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Inclusive Walnut Value Chain Development in the Republic of Moldova

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Declaration

I hereby declare that the present thesis has not been submitted as a part of any other examination procedure and has been independently written. All passages, including those from the internet, which were used directly or in modified form, especially those sources using text, graphs, charts or pictures, are indicated as such. I realize that an infringement of these principles, which would amount to either an attempt of deception or deceit will lead to the institution of proceedings against myself.

Uetersen, 19.06.2018 

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Abstract

"Moldova goes nuts" could be a slogan of a walnut based rural development program that would reduce poverty, decrease rural migration and even diminish environmental degradation. A naïve utopia for the poorest country on the European continent? Maybe not - the hype around walnuts in the Republic of Moldova is rather justified. Due to favorable pedo-climatic conditions, a preferential trade agreement and geographic proximity to the world's largest walnut importer, the EU, Moldova has an excellent opportunity to supply part of the region's yearly demand of about 180. Mio Tonnes of walnuts (in-shell basis). Moldova's relatively small walnut sector already brings in over a half of all agricultural income of the country. But how do we make sure that the benefits also reach the poorest and most vulnerable rural populations? The present thesis aims to analyze the current walnut value chain and identify its current strengths and weaknesses as well as future prospects. Based on the inclusive value chain development theory, it tries to pinpoint the necessary conditions and suggest possible interventions that would enable harvesters, informal and individual growers as well as small and medium farmers to get more integrated into this growing industry. To this end, rapid market appraisal is carried out through desktop research, key-informant interviews, and participatory workshops while stakeholder analysis receives a special focus. The findings illustrate a rather low level of trust and cooperation in the sector. The major trend in the value chain is vertical integration. In order to support the poorest link of the chain – the harvesters and smallholders – institutional solutions are needed. Improving management of existing public property walnut plantations, facilitation and incentives in creation of small producer cooperatives, simplification of access to finance, inputs and knowledge, and re-thinking taxation options are the key points to name. Overall strengthening of the value chain requires a strong push for a united industry task force, creation and bold promotion of a trustworthy national brand, quality assurance and a stronger focus on organic production. The classical value chain upgrading options are also valid for Moldovan walnuts: creation of diverse value added products, diversification of market channels and geography and of course improving of the overall business environment through de-bureaucratization. The study calls for re-starting efforts based on provisions of the existing Walnut Law and for establishing a new strategic program for development of the inclusive walnut value chains in the Republic of Moldova.

List of Figures and Tables

Abbreviations

AIPA – Agency for Interventions and Payments in Agriculture

CBI – Centre for the Promotion of Imports from developing countries

CIAT – International Center for Tropical Agriculture

CIF – Cost, Insurance and Freight

CIP – International Potato Center

CIS – Commonwealth of Independent States

CZK – Czech Koruna

CWB – California Walnut Board

CWC – California Walnut Commission or Chilean Walnut Commission

DANIDA – Danish International Development Agency

DCFTA – The Deep and Comprehensive Free Trade Area

DFID –UK Department for International Development

DIIS – Danish Institute for International Studies

FAO – Food and Agriculture Organization of the United Nations

FOB – Free on Board

FTA – Foreign Trade Agreements

GD – Government Decision

GDP – Gross Domestic Product

GEF – Global Environmental Fund

GVC – Global Value Chains

GTZ – German Agency for Technical Cooperation

ha – Hectares

IFAD – International Fund for Agricultural Development

IIED – International Institute for Environment and Development

ILO – International Labour Organization

INC – International Nut and Dried Council

IFPRI – International Food Policy Research Institute

INRM – Integrated Natural Resource Management

LPA – Local Public Administration

M4P – Making Markets Work Better for the Poor Project

MADRE – Ministry of Agriculture, Regional Development and Environment (after 2017)

MAFI – Ministry of Agriculture and Food Industry (before 2017)

MEI – Ministry of Economy and Infrastructure

MIEPO – The Moldovan Investment and Export Promotion Organization

MOLDAC – National Centre of Accreditation of the Republic of Moldova

MT – Metric Tonnes

NBS – National Bureau of Statistics of the Republic of Moldova

NGO – Non-Governmental Organization

NDS – National Development Strategy

NGER – National Green Export Review

ODA – Official Development Assistance

ODA – Overseas Development Administration

OECD – The Organization for Economic Co-operation and Development

PPP – Public-Private Partnership

RCA – Revealed Comparative Advantage

RMA – Rapid Market Appraisal

RTA – Revealed Trade Advantages Index

SA – Stakeholder Analysis

SDC – Swiss Agency for Development and Cooperation

SRL – Societate cu răspundere limitată (Limited Liability Company)

SWOT – Strengths, Weaknesses, Opportunities and Threats

UAPCN – Uniunea Asociaţiilor Producătorilor de Culturi Nucifere - Union of Nut Growers' Associations of Moldova

UNIDO – United Nations Industrial Development Organization

UNCTAD – United Nations Conference on Trade and Development

USAID – United States Agency for International Development (USAID)

USDA – United States Department of Agriculture

VC – Value Chain

VCC – Value Chain Collaboration

VCD – Value Chain Development

WGA – Walnut Growers' Association (Union of Nut Growers' Associations of Moldova)

WFTO – World Fair Trade Organization

WTO – World Trade Organization

1. Introduction

Walnuts, fruits of the *Juglans regia*, are an important commodity of international agricultural trade. The world's appetite for walnuts is on the rise. While China is the biggest producer and consumer, the European Union is the biggest importer of walnuts in the world. The United States of America, and especially the State of California, is the main exporter covering over 55% of the European walnut demand (USDA, 2017). From an environmental point of view, it makes more sense to produce this product in geographical proximity – at least on the same continent. Moldova is lucky to be located within the 7% of the world's territory where *Juglans regia* can grow at its best.

Although walnuts were not considered an industrial crop during Soviet times, Moldova has inherited a significant network of wind protection walnut alleys, planted along the roads in the 50s and 60s. Since the adoption of the Walnut Law[1] in 1999, attention towards *Juglans regia* as a business commodity has increased. Professional orchards have experienced a rapid 6-fold growth reaching about 24,000 hectares in 2015 with the area constantly expanding. (MIEPO 2017). The current yielding area of the orchards is 16,000 hectares according to the National Bureau of Statistics of Moldova. The orchard harvests together with walnuts collected by rural populations from the public property road plantations make up about 100 Mio. US$ export income per year since 2015 (NBS, 2017)

There are already proven trade relations between the EU and Moldova in the walnut sector. Currently, Moldova is supplying approximately 1.4% of the European demand (UN Comtrade, 2017). Mostly shelled walnuts are exported by large companies and sold to wholesalers. Expanding and upgrading the walnut export to Europe, but also other destinations, is a great way for Moldova to potentially come out of poverty. For this purpose, the entire value chain should be examined. With the "inclusive" value chain approach, it can be analyzed how the most vulnerable actors of the walnut sector (small farmers, and especially women and youth) could get more benefits from this Moldovan "goldmine". Inclusive Value Chain Development is a widespread approach in the global fight for poverty reduction. Through a Rapid Market Appraisal it is possible to analyze the Moldovan walnut value chain and give recommendations for possible interventions.

[1] Law No. 658 of 29.10.1999 - http://lex.justice.md/index.php?action=view&view=doc&id=311709

1.1. Socio-Economic and Agricultural Context

The Republic of Moldova is a small-sized country in Eastern Europe landlocked between Romania and Ukraine. The overall territory of Moldova is 33,846 square kilometers and size of population is 3.5 million. Country's GDP constituted 6.75 billion € in 2016 (NBS, 2017). The GDP has grown by an average 5 percent per year in the past 15 years, while the average national poverty rate declined from 26 percent in 2007 to 11 percent in 2014. In this context rural poverty decreased from 30% to 19%. GDP growth was mostly driven by private consumption and housing, not creation of value. The private consumption in turn was fueled by remittances which accounted for over a quarter of GDP in 2014 (World Bank Group, 2016). This makes Moldova a "bronze medal champion" in the world's top of remittance-dependent countries after Tajikistan and the Kyrgyz Republic.

Even though Moldova has experienced an increase in living standards in the past decade, such a path of economic growth is not sustainable. The country has not managed to significantly strengthen its production base and to use the economic growth for higher economic resilience. Since 2000 the proportion of import to export of overall goods has remained at approximately 50%. In absolute terms, the commercial balance deficit has grown considerably from -249.6 Mio. US$ in 2000 to -1984.7 Mio. US$ in 2017 (NBS, 2017).

The average monthly salary in the Republic of Moldova in 2016 was about 230€, with higher values for cities and lower for the rural areas. The average monthly pension constituted an appalling 60€. (NBS, 2017). This is barely enough to sustain livelihoods and many people rely on help of their relatives working abroad. Labor migration has other social effects, especially on the children and elderly who are left-behind, on quality of remaining labor force and the overall demographic structure. The situation illustrates a case of significant vulnerability and persisting rural poverty, even if overall poverty indicators show progress.

Poverty reduction has been one of the world's major objectives since the Millennium Development Goals in 2000. Poverty is pervasive in rural populations, especially of post-collapse economies, and is strongly interconnected with agriculture. As the world agreed on the new 2030 Agenda for Sustainable Development, including the UN Sustainable Development Goals (SDG) in 2015, the green economy and inclusive value chain development have gained more attention worldwide. This process is reflected also in most of Moldova's framework documents, starting with the National Development Strategy

(NDS) Moldova 2020, which is currently being revised into NDS Moldova 2030. The Green Economy package, newly adopted by the Government of Moldova in February 2018, and the National Strategy on Agriculture and Rural Development of Moldova 2014-2020 also recognize the urgent importance to develop in the direction of stronger, value added and organic agriculture as a means for sustainable rural development.

Agriculture is one of the key sectors of the national economy, contributing approximately 14.5% of Moldova's total GDP and 17% if counted together with food processing (World Bank, MIEPO, 2016) and employing more than a quarter (28%) of the country's population, half of which are women (FAOSTAT, 2016). Approximately 70% of rural population rely on agriculture for their livelihoods (World Bank; CIAT, 2016). Agri-food exports accounted for roughly 45% of the country's total exports in 2016, with major commodities such as walnuts, apples, and cereal/grains (MIEPO, 2016). Agriculture and food processing industry is one of five priorities for the Moldovan Investment and Export Promotion Organization. Still their potential remains largely unexploited (MIEPO, 2017a).

Perennial plantations and especially nut orchards are some of the most efficient forms of agriculture in Moldova in terms of return on investment. Figure 1 illustrates the hierarchy of use of the overall surface of land in the country. It makes clear how much more attention could be given to establishing the highly productive and profitable walnut plantations.

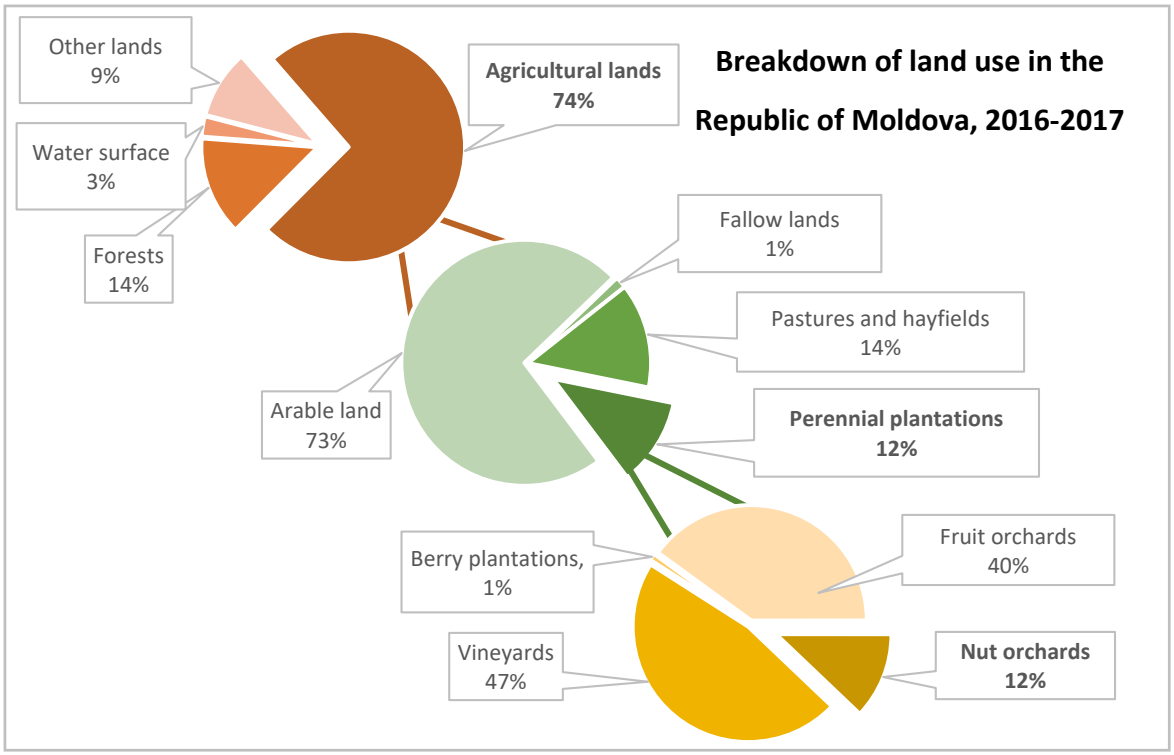

Figure 1 - Breakdown of land by use hierarchy, 2016-2017
(Source: own representation based on data of the National Bureau of Statistics 2016-2017)

Perennial plantations occupy 288,800 ha, or 12% of the overall agricultural surface and only 42,000 ha or 15% of them are dedicated to various nut crops, mostly walnuts, but also almonds and hazelnuts (NBS, 2017). Wine and fruit industry were very developed in the Soviet times, while nuts were largely overlooked. Another reason why nut plantations have not yet "conquered" a larger share lies in the long-term freezing of capital. Walnuts start bearing fruit only after 5-7 years and many small farmers with limited access to financing cannot wait that long as they are caught in the constant survival spiral. Therefore, the majority of industrial plantations are owned by just a few large firms with capital power.

Farm structures in the Moldovan agricultural sector can be divided into two major classes: the smallholders and the corporate sector. The first category owns peasant farms or just the little land adjacent to their household or sporadically spread around the village. The smallest farmers generate limited surplus of crops that are mostly sold in open-air agricultural markets. The agro-industrial enterprises own or lease large consolidated surfaces usually starting from 50 ha. The larger ones are usually export-oriented (Moroz et al., 2015). For the purpose of this study we differentiate the smallholder sector into individual / informal growers and small and medium farmers as shown in Table 1.

Table 1 - Agricultural holdings by size categories

Category	**Size of agricultural holdings**	**Area (ha)**	**% of total area**	**Nr. of agricultural holdings**
Individual and informal growers	0 - <2 ha	445,216.26	34%	779,600
	2 - <5 ha	306,984.90		104,996
Small and medium farmers	5 - <10 ha	74,138.42	6%	11,509
	10 - <20 ha	24,980.03		1,868
	20 - <30 ha	13,885.52		574
	30 - <50 ha	24,568.49		638
Large agro-industrial enterprises	50 - <100 ha	44,425.41	60%	617
	100 -<200 ha	89,859.58		621
	200 - <500 ha	314,416.18		963
	500 - <1000 ha	378,418.83		550
	1000 - <2500 ha	338,692.99		229
	≥2500 ha	187,953.41		49
TOTAL		2,243,540.02	100%	902,214

(Source: adapted from the General Agricultural Census 2011 - NBS, 2012)

The individual and informal growers are the poorest and most vulnerable segment of the agricultural sector, with very limited access to finance. Many of them rely partially on sporadic off-farm income for survival or leave the country for work abroad.

1.2. Relevance, Objectives and Flow of the Study

The considerations exposed in the previous sub-chapter make it clear that Moldova needs to increase its economic resilience through more sustainable production and export of high value goods and services. A development path is needed that would benefit the most vulnerable rural population with low levels of education and high involvement in agriculture. For this purpose, development of inclusive value chains around the most promising agricultural commodities could become a successful long-term strategy.

Researchers at the Moldovan Agrarian University conducted a study on relative trade advantages of Moldovan agricultural commodities in the EU market. Based on trade flows in 2012, the highest Revealed Trade Advantages Index[2] (RTA) of 10.68 was calculated for value added products of vegetables, fruits and walnuts (Cimpoieș & Coșer, 2014). According to data of the National Bureau of Statistics in 2014 the net weight share of walnut in the overall fruit export of Moldova constituted 6.2%, while the trade value share was 57%. The walnut sector generates a considerable amount of income that is relevant especially for poor rural households and women. Alexandru Jolondcovschi, the honorary president of the Union of Nut Growers' Associations of Moldova (UAPCN) boldly estimated that in 2018 over 50% of rural population derive at least partial income from the walnut crop. Walnut-based rural development programs could ensure local employment, decrease migration, improve soil stability and contribute to a more sustainable local economy. Walnut consumption worldwide is steadily growing, driven by more health conscious consumer behavior and rising demand for premium foods. Europe is the world's largest importer of walnuts. The gap of over 180,000 Tonnes (in-shell basis) between EU walnut production and consumption provides an excellent opportunity for Moldovan walnut exports.

Despite the great potential of the walnut sector for development of the country, few studies have been conducted in this field so far. During the present research only two solid, but rather old works were identified: a Master thesis from the University of Hannover "Export of walnuts and apple juice concentrate from Moldova to European Union" (Ignat, 2002) and a diagnostic study commissioned by USAID "Walnut Sector of Moldova: Analysis of constraints - forming a competitive and sustainable sector" (Brînza, 2009). Both studies

[2] The RTA index is a specialization of the Revealed Comparative Advantage or Balassa index. RCA characterizes the ratio of a commodity's share in total country's exports to the share in world's exports. RTA developed by Vollrath (1991) also takes into consideration the import component of observed trade patterns

provide valuable insights into the walnut industry and outline recommendations, which, for the most part, are still relevant today. Nevertheless, a lot has changed since then both globally and on the national scale. Furthermore, an inclusive value chain approach has not been applied to the Moldovan walnut sector so far. Based on the above-mentioned justification the present study attempts to reach the following objectives:

- To understand how the walnut value chain is structured and examine the performance, interests and inter-linkages of actors
- To analyze national and international influences on the evolution of the value chain, including global trends, production and trade dynamics and institutional framework
- To identify the key strengths, weaknesses, opportunities and threats in the value chain
- To discover potentials for upgrading the value chain with a special focus on poverty reduction and integrating the most vulnerable population
- To provide a set of recommendations which can be further developed into a practical value chain intervention for the walnut sector in the Republic of Moldova

In order to reach the set objectives, this study follows a logical organizational flow. The first Introduction chapter sets out the basic context in which the study is embedded. It sketches the basic agricultural and economic parameters and argues for the relevance of Walnut Value Chain Development as a means for the country to come out of poverty. The Theory chapter reviews general understanding and several approaches to value chains existing throughout the international development world. It emphasizes the “inclusiveness” aspect of value chain development and reflects the main approaches in Value Chain Coordination, Collaboration and Upgrading. The next chapter, Research Methodology, briefly outlines the conceptual framework of the study and explains the applied research methodology with specific reference to Rapid Market appraisal and subordinated tools like Stakeholder and SWOT analyses. The Results chapter lays out the key trends of the Global and National Enabling environments, from conventional and organic production and trade, institutional and legal aspects, to value chain mapping and stakeholder analysis. The chapter on Conclusions and Recommendations has more to it than just a discussion character. It also illustrates some of the main conclusions and learnings with specific case examples. This fifth chapter represents a gradual and organic bridge from factual results to the final distilled thoughts presented in the Summary and Outlook chapter.

2. Theory – Value Chain Development

This chapter attempts to sketch out a basic view of key definitions and approaches to Value Chain Development (VCD) that emerged over the past 30 years. As the ultimate goal of this study lies in providing initial recommendations for real Value Chain (VC) intervention, this chapter focuses more on practitioner-oriented aspects of the VC theory coming from the international development community and less on purely scientific and philosophical ones.

2.1. General Understanding of Value Chains

The general Value Chain concept became popular after Michael Porter's book "Competitive advantage: creating and sustaining superior performance" (Porter, 1985). Porter's object of examination was a single enterprise. His Value Chain approach focuses on the firm's internal system of activities and analyzes how inputs are transformed into the outputs for the final customers. The generic chain common to all business, which Porter developed, is divided into primary and support activities. By identifying building blocks of the value chain and their links, it is possible to come up with a strategy to increase value at certain nodes, which in the end leads to an enhancement of competitive advantage. This useful view has been gradually expanded by other researchers, business analysts and development practitioners to encompass activities beyond a single firm. USAID defines value chain as "the full range of activities and services required to bring a product or service from its conception to sale in its final markets" (microlinks, 2012).

Since Porter, many international organizations and state development agencies adopted and further developed this approach. A wide range of conceptual frameworks have been designed and tried out. They are mostly related to each other but often shift focus to a certain aspect due to differences in geographical area, commodity type, target group and desired outcomes. Donovan et al. (2015) implemented a comprehensive study of VCD concepts and methodologies presented in VC guides by 11 different organisations and analysed them according to objectives, general approaches, methodological desgin and data collection / processing recommendations. The overview table can be found in Annex 1.

Approaches of these development actors vary in terms of their goals (e.g. poverty reduction, economic growth, or decent work), their perspectives (e.g. better market links vs. improved business environment), and their target audience (other organisations, goverments or private sector). Donovan et al. (2015) identify two general types of definitions for value

chain development found across the available literature: “an actor/chain type that focuses on strengthening certain actors and improving relations between smallholders and other actors in a chain, and a business-environment type that focuses on improving the business environment in which chain actors operate.” Authors remark that ILO (2009), GTZ (2008), World Bank (2010), USAID (n.d.), CIAT (2007) and IIED (2008) focus on the concepts of governance or institutional set-up as well as upgrading, even if exact wording might differ. Their main intervention mechanisms are related to building or improving links between smallholders and other chain actors. Other approaches look at VCD through the lens of the political, legal, and market context. For example, DFID (2008) analyzes the “market system” and aims at identifying solutions for the elimination of bottlenecks leading to underperformance. FAO (2007) also studies the political, legal, and market environments with a special focus on the regulatory aspects, access to technologies and inputs, and structure of competition and/or possible synergies among the key chain actors.

Humphrey & Navas-Alemán (2010) identify four main types of interventions that are usually designed in frames of VCD projects. The first type is the most relevant for inclusive VCD that will be further discussed in subchapter 2.3. This approach targets the weakest link of the chain, mainly smallholders, and tries to help them add value to primary production, or get better integrated into the existing chain mechanisms. The second type deals with improving coordination along the entire chain in order to eliminate efficiency bottlenecks and facilitate the flow of knowledge and resources. The third type is concerned with improving linkages of collaboration between two or more enterprises through better communication, trust building and joint innovations. The fourth type is about creating new or alternative links to replace the old malfunctioning ones or to tap onto new innovative market outlets.

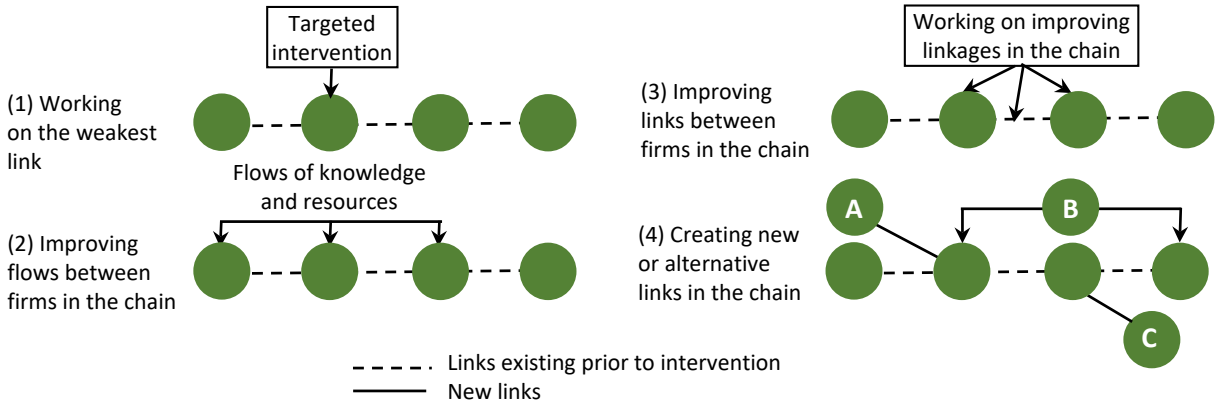

Figure 2 - Schematic representation of value chain development interventions
Source: (Humphrey & Navas-Alemán, 2010)

2.2. Global Value Chains

The Global Value Chains (GVC) perspective deals with vertically inter-related activities and complex mechanisms spread throughout the globe, but combining factors of production in order to make and distribute a final product to the consumer (Frederick & Gereffi, 2011). The concept was first collectively framed in the discussions of the Global Value Chains Initiative (2000-05), supported by the Rockefeller Foundation. It was further developed and formed by Gereffi, Humphrey, and Sturgeon (2005). The World Bank Group, (2017) defines the main objective of GVC studies as "to explore the interplay between value distribution mechanisms and organization of the cross-border production-consumption nexus".

