt, Italy, France, Greece, Morocco).

The report sheds lights on the following: Explain the notion of voluntary sustainability standards, Discuss the three types of supply chain systems and VSS and the effect of VSS in providing mechanisms to make informed choices (for buyers) and to capture market value for sustainable commodities (for producers/retailers) across value chains.

Voluntary sustainability standards are a non- governmental regulations or initiatives' aims to move toward sustainable production, supply and consumption, to meet the demand (Komives and Jackson 2014).

Specifically, the work aimed to identify and characterize the most significant sustainability schemes applied in three types of supply chain systems:

1. Short Food Supply Chains (SFSCs)
2. Export-Oriented Supply Chains (EOSCs)
3. Green Public Procurement (GPP)

A systematic methodology was adopted, based on:

- Desk research using targeted keywords across national contexts;
- Interviews with local experts and certification bodies;
- A set of shared assessment criteria, including relevance to sustainability, applicability to smallholders, focus on fruit and vegetable chains, and recognition at local or international levels.

In total, 86 standards and schemes were identified and categorized according to the dimensions of sustainability they address—environmental, socio-economic, cultural, and food safety. Each scheme was then assessed based on seven key features, including adoption requirements, expected benefits for SMEs and workers, and stakeholder involvement.

The analysis showed:

- A greater diversity of VSS in SFSCs, often characterized by locally rooted approaches and participatory models (e.g. Participatory Guarantee Systems).
- More standardized and internationally recognized schemes in EOSCs, oriented toward export markets and compliance with global trade norms.

- GPP frameworks vary significantly across countries: while Italy, France and Greece have structured national action plans and minimum environmental criteria, Morocco is progressing steadily, and Egypt is still in a preparatory phase.

1. Introduction

Voluntary Initiatives has long become a key mechanism in improving various tenets of sustainable development in agriculture production, trade and consumption. VSS are referred to as market based or buyer-led regulatory instruments (Manning et al., 2012; Potts et al., 2014), implementing more rigorous and enforceable criteria transcendent to the state regulations on a range of social and environmental issues that promise a road map for sustainable development (Giovannucci et al., 2014; Marx et al; 2022; Schönherr, 2022), in parallel to most recent international treaties, such as the 2030 Agenda for Sustainable Development (UN 17 SDG's) (UN, 2015). They do so by catalysing new forms of collaboration and agency to promote sustainable agricultural production and trade outcomes, and implementing assurance methods verifying that supply chain actors compliance (Giovannucci et al; 2014), and communicating those achievements to consumer market with a verifiable 'logo' or 'label'(Mwangi and Wardell, 2019; Ningsih et al., 2020). According to the United Nations Forum on Sustainability Standards (UNFSS) (2013, p. 3), VSS is described as "... specifying requirements that producers, traders, manufacturers, retailers or service providers may be asked to meet, relating to a wide range of sustainability metrics, including respect for basic human rights, worker health and safety, the environmental impacts of production, community relations, land use planning and others".

VSS can be administered by a non-governmental organization (NGO), government, or the private industry stakeholders. In a nutshell, VSS can vary on a great number of characteristics, such as nature (practice or performance based), commodity focus, standard criteria (minimum criteria versus best practice), ownership (Single organisations, multi- stakeholder, NGO, non-competitive), audit methodologies and consumer markets (See Fiorini et al., 2017; Bennet, 2018). In terms of ownership, they can be developed by single organisations, i.e., private businesses to mitigate risks in their supply chains, or emerge through multi-stakeholder processes for sector-wide outcomes (Schönherr, 2022). Bennet (2018) referred to the latter as the most legitimate type of standards due to their inclusion of a broad range of stakeholders in standard development and governance (Bennett, 2018). In terms of Criteria, standards have different levels of precision; they are typically nested in general principles, which then are further specified into specific indicators which can be measured. The latter is necessary in the context of audit protocols which are one of the main monitoring instruments.

Monitoring and assurance mechanisms are key as they provide evidence of market actors (including production) compliance in accordance to a set of measurable criteria (Giovannucci

etal., 2014; Ningsih et al., 2020). The assumption is that the sustainability claim gives credibility to businesses and adds value to consumers, possibly by the use of a logo, and can thereby create market demand (Mwangi and Wardell, 2019). Evidence can be provided by self- verification (first-party), second-party verification (e.g., buyer) and independent-third-party verification (e.g., accredited certification body – certification on third-party auditors' reports). The sustainability claim can be 'transported' along the supply chain, from producers to consumers and companies, by a chain of custody and traceability mechanism.

One of the most predominant categorizations of VSS are national versus international origin; national standards are those developed by national standardizing bodies and are intended to be implemented within a country. Both national and international VSS, in many cases, overlap in their form, content and objectives. Moreover, they can both be adopted and repurposed by the other, as several countries tend to adopt international standards as their national standards (UNFSS, 2013). Another differentiation is the private versus public VSS. Private standards are those owned, developed and implemented by non-governmental organizations, including businesses, industry groups or multi-stakeholder groups. Public standards on the other hand are those emerging from public sector initiatives or governmental entities (e.g., CAP reforms). Public standards re-emphasize the role of the state represented by local governments could play a supportive role to accelerate the uptake of sustainable practices. This is grounded on creating incentive mechanisms, i.e., offering promulgated rewards for adopting certain practices or penalties for not abiding by environmental laws and regulations, provide training to producers, and raise consumer awareness.

Nowadays, sustainable products are growing worldwide, and the VSS since their emergence in mid to late 1990s, have been on a continuous rise, which allowed sustainability products to propel a significant shift from specialty niches into mainstream markets (Potts et al., 2014). The case of organic food and farming is one of the most representative cases of this kind of scaling up process, as we can observe every year more and more agriculture land dedicated to the sector and increase in organic products assortment in new and bigger markets, particularly in the EU and Northern American market (See Schlatter et al., 2020). This is a result of Consumer awareness of sustainability, ethical, and safety issues inherited in the food systems, leading to increasing emphasis on the environmental/social sustainability of production processes, the ethical content of a business, and the impact of production/consumption on health and safety. VSS model as intermediaries regulating the transmission of information from producers to customers downstream the supply chain and final consumers (Glasbergen, 2018; Mwangi and Wardell, 2019). Thus, the foundations of VSS builds on the assumption that with compliance with their market-based standards, it would contribute to establishing a system of sustainable production that mitigates negative social and environmental impacts (Giovannucci and Ponte, 2005) and create economic benefits through growth of lucrative markets with many income

generating opportunities may help improve the livelihood of (small) farmers, , drive responsible business practices, enhance brand reputation and support customers through their purchasing decisions (Smith et al; 2019; Molenaar et al., 2019 ; Marx et al; 2022).

With this in mind, this study aims to capitalize on the importance of VSS and attempts to explore, assess and identify key VSS fitting to the context and conditions of the project's partner countries (Egypt, France, Greece, Italy, and Morocco). In the next sections we begin with exploring VSS more in detail, in terms of its role within supply chains at Global and Local levels and potential role VSS can play in boosting sustainable development and some of the challenges they are confronted with. We then present the methodology implemented to provide **a review on VSS operating in Egypt, France, Italy, Greece and Morocco**. Finally, we present the findings emerged from the analysis of each country dataset separately.

2. VSS and supply chains: Bridge the gap towards sustainable food systems

The rise of global value chains (GVCs) in the 20th century, is considered as a key driver behind the growth of VSS, as countries have increased interdependence in sourcing products (ITC, 2016; Fiorini et al., 2017). In the international trade context, VSS is interpreted as instruments for participation in Global Value chains (GVCs), facilitating trade framework between countries in the Northern developed (European and North American markets) and southern least developed countries (ITC, 2016). They have myriad impacts on value chains governance patterns, associated with changing chain structure and participating actors, and mechanisms for standards selection, implementation and monitoring. It has been widely emphasized that, the rise of GVCs has facilitated many gains along the supply chains at the downstream and upstream levels. For example, fostering coordination and value chain integration, facilitate the marketability of sustainable exports to the growing and lucrative responsible markets and offer consumers a greater variety and assortment of goods.

At the interplay between local and global , participation in GVCs open various opportunities for growth strategies to small and poor stakeholders, enabled by sustainable methods, achieving economies of scale through better and more effective management of the local value chains, lowering transaction costs, better coordination and communication between chain actors (Von Hagen, 2013), improve access to credit, increase levels of empowerment and risk management tools and provide technical support (e.g., training). The latter help to improve suppliers' competences and confidence in applying VSS. In the individual collective scale of the small local agribusinesses, these aspects may contribute to the achievement of sustainable development goals globally (Marx et al., 2022).

In the realm of local chains, there has been a growing trend of Short Food supply chains, in which various sustainability attributes related to 'local production and sustainable food consumption' is

of greatest interest of NGO's and public policy, to make sustainability dominant driver of purchasing decisions for consumers. In this regard, there has been a growing debate that VSS certification may only create 'islands of sustainability' for agribusinesses and food enterprises, rather than creating systemic changes that are needed in an agricultural sector, largely dominated by unorganized smallholders in developing countries (Piao et al., 2019). This culminated in calls emphasizing the need of comprehensive approaches that realize benefits for rural community and the environment (Nelson & Philips, 2018; Glasbergen, 2018).