For many developing countries it has been a challenge to embark on the dynamic GVC development train. GVC research tries to analyze factors associated with successful integration into GVCs. There are many factors, such as taxation, trade policy, logistics, business services, investment and innovation, industrial development, environment enabling entrepreneurship, but also geography clearly matters. Three major interconnected production hubs can be identified where extensive trade in parts and components are concentrated: the United States, Asia (China, Japan, Republic of Korea), and Europe (especially Germany). Countries in geographical proximity to these focal points have higher chances of being integrated. In combination with geography, unit labor costs also play a major role. According to OECD (2007) definition "Unit labor costs measure the average cost of labor per unit of output and are calculated as the ratio of total labor costs to real output. ULCs can be calculated as the ratio of total labor compensation to real GDP". Those developing countries which are characterized by low unit labor costs rather than low wages are usually better integrated in GVCs (World Bank Group, 2017).

2.3. Inclusive and Pro-Poor development

In most cases, Value Chain approaches were adopted and advanced by ODA agencies in order to help the poor, e.g. "pro-poor growth" in the ValueLinks Methodology (GTZ, 2008). An important term in the evolution of this concept was "inclusiveness" in dealing with value chains. This term refers to the expanded set of expectations resting upon systemic interventions in value chain development (IFPRI - International Food Policy Research Institute, 2016). In their work, Haggblade et al. (2012) write: "The business school graduates

who drive corporate strategy at large agribusiness firms conduct proprietary market assessments that form the basis for internal strategic plans. Serving as a counterweight, value chain assessments provide open-source, countervailing analytical and diagnostic power on behalf of the least powerful members of global value chains, the rural poor." The inclusive value chain approach especially aims at sustainably connecting small-scale producers and vulnerable populations, like women and youth, to the markets and letting them benefit more from the created value.

The ValueLinks methodology developed by the German International Cooperation (GTZ, 2008) identifies several generic factors repeatedly appearing across the globe, which hamper the poor and vulnerable market actors from benefitting more from the value chain. Business environments, especially in developing counties, are a big challenge, since SMEs are more vulnerable to risks and bear higher transaction costs in contrast to large firms. They have limited access to finances, due to high interest rates and high collateral requirements. Small-holders suffer from limited access to quality raw material inputs and business services as well as lack of assets limiting their investment capacity. Also, external factors like lack of infrastructure and geographical seclusion of marginal locations, where market access is critically limited, play an important role. Additionally, poor are often put at a disadvantage in labour markets due to low education and health problems.

But, how much utility is in this additional term "inclusive"? In fact, it's questionable whether the way value chain development as seen by ODA agencies in the past decades has not already been inclusive by default. Is "Inclusive" simply a new buzzword to replace the "pro-poor"? McKague & Siddiquee, (2014) in their Book "Making Markets more Inclusive" equate the classical value chain approach with inclusive market development or pro-poor value chain development, stating that its ultimate goal "is to grow the economic pie and ensure that all parties especially the most vulnerable, have as much information and market power as possible". So it could be assumed that VCD interventions by ODA agencies should have rendered significant results for the poorest and most vulnerable. To perform a full review of ODA activity related to VCD in the past two decades would go beyond the scope of this study. What becomes clear after consulting the major review works (Humphrey & Navas-Alemán, 2010), (IFPRI , 2016) is that in practice, and that leading actors' ability to design and evaluate successful interventions is still evolving through an iterative process of trial, error and reflection and also through sound critique.

Stoian et al., (2015) challenges the existing pro-poor VCD practice. The authors argue that most of the conceptual frameworks and interventions of external actors are often built on the wrong assumptions that "poor households (1) have sufficient resources to effectively participate in VCD, (2) do not face substantial trade-offs when using these resources, and (3) are able to assume higher risks when reinvesting capital and labor." Decades of personal experience as well as comprehensive literature review convince the authors that in reality many poor households are much less "value chain ready" than assumed. They are usually involved in subsistence agriculture, while the products, which are mostly comprised of surplus rarely undergo a smart market-targeting process. Additionally, they pursue other occasional non-agricultural income generating activities, especially off-season, which also require time and energy. This diversification makes their entire livelihood more resilient. Competitive participation in VCD would require them to specialize, incurring higher resource investment and thus also higher risks. "Involving the rural poor in VCD therefore calls for a sound approach to address the complex trade-offs between income generation, food security, gender equity, sustainable natural resource management, and overall livelihood resilience" (Stoian et al., 2015). The authors suggest adopting an "asset-based multi-chain-approach" that would minimize risks and couple small-holders' resilience with further investment potential. One of the cases illustrating this reasoning is Nicaragua-based Soppexcca Cooperative: uniting 500 coffee-producers. Despite donor intervention with over 2 Mio. US$ and a significant economic improvement of the overall cooperative, one third of the households faced major difficulties to intensify coffee production and thus partake from the benefits of the intervention. These were mostly the vulnerable households with a minimum asset endowment / access (very little land property, limited or no savings, high dependence on off-farm income) and often headed by an older family member or a woman (IFPRI, 2016).

Thus, developing truly inclusive value chains remains a complex and challenging endeavor. In addition to economic improvements, a wider meaning of the term could also be applied to psychological implications of co-designing the value chain in a more participatory manner, developing a feeling of ownership for the specific agricultural sector and being proud of a more dignified work.

2.4. Analysis of Value Chains

There are multiple ways to handle analysis of value chains: from Rapid Market Appraisals to complex methodologies involving a range of sophisticated economic tools. Even if the scope of analyzed value chain is not global, still, looking from an international perspective is useful. The value chain approach to economic growth and poverty reduction developed by USAID (2006) analyzes value chains through two lenses: the national and the global enabling environments. The national enabling environment encompasses the upstream and downstream supply chains as well support sectors. It includes the legislative framework and state policies affecting operations, public and private infrastructure, and support sectors (e.g. finances, legal consultancy, packaging). The global enabling environment encompasses global supply and demand trends, multilateral and bilateral trade agreements between countries, standards, tariffs and import duties, and aspects related to organic or fair trade certification of products.

In general, the angle and focus of value chain analysis depends on the ultimate goal. In the case of inclusive value chain development, the following aspects are suggested by Humphrey & Navas-Alemán (2010) as key elements for analysis and interventions:

- Focus on inter-firm linkages, especially identifying how the poor are integrated
- Identifying weak or poorly functioning links on all levels of the chain to improve overall efficiency
- The quality of stakeholder relationships on all levels
- Value chain governance
- Flows of knowledge and resources along chains
- The distribution of functions along the chain related to vertical coordination
- The role of lead firms, as holders of power and key resources that strongly impact other actors of the chain. Changing their behavior could have lasting effect on a multitude of small producers
- Distribution of power, risks and returns along the chain

In the work “A Conceptual Framework for Promoting Inclusive Agricultural Value Chains” developed for IFAD by Haggblade et al., (2012) key questions for overarching analysis are suggested: “In which channels and competitive niches can the poor, women and youth compete?”, “How can they adapt in order to raise productivity and shift into the growing,

lucrative and competitive channels?", "In what circumstances do the presence of large firms and small firms prove complementary?", "How can interventions help poor and vulnerable groups to compete in commercially viable market niches?"

All the VCD guides compared by (Donovan et al., 2015) provide various indicators or research questions for the value-chain analysis. Although quantitative data is crucial, recommendations are often inclined even more towards emphasizing a high importance and value of qualitative data. The two most commonly used methods for data collection and analysis are: participatory workshops and individual interviews with key stakeholders. Table 2 presents recommendations on the amount of data to be collected according to levels of analysis across the different VCD guides. The collected and analyzed data helps answer the major qualitative questions that are set in the beginning.

Table 2 - Data collection recommendations by different organizations

Recommended level of data collection	**Limited or no data**	**Moderate amount of data**	**High amount of data**
Intrahousehold	CIP, CIAT, FAO, DFID, GTZ, IIED, M4P, ILO, World Bank, USAID		UNIDO
Household	CIP, DFID, IIED, World Bank	FAO, GTZ, ILO, USAID	CIAT, M4P, UNIDO
Businesses actors	DFID, IIED, World Bank. UNIDO	GTZ, ILO, USAID	CIP, CIAT, FAO, M4P
Chain/market		CIAT, UNIDO UNIDO	CIP, FAO, DFID, GTZ, IEED, M4P, ILO. World Bank, USAID
Service provider	CIP	CIAT, FAO, DFID, GTZ, IIED, M4P, ILO, World Bank, UNIDO, USAID	

(Source: Donovan et al., 2015)

2.5. Value Chain Upgrading

Most Value Chain Development endeavors aim at improving the VC Performance, often through upgrading the chain. According to Stamm, (2004) upgrading is "the process that enables a firm or any other actor of the chain to take on more value intensive functions in the chain, make itself harder to replace, and thus appropriate a larger share of the generated profits". Many researchers and development practitioners formulate suggestions for generic upgrading strategies. In this context Riisgaard et al., (2010) formulate one of the most comprehensive lists of possible approaches structured in three main types:

1) Improve process, product or volume (same node)

This type of upgrading strategy ensures retaining the current position of a firm in the value chain and becoming more competitive (e.g. responding to lower prices through cost reductions). *Process upgrading* can imply a better delivery schedule, reducing negative externalities (waste or pollution), better client communication, or more efficient payment methods. *Product upgrading* could mean improving quality standards, obtaining certification, shifting to more "sophisticated" products or packaging. *Volume upgrading* is clearly related to growth in production or processing through yield, area or technology increase.

2) Change and/or add functions (up- or downstream; several nodes)

Functional upgrading refers to the situation when a market actor takes on an additional role in the value chain (e.g. adding processing to its portfolio, or provision of finance). Such types of upgrade usually lead to vertical integration. *Functional "downgrading"* denotes the abandonment of a certain value chain node by a firm in order to specialize and increase competitiveness by focusing on fewer activities but doing them better.

3) Improve value-chain co-ordination vertically or horizontally

Here the term *vertical contractualization* is used, which means 'getting a better deal' through improved business linkages with other actors below or above in the value chain. This often implies moving away from spot markets and into stable contractual relationships. The benefits may include price security and reductions, better access to market information, inputs and finance or minimized marketing costs. *Horizontal contractualization*

is often employed among small farmers that agree to cooperate in order to tap into economies of scale through gaining more bargaining power, investing in joint equipment, group certification, insurance or marketing, bulking products for sale (Riisgaard et al., 2010).

Another type of value-chain upgrading beyond national borders and beyond the power of an individual firm, as in process upgrade, is by minimizing frictions of international trade as seen from the GVC perspective (World Bank Group, 2017). Time lost waiting at borders for import of inputs and export of outputs can have grave influence on the trade and profits, thus affecting the whole value chain. Djankov et al. (2010) found that each day of delay at customs has the same economic effect as adding 70 kilometers to the distance between trading partners. In this situation, time-sensitive agricultural goods are being particularly affected. A value chain upgrade in de-bureaucratization of imports and exports requires a complex set of actions to be undertaken by authorities of one or several countries.

2.6. Vertical Coordination

There are several ways in which vertical coordination happens in the value chain. The following categorization is based on Minot & Sawyer (2016). The most flexible one is called *spot markets.* It implies no prior commitments, the coordination of supply and demand with respect to quantity, quality, and timing occurs only through the price and direct "on spot" negotiation between seller and buyer. Spot markets work well for products with homogenous, nonperishable products, where quality can be easily observed. They are more common for domestic channels where consumers are less quality sensitive (Minot & Sawyer, 2016).

Contract farming is a form of vertical coordination incurring higher transaction costs of agreement negotiation, set up and enforcing, but also providing more security and planning through a more binding character. It is suitable for goods, which imply higher transaction costs, e.g. specific quality requirements, perishability, and technically difficult production. Because of the large fixed costs of the contract farming scheme, the buyers are usually large processing or exporting firms or supermarket chains. For usual wholesales and other small-scale buyers the arrangements are generally not worthwhile (Minot & Sawyer, 2016).

Vertical integration is the strictest form of vertical coordination, implying one-company ownership across multiple steps of the value creation. By uniting production, processing

and export under one corporate umbrella, firms receive more control over the product quality and delivery times. They are less dependent on contract failure or opportunistic behavior of their possible supply or service providers. The transaction costs are internalized. One drawback of this method for the firm itself can lie in reduced motivation of workers, who are paid daily wages, in comparison to farmers who work for themselves (Minot & Sawyer, 2016). Contract farming can be viewed also as outsourcing from the perspective of vertical integration. In this case the power exercisable over suppliers is less pronounced than over employees in vertical integration schemes (World Bank Group, 2017).

Destination markets have a clear influence on the type of vertical coordination, with higher quality standards driving tighter coordination schemes. The same commodity can be grown and traded through spot markets for local and regional consumption, through farming contracts for more demanding urban populations and through complete vertical integration in the case of exports to countries with highly advanced food safety requirements or organic food markets. (Minot & Sawyer, 2016).

2.7. Value Chain Collaboration

Value Chain Collaboration (VCC) can be defined as a voluntary association between different stakeholders within or outside the value chain. Such actors are usually producers or buyers, but can also be other actors, like NGOs and governmental structures (Helmsing & Vellema, 2011). The classical collaboration of actors within the chain (suppliers with processors and exporters) can be analyzed under vertical coordination mechanisms. Horizontal collaboration between chain actors with similar functions can be illustrated by famers' cooperatives, strategic corporate alliances or joint ventures. Such types of cooperation are challenged by the inherently competitive nature of markets and high transaction costs of finding common ground, however, cases of horizontal collaboration do occur on all levels of value chains. Agricultural farmers' cooperatives are an especially widely spread form of horizontal cooperation, serving as a means to exploit economies of scale, exchange knowledge, and reach common economic goals. Industrial manufacturers and exporting firms sometimes cooperate for the purpose of optimizing joint distribution networks (Bahrami, 2002). Other innovative collaboration mechanisms "beyond the chain", include

public-private partnerships (PPPs); creating social value (CSV) arrangements; and innovation platforms. (Ros-Tonen et al, 2015).

The concept of PPPs are becoming increasingly popular especially after the World Summit on Sustainable Development in Johannesburg in 2002 where they had been coined as a means for reaching multiple objectives in terms of economic, social and environmental sustainability (Laven & Pyburn, 2015). To economic agents, this arrangement can give more credibility and also, at times, access to public funding. To governmental structures, PPPs can also mean attraction of investment, new jobs, locally sourced taxes and addressing issues that the public sector had no capacity to cope with alone.

The concept of *Creating Social Value* can be seen as an out-branching of Corporate Social Responsibility, especially in the international context, where firms source products from small-holders and attempt to improve their livelihoods through additional activities (like training, micro-finance, infrastructure development, etc.). This approach is often embraced by large multinational corporations (e.g. Nestle), although it is often criticized as "green-washing". (Ros-Tonen et al., 2015) Smaller commercial or even non-profit entities also appear to have created links with small farmers and rural poor especially in the global south and provide organic and fair-trade products to demanding audiences in economically powerful countries.

The third kind of VCC 'beyond the chain' described by Ros-Tonen et al., (2015) are the so called *Innovation Platforms*. This type of collaboration is driven primarily by action research programmers that create spaces for collaborative learning and action among direct chain actors and also for extension officers, NGOs, governmental officials and researchers. Such innovation platforms ultimately aim at alleviating poverty among smallholders through the means of technology uptake, better institutional coordination and more efficient knowledge generation and transfer, which would result in improved performance of the overall system (Röling et al., 2012).

3. Research methodology

3.1. Conceptual Framework and Research Design

According to different estimations, about 25-50% of the rural population in Moldova try to obtain a regular or occasional income from agricultural activity related to walnuts. For the poorest of them, it's harvesting from the public plantations along the roads and in a good case one or two family trees in the courtyard. Some of them, especially rural women, try to add value to their produce by cracking the walnuts and selling the shelled kernel. For those who were able to make an investment, it's usually growing and harvesting from an own small orchard of about 0.5-5 ha. Some people work as employees for the large walnut producers and processors. The income of these three most vulnerable types of actors in the walnut value chain is influenced by a set of variables emerging from the national and international enabling environments. Primarily, it's the international trade in walnuts, global market prices, quality standards and requirements, state policies, foreign direct investment as well as interactions among key national stakeholders. Furthermore, availability of local storage and processing infrastructure, availability and quality of agricultural input, access to finance, extension, training and consultancy services as well as scientific research shape the context which influences the entire value chain and, of course, incomes of the poor. Figure 3 attempts to create a visual representation of the elaborated conceptual framework.

The inclusive value chain theory builds the basis for this thesis. Theoretical approaches presented in chapter 2 are vast systems of concepts and procedures: starting from a general decision about whether to engage in the VCD, and ending with Monitoring and Evaluating the impact of VC interventions. This thesis is mostly focused on the VC analysis aspects of the respective approaches as well as some tools for selecting upgrading recommendations. The research area is encompassing the whole Republic of Moldova as well as international markets relevant for walnut trade.

Throughout the study, the theme of organic agriculture reappears on several occasions, since it is viewed by the author as one of key ways not only to upgrade the value chain, but also to directly improve livelihoods of its most vulnerable actors. The research starts with an investigation of the global enabling environment in order to understand the large context in which the national enabling environment and consequently the Moldovan walnut value

chain are embedded. Further, the rapid market appraisal of the walnut sector in Moldova and an exploration of the institutional framework are performed. As the next step, the value chain is mapped and subsequently a deeper view on the actors of the value chain is reached through an exercise of stakeholder analysis. The findings obtained help to make an overall analysis of strengths, weaknesses, opportunities and threats of the sector and suggest recommendations for upgrading the value chain, diversifying the markets and improving internal organization of the sector with the ultimate goal of letting the vulnerable and poor benefit more from this growing industry.

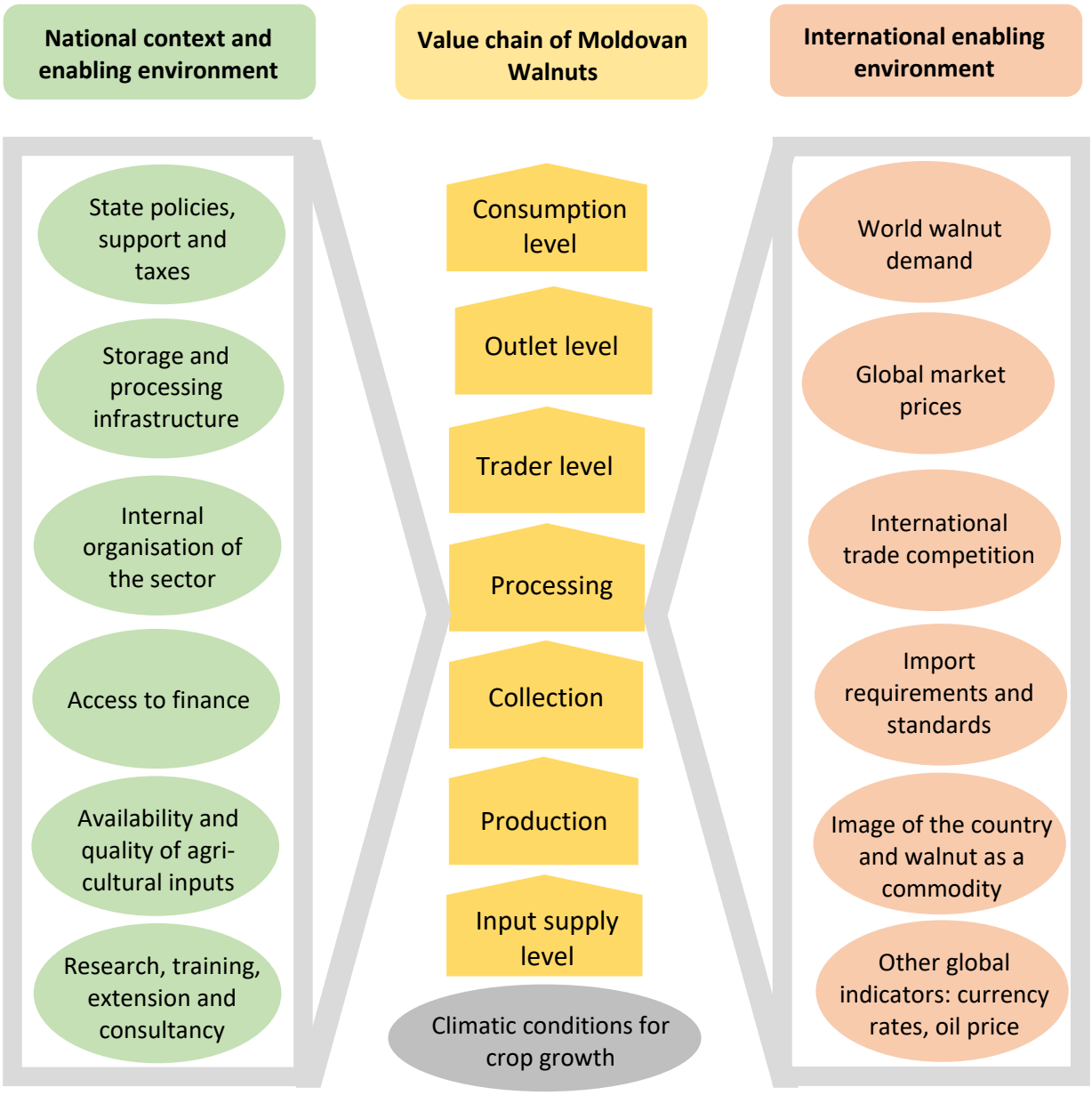

Figure 3 - Visual representation of the conceptual framework of the study
Source: own representation

3.1.1. Desktop Study of Literature and Documentation

The primary sources for quantitative data on national and international production and trade were the UN Comtrade Database, the United States Department of Agriculture Data, EU Trade Statistics, the Moldovan Bureau of Statistics and the data provided by the International Nut and Fruit Council as well as some additional data supplied by the National Union of Nut Growers' Associations, or shortly Walnut Growers' Association (WGA) and the Moldovan Organic Value Chain Alliance. The international trade statistics used in this study are based on Combined Nomenclature codes for walnuts: 08023100: Fresh or dried walnut in shell and 08023200: Fresh or dried walnut, shelled

The secondary data was sourced through review and analysis of the key sectorial publications and reports concerning value chain approaches, Moldovan agriculture in general, organic agriculture in particular, international and Moldovan walnut sectors and other relevant documents related to exports and economic development of Moldova.

3.1.2. Interviews and Workshop Discussions

Another primary source of data, both the quantitative and qualitative, was represented by formal and informal interviews carried out by the author, based on a structured questionnaire, when possible. The questionnaire includes 32 questions depending on the type of stakeholder interviewed and can be found in Annex 2.

Workshops held with key stakeholders of the Moldova walnut sector were another valuable source of insight especially on controversial aspects of the value chain development. The workshops where organized by UNCTAD in cooperation with the Ministry of Economy and Infrastructure and the Ministry of Agriculture, Regional Development and Environment with direct involvement of the author. The second stakeholder workshop was, to a large extent, planned and moderated by the author. The events were held in a participatory manner with opportunities for all involved to express their opinion in plenum, in small working groups and individually. The first stakeholder workshop was held in September 2017 and it helped identify the major questions and concerns for the sector and suggest several possible lines of action. The second stakeholder workshop was held in April 2018 in order to discuss and validate findings from the desktop research and interviews as well as national action plan suggestions.

Interviews and workshops included actors throughout the entire walnut value chain: nurseries, harvesters, collectors, processors, exporters, sector associations, scientific research actors, certification agencies, governmental bodies (Ministry of Agriculture, Regional Development and Environment), etc.

3.2. Rapid Market Appraisal

Rapid Market Appraisal is a system of practical analysis tools used by development practitioners, rather than the academic community. The following description is based on earlier work of Holtzman (2004) in Nepal and an operational guide prepared by the International Center for Tropical Agriculture (CIAT) in cooperation with Helvetas and Catholic Relief Services for their work in Vietnam (Wandschneider et al., 2012). The purpose of Rapid Market Appraisal (RMA) is to offer a quick and effective way of analyzing the current market situation and potential of a specific commodity in order to create appropriate system interventions. On the one hand this approach can provide a status quo snapshot of the value chain, its basic structure in terms of key players, distribution channels and benefits as well as its historic developments. On the other hand it can offer an outlook into the future regarding growth potential of the local and international markets. It can help explain reasons for inefficiencies and underperformance of the system and provide a solid ground for creating institutional and financial interventions.

The following issues are proposed for analysis in the RMA framework: commodity characteristics, consumption patterns, international trade and commodity competitiveness, supply situation, prices, driving forces behind the trends, organization and operation of marketing systems, infrastructure, policies, individual types of participants of the value chain according their function and interest, degree of organization of key market players, costs and margins along the value chain, barriers to market entry, and availability of market information.

Several principles according to which RMA is operated are: vertical (value chain) perspective, understanding competition, optimal ignorance / cost-effectiveness (due to limited resources and time for undertaking the investigation). As a result, RMA focuses on grasping quantitative and qualitative trends in supply, demand, market structure, and product requirements of different buyers. RMA does not follow a fixed pre-scribed

procedure, but rather provides a diverse range of simple methods for collecting, structuring and analyzing quantitative and qualitative data. Such tools can be, but are not limited to: stakeholder analysis, trend analysis (price, production and trade), growth projections, market volume, profitability analysis, margin analysis, SWOT, problem / solution trees, and scenario building. The following subchapters shed more light on the specific application of the Stakeholder and SWOT analyses that were used in this study.