This implies that these short chains would short circuit the long, often disintegrated supply chains, characterised by arm's-length relationships and information asymmetry. Therefore, the information of farmers and farming methods is directly available to local customers, local and seasonal consumption is fostered, and trust is rebuilt between consumer and farmers. At the producer and production levels, this implies structural innovation at supply chain, improvements in productivity, quality and profitability, where farmers can secure most revenue for themselves, instead of getting economically squeezed due to increasing competition from oversupply result from international trade in the Northern markets (e.g., absence of price premiums), and/or limited market demand in the national less aware markets. When directly embedded within local landscapes and supply chains, VSS focus on smoothen accessibility to small-holders, deliver socio-economic and environmental outcomes, improve small-holders livelihoods, strengthening rural economy and increasing sustainable demand in emerging and developing economy. Thus, in SFSCs context, VSS can be viewed as a means to an end toward achieving sustainable development at local/national agriculture food circuits. This is achieved through training provided to farmers in good agriculture practices, new assurance approaches (e.g., self-assessment, peer reviews), increasing peer to peer awareness and learning among farmers/producers, more transparent practices and better shared implementation and lower certification cost schemes, (e.g., PGS) (Nelson & Philips, 2018). In addition to that, there are some complementary services offered by these Innovative VSS, including capacity building, access to credit schemes, as well as farm information and extension services. Stakeholders' accessibility is being promoted by opening a dialogue with smallholders in standard setting and enabling farmers to be certified as a group.

To sum up, a positive association is found between VSS and food supply chains, opening a new chapter for 'innovative' sustainability governance that represent a 'paradigm shift' to enabling improvement that not only would fit the needs and requirements of these local southern value chains, but also would have a positive effect on sustainability of Global value chains.

3. Methodology:

Data on VSS operating in each of the five partner countries has been constructed by carrying out extensive research in scientific journals, standards-related databases and collection from certification bodies. In order to gather data on VSS, one researcher in each country has first searched the following keywords, translated in each country language, using Boolean search operators and Google search engines between December 2021 and March 2022: 'Food certificates', 'Food safety certification', 'Sustainable food certifications', 'PGS certifications', 'Global food certifications', 'Local standards'. Where necessary, several key experts in agriculture, supply chains and certification bodies in each country were interviewed to gather further information on VSS operating in the agriculture and food sector. The search was subsequently refined against a set of criteria that were selected and validated in consensus among partner countries (See table 1). This allowed to refine the list of VSS identified to the ones most relevant to this study.

Table 1. Criteria of certifications/schemes assessment.

List of criteria	
1	Does it consider sustainability?
2	Is it an Organic Certification?
3	Is it suitable for small scale farmers (Small producers)?
4	Is it focused on fruit and vegetables supply chains?
5	Is it widely known or recognized?
6	Is it targeted at the consumer (or B2B partners)?
7	Is it focused on agricultural production, or does it include the supply chain (trading, storage and transportation)?
8	Related to partner countries (Egypt, Italy, France, Greece, Morocco)?
9	Overall suitability for the aims of the project?

The resulting standards were then categorized according to their applicability in the three supply chains of interest (*i.e.*, SFSCs, EOSCs and GPP).

The categorization of standards was followed by a more thorough characterisation of each identified scheme or/certification (See Table 2). This facilitates comparison of VSS selected based on stakeholders' involvement, requirements and expected sustainability outcomes. This reiterative, refinement process transcends the Logical Framework Matrix and task-based approaches. Thus, although the characterisation and comparisons are formally judged to be completed, data obtained from T2.2 and subsequent activities are expected to lead to further revisions, adaptations and changes.

Table 2. Characteristics of standards

Selected characteristics	
1	Actors involved
2	Challenges
3	Requirements of adoption
4	Expected economic benefits for SMEs
5	Expected social benefits for workers and communities
6	Expected environmental benefits
7	Main feature

Although due care was taken during the process, further data, future insights, and the dynamic development in the field are likely to lead to subsequent adaptations, additions, revisions and possibly deletions during the course of the project lifetime. A consensus-based decision making after reviewing experts and/or stakeholder input, is envisaged to remain applicable.

4. Findings:

The studies identified 86 schemes spreading over Egypt, France, Greece, Italy and Morocco, these standards vary in name, type and structure but can be grouped based on the field they are related to and the scope of sustainability dimension they mainly prioritize.

Several standards identified focus on production process, such as organic agriculture such as Organic EU, USDA Organic, JAS and Bio Suisse. Several VSS were country-specific but were strongly embedded in international organic standards and laws. These schemes include Label Rouge, Nature et Progrès, Agriculture Intégrée (Integrated farming) in France, AIAB Italia Guarantee in Italy, ECOSERT, Biopartenaire and Biomaroc and BIOLABEL in Morocco. Overall, all of the identified schemes do not create any additional rules, rather, they rely on international organic regulations and laws and translate them based on each country's context. Similar to the country specific organic standards case, Biodynamic PGS standards, are derived from the Demeter international standards, especially the Economy of Love scheme in Egypt.

All organic and biodynamic identified schemes follow similar organizational structures and assurance mechanisms. They are viable for export markets, and rely on third-party inspection and certification. Thus, more local and community-driven schemes are adopted in some of these countries that eliminate third-party involvement and rely on a set of organic and biodynamic standards for the purpose easing the stringency of compliance requirements to increase producers' adoption and willingness to transition towards more sustainable production, and boost the organic and biodynamic presence at the local market. Examples of these schemes include, Participatory Guarantee Systems (PGS) (PGS-Demeter) and France (PGS-Organic, Nature et Progrès).

The VSS identified can also be categorized based on the sustainability dimensions they prioritize (See Figure 1). Environmental sustainability refers to the process in which farmers'/producers and other supply chain actors implement production processes and management systems that avoids or reduces the harm on environment and improving eco-efficiency, such as reducing waste and the use of resources (De Marchi, *et al.*, 2013) and protect biodiversity (Potts *et al.*, 2016). Several standards identified focus on improving the environmental outcomes (Figure 1); some of them are common in every country such as Organic EU, GLOBAL GAP in Egypt, France, Morocco and Italy (also known as Global Grasp). Whereas others are country-specific such as the Economy of Love standard in Egypt, Haute Valeur Environmental (HVE), ISO 14001 and EMAS in France. In Greece, EPD (International Environmental Declaration) and ISO 14000 were identified, while LEAF and ECOLABEL RBA were identified in Morocco.

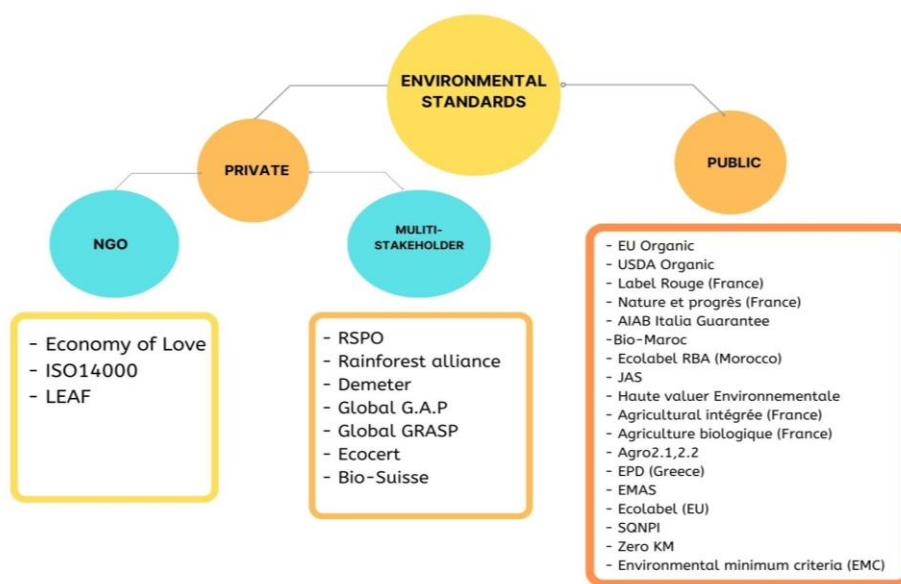


Figure 1. Identified environmental standards.

In terms of socio-economic dimension, a large number of standards were found to highly emphasis in supply chain operations (See Figure 2). For example, Fairtrade international, which is adopted in Egypt, France, Greece, Italy and Morocco, along with some local initiatives, i.e. Economy of Love in Egypt (EOL) and Fair for life and SMETA Sedex in Morocco. Socio-economic outcomes are also tackled by the Protected Geographic indication (PGI) and Protected Designation of Origin (PDO) schemes. These labels indicate the origin of a product in a specific place, region or country, whose given quality, reputation or other characteristic are particularly attribute to its geographical origin. More precisely, the territorial embeddedness is higher in case of the PDO label (all production and processing phases must be realized in the area of origin), than of PGI (it is enough that just one phase is realized in the area of origin). These specific schemes aim to recognize and give value to local and traditional knowledge, as well as endemic products of specific regions.