Ample participation of key-informants is crucial to a successful RMA. Relevant stakeholders acting on different levels of the value chain and in supporting areas should be identified and thoroughly involved in the interviewing, data collection and also discussion of RMA findings. It's a dynamic investigative endeavor, requiring a high degree of flexibility.

3.2.1. Stakeholder Analysis

Stakeholder analysis (SA) has been in use as a powerful tool for business management, policy work, natural resource management and the planning of development projects since the 90s. The first mention of stakeholder analysis can be found in earlier cornerstone work of Freeman, (1984) who created the foundation of the stakeholder theory. In Natural Resource Management and Development Cooperation, stakeholder analysis has enjoyed growing attention especially since many projects failed as a result of not adequately understanding the dynamics among relevant actors. (Reed et al., 2009). With the rise of participatory approaches, stakeholder analysis has become recognized as indispensable for project success.

One of the key academic works in the field of stakeholder management, (Grimble & Wellard, 1997) identifies two main branches of SA, one based on the Overseas Development Administration (ODA, now DFID), another on the National Resource Institute. The ODA approach is a social development tool, used primarily for management and mediating and mostly concerned with project implementation. The NRI approach is more of a heuristic tool with stronger economic content for analyzing and predicting, concerned more with understanding of problem and policy issues. Another key academic review work (Reed et al., 2009) differentiates between normative vs. instrumental stakeholder analysis. The former is used mostly for addressing legitimacy of stakeholder roles in decision-making processes, while the latter aims pragmatically at understanding and influencing

stakeholders towards specific policy or project-related outcomes. What is surely common to both these and many other works on SA is emphasized importance of analyzing the interest and power of influence of stakeholders as well as mapping their relationships. Multiple techniques exist to this end: Interest-Influence Matrices, Q-methodology, Actor-Linkage Matrices, Social Network Analysis, Knowledge Mapping, Radical Transactiveness, etc. which are implemented through focus group discussions, semi-structured interview, snow-ball sampling, or simply desktop work (Reed et al., 2009).

For the purpose of this study, the methodology of Stakeholder Analysis will focus on description of roles, the influence vs. interest analysis matrix based on Grimble & Wellard (1997) with additions from (Eden & Ackermann, 1998) - Figure 4 and actor-linkage matrix based on (Biggs & Matsaert, 1999) - Figure 5.

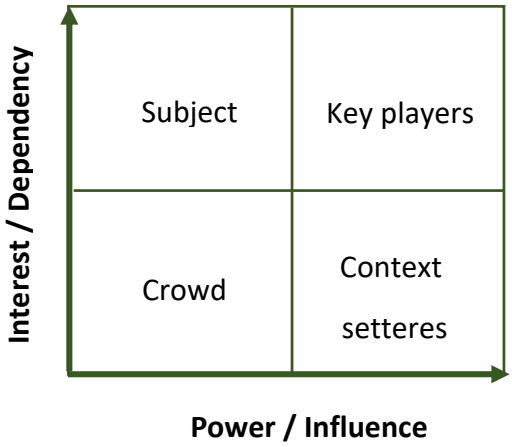

Figure 4 – Influence / Interest Grid for stakeholder analysis

	Stakeholder A	Stakeholder B	Stakeholder C
A		Score (comment)	Score (comment)
B	Score (comment)		Score (comment)
C	Score (comment)	Score (comment)	

Figure 5 - Actor-linkage matrix for stakeholder analysis

3.2.2. SWOT Analysis

There is no proven origin for the term SWOT analysis. Academic papers and online wikis differ in their attribution, referring to Harvard and Stanford Universities, but most agree, that it emerged between 1950 and 1970. Panagiotou (2003) describes that SWOT framework emerged from efforts of Harvard Business School to analyze case studies in the 1950s. Helms & Nixon (2010) and Chermack & Kashanna (2007) review the SWOT-related literature of the past decades and synthesize that SWOT was developed as a tool by Learned et al., (1969). Regardless of its exact historical origin, SWOT has become one of the commonly used tools for simplifying and analyzing a wide range of strategic issues (organizations, institutions, processes, products, individuals, etc.) especially in business.

Glaister & Falshaw (1999) and (Panagiotou, 2003) found that SWOT analysis is one of the most used and highly ranked planning tools in strategic management, although it is also heavily criticized for its vagueness and oversimplification.

The technique is applied to evaluate internal and external factors, bearing both positive and negative implications for the system. Thus the well-known SWOT-analysis matrix emerges, as shown in Table 3. As a result of SWOT analysis, teams usually strive to create strategies that build on the strengths, eliminate or cushion the weaknesses, exploit the opportunities and prevent the threats:

Table 3 - The classical SWOT analysis matrix

	Favorable	**Unfavorable**
Internal or currently present	Strengths	Weaknesses
External or potentially possible in the future	Opportunities	Threats

SWOT has essentially remained unchanged although many models and frameworks refining or building upon it have appeared – these are slight derivations of the same root. Most SWOT analysis set ups combine views of a range of individuals and follow the same procedure: 1) Define the objective; 2) provide an explanation of the procedure to participants 3) Ask contributors to analyze the object of study and classify its strengths, weaknesses, opportunities and threats on a two-by-two matrix 4) Aggregate all contributions into a single matrix 5) Engage the group in discussion about the classification of each item 6) Draw conclusions and come up with specific actions or next steps (Chermack & Kashanna, 2007).

When it comes to Rapid Market Appraisals and Value Chain analysis, Wandschneider et al. (2012) suggest the following internal factors for review: financial and intellectual resources, location, efficiency, infrastructure, quality, staff, management, price, delivery time, cost, capacity, relationships with customers, brand strength, and principles. For the external ones they suggest: political / legal context, market trends, economic conditions, expectations of stakeholders and public, technology, competition, PR and overall image, global markets, security and climate change. For the best results, SWOT analysis needs to have a well-defined objective, for example, selecting a commodity that will bring farmers higher profits or identifying value chain upgrading potential (Wandschneider et al., 2012).

3.3. Limitations of the Methodology

Simplification is ubiquitous in any type of analysis-for-action and certainly in the VC approach. This means that complex feedback mechanisms in the value chain, fine nuances between similar actors, or external effects that are beyond the most obvious ones, might not be fully taken into consideration.

Subjective opinions of key informants need to be crosschecked with other subjective opinions of other key informants with available literature as well as with quantitative data. Still, it is not possible to validate all statements with all the other key-informants. One way to deal with this limitation is by employing participatory group methods like workshop discussions. Such a group approach helps minimize the risks of one-sided opinions, but it is very demanding in terms of resources and working time. Likewise, during participatory group processes it can happen that mostly the opinions of people with "stronger voices" find their way to the overall aggregated analysis. There is also a danger of misrepresentation of information due to conflict of interest, when individuals representing official governmental bodies, businesses or non-profit organizations do not give responses in complete detachment of their personal advantage.

Collection and analysis of quantitative data from official databases also represent a source of inconsistencies. For example, there are several limitations in collection and aggregation of data openly stated by the UN Comtrade Database. Trade data of country groups may lack some specific countries' data who choose not to report in a certain year. This is due to confidentiality issues, communication flaws or a simple failure to report on time. Some countries neglected to report in the most recent commodity classifications, while conversion between older and newer classifications may imply that some products are left out or added. When one country reports the trade value of imports from a partner country, they are usually different from representation of exports by this trading partner due to inconsistencies in timing and prices (Cost, Insurance and Freight (CIF) vs. Free on Board (FOB)). Besides this, many countries report the country of origin and not the immediate trading counterpart as the source of imports.

In general VCD is a complex gradual process that requires a deeper and a more systemic procedure, a larger team and a longer time span than is possible to achieve by one student in the frames of a Masters' Thesis, even if it is connected to an existing development project.

4. Results and Discussion

4.1. The Global Enabling Environment for the Walnut Value Chain in Moldova

4.1.1. General Export Trends and Support Policies

Pursuing a liberal trade regime, in 2001 the Republic of Moldova became a full-right member of the World Trade Organization (WTO). This step caused a gradual advancement in external trade and increased efforts of adopting international standards in the production processes. Moldova has signed Free Trade Agreements (FTAs) with 43 countries to date. The one that influences Moldova's trade the most is the Deep and Comprehensive Free Trade Area Agreement (DCFTA) with EU member states. There are also FTAs with Commonwealth of Independent States (CIS) members, all countries of the Stability Pact for South Eastern Europe (SPSEE) and Turkey. Additionally, Moldova has signed preferential trade agreements with Canada, Japan, Norway, Switzerland, and the USA (MIEPO, 2017a). Official negotiations on a potential free-trade Agreement with China is already underway (MEI, 2017).

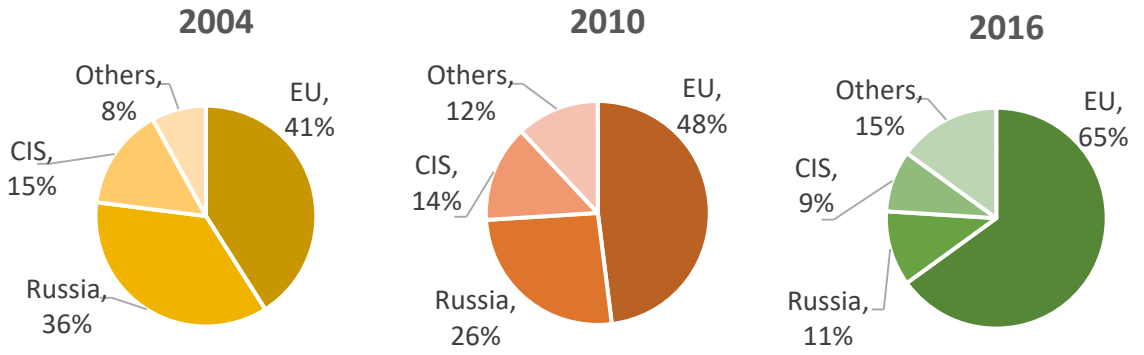

Figure 6 - Regional export trends for goods from the Republic of Moldova (Source: German Economic Team Moldova, based on NBS 2017)

In 2004 more than 50% of Moldovan exports were destined for CIS countries, including Russia. In 2010 the EU accounted for 48%, CIS including Russia accounted for 40% and by 2016 almost 2/3 of Moldovan exports were directed to the EU. This trend demonstrates a clear regional re-orientation of exports toward the EU in the past decade. At the same time, CIS and Russia remain important export destinations. The share of "other" export destinations has almost doubled since 2004 mostly due to increase in export and trade with Turkey, but also China and Egypt (German Economic Team Moldova, 2017).

The evolution of exports of agri-food products to the EU has been determined by both climatic conditions as well as by the trade restrictions imposed by the Russian Federation as a reaction to Moldova signing the Association Agreement with the EU. Top trading partners of Moldova in the EU are Italy, Romania, Greece and Germany both for imports and exports. Narrow geographic orientation with approximately 90% of Moldovan exports and 86% of imports in agri-food and agriculture-related trade with only 10 EU member states out of the 27 is limiting the diversification of markets, creating risks, hampering the choice of market niches and reducing penetration capacity to new markets.

On September 1, 2014 Moldova signed the Deep and Comprehensive Free Trade Area (DCFTA) Agreement with the EU and in July 2016 it was fully enforced. DCFTA implies a complex process of adoption of EU standards and directives. It applies free trade principles of the WTO to trade relations between Moldova and EU member states. DCFTA facilitates trade in products and services by removing most import duties.

One of the key functions of DCFTA is aligning Moldovan trade-related laws with EU legislation. This will enable Moldova to become a more trustworthy trade partner through better governance and the rule of law. As a result, more foreign investment will flow in and more openness of the EU market for export can be expected. (MIEPO, 2017a).

According to a report analyzing two years of implementation of DCFTA, 65% of Moldovan exports were oriented toward the EU market and amounted to 2.2 billion Euro (MIEPO, 2017b). Compared to the 2014-2016 period, overall exports of goods and services increased by 16% (12% for goods). The share of agri-food commodities on EU markets rose by 45% (from 278 to 504.2 Mio. €). The trade balance of agri-food products constituted approx. 174 Mio. €, which represents a 5-fold increase in comparison to the period before DCFTA.

Among the main agri-food products exported to the EU are sunflower seeds, which account for 25% of EU food exports, directed in the proportion of 44% to Romania and 32% to the UK. It is a spectacular increase of 2.8 times that of the previous period. Walnut exports account for 15% of agri-food exports to the EU, with the main destinations being France (37%), followed by Austria and Germany with 14% each. Also, the evolution of exports is remarkable for honey (+ 40%) - one of the few products of animal origin admitted for export to the EU (Expert Grup, 2017).

At the same time, the lack of homogeneous, compliant, packaged and certified domestic products that would be accepted by EU importers substantially reduces the capacities of Moldovan products to cover the contingencies and tariff concessions established by the DCFTA. The non-tariff measures established by DCFTA (sanitary, phyto-sanitary, quality standards, product certification and compliance) are currently the most serious barriers to increasing the export capacities of Moldovan agri-food products in the EU. The adjustment of the legislative - normative framework, the compliance of the local agricultural sector with these requirements, and the exclusion of non - tariff measures in the future could have a much greater impact than the elimination of the import tariffs on both sides.

The growth potential of agricultural and agri-food exports from the Republic of Moldova could suddenly slowdown in the short term if agricultural producers do not adopt and meet the relevant EU standards. In this context, non-compliance with EU sanitary-veterinary requirements and the EU safety and quality standards could diminish competitiveness, penetration and slow down exports of domestic products to other world markets.

Besides the positive effect on the trade with the EU, signing of the Association Agreement and DCFTA in 2014 had an adverse effect on trade with the Russian Federation. In July 2014, Russia started to introduce restrictions on delivery of Moldovan products (especially wine, fruit and canned vegetables). Consequently, by August 2016 the export of Moldovan goods to the Russian market decreased by 325 Mio. US$.

4.1.2. International Consumption, Production and Trade of Walnuts

The walnut is an increasingly important commodity in international trade. The overall global supply value of walnuts has reached 5.5 Billion US$ in the 2016/2017 season (INC, 2017) which sets it at 4th place after almonds, pistachios and cashews. In 2014 walnut supply value was at 2nd place but in 2015/2016 the global market price had significantly dropped.

4.1.2.1. World Consumption of Walnuts

International Nut & Dried Fruit Council (2018) estimates that in 2016 walnuts were the second most preferred nut type in high-income countries (defined by OECD) with 18% share

after Almonds (39%). In middle-income countries walnuts were the most consumed nut in 2016 (29% share). Table 4 illustrates the major walnut consumption trends.

Table 4 - Estimated world walnut consumption 2011-2016

Countries	**Total Consumption (Metric Tons, Kernel Basis)**					**per capita consumption (kg/year)**
	2012/13	**2013/14**	**2014/15**	**2015/16**	**2016/17**	**average 2012-2017**
China	347,094	365,085	408,718	459,487	491,453	0.18
European Union	98,376	112,009	119,017	131,068	138,889	n/a
France	16,271	21,907	18,333	24,998	21,680	0.32
Germany	12,085	12,154	14,763	17,922	16,856	0.18
Italy	9,124	8,596	8,707	12,748	13,829	0.18
Spain	7,951	8,955	8,815	11,202	13,746	0.22
Netherlands	2,944	3,632	4,455	9,894	10,650	0.35
UK	5,146	5,351	6,711	8,225	9,001	0.11
Greece	1,081	1,550	1,410	2,544	2,466	0.16
Austria	1,397	1,619	1,200	2,342	n/a	0.19
Turkey	50,214	49,188	43,205	60,470	63,547	0.30
United States	65,926	66,206	60,078	58,192	64,103	0.43
Japan	11,838	12,393	16,239	17,222	17,094	0.11
Korea, South	12,051	12,436	14,487	13,034	13,675	0.26
Ukraine	16,641	17,346	18,436	16,829	14,829	n/a
India	10,641	11,282	13,974	18,419	15,726	0.01
Canada	8,846	9,487	7,650	10,256	11,325	0.24
Iran	556	6,538	4,829	8,248	8,547	0.61
Other	48,504	46,966	45,274	47,457	56,218	n/a
Total World	670,686	708,937	751,908	840,683	893,568	0.09

(Source: Own representation based on USDA, 2017 and INC, 2018)

4.1.2.2. World Production of Walnuts

World walnut production was estimated at 871,849 Metric Tonnes (kernel basis) in season 2016/2017; up by 20% from the previous season. The jump in higher supply from 2015 to 2016 was mainly explained by China's production that increased by 55% over 2015/16, followed by Chile and the USA, up 22% and 11% respectively. In the past 10 years, walnut production has doubled, as Figure 7 shows.

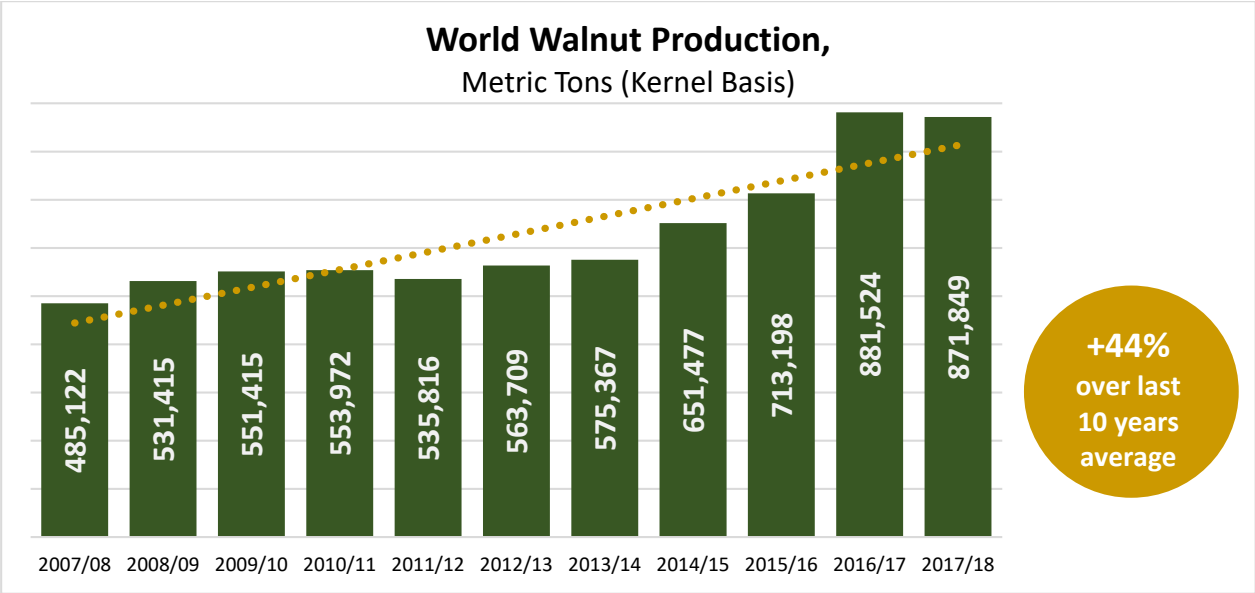

Figure 7 - World walnut production 2007-2017
(Source: INC 2018)[3]

China and USA lead global production with 42% and 29% respectively (INC, 2018)(INC - International Nut & Dried Fruit Council, 2018). From a historical perspective demonstrated in the table below, it becomes clear that China, USA and Chile have been rapidly expanding their walnut production sectors. Moldova experienced a moderate and Ukraine a very modest increase, while the EU – the main walnut importer worldwide - has barely increased its production in the past 5 years.

Table 5 - Production of walnuts by countries 2012-2017, MT, Kernel Basis

	2012/13	**2013/14**	**2014/15**	**2015/16**	**2016/17**
China	307,692	333,333	384,615	427,350	452,991
United States	192,680	190,741	221,369	233,774	259,750
European Union	47,009	47,009	46,111	49,573	48,291
Ukraine	41,427	49,483	43,906	49,179	44,872
Chile	22,650	25,641	34,886	34,188	42,735
Turkey	36,325	32,051	17,094	25,641	26,923
Moldova	9,701	9,872	13,675	12,821	13,462
Other	18,932	21,667	18,590	18,590	16,667
Total	676,415	709,797	780,247	851,115	905,690

(Source: USDA 2017)[2]

[3] The difference in total production amounts is attributed to deviating data collection methods of INC and USDA. The in-shell to kernel basis conversion ratio used for USDA data is 2.34.

According to the president of the WGA, Oleg Tîrsîna, Chile is one of the most important competitors for the Moldovan walnut sector, especially regarding the European market. Chile has been extensively investing in expansion of walnut plantations at rates of almost 10.000 ha per year. This is a tremendous growth that Moldova can't keep up with. The growth of Chilean walnut sector is also attributed to strong institutional organization and state support.

4.1.2.3. World Export of Walnuts

In the decade between 2007 and 2017 the world exports of walnuts have more than doubled reaching almost 322,000 MT (kernel basis, comprised of 220,953 MT in-shell and 227,572 MT kernel in 2017) (UN Comtrade, 2017). The USA was the main exporter of shelled walnuts during 2017, constituting more than half of total exports, with Germany as its main destination, but also Japan and South Korea as important trade partners. Ukraine and Chile marketed their walnuts mainly to the Middle East and Europe. Moldova is apparently at 4th place in world exports, mostly delivering to Europe. Moldova is also known as the processing country, providing walnut cracking services mainly to French partners (INC, 2017).

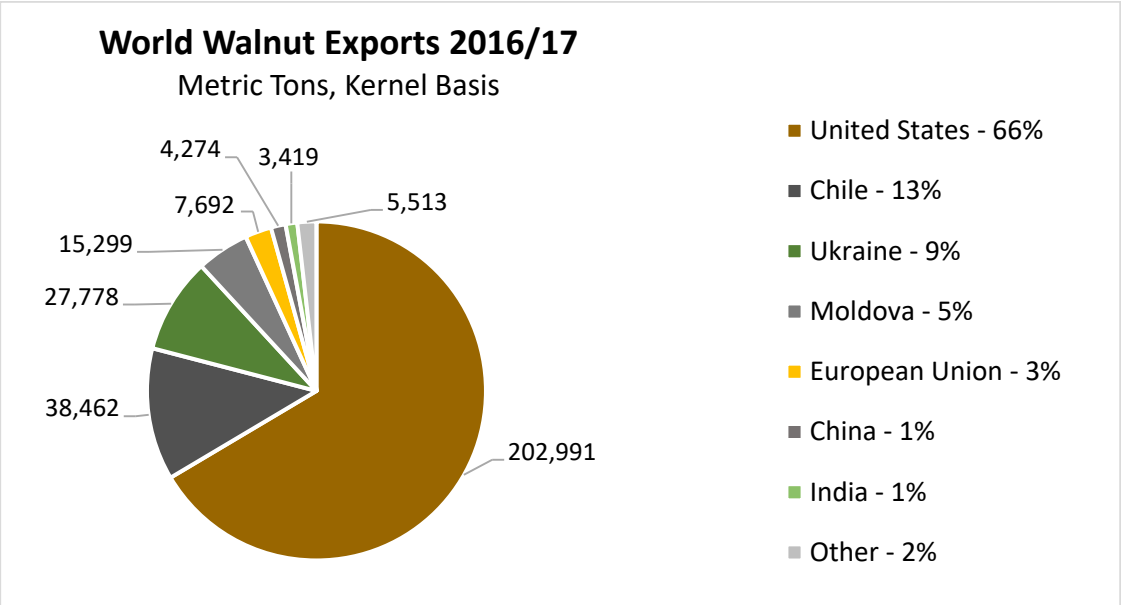

Figure 8 - World walnut exports in 2016/17
(Source: USDA 2017)

4.1.2.4. World Import of Walnuts

The 12 largest world walnut importers are presented in Figure 9.

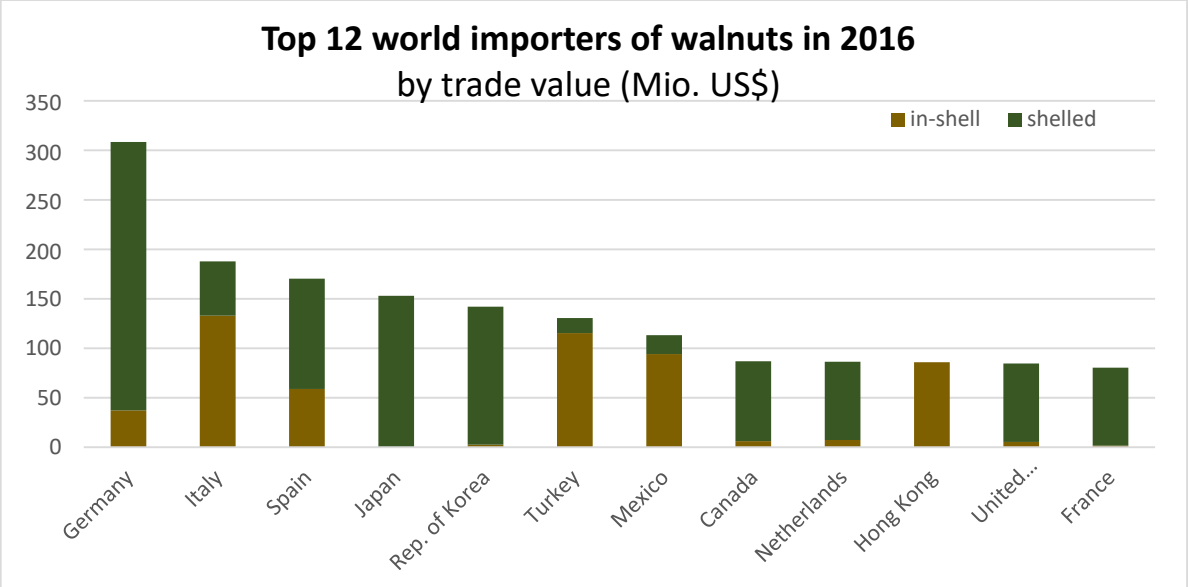

Figure 9 - Top 12 world importers of walnuts in 2016.
(Source: own representation based on UN Comtrade Database, 2017)

According to both UN Comtrade Database, 2017 and INC - International Nut and Dried Fruit Council, 2017, Germany is the world's leading importer of shelled walnuts. The national demand for walnuts has grown in the past decade. In 2016 Germany imported 25,978 Metric Tonnes of walnuts (kernel basis) which amounts to almost double the imports in 2006 (INC, 2018).

4.1.2.5. EU Market Situation

The EU population totals about 500 million with an average GDP per capita of around US$ 30,000. Although the EU produces its own walnuts, the domestic consumption is supplemented 65% by imports. The trend in consumption growth has been accompanied by an increase in imports, but not in production (USDA, 2016). Table 6 presents the overview of supply and demand in EU 28.

Table 6 - Key figures of the European supply and demand of walnuts 2016

	In-shell basis, Metric Tonnes	**Kernel basis, Metric Tonnes**
Production	113,650	48,568
Import	180,000	76,923
Consumption	275,650	117,799
Export	18,000	7,692
Stocks	40,000	17,094

(Source: USDA, 2016)

For 2017-2018 European Union's production is forecast to be around 115,000 Tonnes with modest reductions in France and Romania. Consumption is expected to remain nearly unchanged following several years of strong growth. Demand is driven by snack foods and cooking ingredients on the retail side and pastries on the industrial side. Imports are expected to further increase.

The EU Market for walnuts is mature with room to expand. This wide gap between consumption and production represents an excellent opportunity for Moldovan walnut exporters. In 2015, the United States was the number one supplier of walnuts, both in-shell and shelled, to the EU and Moldova was proudly occupying second place with Chile being very close behind in third place. However, taking into consideration Chile's rapid walnut industry growth, it can be expected that in 2017 or 2018 Chile might outpace Moldova.

Table 7 - EU-28 imports of walnuts by origin, MT, in-shell basis

Country of origin	**2012/13**	**2013/14**	**2014/15**
United States	72,552	84,839	97,651
Moldova	21,262	23,280	24,452
Chile	16,464	21,710	24,041
Ukraine	18,041	19,855	22,206
China	3,617	5,014	3,404
Others	10,138	11,126	10,267
Total	133,350	156,408	175,317

(Source: USDA Tree Nuts Annual 2016)

4.1.3. Import Requirements and Standards

In this chapter we address European Union as the main export destination for Moldovan walnuts. Luckily Moldova enjoys a tariff preference of 0% in frames of DCFTA. Nevertheless, required standards are rather high. This entire subchapter compiles requirements that apply for the import of shelled walnuts to the EU based on the information provided by the EU Trade Helpdesk (European Commission, 2018).

Control of contaminants in foodstuffs is based on the following legislative acts:

- Council Regulation (EEC) No 315/93 of 8 February 1993 laying down Community procedures for contaminants in food (OJ L-37 13/02/1993) (CELEX 31993R0315)
- Commission Regulation (EC) No 1881/2006 of 19 December 2006 setting maximum levels for certain contaminants in foodstuffs (OJ L-364 20/12/2006) (CELEX 32006R1881)
- Council Regulation (EU) 2016/52 of 15 January 2016 laying down maximum permitted levels of radioactive contamination of food and feed following a nuclear accident or any other case of radiological emergency (OJ L-13 20/01/2016) (CELEX 32016R0052)
- There is a specific risk for nuts in relation to contamination with aflatoxin. Regulation (EC) 1152/2009 outlines the fact that nuts exported to the EU have to be accompanied by a health certificate demonstrating the nuts have gone through sampling.

Control of pesticide residues in plant and animal products for human consumption:

- Regulation (EC) No 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC (OJ L-309 24/11/2009) (CELEX 32009R1107)
- Commission Implementing Regulation (EU) No 540/2011 of 25 May 2011 implementing Regulation (EC) No 1107/2009 of the European Parliament and of the Council as regards the list of approved active substances (OJ L-153 11/0/2011) (CELEX 32011R0540)

- Commission Decision 2011/163/EU of 16 March 2011 on the approval of plans submitted by third countries in accordance with Article 29 of Council Directive 96/23/EC (OJ L-70 17/03/2011) (CELEX 32011D0163)
- Regulation (EC) No 396/2005 of the European Parliament and of the Council of 23 February 2005 on maximum residue levels (MRLs) of pesticides in products of plant and animal origin (OJ L-70 16/03/2005) (CELEX 32005R0396)
- Commission Decision 98/536/EC of 3 September 1998 establishing the list of national reference laboratories for the detection of residues (OJ L-251 11/09/1998) (CELEX 31998D0536)
- Commission Implementing Regulation (EU) 2016/662 of 1 April 2016 concerning a coordinated multiannual control programme of the Union for 2017, 2018 and 2019 to ensure compliance with maximum residue levels of pesticides and to assess the consumer exposure to pesticide residues in and on food of plant and animal origin (OJ L-115 29/04/2016) (CELEX 32016R0662)

Health control of foodstuffs of non-animal origin:

- General foodstuffs hygiene rules according to Regulation (EC) No 852/2004 of the European Parliament and of the Council (OJ L-139 30/04/2004) (CELEX 32004R0852);

Traceability, compliance and responsibility in food and feed:

- General Food Law And Food Safety Regulation (EC) No 178/2002 of the European Parliament and of the Council (OJ L-31 01/02/2002) (CELEX 32002R0178)

Labeling of foodstuffs, but not applicable for bulk transport:

- Regulation (EU) No 1169/2011 of the European Parliament and of the Council on the provision of food information to consumers (OJ L-304 22/11/2011) (CELEX 32011R1169) changes existing legislation on food labeling.

For in-shell walnuts there is a special regulation describing minimum standards on ripeness, condition, market size, moisture (12% for the whole nut and 8% for the kernel), and categorization in 3 classes (Extra, I and II). This Commission Regulation (EC) No. 175/2001 applies to walnuts intended for the final consumer but not for industrial processing.

According to the EU Trade Helpdesk (European Commission, 2018) the following documents are necessary for the customs clearance procedure:

- Commercial Invoice
- Customs Value Declaration
- Freight Documents (Transport Documentation)
- Freight Insurance
- Packing List
- Customs Import Declaration (SAD) with associated documents:
  - Certificate of Origin (issued by the Customs Authority)
  - Certificate of Inoffensivity (National Food Safety Agency)
  - Certificate of Conformity (Center for Applied Metrology and Certification)
  - Results of laboratory tests (including radiology and microbiology)
  - Phyto-sanitary Certificate (National Food Safety Agency)

4.1.4. Trends for Value Added Products

This subchapter briefly examines organic walnut market and walnut oil trends using the example of Germany, since this country is the world's largest importer and 5th largest consumer of walnuts and the largest organic market in the EU.

4.1.4.1. Organic Market Trends

The importance of organic agriculture worldwide has been growing in the past two decades, driven by a raising awareness about progressing resource degradation and climate change, but also due to consumers' demand for healthier alternatives. The Swiss Research Institute for Organic Agriculture (FiBL, 2017) estimates that over the past fifteen years, in the period 2000-2016, the global market for organic products has more than quadrupled from 17.9 to nearly 90 billion US$. Meanwhile, the value of European Union's organic market amounted to 30.5 billion US$ in 2016, which is 10% more than in 2015. The largest European Union market for organic products in 2017 was Germany, worth 8.6 billion € followed by France (5.5 billion €) and the UK (2.3 billion €). At the same time, the organic market of other European countries, such as Denmark, Sweden, Norway, Switzerland, Austria, Italy and Spain is growing fast.

The Centre for the Promotion of Imports from developing countries (CBI, 2016) estimates that for fair trade and organic walnuts, producers can achieve a higher proportion of the ultimate selling price and thus get 30-50% more value added than in case of the conventional product despite the greater costs involved for certification.

In general, European consumers are interested in naturalness - "organic", "natural" or "additive-/preservative-free" are featured strongly, while "fiber", "protein" and "low sodium" claims are also popular. Although many people perceive walnuts to be healthy anyway, there is a significant group that is willing to pay a premium for organic walnuts (CBI, 2014). While main-stream retail prices in mid-market in Germany range from 1.50 to 2.00 € per 100 g, the organic and premium segment can reach up to 3-4 € per 100 g. Luckily, Moldovan walnuts are already found on the shelves of organic shops in Germany, like Biocompany or DM under local brands, and also being sold in the premium segment like Rapunzel. Still, the organic walnut market is rather small. An independent expert and journalist researching on the organic walnut market for the Bio Linéaires magazine estimated that Moldova produces and exports the largest volumes of organic walnut kernel to the EU (approximately 2000-3000 Tonnes per year), followed by the US and France (B. Balmer, personal communication, May 2018).

Organic certification can also help cushion price instability. The price for walnuts on the global market experienced a significant drop of almost 30% in 2015 and 2016. Rachel Elkins from the University of California Cooperative Extension pomology states: "My understanding is that it is a combination of storage overage due to the dock strikes last fall, the strong dollar reducing export opportunity, and reduced demand from China, as their economy is stressed and they focus on […] domestic product". She notes that nevertheless, demand for organic walnuts is remaining steady and even increasing, and organic walnut prices have not dropped the way conventional prices have (Jeffries, 2016).

European consumers are often environmentally conscious in terms of recycling and disposal of packaging. There is a trend to larger pack sizes. Visibility of the product and the appeal of the packaging are important factors, because snacks are often purchased on impulse.

4.1.4.2. Fair Trade Trends

Fair Trade is one of the globally growing trends concerned with creating better conditions for suppliers, usually referring to vulnerable rural population - smallholders and workers. The most widely recognized definition of fair trade emerged from an informal agreement of key global Fair Trade networks (Fairtrade International and the World Fair Trade Organization which has recently submerged the Network of European World Shops and European Fair Trade Association). The definition states: "Fair Trade is a trading partnership, based on dialogue, transparency and respect that seeks greater equity in international trade. It contributes to sustainable development by offering better trading conditions to, and securing the rights of, marginalized producers and workers - especially in the South. Fair Trade organizations (backed by consumers) are engaged actively in supporting producers, awareness raising and in campaigning for changes in the rules and practice of conventional international trade" (Fairtrade International, 2018). Fair trade aims to help the poor to step out of vulnerability and move towards security and economic self-sufficiency through paying higher wages and securing better working conditions. The approach also means empowering producers and workers to have a stronger voice and stand up for improving their livelihoods.

International Fairtrade mark

"Fairtrade International" is the largest and most trusted fair trade certification label worldwide. The organization limits its producer certification to countries with low and medium development status based on OECD Development Assistance Committee Definition. As the map in Figure 10 shows, Moldova is not yet integrated in the network, like the most of Eastern Europe and Balkans.

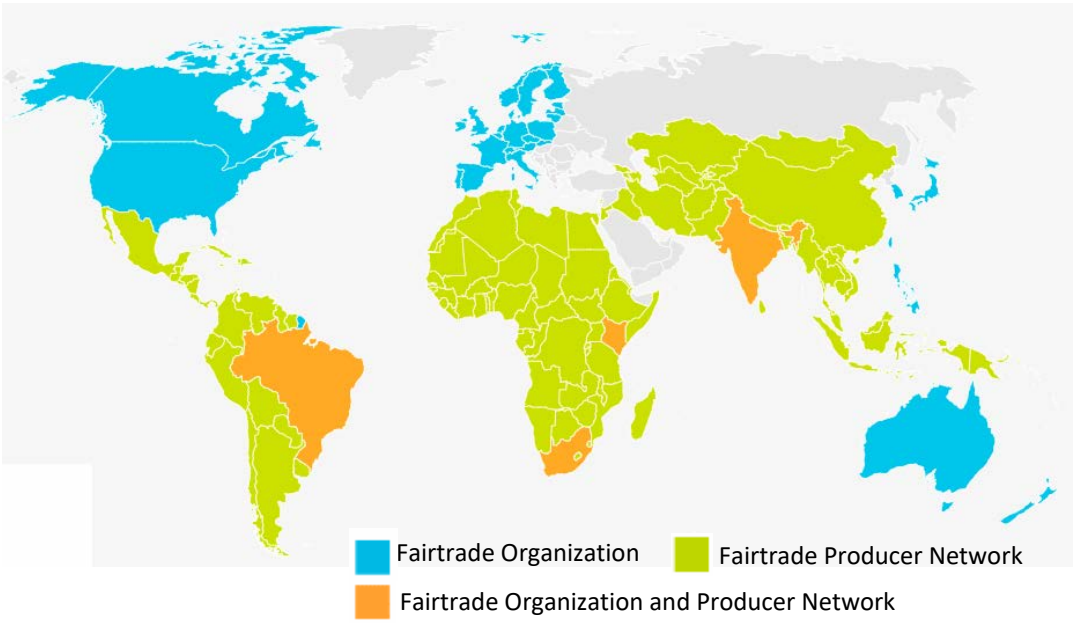

Figure 10 - Geographical scope of Fairtrade International
(Source: www.fairtrade.net)

FLO-CERT is the certifying body operating on behalf of Fairtrade International. The minimum initial cost of certification for the smallest producer unit (1 person, 1 product) starts with 2,100€ for the first year and 1,200€ for maintenance of the certificate in the following years. With the increasing number of employees or cooperative members, products and processing steps the cost rapidly raises.

Fairtrade International reports that worldwide sales of products under their label have amounted €7.88 billion in 2016, which represents an aggregate growth of 34% compared to the year before. Especially countries, where a National Fairtrade Organization is established, have experienced steady growth in the past years. The markets with highest sales increase were Austria, France, the Netherlands, Norway and Switzerland. These developments enable over 1.6 million producers and workers in 73 countries worldwide to benefit from the current Fairtrade model. Besides higher revenues for better wages and sustainable production, the beneficiaries receive a Fairtrade Premium – an additional payment for general systemic improvements, e.g. education, health, crop technology, etc. In 2016, the cumulative sum of the Premium paid out in different countries amounted to 150 Mio €.

The World Fair Trade Organization has a membership model, where members need to comply with WFTO standards and then get accredited to use the WFTO label. Members of WFTO can be producer (Fair Trade Organization) and other actors in the field (Fair Trade

Support Organization) The application fees for producers or traders range from 100€ to 750€ and the annual membership fee varies from 400€ till max 2,600€ depending on the size of yearly turnover (WFTO, 2018).

WFTO label

There are multiple other international organizations dealing with Fair Trade approach, like "Fair for Life", "Catholic Relief Service Ethical Trade", "Fair Trade Federation", and also smaller ones focusing on certain commodities and regions (e.g. bananas, handcrafted jewelry, shop networks in specific European countries, etc.). This growing movement of ethical actors promoting fair trade represents a promising worldwide process that can be of high relevance for the Moldovan walnut VC in terms of designing inclusiveness. Pakistan, Kyrgyzstan and Uzbekistan, for example, are already supplying fair trade certified walnuts to Europe (GIZ, 2015; Lemberona, 2018; Premcrest, 2018). Although the quantities are very small, they are the first ones to occupy this emerging trade niche.

4.1.4.3. Walnut Oil

Pressing walnut oil is the classical value addition to the existing value chain. Walnut kernels contain a 60-70% oil fraction. According to Technavio (2017) the current value of the worldwide walnut oil market is approximately 27.23 billion € 2016 with ca 578 Mio.€ for cold-pressed oil. The company estimates the worldwide walnut oil market to increase at a Compound Annual Growth Rate (CAGR) of ~4.7% between 2017 and 2021.

The global walnut oil market is segmented on the basis of application, distribution channel, and region. Based on its application, different uses can be identified: oil as nutritional supplement, cosmetics products, aromatherapy and others such as wood finish and paint thinners etc. Amongst all applications, the cosmetics segment is expected to dominate the market over the forecast period, owing to the increasing demand for natural oil based skin care and hair care cosmetics. Nutritional supplements product segment is forecasted to grow due to its popularity in weight loss therapy and nourishment by omega-3 fatty acids. Walnut oil blends well with other massage oils, thus, increasing popularity in aromatherapy which is another factor driving growth of walnut oil market.

North America and Asia Pacific occupy the major share of the global walnut oil market and are expected to grow at a steady rate. Western Europe regional market is expected to grow at a relatively higher growth rate over the forecast period, due to the increased demand driven by awareness among consumers about the health benefits of walnut oil (Transparency Market Research, 2017).

CBI states that in 2014 the walnut oil market in Germany alone was worth approximately 20 Mio. US$ in retail price equivalent. This equates to approximately 1,200 Tonnes. The market is fairly stable. Most walnut oil is purchased by consumers for consumption at home (10 Mio. € estimated to be 600 Tonnes or 700,000 Liters). Typical nut oil consumers tend to be in the 45-64 age group, of above average income.

4.1.5. International Institutional Best Practices in the Walnut Industry

A successful industry sector usually entails a history of evolution and a certain degree of institutional set-up. Moldova's walnut sector is still young and very weakly organized. In this sub-chapter we briefly examine the two most prominent walnut industries in the world. Learning from the experiences in California and Chile could enable Moldova to make key decisions on the path for future sector development and try to remain competitive in the dynamic global walnut market.

4.1.5.1. California Walnut Board / California Walnut Commission

The California Walnut industry, located mostly in California's Central Valley, is the world's oldest and largest walnut industry with a high level of institutional complexity. It enumerates over 4,000 growers, almost 100 traders, generates $1.4 billion in primary production revenue and provides income to approximately 60,000 people directly and indirectly. The two main bodies governing, developing and promoting the sector are the California Walnut Board (CWB), established in 1948, and the California Walnut Commission (CWC), established in 1987 through a Federal Walnut Marketing Order (California Walnuts, 2018).

The Board represents walnut growers and handlers and is funded by mandatory assessments from the handlers, which it can collect due to being empowered by the

Agricultural Agreement Act of 1937. The collected money is used for development of the industry and is subject to approval by the USDA. CWB promotes usage of walnuts in the domestic market through supporting walnut production and post-harvest research through funding. The board is governed by a Federal Walnut Marketing Order and administers the Grades and Standards committee, the Export committee, concerned with eventual volume controls and/or minimum prices for the whole industry, and several other committees. The composition of the board is ten elected members: four traders, five growers plus one public member. In case there is a trader with a marketing share larger than 35% in the past two years, all 4 seats are allocated to him automatically. Currently there is no such case (California Walnuts, 2018).

The Commission, established in 1987, is an agency of the State of California collaborating closely with the Secretary of the State Department of Food and Agriculture. Its budget builds up from the mandatory assessments of the growers. The CWC was initially established to promote exports and develop overseas trade. Currently, it's also involved in walnut health research and is responsible for communication in the large industry. For this purpose, it administers the Intra-Industry Communications committee targeting the growers. The Commission consists of 13 members made up of 8-10 walnut producers, 2-4 traders and a public member. Twelve out of thirteen seats are occupied through an election process (California Walnuts, 2018).

There are more committees, activities and further organizational nuances in both the CBC and the CWC work, but their description would go beyond the purpose of this study. The main idea to demonstrate here is a high level of organization in the industry achieved through solid state politics. A high degree of unification in the industry brings tangible results. The whole sector, represented by both CWC and CBC works in close collaboration and under one industry brand: "California Walnuts" which is very well known and respected in the US and around the world.

Sector brand logo for California Walnuts

4.1.5.2. Chilenut and Chilean Walnut Commission

Chile is the second largest walnut exporter in the world. Chiles' walnut industry is younger than the Californian one, and it could learn a lot from the US experience. First Chile

experimented with its own walnut varieties, but in the beginning of the 2000's, Chandler walnuts were introduced from California. This variety has proven to be very successful also for international trade due to the high quality of the large, light and sweet kernel. Today the Chandler variety is the predominant one, composing over 70% of all walnuts grown in Chile (Produce Report, 2017).

In 2016, Chile's walnut industry accounted for over 2,000 producers, with the total plantation area of 40,000 ha. This area is increasing by 1.500-2.500 hectares per year. This year (2018) Chile is going to reach the milestone of 100 Thousand Tonnes of walnut production. In 2025, the plan is to be at production levels of 200 Mio. Tonnes with annual growth of 5%. Today Chile is supplying 11% of global walnut trade and by 2025 this number is expected to grow to 18% (Chilean Walnut Commission, 2018).

The Association of Producers and Exporters of Nuts of Chile, "Chilenut", is a trade association created in 2002 that brings together producers and exporters distributed between the fourth and ninth regions of Chile, as well as private consultants and nurserymen linked to the industry of nuts. The entity currently represents 55% of the national surface planted with nuts and 20% of the export strength of Chile. Its main objectives are to improve the technical management of walnut orchards, to diffuse and communicate agricultural knowledge, promote the Chilean walnut and manage technical public affairs. "Chilenut" organizes a yearly trade show, "Exponut", which gathers "more than 400 producers, exporters, suppliers, investors and entrepreneurs around technical and commercial seminars, a business conference and the largest specialized exhibition of products, services and machinery for the sector." (INC, 2018)

Chilean Walnut Commission A.G (CWC) was founded in 2009 to represent the interests of the processing and exporter segment of the industry. In 2016 it included 19 member companies representing almost 75% of the sector. A large part of the export firms have vertically integrated production and processing as well. The main goals of CWC are market research, international marketing, opening up new markets and industry quality standards. The trade association helps its members to identify and develop business opportunities in the external markets and manage government relationships.

National logo for Chilean Walnuts

"Walnuts from Chile" is a recognized sector brand established as a joint public and private-sector effort between Chilean Walnut Commission and an agency of

the Ministry of Foreign Affairs of Chile “ProChile”. It strategically promotes the country’s export brand and the whole industry in key global markets. This initiative has had significant success worldwide (Chilean Walnut Commission, 2018).

Every year the commission organizes an international promo campaign with a focus on specific markets: in 2018, for example, it will be targeting India and Korea. This year it will be the main sponsor of INC Congress 2018 that will take place in Chennai, India and will thus get more exposure and visibility in the walnut trade world. The amount allocated for the promotion of the Chilean walnut for 2018 is 3 Mio. US$ (10 times the 2017 investment), which is still not much in comparison to California that spends ca. 34 Mio. US$ yearly on marketing and research, but is a very significant sum in comparison to Moldovan non-existent sector promotion.

After entering a joint operating agreement in 2016, Chilenut and Chilean Walnut Commission will join forces to operate under a single association which represents 90% of growers and 80% of exporters (Chilean Walnut Commission, 2016). It’s an additional sign that the walnut sector in Chile has managed to get consolidated successfully, putting priority on cooperation and unification for the positive image of the country brand. The sector has also benefited from strong governmental support and the ability to manage successfully public-private cooperation.

4.1.6. Image of Moldova’s Walnuts Abroad

In general Moldova is not well known in the world outside CIS countries. Even if people have heard about it, the first associations that come up are “poverty”, “corruption”, and “migration”. However, being the third largest EU supplier of walnuts after USA and Chile, Moldova does receive some attention from walnut consumers who want to make conscious decisions about the origin of products.

Unfortunately the author’s informal scan of consumer reviews in online shops in Germany has shown that there are repeated cases of negative feedback on walnuts from Moldova. The usual dissatisfaction from consumers is related to the fact that the nuts are not fresh any more, sometimes bitter, not as light and big as the ones from Chile, and sometimes too many broken pieces are found in a package claiming to provide halves. Several consumers claimed to never ever want to buy Moldovan walnuts again. Of course there are also many

positive reviews and appreciation stipulating that Moldovan walnuts are finally the ones with real taste compared to the industrial monoculture walnuts from California, as well as general notes of overall satisfaction. However, negative reviews have more power than the positive ones.

The complaints about lacking freshness of Moldovan walnuts can be traced to the fact that on average, Moldovan walnut kernels have a longer way to the final consumer than the ones from Chile or USA. In the case of walnut kernels collected from the local population, it can be days while the shelled product rests at a harvesters/growers home, and then several more days for collection, again a range of time for processing, sorting and packaging. Further, due to non-transparent and complex export procedures, trucks with Moldovan walnuts kernels sometimes spend quite a long time waiting for approval documents at the border. In order to preserve their taste and quality, walnuts can be stored up to 1 year at refrigerated temperature of 4°C, and about 2 years in a freezer (-18°C) (Bruhn et al., 2010). However, at room temperature, even in airtight containers, walnut kernels can start losing taste and becoming rancid after 4 weeks due to a high percentage of sensitive Omega-3 fats. Certainly, the way a trader in the country of consumption stores walnuts is also a very important factor affecting the product freshness, but this is beyond the influence of any national value chain intervention.