Moreover, Traditional Specialty Guaranteed (TSG) is another European label which identifies the traditional dimension of a product, such as the way the product is made or its composition, without being linked to a specific geographical area.

PGI and PDO schemes had strong presence in four of the five countries, France, Italy, Greece and Morocco, however, they differ in name, form or targeted product. They can also be known as AOC (Controlled Designation of Origin) and AOP (Protected Designation of origin) in France, or IGP Maroc, AOP Maroc, Indication Géographique, and Territoire du Maroc in Morocco.

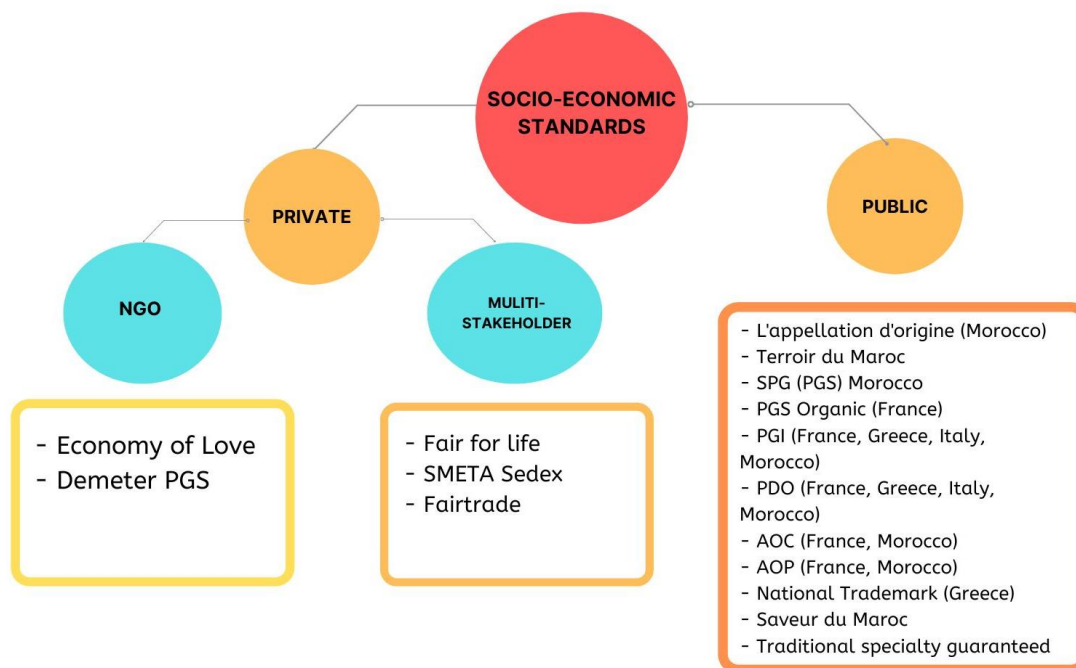


Figure 2. Identified socio-economic standards.

Regarding the cultural dimension, none of the countries has particular schemes that target exclusively prioritizing cultural outcomes with the exception of Greece having the “we do local” standard (see Figure 3). However, other standards may tackle multiple sustainability dimension, including the cultural dimension, such as Traditional Specialty Guarantee (STG) in France, Greece and Italy, we do local in Greece, and Saveurs du Maroc in Morocco, and the Economy of love standard in Egypt.

A final category of standards identified in the assessment were those related to food quality and safety (Figure 3), these standards include HACCP and ISO (*e.g.*, ISO 22000, ISO 9001) present in every country, in addition to Cash and Carry certification in Italy, ONSSA, BRC food, IFS food and FOODEX in Morocco.

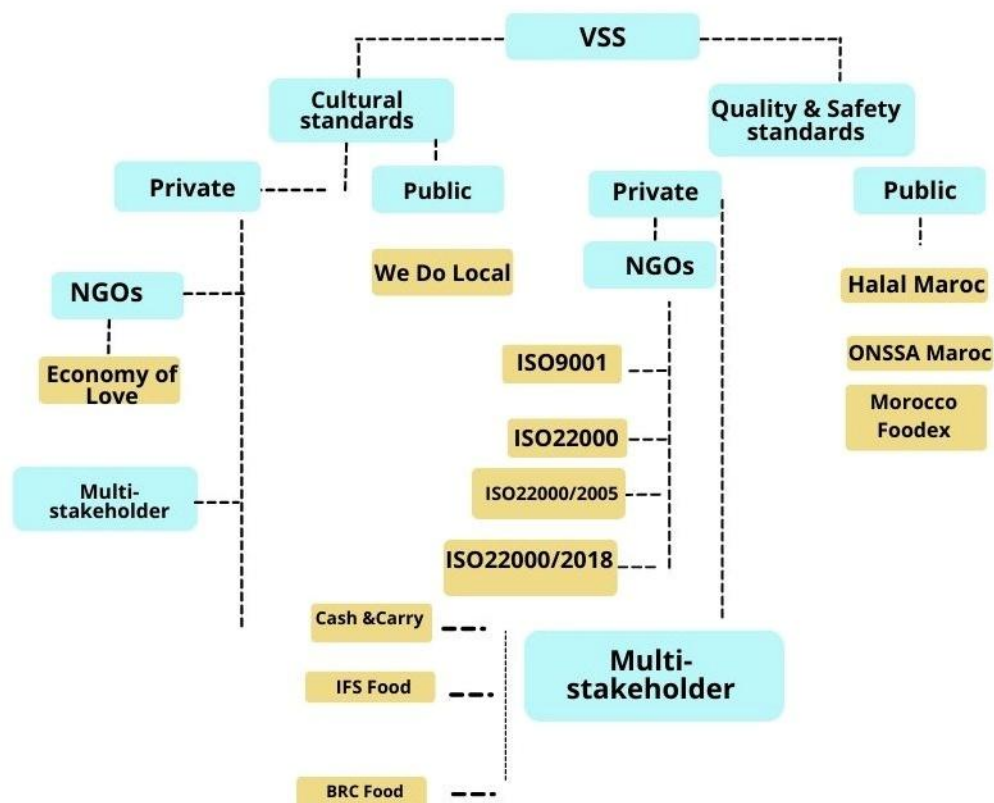


Figure 3. Identified cultural, and food and safety standards.

4.1. VSS in Egypt

12 schemes were identified in Egypt (Figure 4), including:

- **Demeter International:** a set of standards certifying agricultural products following biodynamic production standards.
- **Bio Suisse:** the main organic standard in Switzerland, equivalent to the Swiss ordinance on organic farming
- **The Japanese Agricultural Standards (JAS):** a set of national standards that regulates organic agriculture in Japan, created and implemented by the Japanese Ministry of Agriculture, Forestry and Fisheries.
- **USDA Organic:** a set of organic regulation adopted in the United States of America, USDA organic is similar to EU Organic standards.
- **Global G.A.P:** is a brand of smart farm assurance solutions developed by Food PLUS GmbH in Cologne, Germany, with the cooperation of producers, retailers, and other stakeholders across the food industry. These solutions include a range of standards for safe, socially and environmentally responsible farming practices.
- **HACCP:** is a management system in which food safety is addressed through the analysis and control of biological, chemical, and physical hazards in every segments of the food

industry from growing, harvesting, processing, manufacturing, distributing, and merchandising to preparing food for consumption.

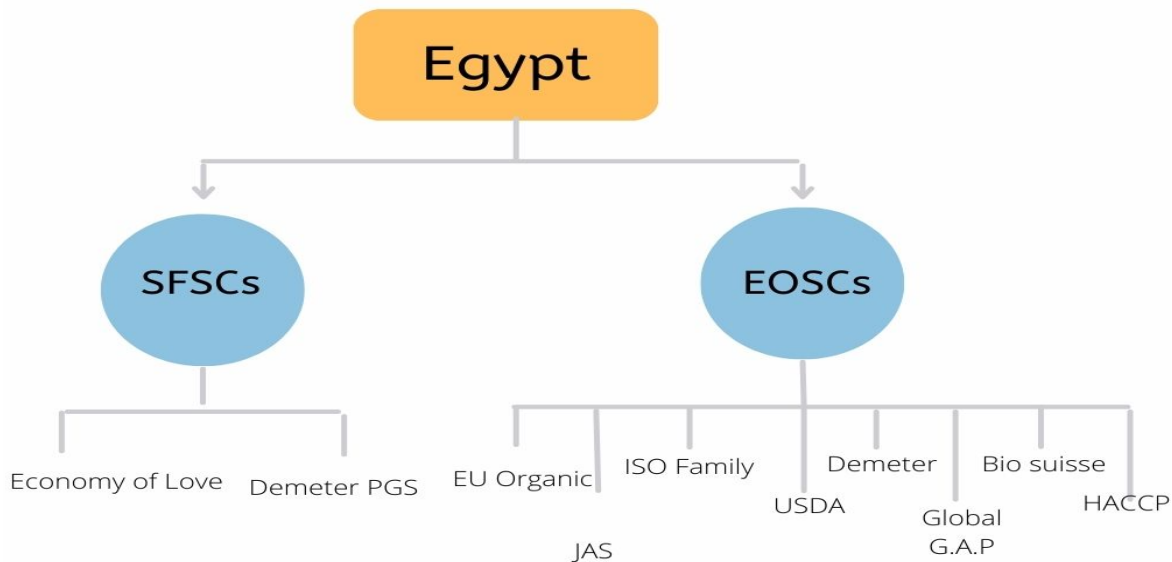


Figure 4. Identified standards in Egypt.

Identified standards were screened through the different indicators selected in the methodology (Table 1 and 2), which led to the selection of three main schemes deemed as suitable for the context of the country in both SFSC’s and EOSC’s, namely Economy of Love certificate, Organic EU and PGS-Demeter.

The first scheme selected for the Short Food Supply Chain is the Economy Of Love (EoL) Standard, a certificate initiated by the Egyptian Biodynamic Association to support ethical and sustainable farmers and companies following biodynamic principles, as well as consumers. EoL is a certification scheme for products that are sustainable, ethical, and transparent throughout the entire supply chain. EoL conforms well to the set of selected criteria used for assessment.

EoL tackles not only biodynamic production which leads to improvement of economic outcomes, but also focuses on the social and cultural dimensions of sustainability. EoL describes itself as a “Holistic” certification standard that covers the entire dimensions of sustainability, it aims to develop communities through education and art in addition to sustainable agricultural practices, to create fair and dignified working conditions, and protect natural ecosystems and the environment. Hence, the first criterion “Does it consider sustainability” is strongly covered.

Moreover, EoL is dedicated to biodynamic agriculture and specifically requires compliance with biodynamic standards, which inherently means compliance to organic standards, as certification to biodynamic explicitly requires the presence of organic certification. In addition, EoL can target small-scale farmers, addresses different stakeholders of the supply chain and a wide range of products including the fruit and vegetable sector and targets B2B and B2C groups as well. it is

widely recognized by several countries including Germany, Italy, USA, Iceland, the Netherlands, Malaysia and the UAE. Finally, EOL has the “ImpacTrace” feature which enables consumers through scanning a QR-Code on the package to access information about the origin of their products, how they were made, and the different processes they went through, which facilitates collaboration and allows for greater transparency, particularly for consumers. Hence, the adoption of the Economy of Love certificate in Egypt can provide major opportunities to create ethical and sustainable supply chains where producers can develop quality products sold at premium prices without compromising their livelihood or community.

In terms of how it restructures the supply chain, the standard involves farmers, processors, licensees, retailers and consumers. It pays a particular attention to the socio-economic dimensions by providing producers with fair and dignified working conditions, as well as premium prices, promotes the engagement of stakeholders through open dialogue, promotes the development of local and rural communities and fair societies, promotes the development of capacities of employees through training and capacity building programs, encouraging life-long learning, and creative expressions, and promotes the involvement of locals. Moreover, It aim to promote workers access to health and social insurance. in terms of Environmental dimension, through the reliance of Biodynamic standards, EOL promote better management agro-chemicals, improves resource management systems, reduces greenhouse gas emissions and the use non-recyclable materials. As for small-holders inclusion, EOL helps them through ensuring transparency within stakeholders’ relationships, ensuring their participation in negotiable agreements.

The second selected standard is PGS-Demeter, which is the first Egyptian PGS system initiated by the Center of Organic Agriculture in Egypt (COAE) in order to guarantee the biodynamic integrity of products without recurring to third-party certification which represents a huge financial burden, particularly for small scale farmers. The PGS system provides several advantages; it eliminates financial burdens arising from third-party inspection which allows the relocation of funds for the improvement of agricultural practices, they allow the possibility of product sales at premium prices in reliable local markets. PGS is also heavily reliant on stakeholders’ involvement and representation of farmers in the setting of standards which gives them the power of decision making. In Egypt, the PGS system focuses on compliance with biodynamic standards, and while this scheme is relatively new, it is gaining traction and popularity all over the world, PGS-Demeter involves farmers, certification bodies, consumers, retailers, wholesalers and processors who can participate in the review committee and oversee the compliance of farms to the standards. In addition, PGS has several socio-economic outcomes, such as increasing the independence of small-scale farmers, alleviating certification costs, promoting the collective use of knowledge and resources, and establishing a favorable environment for peer-learning between farmers. PGS helps foster community values and support community development as it relies heavily on trust-based relationships and creates a sense of community between farmers and consumers, this participation reinforces social inclusion and farmers’ empowerment.

Thousands of organic producers and consumers are currently verified through PGS initiatives around the world, and while details of methodology and process vary, the key elements and features remain consistent worldwide. However, the recency of the systems entails several downsides that need to be addressed, particularly issues of trust and confidence as farmers are included in the inspection of lands, which requires a high level of integrity so that the conversion from conventional farming to PGS Demeter does not get hindered.

The selected standard in export-oriented supply chain is Organic EU which the most common and fitting standard for Egypt, it is a farming method that is internationally regulated and legally enforced by many nations t is largely based on the standards set by the International Federation of Organic Agriculture Movements (IFOAM), an international umbrella organization for organic farming organizations established in 1972. Organic EU allows organic products to be commercialized within the European Union and includes a set of production standards for growing, storage, processing, packaging, and shipping that include avoidance of genetically modified seed, use of farmland that has been free from prohibited chemical inputs for several years (often, three or more), for livestock, adhering to specific requirements for feed, housing, and breeding, keeping detailed written production and sales records (audit trail) and maintaining strict physical separation of organic products from non-certified products, undergoing periodic on-site inspections. Organic EU promotes a series of sustainability outcomes, particularly premium prices for farmers and access to international markets, the practices required by the standards helps improve the soil, enhance biodiversity and protect natural resources and water bodies, it would also help mitigate climate change. The standard covers farmers, producers, processors, distributors, exporters, restaurant owners, and any other stakeholder of the agri-food sector. While EO organic opens valuable opportunities, it still presents some challenges particularly related to high cost and technical capabilities of compliance.

4.2. VSS in France:

Twenty-one schemes were identified in France (Figure 4), which were matched with the different criteria selected in the methodology (Table 1 and 2). These VSS include EU Organic, USDA Organic, Global G.A.P, HACCP, in addition to:

- **Label rouge (Red Label):** is a national sign referring to commodities produced or manufactured in a way that give them a higher level of quality compared to other similar marketed products. The label covers food and non-food items, as well as non-processed agricultural products, regardless of their geographical origin. In addition, all products must meet the requirements defined by the standard, which were designed by the National Institute of Origin and Quality (INAO) and approved by a ministerial order published in the official journal of the French republic.
- **Nature et Progrès:** is one of the oldest organic PGS in the world, active since 1972 and recognized by IFOAM. It involves farmers, consumers, agronomists, technicians and even doc-

tors who develop their own certification process and requirements based on 15 production standards and associated with an ethical chart. This PGS scheme offers a viable alternative to organic certification and relies on a vision of society based on relations of friendliness and closeness between people and their environment.

- **Haute valeur Environnementale (HVE):** also known in English as “High Environmental Value” is a certification created and implemented by the French ministry of Agriculture that aims to recognize agricultural production systems that voluntarily engage in environmentally friendly approaches. This certification does not certify the quality of the products but rather the environmental performance of the production. This standard requires the compliance with four main themes; biodiversity preservation, phytosanitary strategy, fertilization and water resources management.
- **Spécialité Traditionnelle Garantie (STG):** Known in English as Traditional Speciality Guaranteed, STG is a quality scheme created in 1992 by the European Union that refers to a product for which its specific qualities are related to a composition, methods of manufacturing or processing based on a tradition. STG does not certify that the protected product has link to a specific geographical area, thus a product can be produced outside the area or the country from which it originates and can still be certified. STG aim to give value to traditional know-how, ancient practices, or typical local, regional or national practices, but which could easily be made outside the country or region of origin.
- **EMAS:** The EU Eco-Management and Audit Scheme (EMAS), also known as the EU EMAS regulation (EC) No. 1221/2009. is a premium voluntary management instrument developed by the European Commission for companies and other organizations to evaluate, report and improve their environmental performance. The standard focuses on an environmental statement which companies use in order to disclose their environmental impacts and be transparent about their environmental management systems, which is verified regularly by an auditor, and approved by local public authorities.