Actual and perceived quality is one aspect, while an actively developed branding and marketing is another equally important issue. In contrast to Chilean and Californian walnuts, Moldova doesn't have a recognized and respected walnut brand. It is yet to be developed, as happened already in case of "Wine of Moldova". Such a brand entails not just a nice logo, but also a lot of continuous underlying work on securing quality standards and managing a bold international appearance. The success of such an endeavor depends on significant investments and a strong cooperation among key actors in the sector.

4.2. The National Context of the Walnut Value Chain in Moldova

4.2.1. Current status of Moldova's Walnut Sector

Moldova has ideal climatic and soil conditions for the production of walnuts - it's within the 7% of the world territory that is suited best for the highest productivity of *Juglans regia* according to the National Walnut Growers' Association. Having at least one walnut tree for personal use at home in rural areas is ubiquitous in Moldova.

Under the Soviet system, walnuts lacked official recognition as a crop and production was not a strategic priority. Some plantations were scattered around settlements and road verges. Still, significant quantities of walnut trees were planted along many country roads in Moldova. The overall area of road plantations is estimated to be over 100,000 ha. The walnut varieties planted in the 50's were not genetically selected or well suited for commercial agricultural production, therefore, they have rather low yields of not more than 1 Tonne per ha. (World Bank, 2003). According to Oleg Tîrsîna, the president of the WGA, walnuts collected from these country roads still represent the most significant source of Moldovan walnut production. He estimates that in the 2018 harvesting season, the proportion of walnuts collected from the roads will fall down to 60% in contrast to 40% from industrial orchards.

In the middle of the 1990's the walnut sector started growing rapidly from a very low base. Due to a low labor force cost, it was possible to process walnuts manually with a much higher extraction rate of unbroken kernels than mechanized methods. In 1999 a so-called "Walnut Law" was adopted, which strongly supported expansion of industrial plantations and subsidized economic activities connected to walnut sector development. The preferential access to the EU market with no tariff duties boosted the export which led to fast development of the marketing and processing industry (World Bank, 2003).

Currently, walnuts are grown in orchards occupying 24,000 hectares, an area that has been consistently expanding (MIEPO, 2016). In 2017, yielding area of the orchards was 16,000 hectares according to the National Bureau of Statistics of Moldova. Average productivity varies from 2 to 3 Tonnes per hectare depending on the variety and climatic conditions. Walnut plantations have registered a rapid growth since the year 2000 from an area of 4,000 hectares and reaching an area of 24,000 hectares in 2014. Thus, the amount of exports grew from 39 Mio. US$ in 2007 to more than 100 Mio. US$ in 2014 (MIEPO, 2016) which

represented 1.5% of the GDP of 6.57 billion US$), and around 40% of the whole agricultural income of the country (UN Comtrade, 2017). In 2015 and 2016 the export amount grew, but due to a rapid global price fall, the overall export value has remained at ca. 100. Mio. US$.

The exports grew significantly since the mid-90s, as Figure 11 shows. It is important to note that Moldova is currently exporting mostly shelled walnuts. The 2017 export of walnuts in-shell was very small: 1,842 Tonnes (ANSA, 2018), which constitutes only about 1-2% of the whole export value. This fact is easily explained by strong investments in the processing industry in the past few years. But still, the amount of in-shell walnuts grew by 17% in comparison to 2016 and will be growing further, according to Oleg Tîrsîna, president of the WGA.

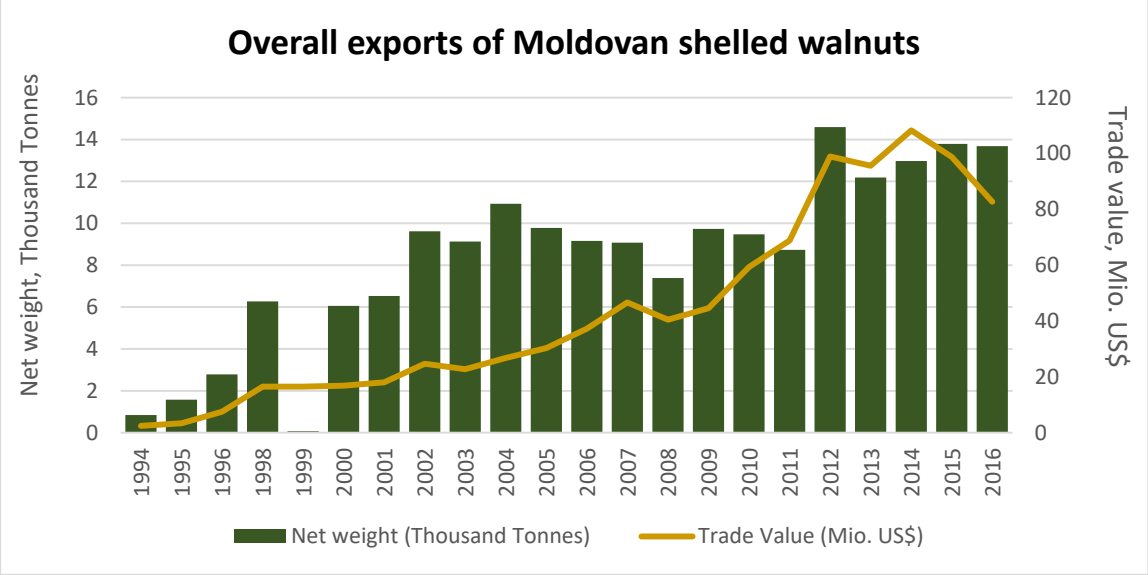

Figure 11 - Overall exports of Moldovan shelled walnuts 1994-2016
(Source: Own representation based on UN Comtrade, 2017)

The major destination for export of Moldovan walnut kernels is currently the European Union countries, taking up ca. 80% of the national export (UN Comtrade, 2017). There are proven trade relations between EU and Moldova in the walnut sector. The amount of Moldovan shelled walnuts exported to the EU grew significantly in the past 10 years, as Figure 12 illustrates. Currently, Moldova is supplying ca. 12 Thousand Tonnes of walnut kernel to the EU, which is only 13.3% of the EU import value ca. 90 Thousand Tonnes (USDA, 2017). The remaining import demand is covered mostly by USA and Chile.

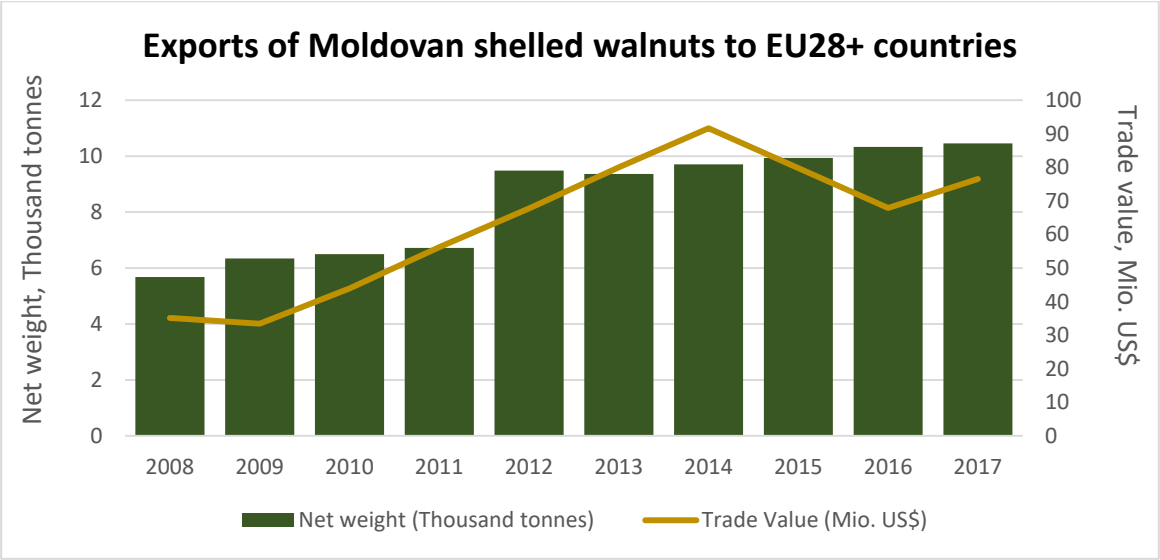

Figure 12 - EU 28+ imports of shelled walnuts from Moldova 2008-2017
(Source: Own representation based on Eurostat Comext, 2018*))*

In order to understand better the export relations to specific countries we can consult Figure 13, which visualizes the 9 most important export destinations for Moldovan walnuts in the past 10 years. The top countries have been selected by the cumulative net weight of exported walnuts for this period.

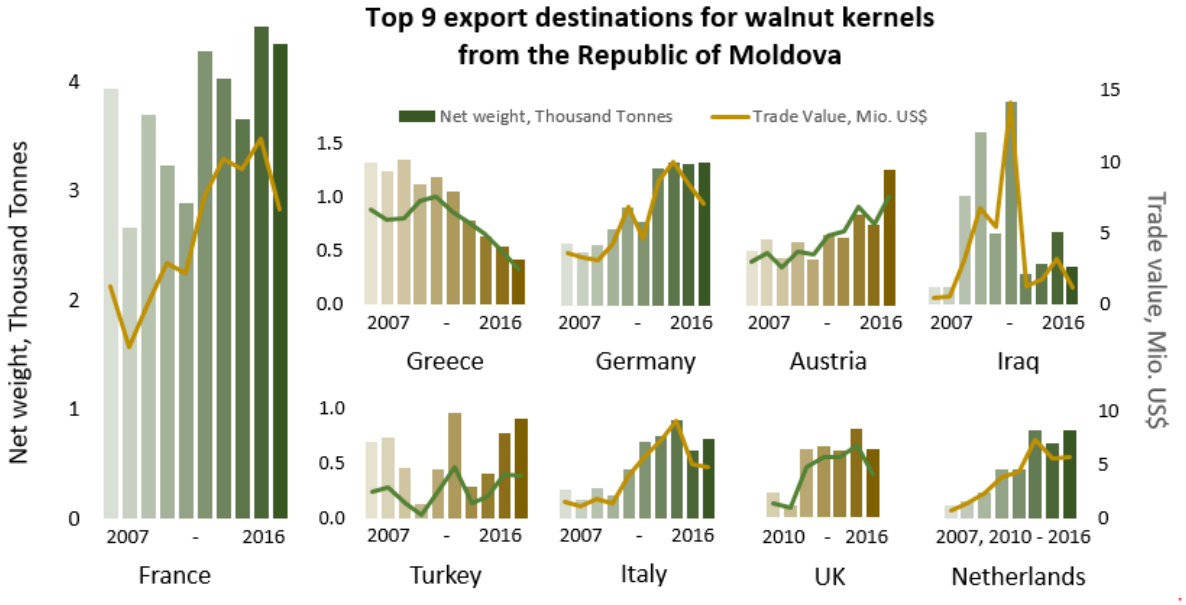

Figure 13 - Top 9 export destinations for walnut kernels from Moldova
(Source: own representation based on UN Comtrade 2017)

Figure 13 shows that France is the major export destination for Moldovan shelled walnuts. This can, to a large extent, be explained by the fact that Moldova imports French walnuts in shell, processes them and re-exports the shelled kernels. In 2017, for example, Moldova imported 2.57 Thousand Tonnes in-shell walnut from France with the overall value of 5.62

Mio € (Eurostat Comext, 2018). This represents ca 8% of the overall French walnut production (USDA, 2016). The second biggest export destination, Greece, has been on decline in the past 10 years due to the country's economic crisis, whereas Germany, Austria, Italy and Netherlands are growing exports markets. As the graph demonstrated through a visible relation of the Trade Value to the Net weight of exported kernels, Iraq and Turkey seem to pay lower prices for the shelled walnuts. An open question remains whether the exporters supply lower quality kernels to these countries or they just settle with lower prices due to lower export organization thresholds. The highest trade values in relation to the net weight can be observed in Germany and Austria. Also organic certification has been on the rise. Organic walnuts from Moldova can be found in German retail chains like "DM" and "Biocompany". In general Moldovan walnut quality is quite competitive, but a joint walnut brand like in the case of "Californian walnuts" is yet to be developed.

For the time being, processing and organic certification are the main value added-activities in the Moldovan walnut sector. Unfortunately, official data on cumulative organic walnut production and export is not available. The national registry of organically certified producers lists 16 walnut growers with the total area of 427 ha. It's important to note that only 91 ha are fully certified as organic, while the remaining 78% are all still in conversion. This also implies that most of these orchards are young and not bearing yet. The areas registered at the MARDM list make up to a small part of the overall organic plantations because they are mostly represented by small and medium farmers. The stakeholders with large industrial organically certified plantations are usually the ones who have vertically integrated adding processing and export into their value chains. These large companies get certified externally in order to be able to export predominantly to the European markets. Throughout the study it was not possible to collect the complete set of data, since only half of these firms and only a small number of international certification bodies revealed exact numbers on certified areas. Based on these numbers and other information available on the large firm and a logical extrapolation, we assume that the area of externally certified organic orchards in Moldova constitutes not less than 2,000 ha.

Apart from the growing area, only vague estimates of production volumes by different industry players and organizations exist. One large producer and exporter has given a very conservative estimate in their interview, saying that organic walnut exports are about 1-2% of the overall volume, which would mean not more than 300 Tonnes. The International

Centre for Organic Agriculture of Central and Eastern Europe - EkoConnect (2011) presents a figure of 4,414 Tonnes of kernel export for 2010 in its report on the organic sector in Moldova. A report on the greening of agriculture states that in 2014 Moldova exported to Germany alone ca. 962 Tonnes of shelled walnuts from organic orchards, and those in conversion with the overall trade value of ca. 4.2 Mio. € (UNDP / GEF, 2014). Based on data collected from international certification bodies, MARDE estimates the volume of organically certified walnut exports in 2017 to be 5,274.8 Tonnes in-shell and 1,576.6 Tonnes of kernel.

The value added products like walnut oil currently play a less significant role in Moldovan export. For example, Prometeu-T company produces walnut oil, but in comparatively small quantities. According to the director of the company, there are not enough walnuts for oil production, and if he does find more walnuts for export, he prefers to sell them as kernels due to high demand and established commercial relations. Still, if stable trade relations for walnut oil export were established, this product could represent a strong income potential since the retail price for organic walnut oil in different size bottles ranges from 40 to 60 € per Liter. Example cases of exported walnut flower or pre-packed and branded walnut trail mix have not yet been identified in Moldova.

4.2.2. Organic Agriculture in Moldova

As demonstrated in chapter 4.1.4.1 the worldwide market for organic products has grown rapidly in the past decade offering higher revenues to certified producers. Moldova, as many other countries that rely to a significant extent on agriculture, recognizes this global trend and tries to adapt to it in order to create necessary conditions to tackle problems related to conventional agriculture, as well as to increase its exports to established markets and penetrate the new ones. Due to a very small and underdeveloped domestic organic market, most activities in organic agriculture are oriented towards export. Still, there is a long way to go in order to give organic agriculture a more prominent place in the sector. According to the MARDE, the surface allocated to agriculture is about 65% (around 22,000 km^2), most of which (19,000 km^2) is currently in use. At the moment, only 300.72 km^2 or 30,072 ha are certified as organic, which represents 1.58% of the total area in use.

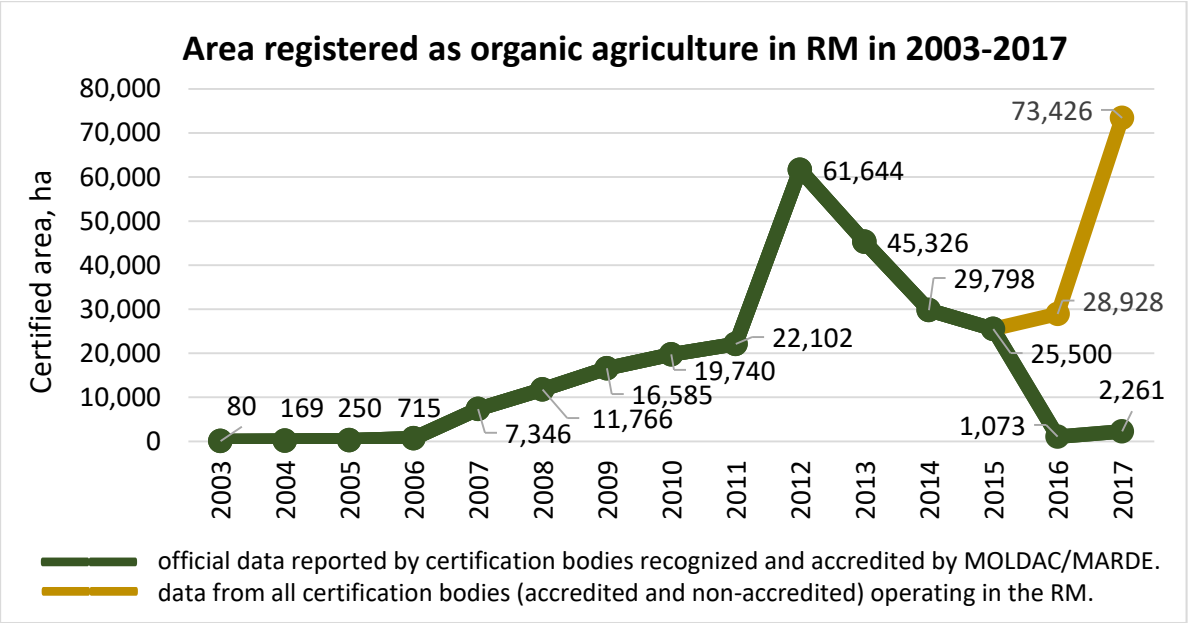

Figure 14 - Area registered as organic agriculture in the Republic of Moldova (Source: MARDE 2017)

Out of 30,072 ha, 22,026 ha (73%) are already certified as organic and 8,747 ha (27%) are under conversion. The apparent graph drop is not a real reflection of the situation. In fact, the overall area of organically certified production has increased. Because of the problems with acceptance of equivalence of Moldovan organic certification, a lot of enterprises don't register their lands in the national system and get certified by international organizations, whose certificates are recognized in the EU. Unfortunately, MARDE does not have access to the data of the externally certified areas and only collects voluntarily disclosed numbers.

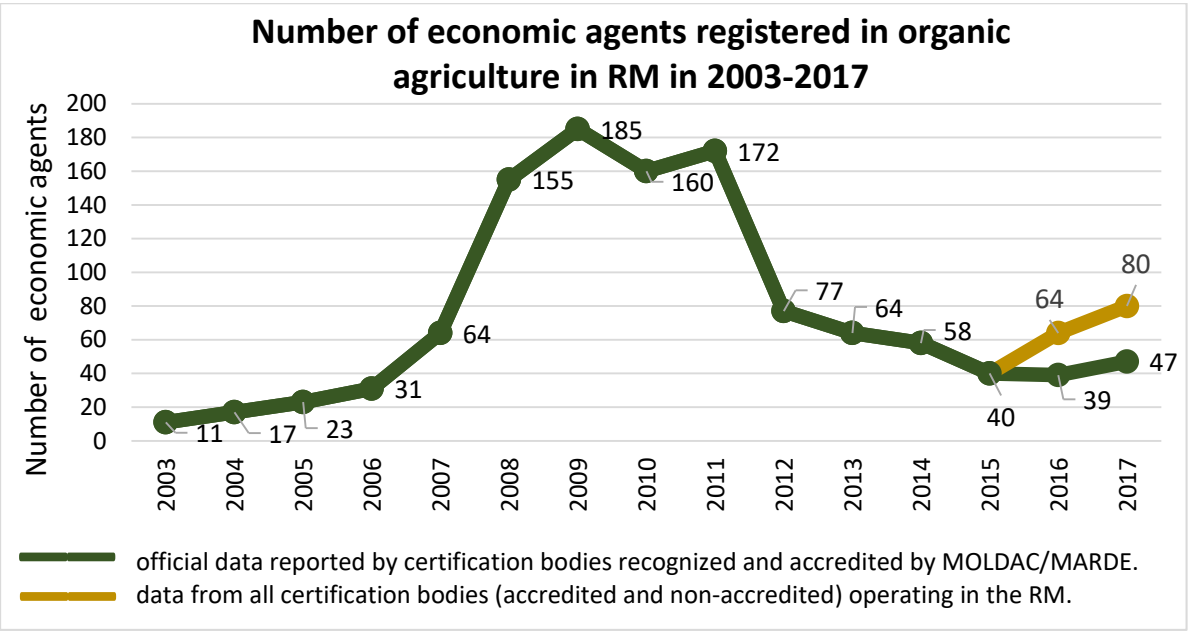

Figure 15 - Number of economic agents registered in organic agriculture in Moldova (Source: MARDE 2017)

Since accredited private certification bodies started certifying Moldovan producers in 2003, the amount of economic agents under the national organic label has grown rapidly. The diminution of the number of economic agents around 2012 happened due to the fact that many small enterprises went out of business or merged - in general there is a tendency of concentration in this regard. Also, the loss of equivalence recognition of the Moldovan organic certificate in the EU has played its role as with the cultivation area.

Nevertheless, for the upcoming years, it is expected that Moldovan organic agriculture sector will grow. The National Agriculture and Rural Development Strategy 2014-2020 recognizes the importance of environmentally friendly agriculture management, by setting "Sustainable Management of Natural Resources" as the second out of its three strategic priorities. The Strategy includes three supporting measures:

- Measure 2.1. Support for the land and water management practices, including land consolidation, crop rotation, irrigation systems and equipment;
- Measure 2.2. Support for environmentally-friendly production technologies and approaches, including organic farming, biofuels, and reforestation of eroded land;
- Measure 2.3. Support for adaptation and mitigation of climate change risks.

The overall Strategy foresees an allocation of around 30% of total available financial resources to "Sustainable Management of Natural Resources". Under this strategic priority Measure 2.1 receives 20%, and the other two – 5% each.

The following table summarizes opportunities for receiving subsidies under the above mentioned strategy:

Table 8 - Amount of subsidies in organic agriculture

Crop type	**Payments per 1 ha of land under conversion in 2016-2017**		
	1st year	2nd year	3rd year
Orchards and vineyards	1500 MDL / 71.42 €	2000 MDL / 95.23 €	2500 MDL / 119.04 €
Medicinal and aromatic plants	1300 MDL / 61.90 €	1600 MDL / 76.19 €	
Vegetables	1500 MDL / 71.42 €	2000 MDL / 95.23 €	
Field crops	800 MDL / 38.09 €	1000 MDL / 47.61 €	

(Source: MARDE 2017)

A significant problem with accessing these subsidies is that in order to be eligible for this particular support, farmers must be certified by a certification body accredited by MOLDAC/MARDE. There are currently two such bodies “Certificat Eco” SRL and “Bio Cert Tradiţional” SRL. As described above, a large number of Moldovan organic farmers who mostly produce for export have shifted to certification by international certification bodies because the national organic label has no use for the export. The foreign certification bodies, in turn, are unfortunately not recognized by MOLDAC / MARDE and therefore, farmers contracting these international services have no access to the national subsidies.

According to Marcela Stahi, head of the Service for Organic Production and Products with a Designation of Origin at MARDE, the short-term solution would be for one of the Moldovan certification bodies to request recognition for the equivalence from the European Commission. However, this is a long process that involves a risky investment of human and financial resources that neither “Certificat Eco” SRL nor „Bio Cert Tradiţional” SRL is willing to assume. Especially since European legislation is changing again in 2021 resulting in ending the system of equivalence recognition and introducing the obligatory conformity to European standards, this risky investment doesn’t look attractive. The long-term solution for many problems of the organic agriculture sector is the final transposition of EU legislation and ensuring its rigorous implementation.

4.2.3. Institutional Framework

4.2.3.1. The Law on Nut Crops and Related Taxes

The Law on Nut Crops (No. 658 of 29.10.1999) sometimes referred to as “the Walnut Law” based on its initial name was adopted in order to foster development of the nut crop sector with the major focus on the production steps of the value chain. The law established a Nut Development Fund that was sourced from the newly instituted export tax of 1%. The endowment of the fund was meant for the following types of activities:

a) Maintaining and developing the walnut genetic fund - 10%;
b) Production of nursery propagation and planting material grafted in nurseries and development of their technical and material basis - 50%;
c) Establishment and maintenance of industrial walnut orchards until the bearing stage - 35%;

d) Promoting the development of walnuts (elaboration of normative and technical acts, editing of didactic-methodical materials, support of propagation activities of advanced technical and scientific achievements, etc.) - 5%.

In 2007 the export tax was raised to 1.5% in order to finance activities under the National Program for Development of Nut Crops instituted by the Governmental Decision No. 8 of 03.01.2006. According to the program goals, the surface of walnut and almond plantations should be increased by at least 14,000 and 10,000 ha until 2020. Furthermore, scientific center for research and development of nut crops was established. Later in that same year, a national council for coordination of activities promoting nut crops was instituted and entrusted with the tasks similar to the ones of the Californian and Chilean Walnut boards.