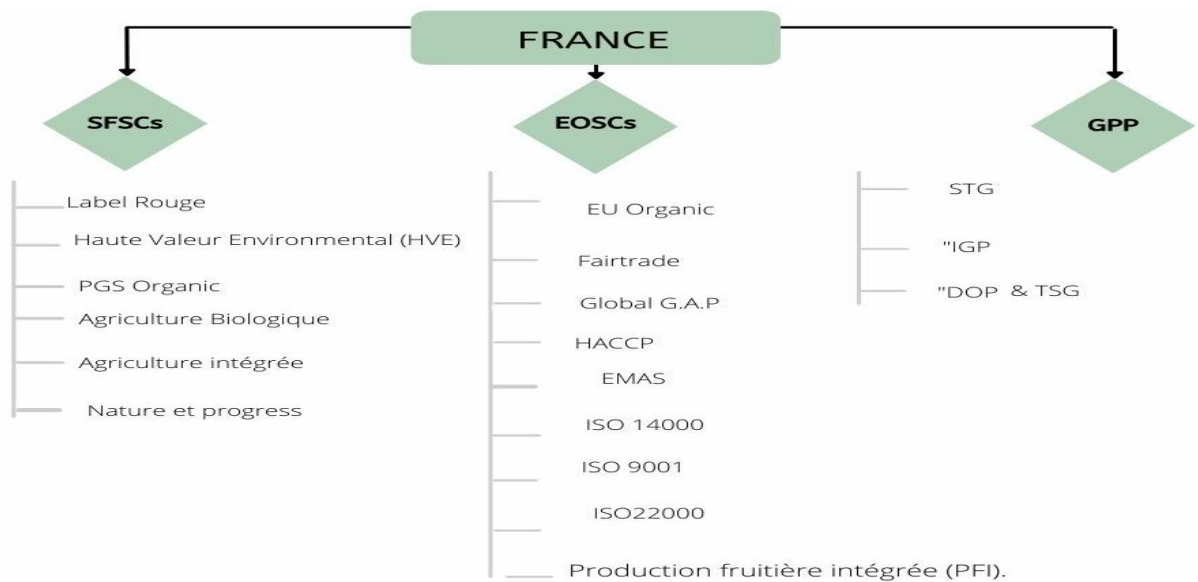


Figure 5. Identified standards in France.

The two selected schemes in SFSC were Agriculture biologique and Appellation d’Origine Protégée (AOP) and one selected scheme in EOOSC was Fairtrade. Agriculture biologique is the French equivalent of organic EU regulations. Hence, they share the same characteristics and outcomes.

The Appellation d’Origine Protégée (AOP) or Protected Designation of Origin (PDO) in English, is a denomination that identifies a product originating from a specific place, region or country, of which the quality or characteristics are essentially or exclusively in the geographical environment including natural and human factors. All the stages of production take place in the defined geographical area. AOP is a sign of identification of quality and origin recognized since 1905 in France, since 1958 internationally (under the Lisbon Agreement) and since 1992 at European level. The designation of origin designates a product whose quality and characteristics are strongly linked to a geographical origin and whose name enjoys an established reputation. Often close links between the specificities of the geographical environment (which includes natural and human factors) and the specificity of the product are assumed, resulting in a somewhat unique quality.

AOP is covering the socio-economic dimension of sustainability, as it adds value to local products in specific geographical area and gives them a competitive advantage in the market. AOP is not an organic standard, but it covers traditional agricultural practices. AOP is suitable for small scale farmers, can be applied to fruit and vegetable supply chain and targets B2B and B2C denomination. The challenge in using this label is the fact that the designation can only apply to a product which consubstantial qualities result both from the virtues of the terroir and from the traditional manufacturing conditions with their rules of know-how which are transmitted, which might hinder opportunities of large-scale production.

For the selected scheme in export-oriented supply chain, Fairtrade is a model of ethical and responsible economy. It is a set of standards developed to support the sustainable development of small producers and agricultural worker. Fairtrade checks the structure of the organization and the measures put in place for the protection of the environment and the safety of employees. Hence, the requirements of the specifications aim to improve the organization and working conditions of producers and to implement, over the long term, effective measures to protect the environment.

Fairtrade promotes the socio-economic dimension as it is supported by several NGOs (such as Max Havelaar France and the Fairtrade/Max Havelaar movement), it allows the cooperation between small producers to certify the assurance of a fair and stable price for their products, as well as more sustainable commercial relations through several stakeholders. It can be applied to fruit and vegetable sector and it mainly targets B2B groups.

Despite its potential, Fairtrade faces several challenges such as the ambiguity regarding ways of compliance with specifications, the uncertainty about the effectiveness of the specifications, lack of Knowledge from small scale producers. However, Fairtrade remains a vital sustainability tool as it fights against the exploitation and violation of human rights toward Producers and paid workers.

4.3. VSS in Greece:

11 Standards were identified in Greece (Figure 6), which are EU Organic, Global G.A.P, Fairtrade, HAACCP, and most notably:

- **International Environmental declaration (EPD):** EPD is a system of environmental declarations that signify a producer/manufacturer's commitment to reducing the environmental impact of its products and services and in reporting them in a transparent manner. Through EPD, manufacturers report through third-party verification the food and the bad impacts of their products and services, and work diligently on improving its environmental performance.
- **ISO 14000:** is a set a framework related to environmental management, it is created to help minimize the adverse effects of an operation on the environment through complying to a series of applicable laws, regulation and other environmentally oriented requirement in order to develop a more environmentally-conscious management systems.
- **We do local:** is a certification standard for companies and businesses at the hospitality sector, it supports the production, economy and human resources of a business in order to promote local culture and gastronomy while respecting people and the environment.

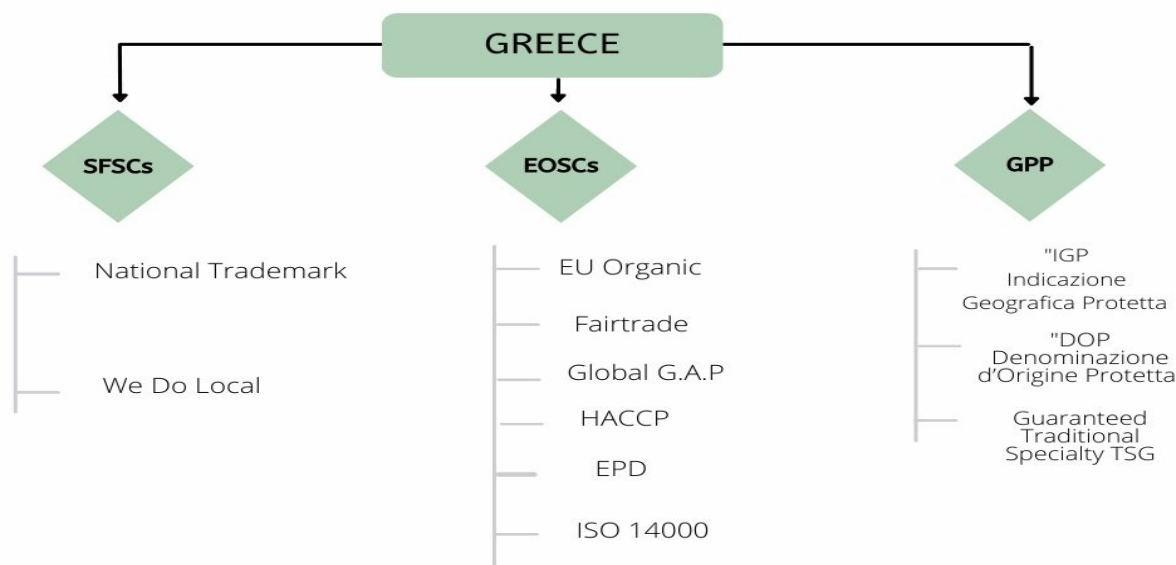


Figure 6. Identified schemes in Greece.

Three schemes were selected from the identified VSS; the Traditional Specialty Guarantee (TSG) and Fair trade for (SFSC) and Organic EU for (EOSC), which were both selected in France and Egypt.

Traditional Specialty Guarantee (TSG) is a scheme that follows the principle of PGI and PDO as it is a certification of commodities produced the traditional way in Greece (e.g., gyros or “klarisio” peach in the region of Kozani). While TSG is not specifically targeting organic agriculture, it does focus on local and traditional production processes, and specifically supports small-scale farmers. TSG promotes several socio-economic outcomes, as it promotes and valorizes local products, and helps preserve local knowledge and know-how while protecting these products from falsification and misuse. Overall, the TSG system is new in Greece, thus several challenges are currently in place such as the lack of consumer awareness, as they might hold a different perception of what “traditional” means for a product, alongside issues of high bureaucracy. TSG primarily involves governmental entities, farmers and farmers’ organizations, which empowers farmers and fosters a sense of community among people producing these local products; it would also open possibilities of added revenues, particularly from eco-tourism.

4.4. VSS in Italy:

Overall, 16 schemes were identified in Italy (Figure 7), including EU Organic, Global G.A.P, Fairtrade, PGI and PDO, in addition to:

- **AIAB Italia Guarantee:** AIAB is an organic certification developed by the Italian Association for organic Agriculture for cosmetic products, it allows complaints to use the label “Bio Eco Cosmesi”. AIAB allows the use of products with low environmental impact and maximum health protection both in the production and packaging process, it prohibits

the use non-organic, non-plant based, allergen-resistant, irritating or harmful raw materials.

- **Cash and carry certification:** is a set of standards directed towards Wholesale and Cash and Carry companies that cover the complete handling of loose and packaged products, as well as the processing of smaller product volumes. The standards helps optimize the efficiency of the processes and workflows of wholesale and cash and carry companies, ensure transparency and traceability, and maintain the safety of food.
- **Farm Sustainability Assessment Program:** FSA is a tool created by the Sustainable Agriculture Initiative (SAI) that allows producers and companies to assess and improve their sustainability practices. SFA is directed towards food and drink companies, as well as farmers, and relies on self-assessment and third-party verification to comply with a set of 112 sustainability criteria covering social, environmental and economic topics.
- **Zero Km:** it is a voluntary participatory guarantee scheme that took place and got popularized in Italy in the last 20 years. It refers to the usage of locally grown food that has not traveled after production, or more literally that it has traveled “zero Kilometers” before being eaten. This indication does not only ensure the quality and freshness of food, but it also signifies the embracement of local identify and traditions, and the minimization of production’s environmental impacts, by reducing the direct and indirect pollution of transportation.
- **Environmental Minimum Criteria (EMC):** EMC is a set of environmental requirements working as a national reference point for green public purchases that can be used by procurement stations, they are developed for the various phases of the purchasing process, and aimed at identifying the best product, service or design solution in environmental terms, throughout its life cycle, taking account of availability on the market. These criteria are defined in Italy within the framework of the plan for environmental sustainability of consumption in the public administration sector (Green Public Procurement - GPP) and became mandatory under Italian law in article 34 of legislative decree 50/2016 (the tendering code) as a uniform and systematic application to help spread environmentally favorable producers, by exerting leverage on the market and prompting the less virtuous economic operators to adapt to the new requirements of the public administration. In addition to environmental protection, EMC demands compliance with social criteria and meeting the public administration’s need to streamline its consumption and reduce its expenditure where necessary.
- **National Quality System of Integrated Production (SQNPI):** Known in Italian as “Sistema Di Qualità Nazionale Produzione Integrata”, SQNPI is a voluntary certification scheme conceived by the Italian Ministry of Agricultural, Food, and Forestry Policies in 2014 and officially became operational in January 2016. SQNPI targets agricultural and agri-food products obtained with integrated production techniques and applies to all companies in the Italian national territory that use integrated agricultural production, in a single form

or in an associated form. SQNPI aims to enhance and identify productions obtained in compliance with regional integrated agricultural production regulations that add value to products towards large-scale distribution and guarantee safety, quality, and cultivation processes that respect the environment and human health. In addition, SQNPI exerts particular attention to traceability, hence all organizations involved in supply chains need to use materials recognized by SQNPI and have to ensure not only traceability but the absence of cross-contamination as well.

Three particular standards were selected for SFSC and EOOSC: Organic EU, Global GRASP and ISO 22000, also known as “Food safety management systems-requirement”.

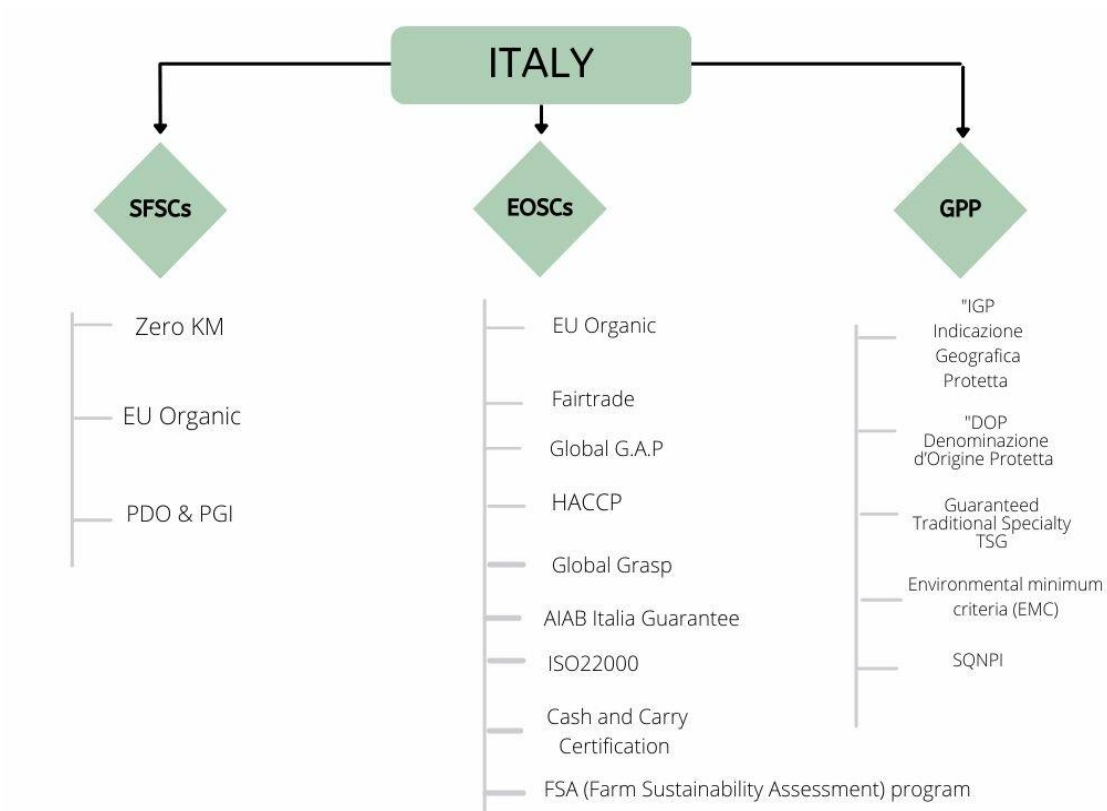


Figure 7. Identified standards in Italy.

Regarding EOOSC, several common certification schemes are adopted, such as Fair Trade, which is marketed with the purpose of compensating smallholders’ farm with fair prices. In addition to geographical indications (PDO and PGI), which label origin-linked products, whose quality is attributable to the area of production. As well as Guaranteed Traditional Specialty, which labels a traditional production specification, where the link with the area of production is not only geographical but cultural, historical and social. Therefore, in order to get this certification, it is necessary to respect a traditional production recipe (which recall a certain regional specialty), regardless the area of production. Based on the assessment, GRASP (Global G.A.P Risk

Assessment on Social Practice) was selected, which is a certification scheme that joins the Global Gap certification with additional requirements concerning the safety of workers' conditions. GRASP is a voluntary, farm-level social/labor management tool for global supply chains. Through GRASP, producers can assess and improve their responsible social practices related to worker's voice, human and labor rights, and child and young workers' protection. As mentioned previously, EU Organic logo gives a coherent visual identity to organic products produced in the EU. This makes it easier for consumers to identify organic products and helps farmers to market them across the entire EU. It aims to produce food using natural substances and processes. This means that organic farming tends to have a limited environmental impact.

Another important process certification is ISO 22000, which covers all the processes in the food chain that impact the safety of the end product, the latest update of ISO 22000 was published in 2018, and it covers standards related to food manufacturing, farming, packaging, catering and animal foodstuffs and feed production. Overall, ISO 22000 sets out requirements for the development of an effective food safety management system, to provide safe products for consumers. Compliance with these requirements can improve supply chains through organizing effective communication within the food supply chain, systematizing activities related to the production of safe food, optimization of resource use, improving the effectiveness of hazards control, ensuring the full identification and traceability of products and increasing the quality and safety of products while ensuring repeatability.

As far as the SFSC is concerned, the selection of schemes for Italy was based on an analysis focused on the "Campagna Amica" farmers market, also known as the "Campagna Amica" foundation. This includes farmers adhering to Coldiretti, the most important farmers' association of Italy. This organization has its own set of internal rules that specifies a participatory guarantee schemes clarifying what farmers can sell, which are either regionally produced products (so called ZERO KM products), products that comply with organic standards, or labeled with geographical indications. ZERO KM products provide a strong contribution to sustainability, by reducing GHG emissions (thanks to the removal of long distances transports), preserving biodiversity and local specificities.

4.5. VSS in Morocco:

Morocco is very rich in standards; 26 schemes were identified (Figure 8), including:

- **Linking Environment and farming:** LEAF is an assurance system that recognizes sustainably farmer products, it certifies businesses that comply mainly with the principles of Integrated Farm Management (IFM) and requirements related to organization and planning, soil management and fertility, crop health and protection, Pollution control and by-product management, Animal Husbandry, Energy efficiency, water management, landscape and nature conservation, and community engagement.

- **ONNSA:** is a food safety standard created by the l'Office National de Sécurité des Produits alimentaires, known in English as "National Office of food safety", a governmental organization regulates through a set of requirements the safety of products to protect the health of animals, plants, farmers and consumers. The ONNSA standards covers through its requirements plant and animal products, seeds, substances used in production, veterinary practices as well as import and export rules.
- **SMETA Sedex:** SMETA is a social auditing tool developed by The Supplier Ethical Data Exchange (Sedex), a not-for-profit, membership organization that works with buyers and suppliers to deliver improvements in responsible and ethical business practices in global supply chains. SMETA assess a company's practices through monitoring suppliers, the health and safety of workers, labour conditions, and human rights along the supply chain. Their standards are related to the following themes: Labour standards, health and safety, management systems, work subcontracting, Environment, and business ethics.
- **BRC FOOD:** is a global food safety standard published by the British Retail Consortium in 1998 for the purpose of helping the food industry comply with UK and EU food safety laws. BRC is an internationally recognized benchmark for best practice in food safety, quality and responsibility, and gives organizations working in the food industry (including retailers, manufacturers, importers, caterers and ingredient suppliers) a framework for managing the safety, integrity and quality of their products and services. The standards targets seven themes: Senior management commitment and continual improvement, food safety plan (HACCP), Food safety and quality management system, site standards, product control, process control, and personnel
- **IFS Food:** The International Featured Standard (IFS) is a global food safety standard recognized by the Global Food Safety Initiative (GFSI) and directed towards manufacturers, wholesalers, distributors, agents and brokers to certify the safety and quality of food products and processes, particularly in food and ingredient manufacturing, food packaging manufacturing, consumer products packaging, and storage, distribution, transportation and logistics.
- **ECOLABEL RBA:** is a standard that certifies products and services that meet a set of environmental and social criteria that help minimize the negative impacts of production systems, particularly for stakeholders in honey, aromatic an medicinal plants, goat meat and rural tourism sectors
- **Fair for Life:** is a certification program for fair trade in agriculture, manufacturing and trade. It was created in 2006 by the Swiss Bio-Foundation in cooperation with the IMO Group, then taken over by ECOCERT in 2014 to meet a specific demand from organic farming stakeholders. Fair for life aims to create responsible supply chains and applies for producers, grower groups, processors, importers, exporters, brands and distributors.