Unfortunately, in 2009 with change in power, the National Council and the Nut Crop Research Center were closed, the Nut Development Fund was dissolved while the collected export tax merged into the general state budget. There was dissatisfaction with how the institutions and the funds were managed, but the reasons for this complete dissolution remain controversial involving rivaling party politics.

In autumn 2013 the fiscal code has instituted a new tax of 2% at the source of payment for acquisition of agricultural products from private individuals. This had a direct effect on the exports since a big part of the walnuts they process and export are collected from the local population. Exporters complained about the double tax pressure and argued that the old export tax of 1.5% was against WTO principles. During the presidency of Iurie Leanca, the export tax together with the whole Chapter V of the Law dedicated to the Nut Development Fund was abrogated on 16.04.14.

Since then, the tax for acquisition of agricultural products from private individuals has been raised to 5% and an increase to 7% is currently being discussed. In neighboring countries, such a tax doesn't exist. Taking into consideration the fact that acquisition of raw material from the local population entails about 10-15% waste fraction, a 7% tax will quickly result in an 8-9% payout for the net weight of marketable walnuts. Processors and exporters are very dissatisfied with this development because this puts even more pressure on their operations. Dumitru Vicol, the CEO of a large producing, processing and exporting company „Monicol" says that such a high tax in Moldova could lead to a drop in exports and might

drive the local population to sell their walnuts to Romanian and Ukrainian operators who could offer better prices.

4.2.3.2. Legal Framework for Organic Agriculture

The first step to build organic agriculture into the national legal framework was the Government Decision no. 863 in 2000 which approved the National Concept of Organic Agriculture, Manufacturing and Marketing of Environmentally Friendly and Genetically Unmodified Products, followed by Law no. 115 from 09.06.2005 on organic agri-food production (Monitorul Oficial, 2005). This law has enabled private control for organic agriculture, accredited in the EN 17065 system and authorized by the Ministry of Agriculture and Food Industry (MAFI). This ensured a monitoring system harmonized with the requirements of the EU at that time.

The following legal acts govern the context of the organic Agriculture in Moldova:

- Law No. 115 of 09/06/2005 on organic food production
- GD No. 149 of 10/02/2006 on the implementation of law on organic food production
- GD No. 1078 of 22.09.2008 on adoption of technical regulation on organic food production and organic food labeling
- MAFI Regulation No. 179 of 10.09.2008 on rules of bookkeeping of Land history records
- MAFI Regulation No. 9 of 19/01/2010 on establishment of the commission authorizing Inspection and Certification Bodies
- MAFI Regulation No. 16 of 05/02/2010 on rules of registration of companies manufacturing organic food
- Law 26 of 24.02.2011 regarding modification to the Law 115/2005 for harmonization the Moldovan legal framework with the new changes in EU regulations.
- GD No. 884 of 22.10.2014 for approving of the regulation regarding use of the national label „Ecological Agriculture – Republic of Moldova";

At the same time, the EU legal framework on Organic Agriculture has been changing in a more dynamic manner to which the Moldovan legislation has not been able to adapt due to various factors, including extremely limited human resource base at the responsible

authority - Ministry of Agriculture, Regional Development and Environment (MARDE). Therefore, currently there is a large gap between the current EU legislation and the Moldovan legal base. In 2016 the Ministry of Agriculture and Food Industry reported a 40% level of harmonization. Some examples of missing elements are regulation of exemptions, regulation of authorization of use of certain products and substances allowed in organic agriculture, provisions assuring control mechanisms to equivalently efficient as in the EU framework, etc. At the moment the core document regulating organic production and labeling in Moldova (Law nr. 115-XVI from 09.06.2005 on organic farming) does not include the latest amendments to the European Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labeling of organic products and repealing Regulation (EEC) No 2092/91. It also fails to include the Regulation (EC) No 1235/2008 of 8 December 2008 laying down detailed rules for the application of Council Regulation EC) No 834/2007 regarding the import arrangements for organic products from third countries. Even though some parts of the new European regulations have been reflected in the newer legislative acts from 2009 and 2011 there is a strong need for a complete transposition into one coherent law, and not in several subordinated legislative documents. Hence, a draft of a new law on organic agri-food production and labeling of organic products from 28.06.2017 with the goal of implementing art. 68 from the Association Agreement between EU and Moldova has been presented for public consultations in September 2017. The current plan at the MARDE is to finalize the elaboration and passing of fully harmonized legislation by the end of 2019 with the support of the Czech Development Agency / People in Need Moldova.

4.2.3.3. National Subsidies

State subsidies cover only 3% of the capital demand in the agri-food sector (Moroz et al., 2015), which stands in a strong contrast to much higher numbers in countries of the European Union. Still, they represent an important factor enabling entrepreneurs to make the decision to engage in agriculture. The subsidies are channeled through the governmental Agency of Interventions and Payments for Agriculture (AIPA) subordinated to MARDE. The allocation of resources is aimed at achieving general and specific objectives established in the National Strategy for Agricultural and Rural Development 2014-2020, Government Decision No. 409 of June 4, 2014, as well as the Financing Agreement between

the Republic of Moldova and the European Commission on the implementation of the ENPARD Moldova - support for agriculture and rural development, approved by the Parliament Decision no. 177 of 22 October 2015. In 2018 the overall amount of state subsidies amounts to 900 Mio. MDL or an equivalent of 45 Mio. €. AIPA supports a very wide range of activities that can be summarized in the following overarching measures:

1. Investment in agricultural holdings for restructuring and adaptation to European Union standards
2. Investments in the processing and marketing of agricultural products
3. Trainings for the implementation of the actions related to the environment and the rural space
4. Improvement and development of the rural infrastructure
5. Consultancy and training services

Currently the national subsidies for initiation of walnut orchards constitute 18,000 MDL (equivalent of 900 €) per ha. Investments per hectare for set up of new orchards vary from 1,000 to 3,000€ depending on walnut varieties as well as technical standards, and complexity of plantations (price for the land is not included). Thus, this state support is crucial for the sector's development. Many small farmers attempt to make investments in 0,5-5 ha of walnut orchards (UAPCN - Union of Nut Growers' Associations of RM, 2017). From the point of view of inclusive value chains, the problem of accessing the subsidies by the small farmers lies in overcoming certain bureaucratic and investment obstacles. For a small plantation, the transaction costs of sourcing the information and completing all registration procedures as well as the proportion of fixed costs for officially recognized operations are too high.

In organic agriculture there are also specially designated subsidies as mentioned in chapter 4.3.2. For walnut orchards they amount to 1,500 MDL (71.42 €) in the 1st year, 2,000 MDL (95.23 €) in the 2nd year and 2,500 MDL (119.04 €) in the third year of conversion. It becomes clear that such a low amount of subsidies is not attractive enough and often not worth the effort for large walnut enterprises that are oriented towards exports. Organic walnut production is completely oriented towards the European market. Therefore, these large companies don't pursue the national organic label. Still, a range of smaller and medium walnut producers with areas ranging from 8 to 30 ha (only one with 3 ha and one with 88

ha) do hold national organic certification, according to (MARDE, 2018), and apply for the respective subsidies.

4.2.3.4. Access to Finance and Existing Support Programs

Bank loans represent an important source of financing to the agricultural sector covering about 30% of the capital demand. However, interest rates (15-20%) and collateral requirements are excessive and hardly accessible to very small farmers. Besides, there is an insufficient supply of long-term loans (over 3 years) that are crucial for funding of perennial plantations and post-harvest equipment. Also, low poorly developed instruments to facilitate access to finance is a problem – there are not or very limited loan guarantee funds, and interest subsidies. (Moroz et al., 2015). To tackle these problems, multiple support programs have been set up that are aimed at fueling the agricultural sector in the Republic of Moldova. The governmental financing web-site www.finantare.gov.md provides quite a long list, which does not claim to be exhaustive. Several examples are described below in this chapter.

One of the key support programs in this sector is Moldova Agriculture Competitiveness Project (MAC-P) implemented with the financial support of the World Bank, the Swedish Government, the Global Environmental Facility and the Government of the Republic of Moldova. It's main objective is to "enhance the competitiveness of the country's agro-food sector by supporting the modernization of the food safety management system, facilitating market access for farmers, and mainstreaming agro-environmental and sustainable land management practices" (World Bank, 2018). It is under implementation since May 1, 2012 and is scheduled to run unil June 30, 2019. The project consists of the following 5 components:

1. Enhancing food safety management (by improving capacity of the sector and ensuring regulatory harmoziation with EU) - 11.80 Mio. US$;
2. Enhancing market access potential (especially for value added horticultural products) - 38.34 Mio. US$;
3. Enhancing land productivity through sustainable land management - 9.00 Mio. US$
4. Project management (supporing integration of the costs and procedures across various government agencies) – 2.60 Mio. US$;

5. Compensatory sales support grants (for those who suffered from trade restrictions in 2014) – 6.80 Mio. US$;

Another important program to mention is the Inclusive Rural Economic & Climate Resilience Programme (IFAD VI) by the International Fund for Agricultural Development (IFAD). It aimes at supporting poor rural entrepreneurs to grow their incomes and increase resilience. The program operates from 2014 until 2020 providing a mix of financial instruments from IFAD, DANIDA and GEF amounting to 16.1 Mio. US$ in loans and ca. 10 Mio. US$ in grants. The program consists of the following components:

1. Climate change resilience and inclusive value chain development:
2. Inclusive rural financing and capacity development
3. Development of economic infrastructure for rural resilience and growth

Under the 1st component, investment grants are provided to enhance the capacity of agricultural enterprises to adapt to climate change.

Another large project initiated in 2016 is the “Fruit Garden of Moldova” (Livada Moldovei, 2018). It manages a fund of 120 Mio. € formed from the resources of the European Investment Bank and provides medium to long term finance in the form of preferential leasing and low interest rate credits to private and public sector operators in the horticultural sector (wine, nuts, berries and table grapes). Project objectives:

- Developing holistically the entire horticulture value chain;
- Improving the quality of the fresh and processed horticulture products, from the nurseries to the final packaging and dispatch of products;
- Reducing the losses along the horticulture value chain by providing a safe and reliable environment for the produce;
- Diversifying the country’s export markets by ensuring that large quantities of consistent quality produce are made available to the customers.

The project offers loans requiring 50% own contribution for post-harvest infrastructure, planting, replanting and/or restructuring orchards including associated nurseries, and investments for processing plants and related industries as well as laboratories, education, training and development of food security. In 2016-2017 alone, with the credit line of the ”Livada Moldovei”, 545.27 ha of walnut orchards were planted in Moldova with a total credit of 286,755.77 €.

Through the support of the Czech Republic Development Cooperation, the People in Need Moldova is currently implementing a project aimed at institutional support within organic farming in the Republic of Moldova. It's main purpose is to increase the capacity, the transparency and the credibility of state institutions in the field of organic farming in the Republic of Moldova. The implementation period is June 2017 – June 2021 and the overall cost 1,590,000 CZK, which is equivalent to ca. 62,400 € The project is implemented in close collaboration with the MARDE and is aiming to produce the following results:

1. Reinforced institutional structure in the field of organic farming
2. Operational system for unified approval of inputs to organic farming
3. Strengthened competency of local laboratory in the field of organic farming
4. Established system for recommendation of organic agro-technological procedures, species and varieties

So far there has been no comprehensive systematic impact evaluation of the agricultural support programs at the state level in Moldova. It is difficult to say how effective they are and which percentage of capital demand they cover. Despite a variety of supportive mechanisms it seems that there are still significant bottlenecks in the whole system. For example one middle-size farmer confessed, she had to take credit with a 16% interest rate for 10 years in order to invest in her organic walnut orchard of ca 20 ha. Most of those interviewed mentioned that the existing support programs are not sufficient. Some said they were hard to access due to the lack of transparency and high bureaucracy, especially for the smallest producers without education and experience with such paperwork. Other key-informants stated that the allocated funds are limited and at times distributed through corrupt schemes. At the same time, administrators of large support funds complain about the lack of qualitative applications and a low absorption capacity for support in the country.

4.2.4. Value Chain Map and Price Formation

Figure 17 sketches a possible view on the Value Chain of walnuts in Moldova. It distinguishes between value chain streams that are oriented towards the domestic market and towards the export market. In this thesis, export oriented value chain component is examined, since it is considerably larger than the domestic one and has stronger influences on livelihoods of the vulnerable rural populations.

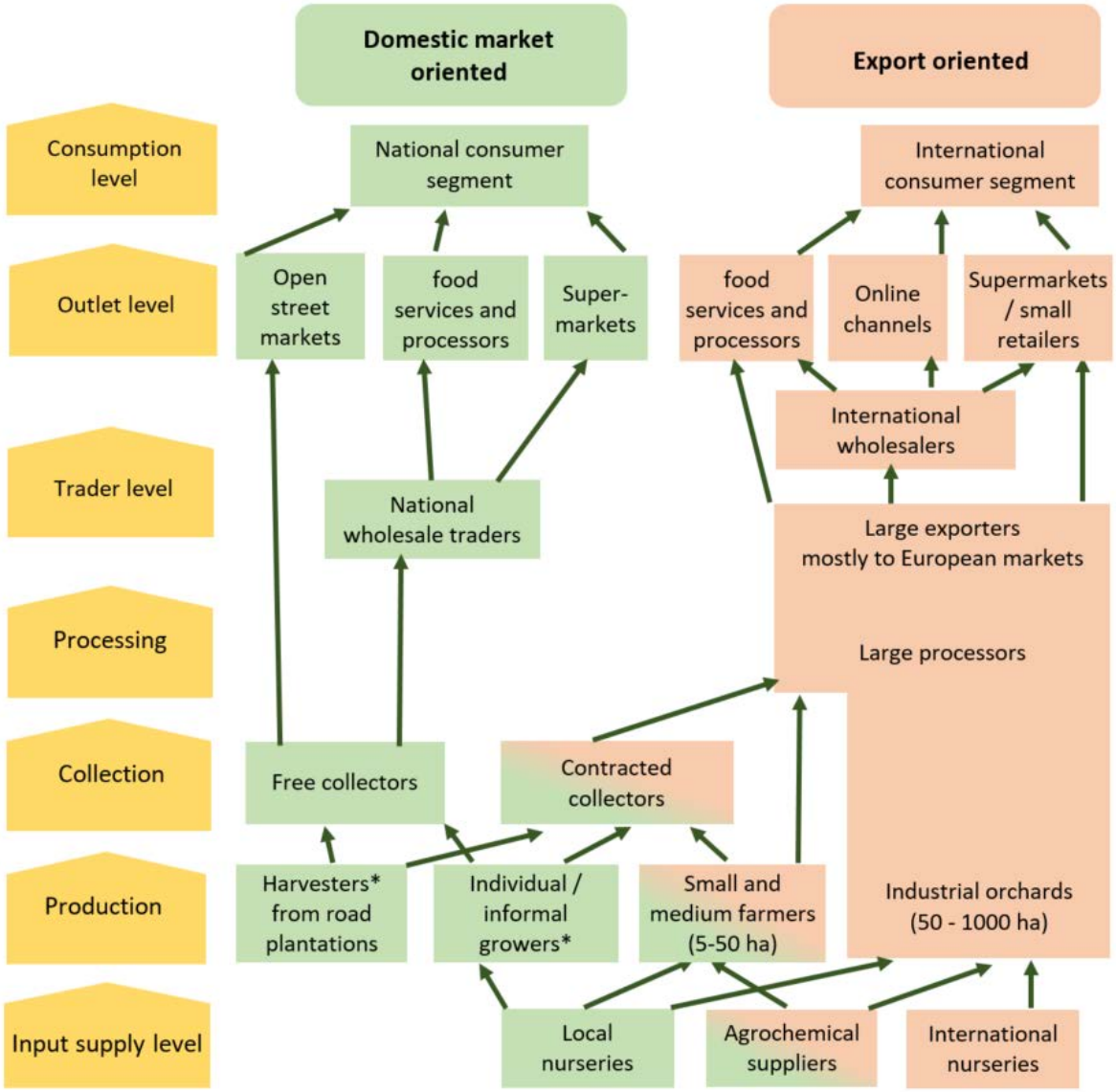

Figure 16 - Value Chain map of the Moldovan walnut sector (Source: own representation)

*Harvesters from road plantations as well as individual / informal growers often try to add value to their walnuts by selling them already shelled. Current level of hand labor remuneration still allows this to be economically competitive.

Although the world market price fell in 2015, walnuts still remain a product with relatively attractive margins in international trade. In an attempt to trace value addition from the first step of the value chain we examine the steps in price formation through to the final product. The purchase price of walnut kernel collected from the local populations ranges from 3.5 to 5.5€ per kg with lowest price for broken dark ember quarters and the highest for the very best quality light halves. The selling price on the domestic market for such premium walnuts can reach up to 180 MDL or even 200 MDL per kg, and equivalent of 9-10€. The selling price of walnut kernel to international wholesalers is 5-10€ per kg depending on the quality and characteristics. In the case of organic walnuts, the value is usually at the higher end of this range. An organic producer shared their operational numbers: A typical export cargo truck is transporting 20 Tonnes of walnut kernel. One such truck with organic walnuts brings around 183,000 € revenue. Thus, the value of one Tonne sold to a European wholesaler amounts to 9,150 €. Walnut in-shell is purchased from the local population at 1.5€ EUR per kg and exported for about 2-3€ per kg. The following figure visualizes the price formation components for walnut kernel until export.

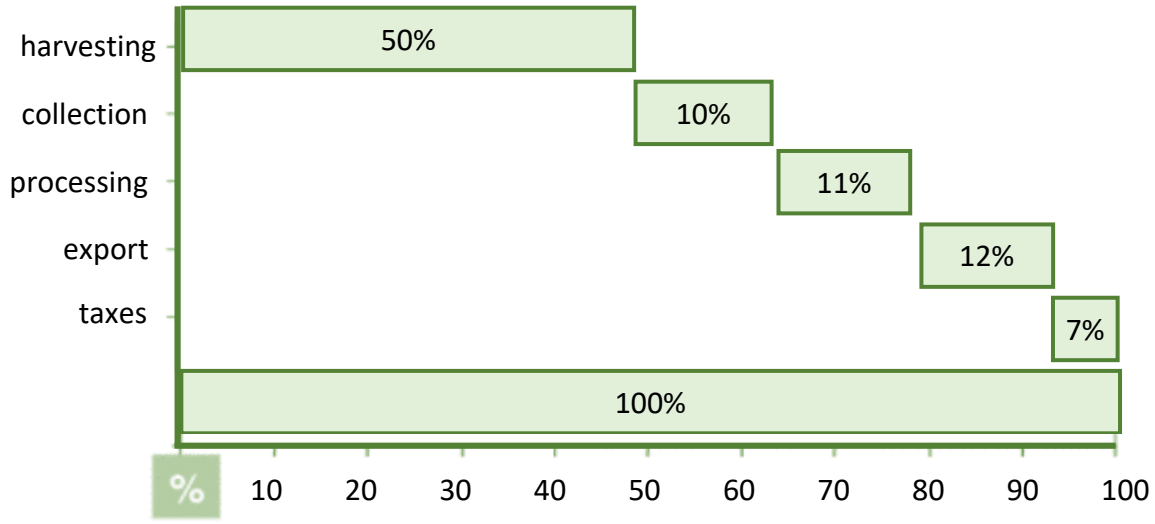

Figure 17 - Steps in price formation along the value chain
(Source: Updated and adapted based on Brînza, 2009)

What happens with the walnut price after export to the destination country? The final consumer price usually at least doubles if not even triples. German small and middle range wholesalers, for example, offer Moldovan organic walnuts for 14-15€ per kg in 10-20 kg packages. The retail prices for organic walnuts in the German and UK markets vary from 19 to 34 € per kg. The cheapest are small retail packages (150 g) for large supermarket chains (Alnatura and DM) or larger retail packages of semi-formal online traders. The most

expensive are small packages of online retail traders operating in special niches (vegan, raw, extra healthy) and of premium brands like Rapunzel. Annex 3 shows a list of organic options available to German and UK consumers. This means that packaging and application of a brand along with all the local taxes seem to influence the final consumer price significantly.

4.2.5. Stakeholders: interests, influence and inter-linkages

Nurseries

There are currently 6 nurseries operating in the Republic of Moldova. Most of them supply local varieties of walnuts (e.g. Pescianschii, Costiujeni, Chisinau, Cazacu, Cogâlniceanu), while some started diversifying their assortment with imported varieties. The largest nurseries are "AMG-Kernel", Soroca; "Gospodarul Rediu", Rediu de Sus, Fălești and "Pepiniera Voinești", Voinești. The smaller ones are "Mihai Conoval", Florești; "Gavrilița Ion", Drochia; "Bobeiko Vasile", com. Zaim, Căușeni. "Pomul Regal" is an importer and distributor of French and American varieties: Fernor, Franquette, Fernette and Chandler. Several firms also export to Romania and CSI countries. Nurseries also sometimes provide consultancy services and technical help in initiation of and care for orchards. The main interest of the nurseries is scientific support for better walnut varieties and pushing the demand for new plantations.

Harvesters

This is the poorest and the most vulnerable type of stakeholder in the walnut value chain. They usually do not own any plantations, but rely on the common pool resources under open access regime. They harvest walnuts from plantations along the roads, and wind protection strips, which usually belong to the national state or the respective territorial unit. The problem the harvesters face is insecurity in access to the harvest, chaotic competition and mostly lack of institutional organization that lead to premature harvesting of walnuts and damaging the trees. Early harvesting causes significant quality losses of the final product and negatively influences the country's image in case of export. Some harvesters crack the walnuts themselves to add value before selling to collectors. The main interest of the harvesters is security in accessing the trees and good, stable prices for their product.

Individual and informal growers (up to 5 ha)

This is a category of walnut growers who sometimes operate without documents or official registration. In this case they also cannot access state subsidies that require official documents including a planting "project". These growers usually rely on walnut seedling from local nurseries or even wild walnut varieties. They supply their products either to national wholesalers for national retail or to collectors that consolidate harvests for big processors. The main interests of individual and informal growers are also good and stable prices, but also support in managing their plantations.

Small and Medium farmers (5-50 ha)

The majority of small and medium farmers operate on landholdings ranging between 5 and 10 ha. Those who pursue organic certification usually have larger plots. Some of the farmers adopt a legal form of "Gospodaria Țărănească" which is the simplest institutional form for operations in agriculture. It is an individual enterprise with relatively low taxes (only 7% for taxable income), and easier fiscal procedures, but with some limitations related to size and risk responsibility as well as access to finance. Others select a legal form of a limited liability company ("Societate cu Răspundere Limitată" – SRL) that implies a more complex fiscal administration procedure and higher taxes, but in the end a larger growth potential, limited responsibility and a higher credibility for access to finance. This category of farmer often tries to access national subsidies for general or organic agriculture. They usually cannot afford international organic certification and are interested in finding ways to reduce these costs. Other main interests of this category are access to agricultural inputs (plant protection measures and fertilizers) and search for more cost-efficient sales channels.

Large industrial growers

Companies operating in this category own plantations from 50 and up to 3000 ha, with the majority ranging between 100 and 1000 ha. These are 10-20 economic agents that were able to make significant investments due to foreign capital or prior financial status. A part of these industrial orchards are set up with the imported walnut varieties like Fernor, Franquette and Chandler, recognized and demanded on the European market. One large industrial grower who made significant investments in the mid 2000's was unlucky with under developed local varieties or bad consulting and has recently re-grafted his almost 10-year old trees with imported varieties to increase yields. A large part of industrial growers are big enough to afford international organic certification, which is a prerequisite for

export to organic markets in the EU. In this case they often don't bother getting a national organic certificate needed to access national subsidies in organic agriculture. The main interest of this category is protection of the orchards as well as investments in further steps in the value chain. This category is also relies heavily on employed labor and are seeking stable and quality workers in rural areas, which is also a challenge.

Collectors

This category is represented by usually small enterprises or individuals who go from village to village in their region of responsibility and collect walnuts from the local population – either from road harvesters or individuals having one or a few trees in their gardens, or from very small informal growers. Collectors take both shelled and in-shell walnuts, but in the recent years it has become more common to collect kernel, since it's the only instrument for immediate quality control in conditions of chaotic and premature harvesting.

Processors

Processors are usually relatively large companies that invested in costly processing equipment and facilities. Such equipment involves cracking, calibration, vibration for removing of residuals, belt conveyors for cleaning and sorting, photo-separators to differentiate structure and color, drying, cooling, etc. Many of them still use manual labor for at least 10% of the cracking and sorting to ensure high yield of light halves. Of course, uniform industrial varieties are preferred for processing, but also non-uniform walnuts acquired from harvesters can be handled. For such walnuts collected from the road plantations, the yield of the kernel is about 25-30% - far from the 40-50% expected from industrial orchards. This category is mostly concerned with finding sufficient and good quality raw material supply as well as financial resources for more efficient and modern equipment. The organic processors among them are concerned with maintaining their international certificates. Processors are also highly relying on employed labor and are in need of stable and quality workers in rural areas, which represents a big challenge.