- **The Roundtable on Sustainable Palm Oil:** RSPO certificate is a set of standards for sustainable palm oil production. It contains a series of environmental and social requirements to which companies must comply with in order to minimize the impact of palm oil cultivation on the environment and communities in palm oil-producing regions.
- **Biopartenaire:** is an organic certification schemes that ensures that product are produced organically while at the same time ensuring that all actors of the supply chain are treated fairly and respected. Products with the Biopartenaire label have at least 50% of ingredients coming from Biopartenaire certified partners.

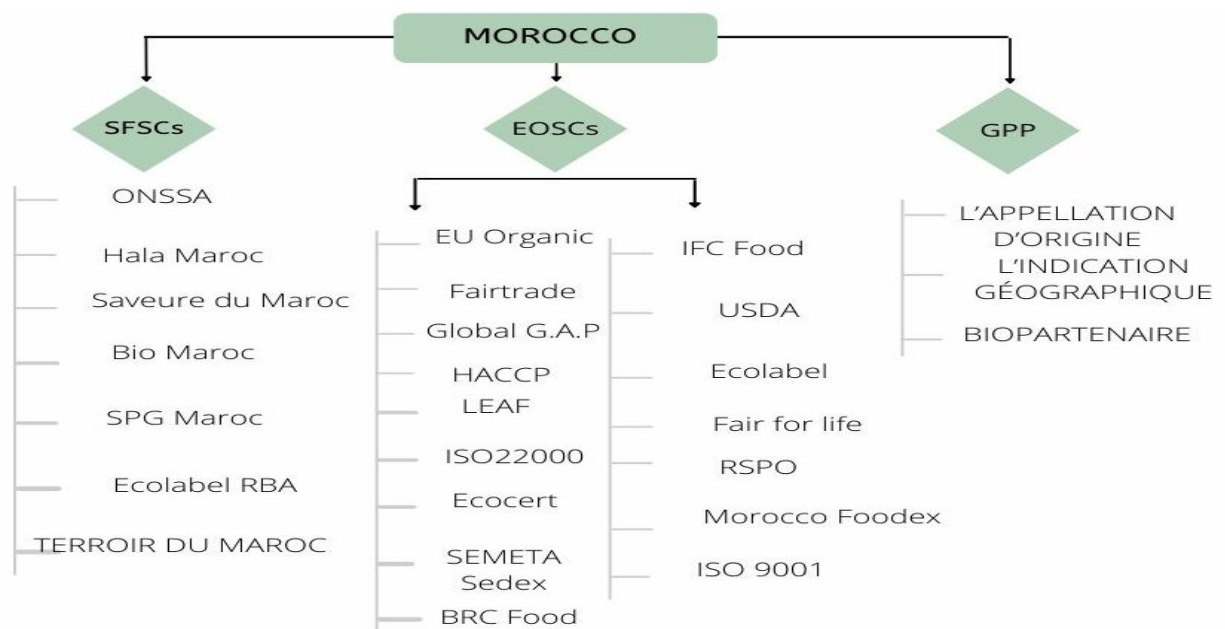


Figure 8. Identified standards in Morocco.

Two schemes were selected for SFSC which are SPG (les systèmes participatifs de garantie) and Saveurs du Maroc, whereas Morocco Foodex was the only scheme chosen for EOCS.

SPG (les systèmes participatifs de garantie) also known as “Participatory guarantee systems”, are locally oriented quality assurance systems. They certify producers on the basis of their active participation, and are built on a foundation of trust, networks and exchange of knowledge. PGS is based on broad stakeholder participation, which means that farmers, consumers, SMEs, rural advisers, local authorities and any other relevant stakeholder come together to make joint decisions, visit farms, support each other and decide which farmers can be awarded the PGS certificate.

PGS is a tool that contributes in transitioning towards sustainable agriculture and empowering farmers and local communities. Hence, the first criteria “Does it consider sustainability” is covered by the scheme. PGS is suitable mainly for small producers and is designed to support

and encourage them in moving towards good agricultural practices. In addition, PGS is suited to local markets and short supply chains, with marketing being done mainly in short circuits (maximum one intermediary) such as local markets, farms or grocery stores. PGS can also complement third-party certification, provide additional guarantees and transparency, can cover fruit and vegetable supply chains, and target both B2B and B2C denominations.

PGS allows for more-appropriate and less-costly mechanisms of certification for smallholder farmers, and actually highlights, and encourages consumers to seek out smallholders. However, some challenges arise from the adoption of this system are mainly related to trust issues regarding the auditing and the awarding of the certification, the lack of necessary know-how and good agricultural practices for small-scale farmers, and the lack of recognition of PGS certified products in the market.

The second scheme is *Saveurs du Maroc*, also known in English as “Flavors of Morocco”. It is a label that provides recognition of products of Moroccan origin. The label is intended for fruit and vegetable producers operating in the country, in addition to olive oil and essential oils. Producers acquiring this label must have their operation in the country and have all of their products from Moroccan origin. *Flavors of Morocco* requires the compliance with a set of standards related to primary production, processing, labeling, nutritional information, and food safety. On one hand, this scheme helps promote the authenticity of Moroccan products and, on the other hand, enhances strengthen local consumption behaviour and the “Moroccan consumer” culture. *Saveurs du Maroc* is a socio-economic standard that protects and adds value to local products. This label improves the competitiveness of companies, particularly small ones. *Saveur du Maroc* requires an external audit to verify compliance with the provisions of the system of management of the safety of foodstuffs specified at the level of these rules and to assess whether the production complies with the declarations of the technical file submitted by the applicant.

The third scheme is “Morocco Foodex” which is a public authority created in 1986 following the liberalization of the export marketing of agri-food products, and placed under the supervision of the Ministry of Agriculture, Fisheries, Rural Development, Water and Forests, which is in charge of quality control, coordination, promotion and operational strategic watch of food exports. As a public organization serving the private sector, Morocco Foodex supports Moroccan exporters in addition to quality control, in the processes of traceability and packaging. Its intervention covers the following sectors, Fresh fruits and vegetables (citrus, tomatoes, red fruits, avocados and other vegetables), Processed vegetable products (canned, dried or frozen fruits and vegetables, olive oil, argan oil, cereals, legumes, spices, herbs, etc.), Fishery products (fresh fish, canned food, etc.).

Morocco Foodex is a food safety standard and leads to positive implications on the environment, as well as the health of farmers and costumers. It targets B2B and B2C groups, and helps facilitate access to information, assists with the procedures and formalities involved in the export of agri-food, Guarantees the compliance of Moroccan products for export and Contributes to the development of the image of Moroccan products and their positioning on an international scale.

4.6. Green Public Procurement (GPP):

In this section, we outline the Green Public Procurement in each country partners. It is worthy to note that, the characterisation of Green Public Procurement (GPP) schemes was approached differently since they are driven by regulatory boundary conditions that determine the behaviour of public institutions when acting as a customer. GPP can be based on or include SFSC or EOOSC-based schemes or formulate VSS in their own right. However, they are usually applicable in the whole country or individual state. Furthermore, their usefulness for non-public, commercial or private customers is not clear, therefore, a report on green public procurement has been prepared for each partner country describing the situation and the relevant identified actors.

According to the communication established by the European Commission in 2008 entitled "Public Procurement for a Better Environment COM (2008) 400", GPP is defined as "...a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured" (European Commission, 2008).

In that sense, GPP is the process by which public organizations function in a way that meets their needs for goods, services, and works in a way that reaches value for money on a whole life cycle basis which could mean generating benefits to the organization, the society, and the economy and at the same time decreasing negative consequences on the environment. The idea aims to encourage public authorities to reduce the environmental impact of their high number of public purchases. GPP's main concerns can be summarized by these five pillars: Local Businesses Capacities, Climate, the Environment, Health and Value for Money.