Exporters

The number of exporting companies grew and fluctuated in recent years, but in 2017 the customs service reported 20-25 companies (IPN, 2018). Most large Exporters are usually companies that have successfully implemented vertical integration throughout the value chain and are producing and processing their own walnuts. Additionally, many of them buy

walnuts in-shell or kernels from harvesters and collectors and process them. Most exporters have one or more collection points located in different strategic locations in their collection regions. There collectors and harvesters trade the nut harvest. Some of the exporters sign supply contracts with different collectors before the start of the collection season in October – November and in some cases even provide them pre-financing for acquisition of walnuts from the general population. The main exporters comply with the requirements of international product safety while some of them also add value through organic certification. Here are a few key exporters known in the market.

- Conventional or partially organic walnuts: “Fundatia Prod”, “Prometeu-T”, “AMG-Group Kernel”, “Reforma Natural Fruit and Nuts”, “Bignuts”, etc.
- Mostly organic Walnuts: “Monicol”, “Irida”, “Fernuci”, “Nutsi International”, “Maestro-Nut”, “Minunata Xenia”, “Nova Nut”, etc.

The exporters as the last step in the national value chain are mostly concerned with maintaining quality, their image on the international markets and of course establishing long-term relations with international clients on beneficial terms. They are also very interested in lowering state bureaucracy regarding exports.

Sector Associations

Union of Nut Crops Growers’ Associations (Uniunea Asociaţiilor Producătorilor de Culturi Nucifere - UAPCN) or shortly called „Walnut Growers’ Association” (WGA) was created in 2006. The founding members were 28 newly formed rayonal (district) associations of producers of walnuts and other nut crops. The launch of the association is, to a large extent, attributed to efforts of Alexandru Jolondcovschi, former vice-minister of Environment to promote the walnuts as a commercial crop. Currently about 180 individual growers or growers’ groups are members of WGA. The association has offered a great deal of consultancy to farmers, especially for initiating new plantations. Currently the WGA is headed by a young nurseryman Oleg Tîrsîna and is organizing annual conferences mostly focused on the newest technological developments and sharing knowledge in production. The Association finances its work from membership fees, which are relatively low and hard to collect. Having very few financial and human resources it operates mostly on a voluntary basis and on quite a low flame in comparison to sectorial associations of countries with more developed industries. Nevertheless, WGA has ambitious plans, one of them being creation of a national walnut brand for successful export representation. The main interest

of the association is growing stronger through institutional support and delivering more impact in the sector as well as attracting a larger proportion of stakeholders into its membership sector. There were attempts to create an Association of Walnut Exporters for Moldova but the large firms did not find enough time and motivation to associate themselves. Some exporters became members of the existing association Moldova Fruct.

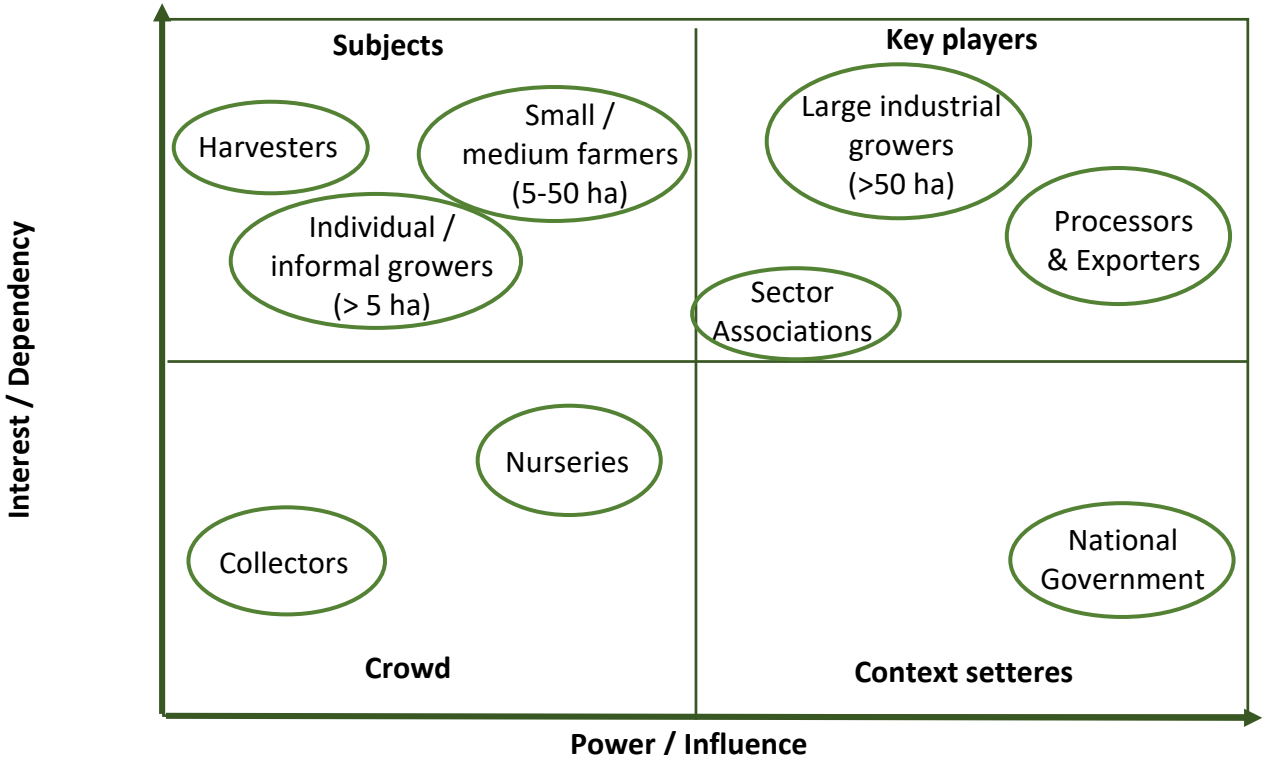

Figure 18 - Interest/Power grid featuring key stakeholders of the walnut Value Chain (Source: own conclusions, based on the research)

The Interest / Power grid makes clear that companies with high capital endowment have the largest impact and a very high interest in success of the value chain. This is one of the reasons most of them try to implement full vertical integration. The most vulnerable and least powerful actors are harvesters, followed by individual / informal growers and small /medium farmers. Nurseries are less dependent on the national value chain because they can also export to neighboring countries and the demand for their product is growing. Collectors have almost no power, but also less interest than farmers, as they have not done any significant investments in orchards and infrastructure.

The actor-linkages matrix in Table 10 visualizes relationships between key VC stakeholders and rates these links according to relevance from 1 (weakest) to 5 (strongest). It helps to better understand influences and dependencies across the value chain. The strongest cooperation / dependency links in the value chain are between Collectors and harvesters or

individual/informal growers. While processors are also very dependent on collectors they are trying to shift increasingly to large industrial growers or set up their own orchards. Small and medium farmers strongly rely on local nurseries and vice versa. This is explained by the fact the former have no economic or administrative power to import proven grafted walnut varieties from abroad, or set up their own nurseries as some large industrial growers do.

Table 9 - Relational inter-linkages between key VC stakeholders

	Nurseries	Harvesters	Individual / informal growers	Small & medium farmers	Large industrial growers	Collectors	Processors & Exporters	Sector Association
Nurseries		-	←(2) occasional clients	← (5) key clients	← (3) sporadic clients (some import, or grow themselves)	-	-	← (3) consultancy and promotion
Harvesters	-		← (1) competition as suppliers or same entity	← (1) competition as suppliers	← (1) competition as suppliers	←(5) most important sales channel	←(2) setting prices and quality demand	-
Individual and informal growers	← (2) occasional provision of trees and consultancy	← (1) competition as suppliers or same entity		← (1) competition as suppliers	← (1) competition as suppliers	←(5) most important sales channel	←(3) setting prices and quality demand	←(4) consultancy, training, representation
Small and medium farmers	← (5) constant provision of trees and consultancy	← (1) competition as suppliers	← (1) competition as suppliers		← (1) competition as suppliers	← (3) occasional sales channel	←(4) setting prices and quality demand	← (3) consultancy, training, representation
Large industrial growers	← (3) occasional provision of trees and consultancy	-	← (1) competition as suppliers	← (1) competition as suppliers		-	←(5) key direct client, or often vertical integration	← (2) consultancy, training, potential promotion
Collectors	-	← (4) key suppliers, but not most preferred	←(5) key suppliers, more preferred	←(3) occasional suppliers, more preferred	-		← (5) key client, setting prices and quality demand	-
Processors & Exporters	-	← (2) least preferred suppliers through intermediaries	← (2) least preferred suppliers through intermediaries	←(3) less preferred suppliers through intermediaries	← (5) most preferred suppliers	← (4) key supplying intermediaries		← (1) potential platform for promotion
Sector Association	-	-	← (3) occasional membership	← (5) wide-spread membership	← (3) occasional membership	-	← (1) rare membership	

(Source: own conclusions, based on the research)

5. Conclusions and Recommendations

5.1. SWOT Analysis of the Walnut Sector

The following table presents strengths, weaknesses, opportunities and threats that were identified and aggregated as the result of desktop study, key-informant interviews and participatory workshop discussions with main stakeholders.

Table 10 - SWOT matrix filled in for the walnut Value Chain in Moldova

Strengths	**Weaknesses**
• Favorable climate and fertile soil • Long tradition of horticulture in general • Walnut – a ubiquitous household culture • Abundance of established trees and selected varieties suited to local conditions • Walnuts are suited to intercropping due to large spaces between the trees • Low maintenance costs for orchards • Availability of agricultural subsidies for walnut orchards • Well-developed processing (kernel extraction industry) • Nearness to EU, world's biggest importer of walnut kernels • Benefits from FTAs with many importing countries • Existence of organically certified producers • Existing contracts for organic and non-organic produce with foreign distributors • Existence of the National Walnut Growers Association, and a recently established National Organic Value Chain Association	• Lack of communication and weak organization among the sector players • Lack of understanding of technological necessities of walnut plantations • Lack of post-harvest processing management and infrastructure for small growers/harvesters (at least storage, washing and drying) • Lack of finance availability for smallholders • Low performance of the peripheral service sectors (packaging, legal consulting) • Non-existence of a Moldovan walnut brand and little recognition for the origin. • Occasional poor quality of walnuts, especially those harvested along the roads too early • Low level of education and workforce proficiency • Inadequate bureaucratic and corruption-driven barriers for export and general business operations

Opportunities	Threats
• Growing walnut consumption worldwide due to proven health benefits • Higher margins from walnut-related investments can attract diaspora and youth to entrepreneurship opportunities in the sector • Training program for growers can bring new farms into better quality or organic production • Expanding the organic certification • A national walnut / organic label can enhance visibility and demand • Improving quality and food safety to meet growing world quality standards • Target higher value buyers with more value-added and convenient products • Diversifying marketing strategies of walnuts abroad • Improving linkages to tourism sector to tap local market for artisanal walnut products • Harvesting senile trees for furniture production • Consolidation of the sector efforts through creating an entity similar to Californian Walnut board or building capacity of the existing associations	• Climate change consequences with less predictable frosts and drought periods • Poor tree management promoting pests and disease • Uncontrolled and too early harvesting of walnuts growing along the roads. • Change in government policy • Increase in taxes for procurement of walnuts from the local populations • Increasing supply worldwide • Global price fall • Rising quality standards of markets and competing countries • Rural population further leaving villages for cities and abroad

(Source: own conclusions, based on the research)

5.2. Value Chain Product Upgrade Potentials

5.2.1. Organic and Fair Trade Production and Certification

Oleg Tîrsîna, the president of the WGA, affirms that organic walnut production represents the most promising option for Moldova's walnut sector. With the big and powerful competitors like California and Chile, the Moldovan value chain has to find its distinct niche

on the global market. Organic or fair-trade based production could be exactly that needed specialization.

Currently, organic walnut production and export require high investments in international certification, starting from several thousand Euro per year. Small growers cannot afford such fees and therefore, this path is not the most inclusive in the current state of affairs. Only if smallholders unite and build cooperatives that exploit economy of scale and share certification costs, they could tap the potential of this value chain upgrade option. For this purpose, large-scale trainings on organic walnut production and post-harvest management are required along with facilitation of cooperatives' creation by small producers. Also, support mechanisms like higher subsidies for organic agriculture and clear incentives for collective action would be needed. Another way to reduce costs of organic certification would be re-gaining the recognition of equivalence of the Moldovan national organic certification by the EU. This is only possible after full harmonization of the legislative base, as well as enforcement and noticeable implementation of the upcoming new law on organic agriculture.

From the point of view of inclusiveness, organic production and certification, as it is operated now mostly by larger firms with almost full vertical value chain integration, still has a beneficial impact on the rural population. Such firms provide jobs and better health-related working conditions in orchards that are managed organically, like in the mini-case presented below.

---------- Mini-Case – Organic walnuts producer and exporter – "Fernuci" ----------

F.P.C. "Fernuci" is a leading production, processing and exporting enterprise that started its activity in 2011 in the village of Ciuciulea, Glodeni district. Olga Petrovsky, originally from the village of Ciuciulea and since 11 years a citizen of Austria, has founded the company together with her husband. Olga Petrovsky is an active member of Moldovan diaspora, strongly believing in the sustainable development potential of her country. In the past few years, Fernuci has become the 2nd largest employer in the area, employing more than 100 people. It is caring for over 20,000 walnut trees on approximately 110 ha of land.

Logo of "Fernuci"

The main varieties of walnut grown are the internationally well recognized Fernor and Chanlder. The company operates in an environmentally friendly manner (e.g. drip irrigation for the largest part of the orchards) and is a holder of the EU organic label. The price of organic walnuts in the European market is double to triple of the price in the national market in Moldova. In the first few years of investment, until the firm's own orchards were ready for harvest, Fernuci was buying walnuts from regional farmers and processing them for export.

The company has its own processing line with French equipment. The company is mostly exporting shelled walnuts to Austria and France and is one of the rare actors on the Moldovan market who have a stable trade relation delivering to a supermarket chain in Austria. The company has ambitious development plans, which include both extending the production, but also having a positive social impact in the village of Ciuciulea.

Source: personal interview with the head of "Fernuci", Olga Petrovsky

Fair trade production and certification are still completely non-existent in Moldova. This fact is attributed to lack of initiative and institutional organization, but also to relatively high costs of certification. Considerable competence, human resource efforts and financial commitment would be required to attract fair trade certification to the country. Taking into consideration that the global fair trade market is about 10 times smaller than the organic market, it is understandable why no initiative has been taken along these lines so far. Still this option deserves more attention, especially if coupled with creation of small producers' cooperatives at the base of the value chain.

5.2.2. Walnut Oil and Other Value Added Products

Walnut oil currently plays no significant role in Moldovan export. For example, the Prometeu-T company is already producing organic walnut oil, however, the preference is still to sell walnut kernels due to high demand and established commercial relations. Still, if stable trade relations for walnut oil export were established, this product could represent a

strong income potential since the retail price for organic walnut oil in different size bottles ranges from 40 to 60 € per Liter.

The “cake” remaining after pressing walnuts can still be marketed as valuable **walnut flower** for different high-value preparations. Soaked in water and smashed until they reach a creamy, fluid condition, walnuts create an excellent **non-dairy milk**. Finely minced and homogenized with basil, salt and spices or other herbs, walnuts can be used to produce a valuable vegan pesto.

Mixed with dried fruits, like raisins, plums, apricots or apples, walnuts create an excellent variation of the classical **“trail mix”** snack. Mixed with dried fruits, cereal and honey, walnuts can appear in granola energy bars. Several small producers are experimenting with these preparations, but cases of large-scale production or export of such high value added products made in Moldova do not exist. The main challenge here is penetrating target international markets (especially the European one) with a pre-packaged product.

Walnut with honey in jars is a possible souvenir dessert. Several companies already have this product in their assortment. For example, “Vladovlad” offers honey/walnut jars at the duty free shop of the Moldovan airport. But such a preparation is not bought and consumed in large quantities – usually it is intended just as an occasional gift/souvenir.

Granola bars with walnuts could be a possible added-value product if the right recipe is found. The global granola bar market is projected to expand at a CAGR of 8.64% during the period 2017-2021 according to “Research and Markets”. This trend is reinforced by urbanization, need for quick energy snacks and growing awareness for healthy food. Currently, there are no Granola bars produced in Moldova for export. Our research has revealed two cases of small-scale enterprises currently investing in granola and energy bar production and both are currently in an experimental stage. In 2017 “Dulce Plai” a small bee-keeping company decided to re-focus especially on this value-added product and started investments in honey-nut-cereal based granola bar production mainly for export. The company is seeking investments in the value of 800,000 € in order to build a mini-factory with a ready line of energy bar production. They plan to first export to the Romanian market due to geographic proximity and well-established trade relations. Another economic agent “VerdeGo” SRL is also in the process of experimenting with granola and energy bars, but with a stronger focus on raw, vegan, gluten-free, organic options. They use green buckwheat, honey, dried fruits, almonds and other ingredients. Walnuts are not the easiest

ingredients to use in such preparations according to Stela Babii-Fetescu, director of "VerdeGo". In contrast to almonds, they get oxidized faster and lose their taste and nutritional qualities. The enterprise has already purchased some units of equipment and is producing mostly for their own restaurant operations, deliver to one of the largest coffee & snack chains in Chisinau "Tucano" and sell through an on-line healthy food retailer.

5.2.3. Touristic Services

Many rural tourism destinations in Moldova offer possibilities of tastings and agricultural product experiences. There are established actors in the wine, fruit and honey industries. These experiences can be replicated also for the walnuts sector. For example, "Eco-village Moldova" in the Criuleni district is offering walnut-tasting, churchkhella-making (a Georgian walnut-fruit-juice preparation) workshops and is projecting to build a walnut museum in the future. At least two walnut museums exist in France, one specializing on organic walnuts and oil. Both represent good cases for learning and replication in Moldova.

Walnut tourism alone in such a small country like Moldova, with a generally weak tourism flow can hardly become a strong enough attraction to develop a significant tourism branch. However, coupled with other offers, like traditional cuisine, wine tasting, fruit picking, and cheese-making it has a chance to add value and to promote activities of the growers in the country. This option is available both to large industrial producers who have significant investment capacities but also to smallholders, who either operate their own little guest facility or are located in a village with existing tourist attractions and rural pensions. An option to penetrate the market with walnut tourism packages could lie in cooperation with local high-end hotels using artisanal product marketing as well as providing touristic agencies with attractive program offers.

5.3. Value Chain Process Upgrade Potentials

In this subchapter we zoom in to a final stage of the value chain export and international marketing. It is evident that all steps of the value chain are interdependent. Therefore, upgrading this crucial element of the value chain could lead to higher returns on the level of primary producers and hence, drive more inclusiveness. Wholesalers in the EU market

and especially France and Germany are currently the main buyers of Moldovan walnuts. The sector would experience more growth and resilience if the exports were targeted to a more diverse group of countries, specialized niches within those countries and would address a larger variety of marketing channels than just bulk sales to traders.

5.3.1. Improving Management of Existing Public Property Plantations

The walnut plantations growing along the roads are a typical common pool resource. In the language of institutional economics, they are *non-excludable,* because it's almost impossible to prevent people from harvesting and they are *rivalrous*, as the same walnuts cannot be harvested more than once. The road plantations are owned by the National Government (Through the Moldsilva Forestry Agency and the National Transport Administration) or Local Public Administration (LPA) depending on the location, and actually managed under an open access regime, which leads to the tragedy of the commons. Usually the harvesting takes place in chaotic first come first-served conditions. Too early harvesting causes low quality walnuts, which endanger the mixed product batches through higher risks of mold. Often, harvesters damage the trees by breaking branches. Furthermore, the trees growing along the roads are not tended to and taken care of for better growth. Their average yield reaches up to only 1 Tonne per ha.

Since about 60% of the overall walnut harvest in Moldova comes from these public property plantations there is a large potential of improvement in this context. In the case of common pool resources, the solution is usually an institutional one. There were several more or less successful attempts by local public administrations across the country to address this issue.

The USAID report on the walnut sector in Moldova (Brînza, 2009) describes positive cases that have been recorded in Drochia and Cimișlia districts where Local Public Administration rented out the road plantations to a private company for a period of 2-3 years. The economic agent invested in plant protection, fertilizing and pruning, thus raising the tree productivity by 50%. Timely collection of ripe walnuts had a positive effect on the quality as well. So after the balance of gains and losses, this intervention has created a net monetary added value of 20-25%.

Another example deals with renting out the trees to individuals. Radu Urechean, the mayor of the Larga village of Briceni district, was spending money from the scarce communal

budget on maintenance of green areas near the walnut trees growing at the entrance to the village. In order to unburden the budget and give more responsibility and income opportunities to the locals, he decided to rent out the 2,500 walnut trees to his village inhabitants for just 1 lei per tree per year. About 2,500 lei is collected into the village budget annually this way. In turn, each renter is obliged to take care of the trees and bushes around, trim and lime them. By knowing which tree "belongs" to whom now, the villagers prevent externals from collecting the nuts (www.madein.md, 2014)

The main question that arises after examining these positive examples, is why does it not happen everywhere? Some LPA leaders are afraid to rent out the trees to private economic agents because this could cause dissatisfaction of the local population that benefits from unregulated harvesting and might cost them votes in the next election. Another answer lies within the fact that only a small number of walnut trees planted along the roads belong to communes and can be decided upon the by the LPAs. Most of these plantations are placed along the national roads and here the gap between the responsible authority and the local population is much larger. Also such institutional solutions require a high degree of organization, pro-actively cooperative behavior and trust: elements that are unfortunately hard to find in a crisis and poverty stricken society that has not yet recovered from consequences of a system change shock. To tackle this issue, strong LPA leadership and wide dissemination of knowledge about successful practices are needed.

5.3.2. Geographic Market Diversification

While France, Germany and Austria remain the key export destinations, perhaps less traditional markets, like new EU members states, should be addressed. The benefit in this case would be reaching out to markets, which have not yet strongly established brand loyalties.

Beyond Europe, for the upcoming 8 years, Asia Pacific is expected to dominate in the walnut sector followed by the Middle East & Africa. More and more walnuts are being consumed in Asia Pacific especially for snacks and for use in pharmaceuticals. This region is expected to become a prominent player by 2025 with a significant CAGR attributed to increase in the per capita consumption of walnuts (Transparency Market Research, 2017). Due to current political tensions between China and the US, the trade in walnuts between these giants

could be hampered. This opens a window of opportunity for Moldova to supply its walnuts to China, where consumption is on a rapid rise. Also punctually targeted supply to CSI and especially Russia should not be overlooked, since Russian big cities (Moscow and St. Petersburg) have a rapidly developing upper class demanding premium products.

Moldova can learn from the example of Chile, which is very active in the Turkish market, but recently has also entered markets in India, Morocco and the United Arab Emirates. Chile's current priority lies on India due to a huge consumption growth potential and rapidly developing markets. Currently, the per capita consumption rate of Indian population is just 0.01 kg per year (INC, 2017). The competition with Chile should not be too severe, since the harvest time in the Northern and Southern hemispheres occur in exactly opposite times of the year and could be complementary for a steady supply.

5.3.3. Marketing Channels Diversification

In the retail trade, almost 50% of all walnuts are commercialized in classical supermarkets and 30% go through the health and bio channel. The remaining 20% are sold through outdoor markets and online (CBI, 2014). One of the key conclusions derived from consultations with Moldovan producers/exporters and EU importers is that it is very difficult, at the moment, to export further value added (packaged end products) and sell them in the European retail chains or otherwise under a brand from Moldova. Author's observations confirm that EU consumers, especially in Germany, are rather conservative preferring brands they recognize and trust. Therefore, Moldova is likely to continue, in the near future, its role as a supplier of raw material that is undergoing final stages of packaging and labeling in the country of consumption. Still, alternative opportunities to penetrate those established conservative markets should be further explored.

One interesting case to learn from is the example of "Teekampagne" – the worlds' largest Darjeeling importer. Teekampagne delivers premium quality organic certified Darjeeling tea directly to the doorstep of the customer while charging a lower price than the usual retailers. At the same time, it manages to pay fair prices to the producers – almost 60% of the final price. And it even gets involved in environmental projects in collaboration with WWF India. Instead of purchasing the goods from a wholesaler and offering them in tea shops with a nice ambience, Teekampagne purchases the tea directly from the producer

and sends it from Hamburg port straight to the end customer and only in large packs of 500 g or 1 kg. (Deutsche Welle, 2012). Such an amount usually allows the final consumer to be all set for the whole year. The costs of operations were cut not only through bulk packaging and omitting intermediaries, but also through concentration on just one tea-variety at the beginning and through very low marketing expenses.

Direct online selling of bulk packages could also be a good option for walnuts, but there are several reservations that need to be taken into consideration rather than simply copy pasting the Teekampagne approach. One problem is that the value of the package per weight is lower than in the case of the tea. If small retail packaging already offers the cost of less than 2€ per 100g, then larger packages need to definitely be cheaper than 20€. Also walnuts have a shorter shelf life then tea, so buying a one-year supply of kernels would only be possible if they are vacuum packed and stored in a cool dark place or just kept in the freezer. It would work only for walnuts in-shell. A community-based distribution channel could have good potential for walnuts that are traded in bulk, with a more personal approach: smallholder oriented, organic and aligned with fair-trade standards. Such channels could be secured through the growing network of community supported agriculture groups that exist in many large cities throughout Europe. A small initiative “Eco-village Walnuts” presented below attempts to make use of this potential.