The evolving of concept of Green Public Procurement in the EU has been happening since 1986 when the EU entered the Single European Act (SEA) (Pouikli, 2021). Ever since the year 2004, when EU public procurement directive has been renewed, the EU has had Green Public Procurement on its agenda and has been gaining focus within EU member states (Palmujoki et al., 2010) since the protection of the environment has lately been one of the main bullet points on the EU political agenda. Today, each EU member state is encouraged to design its own National Action Plan (NAP) for greening their public procurement.

GPP is applied in many sectors. For the food green public procurement, it concerns catering, vending machines and the purchase of all sorts of food including fruits and vegetables. EU GPP criteria could be formulated as four types (European Commission, 2019): selection criteria, technical specifications, award criteria and contract performance clauses.

4.6.1. GPP in Italy:

In April 2008, the national action plan for green public procurement known as the “Action Plan for the environmental sustainability of public administration consumption” was approved by the Ministry of the Environment and the Protection of the Territory and the Sea (Italian Ministry of the Environment, 2021). This NAP worked as framework on GPP in Italy, it lays down requirements for public authorities and specifies criteria for participating in tenders. It also requires a management committee to ensure an adequate management of the NAP, this committee is responsible for planning and implementing training activities, and for programming the activities that define the minimum environmental criteria – “Criteri Minimi Ambientali” (CAM) in Italian – required to participate in GPP tenders. On another hand, there exists monitoring activities which is essential and an obligation since 2016 in order to ensure the achievements of the objectives set by the GPP national action plan in Italy. The latest CAM for the collective catering services and food products were updated in April 2020 and published in the official Gazette. All regions are obliged to apply this legislation in the GPP tenders. Moreover, the regions in Italy that have adopted a GPP Plan are 4 out of 20, such as: Sardinia; Veneto; Puglia; Emilia Romagna.

When it comes to the GPP criteria (CAM) that are mostly applied in Italy, there is the application of minimum percentages of organic fruit, vegetables, legumes, and cereals. Localism, seasonality of fruit and vegetables, and their freshness is very critical, that’s why calendars of conventional and organic fruits and vegetables products were developed in synergy with the region’s agriculture directorate in which suppliers can check for a whole series of products availability on a monthly basis, i.e., what does the national market in general and what does the regional market in particular supply seasonally. When it comes to criteria regarding the reduction of GHG emissions, there is the *Zero Kilometer* certification. To be mentioned also are organic certification in the storage units, warehouses and kitchens and certifications for conventional products are requested like ISO 9000, ISO 22000 which take part of the environmental management systems, and personal training of the staff within these new environmental aspects. Other than that, municipalities try to include other criteria regarding food waste prevention, and waste management improvement.

4.6.2. GPP in France:

France’s latest NAP is the National Action Plan for Sustainable Procurement (PNAD 2021-2025). Public procurement is the process of purchasing made by a contracting authority according to the public procurement code or to the ordinance of June 6, 2005, related to contracts awarded by public or private parties not subject to the public procurement code. France considers that developing a national action plan for sustainable public procurement would form a roadmap to

pragmatically tackle over the time the obstacles that are slowing down the rise of sustainable public procurement. This sort of NAP would be helping in the fight against climate change and strengthening resilience to its effects in terms of public procurement throughout the integration of the environmental and social aspects into public procurement contracts. The main objective of the plan is that by the year 2025, 100% of public procurement contracts will consider at least one environmental criteria, and 30% of public procurement contracts will consider one social criteria. In that sense, the PNAD works on two axes, the buyers (help them identify products meeting these criteria) and decision makers (promoting objectives of the plan).

Labels and certifications in France are used to determine the eligibility of products for GPP. These schemes ensure that products and services comply with national, European, and international standards and technical specifications.

4.6.3. GPP in Greece:

In October 2020, the National Action Plan for the promotion of Green Public Procurement was established by an inter-ministerial committee. This NAP is based on European regulations. The framework in which the plan was developed makes a link between the National Strategy for Public Procurement, the National Strategy for the Circular Economy, the National Action Plan for Energy Saving and sustainable development. This GPP established framework have some main targets like the adoption of a minimum and basic level of green criteria in public procurement of products, services, and works. Another target is to achieve a gradual increase in GPP implementation during the next three years in a number of sectors with a wider integration of life cycle cost estimation. The plan also points out the importance of spreading environmental and economic benefits upon GPP implementation and focuses on the raising awareness part where it is essential to be building capacity and encouraging active participation of stakeholders whether public authorities or economic actors. At last, like other action plans the monitoring part takes a great importance where achievement of the NAP objectives should be monitored and controlled (Ministry of Development and Investment, 2020). The application of the NAP sets several milestones e.g., for communication activities, education / training activities through an electronic platform that is upgraded/redesigned every three years' period (Interreg Europe, 2021). So far, no specific certification scheme exists to be used within the process of GPP implementation.

4.6.4. GPP in Morocco and Egypt:

In Egypt there is no on ground implementation of the Green Public Procurement. While in Morocco, sustainable procurement is recent and it is mostly obvious at the level of the national strategy for sustainable development. Their commitment to sustainable public procurement is also supported by a legal framework that essentially needs improvements and some

clarifications of the legal texts, also raising awareness and spreading information on the process should be taken into consideration. The elaboration of criteria related to GPP is still in its infancy and the platforms related to decision making are still lacking. According to El Haddadi et al., 2021, future action plans for the establishment of GPP besides building awareness is to develop decision making tools for implementation and monitoring in order to support future sustainable purchasing practices (El Haddadi, Mourabit, & El Haddadi, 2021).

In Egypt, as part of the EU-funded SwitchMed program, the Ministry of Environment of Egypt, the United Nations Environment Program (UNEP), the Centre for Environment and Development for the Arab Region and Europe (CEDARE), have worked together to develop a variety of tools and methodologies to promote Sustainable Public Procurement in Egypt, namely "Sustainable Public Procurement Guidelines for Practitioners". Egypt is currently preparing a new public procurement law guided by the research done within the SwitchMed work on sustainable public procurement (UNEP).

5. Conclusion:

The analysis of the schemes and certificates in the five countries showed that a great degree of similarity in the VSS under the export-oriented supply chains (EOSC) and several of these standards are utilised quite frequently in all five country, for instance: organic EU, fair-trade international, global GAP and ISO22000.

In short food supply chains (SFSC), there were a huge diversity in the certifications in each country, for example, Egypt has economy of love (EOL) and Demeter PGS that both have commonalities, being based on a similar philosophy that describes the whole farm as an organisation. However, they differ considerably in detail and complexity. France has agriculture biologique (AB), appellation d'Origine Protégée (AOP), label rouge. Greece has Traditional specialty guaranteed (TSG), organic products, we do local. Italy has organic products, ISO22000 and AIAB Italian guarantee. Morocco has Les systems participatifs de garantie (SPG), Saveurs du Maroc and Halal Morocco.

Unsurprisingly, the number of certificates and standards which exist in export-oriented supply chains are higher than in short food supply chains. Consumers in high income countries are willing to pay premium prices for high quality, organic, or sustainable crops.

Regarding to the green public procurement, the three countries (France, Italy & Greece) are quite similar in their policies, in Morocco there is a good progress in this part, but in Egypt is still not available.

6. Deliverable contribution to SDGs

Deliverable 2.1, "Report on Review and Analysis of Existing Sustainability Standards and Paths," contributes significantly to the achievement of several Sustainable Development Goals (SDGs) by focusing on the role of voluntary sustainability standards (VSS) in promoting sustainable agricultural production, supply chains, and consumption practices. The specific contributions include:

- 1. SDG 1: End poverty in all its forms everywhere:** The deliverable highlights the role of VSS in providing small-scale farmers with access to premium markets and fair pricing. By fostering inclusion and reducing barriers to participation, VSS schemes support the livelihoods of small-scale farmers and producers in the Mediterranean region. Examples include participatory guarantee systems (PGS), which reduce the cost of certification and promote community-based approaches.
- 2. SDG 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture:** The deliverable analyzes standards such as Organic EU and Biodynamic Agriculture, which emphasize sustainable farming practices that improve soil health, reduce pesticide use, and promote biodiversity. These practices enhance the quality and safety of fruits and vegetables, contributing to food security and nutrition.
- 3. SDG 8: Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all:** The report identifies socio-economic standards such as Fairtrade and PGI/PDO that promote fair wages, ethical trade, and improved working conditions for agricultural workers. By supporting market access and fair compensation, these standards drive inclusive economic growth and decent work.
- 4. SDG 12: Ensure sustainable consumption and production patterns:** The deliverable discusses standards that reduce environmental impact, such as ISO 14000 and organic certifications, which encourage responsible resource use, waste reduction, and sustainable farming practices. By promoting locally sourced and certified products, the report also addresses the reduction of carbon footprints associated with food transportation.
- 5. SDG 13: Take urgent action to combat climate change and its impacts:** Environmental standards such as GLOBALG.A.P. and organic certifications promote practices that lower greenhouse gas emissions, improve water management, and protect natural ecosystems. These contributions are essential for mitigating climate change in the agricultural sector.
- 6. SDG 17: Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development:** The deliverable emphasizes the importance of multi-stakeholder collaboration in developing and implementing sustainability standards. It

highlights partnerships between governments, NGOs, certification bodies, and producers as critical for achieving sustainable development goals across Mediterranean countries.

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