Another way to diversify target markets is to look into buyer segments. Walnuts are popular with many of the ethnic population groups in Europe and especially Germany, particularly those from Turkey, the Middle East and North Africa and targeting them can represent a promising niche. Also timely adaptation to the customer needs is important. The peak of walnut purchases in Europe is in the winter – mostly before Christmas, but purchase throughout the year is growing. Thorough market research, alternative niche penetration and creation of effective trade partnerships for the added-value products are needed for Moldovan walnuts to remain competitive. Support for this process upgrade of the value chain could be offered by MIEPO.

---------- Mini-Case – “Eco-village Walnuts” ----------

Eco-village Walnuts is a non-profit social entrepreneurship initiative that aims at creating resilient rural communities through walnut farming based on organic and fair-trade principles and cooperation. The initiative unites small walnut growers from the village of Rîșcova in Moldova and helps them sell their walnuts, kernels and value-added preparations for a decent price right from home. The target customer audience are Europeans who appreciate taste and quality, but also care about social impact.

The main focus of the project is to contribute to sustainable livelihoods of the locals. In a good season, one mature walnut tree can provide a monthly income of 200 €. The main providers of walnuts and cracking services are elderly women as well as women from economically unstable families. The initiative is also seeking to build more local economic resilience by upgrading the walnut value chain through processing and preparation of special products like walnut butter, walnut milk, walnut-based trail mixes and Georgian-style Churchkhella (dried preparations of walnuts in grape juice).

Package of Eco-village Walnuts

If any profit from sales is generated after paying decent remunerations for the local growers and crackers, it is reinvested in village development. Some social activities involve extra-curricular educational activities in the kindergarten and school, local infrastructure improvement and operation of a local environmental Training Center with a special focus on organic gardening & community building.

This initiative is possible due to the fact that the key people involved from the village have lived abroad and built up links to Europeans. This makes it possible for them to do direct marketing through networks of friends and acquaintances and thus offer final consumer prices lower than any retail chain. Such an experience can be replicated or scaled up especially due to a relatively big diaspora network of Moldovans living in Europe, Russia and the USA. The main challenge here is of course the administrative organization of import procedures to target countries, which only makes economic sense at large quantities.

Source: personal interview with a co-founder of “Eco-village Walnuts”, Julian Gröger and www.eco-village-walnuts.org

5.4. Improving Value Chain Coordination

5.4.1. Horizontal Cooperation among Small Producers

In the globalizing world, with ever-growing scales of production and concentration of capital, small farmers are hardly able to remain competitive in the agricultural commodity markets. This is one of the main reasons why horizontal cooperation and namely, association of the producers, is crucial for survival of smallholders who want to go beyond subsistence agriculture. In Moldova, farmers face barriers and stereotypes related to the memories of collectivization in the past. The sudden system collapse, expansion of the most brutal form of capitalism, often criminal fights for "survival of the fittest", as well as corruption proliferating through today, has broken trust of many individuals.

In the context of inadequate access to finance, technology and strong markets there is no way around famers' association if smallholders want to add value to their products and processes, become more resilient, and come out of poverty. To this end, substantial facilitation and support in overcoming mistrust and creation of effective small producers' groups or cooperatives are needed. These forms of collective action would ensure scale effects and quality management. Sharing of equipment, expertise, joint bulk sales and vertical expansion along the value chain are the basic features of such cooperatives.

Another level of cooperation for the producers' groups would be membership in a sectorial association, which could offer following benefits to its members:

- Service of economic analysis of agricultural holdings to its members;
- Support in accessing supply of equipment and agricultural inputs;
- Supporting innovations in the field of walnut production;
- Application of organic production technologies and good agricultural practices;
- Organization of demonstration plots;
- Assistance in assuring the quality of products based on market requirements
- Marketing training for producers;
- Promotion of group members in product distribution networks, processing enterprises, supermarkets, wholesale bases, intermediaries and outlets, etc.;
- Facilitating trade;
- Promoting members at exhibitions and fairs in Moldova and abroad;
- Trainings on growing, harvesting and processing techniques;

- Production and dissemination of didactic manuals;
- Study visits and exchange of experience;

This cooperation model already exists in the form of the Union of Walnut Growers' Associations, founded in 2006. In order to function effectively, the association needs external support, at least for several years, until it becomes more impactful and self-sustainable. This is an easier task than reinvigorating the old and stagnating producer groups throughout the country or facilitating creation of the new ones. Creation of cooperatives in Moldova needs to be facilitated and incentivized. Therefore, having a strong national growers' association is the key to promotion and creation of smallholder cooperatives on the basis of the value chain.

5.4.2. Overall Sectorial Cooperation and the National Brand

Most value chain intervention manuals highlight the relevance of institutional actors consolidating the sector. These are working groups, industry associations, value chain task forces, commissions, industry councils or boards that connect other value chain participants and support the sector development (Haggblade et al., 2012).

As described in section 4.2.5, the Union of Associations of Walnut Growers of Moldova has existed since 2006. It has done a lot to promote nut crops throughout the country and help initiate industrial plantations, however, its voice and impact are rather week, especially internationally, as it operates with very limited human and financial resources. Section 4.3.2.1 about the Law on Nut Crops described how The National Council for Promotion of Nut Crops instituted by the Government was created in 2006 and dissolved after three years. In general, the level of organization and cooperation in the sector is relatively low. Large exporting firms have gone a long way to reach their economic successes and many of the company leaders are rather cynical about any prospects of cooperation in the sector. They reveal having had very challenging paths and often "fighting" with the government and the national bureaucracy, which makes them skeptical toward public-private cooperation. Sector associations are often not trusted since many NGOs are regarded in Moldova as an agent driven by private economic interests of one or a few individuals behind the association. There is rarely a case of a true democratic process and an association emerging from a consensus and pro-active cooperation of a wide base of people,

consciously managing any possible conflict of interest. If there is such a case, gaining support and building cooperation links is a huge amount of work requiring lots of time, as mistrust is still pervasive in all social and economic affairs of the country. Still, without this cooperation, it is not possible to develop the value chain further and create a strong national brand that would allow growth in exports.

In order to make Moldovan walnuts more visible and respected in the global market, the Walnut Growers' Association has recently initiated discussions about creation of a Moldovan walnut brand: "Moldova Nut", similar to "Moldova Fruit", which already exists and seems to enjoy respect and trust by the growing number of foreign trade partners. According to Oleg Tîrsînă, the president of WGA, Moldova has several very valuable walnut varieties that would be appreciated in the European Market – especially the "Pescianschii" variety (pronounced "Pes-chuns-ky"), characterized by a large light kernel and sweet taste, coupled with a thin and easy-to-break shell. He calls this walnut variety "Gold of Moldova". The idea for the first stage of the brand promotion is to start selling Moldovan walnuts in-shell from professional industrial orchards with high quality control directly in supermarkets and gradually build trust of European consumers.

Creation of a national product brand requires a significant investment of financial resources as well as agreement among the key stakeholders to adhere to this common strategy. In light of the weak self-organization of the sector, (no sectorial board, a weak sectorial association mostly dealing with growers, no separate entity for export promotion, little coherence and cooperation among large exporters) creation and endorsement of such a brand on the national level seems to be a significant challenge. Only if additional actors like the Moldovan Investment and Export Promotion Organization (MIEPO) as well as relevant departments of the Ministries of Economy and Infrastructure and the Ministry Agriculture, Regional Development and Environment step into this endeavor it is possible to consolidate funds and human resources to make this idea real. Experience with successful sectorial cooperation are rare, but still present in the Republic of Moldova. One of the most prominent examples is "Wine of Moldova" presented below. It shows that significant external push (e.g. donor support) was needed in order to enable comprehensive market research and facilitation of the value chain coordination, which resulted in creation of a Public-Private Partnership and evolution of a strong national brand. If enough sectorial facilitation happens, the walnut value chain actors might decide to cooperate without

building a PPP as in the case of “Wine of Moldova”. They would then rely more on private sector association but, institutional strengthening, capacity development and funding of the main sector Association(s) is inevitable if any results are to be achieved.

---------- Mini-case – “Wine of Moldova”----------

National brand logo of the "Wine of Moldova"

One of the most successful stories of sectorial organization and product branding is the case of “Wine of Moldova”. The wine industry was one of the largest during the Soviet period. Approximately 30% of all wine sold in the USSR was produced in Moldova. Unfortunately, the walnuts did not enjoy such attention back then and the walnut industry has a much shorter history of development.

After the 1990s, the wine industry was slowly privatized. Due to the fact that it remained a strategic sector, a wine department remained instituted within the Ministry of Agriculture the Moldova. However, it did not work well due to lack of resources and power abuse and gradually was dissolved.

Wine producers and exporters have attempted to create associations to strengthen their efforts and advocacy. The Union of Producers and Exporters of Wine and the Moldovan Wine Guild were the most successful associations, but for the reason of lack of resources they usually had only one or two employees. This limited human resource capacity didn’t allow for much impact. Additionally, as the presidency of the association was rotated among various companies, again power abuse happened and other producers often would lose trust, deciding to quit.

With the significant support of USAID over the past 10 years, a lot of resources were directed to market studies including analysis of various international best practices (e.g. French and Australian wine brands and associations) and to facilitation of the VCD. The Ministry of Agriculture and key producers were involved in the official working group.

Out of this process a new entity emerged – National Wine Office, operating as a public private partnership. The agency has autonomy in its decisions and it coordinates its activities with the Ministry rather than subordinates to it. The national Wine Office is governed by a board elected from a wide base of large and small wine producers. The budget is made up of mandatory contributions from the producers, namely export taxes, other state contributions and funds from external donors (no more than 30% of the total budget). The agency finances subsidies, supports reforms, creation and maintenance of registries, and especially focuses on marketing and international promotion as well as development of local wine tourism. Promotional materials are disseminated widely though international events, through the internet and also through the network of cooperation partners like foreign embassies in the republic of Moldova. The National Wine Office currently employs about 30 staff members.

This sectorial cooperation model is one rare success story for Moldova. Most value chain actors appreciate the growing power of the brand, fully funded participation in international fairs, on-going promotional and touristic events and other beneficial activities. At the same time, they are burdened by the export tax, which is unusual for the global wine market. In the situation of power struggles and prevailing personal interests, the main challenge that remains is an uneven distribution of benefits.

Source: personal interview with an independent wine industry expert Daniela Luca

5.5. Other Aspects: Bureaucracy, Taxes, Access to Resources

In 2009, the USAID walnut sector report (Brînza, 2009) proposed measures for de-bureaucratization of the exporting procedures. Several factors were identified that hamper productiveness of the sector: procedure of issuing certificates, phyto-sanitary services, customs' clearance, etc. These steps consume a lot of time and resources. It is evident that they are necessary, but the procedures could be designed in a more efficient way, for example, by reducing the number of days it takes to issue a document, or consolidate the gathering of the documentation to one or few contact points.

Another aspect burdening the value chain proliferation was discussed in chapter 4.2.3 Institutional Framework. It concerns the state tax on procurement of products from the

local population. Starting from 2% in 2013 and reaching 5% as of today, the tax has been putting increasing pressure on this vulnerable chain link between individual harvesters / small growers and collectors contracted by large processing and exporting firms. Current discussions of tax raise to 7% are not encouraging for the re-design of the value chain towards more inclusiveness. Certainly, taxes should come from somewhere, but it should be thoroughly evaluated whether taxation at this step of the value chain really makes sense. The effect of this tax leads to even more vertical integration by the large firms. This tendency for processors and exporters to set up and operate their own large industrial plantations allows them to better control quality of production. The harvesters and small producers remain outside the big marketing channel. If the acquisition from the local population becomes even more costly, it will hamper access of the poorest value chain participants to benefits offered by established export relations. Abrogating the acquisition tax and re-instituting an export tax could lead to more inclusiveness.

Progressive salary taxation is another important issue to be addressed at the state level in Moldova. Besides a strong mistrust in the use of public funds, another reason for tax avoidance lies in rather high taxes even for small incomes. At the moment the only progressive taxation step is 7% for incomes below 140 EUR Net and 18% for everything above it. There are a few other minimal tax reductions based on the number of children and other social aspects, but they do not make a considerable difference. When all employer and employee taxes are added, a total number of 42% of Gross for all state fees emerges. Unfortunately, obligatory payments for medical security and other social insurance channels do not result in adequate services and people still have to pay privately. Taking into consideration that expected Net income in the rural areas reaches 200 € per month, the employer has to budget 346 € for one worker. Lowering the overall income tax or adding more incremental steps to the progressive taxation, at least for the rural areas, would decrease pressure and enable large firms to be more eager to officially employ local workers for orchard management and walnut processing.

Access to finance, inputs and knowledge is another crucial aspect for successful participation of the most vulnerable value chain actors. Lowering collateral requirements and providing of low-interest and long-term loans would enable more smallholders to make investments in walnut orchards. The existing financial support programs should be comprehensively evaluated and a more systemic approach to the financing problem,

persisting for decades, should be found. Also, development of a quality extension service network and provision of large-scale trainings would be very important to avoid quality losses in production. The current demand for acquisition of knowledge is mostly addressed by private nurseries that have their own agenda of selling certain varieties of seedlings or commissioning a particular orchard consultant. This has led to fraud schemes in the past. For example, one big farmer has been coaxed into buying a certain variety of seedlings, that turned out to be unproductive, so he had to re-graft a few hundred ha after waiting over 10 years for the harvests to reach at least 1 Tonne per ha.

6. Summary and Outlook

Walnuts represent an excellent case for inclusive value chain development in Moldova. Global trends in walnut consumption, production and trade confirm a raising demand for this agricultural commodity, driven by growing health consciousness. Moldova's nearness to the EU, the world's largest walnut importer, coupled with favorable trade arrangements, sets out an attractive opportunity for export promotion. Due to a well-developed processing industry, Moldova is able to supply quality walnut kernels according to high European standards. Organic certification is also on the rise, as the exporting firms have discovered this profitable niche.

The prospects might look very positive, however, the speed and character of development of the sector are not sustainable in the long run. Strong competitors like California and especially Chile were able to set up effective value chain coordination mechanisms and are investing a lot in expansion of plantations, quality assurance, a powerful brand and in international marketing. Moldovan walnut value chain, in turn, is characterized by low levels of internal organization and cooperation among key stakeholders. There is no significant state support and no united industry task force that would address key bottlenecks and propel strategic sector development.

Furthermore, the current direction, in which the walnut Value Chain in Moldova is evolving is not favorable for the most vulnerable segment - harvesters and smallholders. The overall trend is towards more vertical integration by large firms, intensive industrial orchards, and growing tax pressure on the acquisition of walnuts from rural population. For the sector as a whole it's not detrimental. Rather, these are clear signs of classic industrialization and capital concentration for the purpose of staying completive in the global market. In the end, this could ensure higher product quality while reducing costs due to economies of scale. However, from the perspective of poverty reduction, the effects are debatable. Because of a weak and costly public administration and on-going corruption, the vast majority of the population does not sense that taxes collected from profitable sectors of the economy benefit the social welfare of the country. The pensions are still extremely low, the medical insurance system is dysfunctional, and kindergartens, schools and universities are poor and provide low quality services. This leads to a conclusion that direct economic empowerment of the vulnerable population through participation in successful value chains is currently a

more effective means of poverty reduction than increasing the general state budget balance.

The walnut export has a potential to accommodate even larger volumes of produce due to established trade relations and high demand abroad, especially in the EU. Overall increase in output through set up of new industrial orchards is already happening, but the key question is how to make the value chain more inclusive for the poor?

The first target group to address are the harvesters and informal /individual growers. Even though walnuts collected from the population are often of lower and non-uniform quality than the ones from industrial orchards, the former could still be channeled to food processors. Also, fair-trade based and alternative marketing approaches could be used to sell better quality walnut kernel collected from individual and informal growers to responsible consumer niches in the EU. In this context, the tax on acquisition of walnuts from the local population should be revised and perhaps lowered – contrary to the current trend of increasing the tax. In order to ensure better productivity and reducing risks of pre-mature harvesting and tree-damage, smart institutional solutions should be applied to the management of current public plantations along the roads. The core of the solution lies in definition of property rights, at least temporarily. Thus, affordable leasing of the walnut alleys to private companies or assigning of tree care and harvesting to individual local inhabitants could be envisioned.

Also small and medium farmers can be better integrated in the value chain. The most complex, but perhaps the most powerful solution, lies in the creation of producers' cooperatives. Due to lack of trust and self-organization among small growers, partially caused by forced collectivization and a sudden system collapse in the past, it is quite a challenging endeavor. Strong facilitation as well as clearly set and communicated incentives are needed for successful cooperatives to emerge.

Another possible avenue for empowering the small growers is certainly access to finance, inputs and knowledge. Low-interest and long-term loans are crucial for smallholders to make investments in orchards that start bearing only after 5-7 years. Also, higher subsidies for organic agriculture should be considered. The large firms can afford international organic certification due to scale effects. The small ones could only grow organically certified walnuts if they share costs as cooperatives or receive state support for particularly this matter. Another hope lies in harmonization of agricultural legislation with EU laws and

subsequent recognition of the equivalent of the national organic certificate that is much cheaper to attain. Also, improved extension services, large-scale trainings and support in accessing quality inputs are needed to ensure good agricultural practices and strengthen the smallholders' competitiveness.

General efficiency in agricultural value chains strongly depends on the overall business environment in the country. De-bureaucratization through reduction of barriers in business operations and export, progressive salary taxation, and facilitation of access to inputs are a few important steps that would benefit the entire economy.

Last but not least, a much better overall sectorial coordination is needed to improve and strengthen the whole walnut value chain. Following the example of California and Chile, Moldova needs a strong will followed by well-planned actions for sector consolidation and promotion. Creation and marketing of a national walnut brand could be just one of the visible outcomes. A lot of internal sectorial work on quality assurance, price and supply coordination would then also be possible. The lowest threshold intervention to this end would entail building institutional capacity and ensuring funding for the only existing sectorial association – Union of Walnut Growers' Associations. More advanced sector evolution would require set up of an industry task force – a council or a board between the state and private companies - that would assume a leading role in the sector development and promotion of exports.

Implementation of the above mentioned recommendations require a combination of pro-active behavior of key value-chain actors, the state and perhaps donor support, at least in the beginning. All things considered, it would be quite reasonable to re-start the efforts based on the provisions of the Walnut Law, and establish a new strategic program for development of the walnut sector. The current study calls for careful and neutral analysis of the sector consolidation process and its institutional collapse that took place in the first decade of the millennium. It also prepares a ground for a deeper market analysis with future outlook and invites to consider walnuts as a key commodity for sustainable rural development. The author's hope is that the results of the study can serve as a contribution to facilitation of truly inclusive walnut Value Chain Development in the Republic of Moldova.

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8. Appendices

Annex 1 - Guidelines for value-chain development by different organizations

Guideline (abbreviation)	Authors	Sponsoring organization
Participatory market chain approach	Thomas Bernet, Graham Thiele,	International Potato Center (CIP)
Guidelines for rapid appraisals of agrifood chain performance in developing countries (FAO 2007)	Carlos A. da Silva, Hildo M. de Souza Filho	Food and Agriculture Organization of the United Nations (FAO)
Participatory market chain analysis for smallholder producers (CIAT 2007)a	Mark Lundy, Veronica Gottret, Carlos Ostertag, Rupert Best, Shaun	International Center for Tropical Agriculture (CIAT)
The operational guide for the making markets work for the poor (M4P) approach (DFID 2008)	Authors not specified	Department for International Development (DFID), Swiss Agency for Development and Cooperation (SDC)
Chain-wide learning for inclusive agrifood market development (IIED 2008)	Sonja Vermeulen, Jim Woodhill, Felicity Proctor, Rik Delnoye	International Institute for Environment and Development (IIED)
Making value chains work better for the poor: A toolbook for practitioners of value chain analysis (M4P 2008)	Tim Purcell, Stephen Gniel, Rudy van Gent	Making Markets Work Better for the Poor (M4P) Project, UK Department for International Development (DFID)
ValueLinks manual (GTZ 2008)	Andreas Springer-Heinze	German Agency for Technical Cooperation (GTZ)
Value chain development for decent work (ILO 2009)	Matthias L. Herr, Tapera J. Muzira	International Labour Organization (ILO)
Building competitiveness in Africa's agriculture: A guide to value chain concepts and applications (World Bank 2010)	Martin Webber, Patrick Labaste	World Bank
Pro-poor value chain development: 25 guiding questions for designing and implementing agroindustry projects (UNIDO 2011)b	Lone Riisgaard, Stefano Ponte	United Nations Industrial Development Organization (UNIDO), International Fund for Agricultural Development (IFAD), Danish Institute for International Studies (DIIS)
Value chain development wiki (USAID no date)	Not specified	United States Agency for International Development (USAID)

(Source: Donovan et al., 2015)

Annex 2 – Questionnaire

Interview Guide - Inclusive Walnut Value Chain Development In the Republic of Moldova

1) Basic info:

Date of interview:	
Name of the Interviewed person:	
Name of the Organization/company:	
Main occupation:	
Address:	
Telephone:	
Email:	
Additional Info:	

Participation in the value chain and links with stakeholders

2) At what levels of value chain do you work?
3) Who are the other key players in the value chain, with whom you coordinate your work?
4) Please describe the relationships with these stakeholders?
5) What is your main interest/challenge within the value chain?
6) How well is collaboration organized in this sector?
7) Who, in your opinion, have a key role in the development of the sector?
8) How is the value creation distributed throughout the chain?
9) How many people do you think derive their income in one way or another from Walnuts in Moldova

Organic production

10) To what extent do you deal with organic walnuts?
11) What is your estimation about the percentage of organic walnuts produced in Moldova?
12) What strength / potential are you seeing in this area, what obstacles / risks?

Input Supply and Infrastructure

13) What are your major needs/opportunities in the areas of input cost, quality, and availability?
14) Are there problems in obtaining some important inputs? Explain.
15) Have you ever purchased inputs jointly with other business? Explain.
16) What are the most important infrastructure constraints affecting your operations?

Standards and certifications

17) What standards or certification requirements should your products match?
18) Who sets these standards and requirements and who helps you achieve them?
19) Do you have any problems with this?

Export and market trends

20) Who and where does the production of walnut sector go?
21) What percentage of all raw material produced in the country is exported?
22) Who are the main exporters?
23) Where is the most accurate and accurate information available?
24) What obstacles do you see for export growth?
25) How strong is the market for your products/services right now? What trends do you see?
26) What do you think about creation of a joint walnut brand to promote export?

Institutional Context and Support Services

27) Which legislative and tax arrangements affect your operations and how do you asses their influence?
28) Which role does access to finance play for you in terms of the walnut value chain?
29) What do you think of existing institutional actors and their influence on the value chain?
    - Walnut Growers Association
    - Ministry of Agriculture and the Ministry of Economy
    - Scientific Institutions
    - Others?

Value Chain Upgrading and Increasing Inclusiveness

30) What potential for adding value do you see in the value chain?
31) Which options of market diversification are thinkable?
32) What do you think should the harvesters and smallholders do in order to get more benefits from the value chain?
33) What can other key players do in order to enable their better integration?
34) How do you see your role regarding the smallholders and in general the poor rural population in terms of the walnut industry?

Final Open Ended Questions

35) What are the major incentives you would like to see for investing in / promoting change in the value chain?
36) What do you think are the strengths and weaknesses, opportunities and threats of the walnut industry in Moldova locally and/or internationally?
37) If you were to design a walnut-based economic development program, which elements would you include?
38) Who else would you recommend me to talk to?

Annex 3 – List online shopping options for organic walnuts from Moldova available to German and UK consumers

Brand	Packaging	Price	Source
lifefood Bio Walnüsse		100 g – 4.59 € 30.99 €/kg	https://www.lifefood24.de/Leckereien-fur-die-Winterzeit/Bio-Walnusse.html?pk_campaign=lifefood-de&pk_kwd=rohe-bio-walnuesse
Keimling Naturkost GmbH		300 g - 6,95 € 23,17 €/kg 2,5 kg - 48,95 € 19,58 €/kg	https://www.keimling.de/walnusskerne.html
DM		150 g – 2,95€ 19,7 €/kg	https://www.dm.de/dmbio-walnuss-kerne-p4010355198068.html
Alnatura		150 g – 2,99€ 19,93 €/kg	https://www.alnatura-shop.de/trockenfruechte-nuesse-saaten/alnatura/walnusskerne-2000024830
Naturata – Walnut quarters		150 g – 4,69 31,30 €/kg	https://www.naturata-shop.de/produkte/nuesse-trockenfruechte/427/walnussbruch-150g?c=93

Rapunzel		3,49 € - 100g 34.9 €/kg	https://shop.rapunzel.de/produkte/nuesse/2116/walnusskerne-halbe
Grape Tree – Organic Walnut Light halves		250 g – 4.99 £ 19.96 £/kg	https://www.grapetree.co.uk/product/100-organic-walnut-light-halves-250g/
Whole Food Earth		1 kg – 16.12 £	https://wholefoodearth.com/shop/wholefoods/organic-walnut-halves-1kg/