Ministry of Foreign Affairs

Moringa Olifeira in Angola

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MORINGA OLIFEIRA IN ANGOLA

FEASIBILITY, ECONOMIC VIABILITY AND SUSTAINABILITY OF PRODUCING MORINGA IN ANGOLA FOR LOCAL, REGIONAL AND EXPORT MARKET

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Content

1.0 Summary in English

Moringa powder, dried leaves or Moringa oil are still relatively new products on the Dutch and other European markets. Even 15 years after Moringa was first introduced in Europe and publicity done at international trade fares, Moringa remains an interesting niche market with grows potential of around 6 – 10 % per year. In the last years many companies brought Moringa products on the market either as single products or in mixture as other superfood or as cosmetics. They profit from the "superfood" trend and from rising market for natural cosmetics with pure oils i.e. Moringa oil from African origin. The use of Moringa as fodder (leaves or press cake) has not penetrated the market, however in African countries this becomes more and more interesting.

The size of the EU market for Moringa was 903 million US $ in 2018 and is expected to grow 6 - 8% during the forecast period 2019 – 2027, to account to 1.89 billion US$ by 2027. The import is currently estimated to be 130 – 160 tons (2024), whereby a part is re-exported to the US. The biggest market are the US followed by Europe. Imports from Angola are almost not existing so far.

New product developments stimulate the market by introducing Moringa in mixture with other superfoods or penetrating the market with Moringa bread, spaghetti, bars, sweets, Moringa drinks and beverages as well as mixed dairy products.

Natural cosmetic producers consider Moringa oil as exotic and using it in skin lotions and creams, shampoos and other products.

Angolan producers can only benefit from the European market if they can offer competitive prices and supply EU organically certified Moringa in high quality and larger quantities. The compliance with the purchase specifications from the EU importers must be respected.

However, Angola has favourable vast fertile land available where Moringa will grow perfectly since water for irrigation is mostly available. The lack of knowledge to produce and to process Moringa organically is a challenge, but knowledge is available from other countries in the neighbourhood and by international experts to overcome this lack. The same is valid for the setting up of quality systems and logistical transport.

Currently the EU importers import almost only raw Moringa leaves and oil in bulk and not finished products. Moringa products packed in final packaging in Angola lack often appropriate and attractive packaging, design and labelling. However, some examples already exist that appropriate packaging is available but rarely. The objective should be to leave as much of the value chain in Angola. For importers this could be also an advantage since labour to process and to pack in final packaging is expensive in Europe and Angola has here a cost advantage. Lack of access to capital and necessary investments in scaling-up, certification, organic farming and export promotion must be overcome to allow a sustainable economic business with Moringa.

However, the local and regional market in Angola and neighbouring countries provides quick win opportunities and the possibility to export Moringa to EU in larger quantities will take time and is a medium to long term objective.

Angolan Moringa growers and processors will need support from other stakeholders to overcome the challenges in their value chain.

The support of NGOs, Moringa Champions, farmer associations as well as support from local agricultural research and international Moringa experts are necessary to establish appropriate training in all areas.
Local analytical laboratories working on a professional high level exists in Angola to ensure quality control.
The Ministry of Agriculture and Forestry is willing to support and create an enabling environment for Moringa exports by providing procedures for conformity and food safety standards.
Banks can promote investments by special programs.
Initiatives from the Netherlands government can support knowledge transfer and market entry missions.
APEX can support in exporting Moringa to the EU.

The goal of this study is to determine the feasibility, economic viability and sustainability of producing (organic) Moringa in Angola for export to the Netherlands/ EU as well as for the local market.
This report describes markets, existing production and processing along the value chain, EU legal requirements, situation of Moringa in Angola to raise awareness and opportunities and gives recommendations to further develop the Moringa sector in Angola.

This study is outlining 5 recommendations short and medium/long term to boost Moringa production, processing and sales in Angola. These are:

1. Support the set-up of a Moringa seed production unit and collect Moringa seeds locally or from neighbouring countries in 2025
2. Create a small group of Moringa champions willing to incorporate selected SME Moringa farmers – start with a Farmer Field School concept for Moringa training and know how transfer in 2025
3. Creation of a Moringa working group within the Agroportal Angola in 2025
4. Support an exhibition booth at an agricultural fair in Angola in 2026
5. Invite selected Moringa producers to participate in a Moringa Market Entry Mission outside Angola for 2027

All in all, the basic conditions to grow and to process Moringa in Angola are existing and very favourable.

1.0 Resumo em português

Moringa em pó, folhas secas ou óleo de Moringa ainda são produtos relativamente novos nos mercados holandeses e em outros mercados europeus. Mesmo 15 anos após a introdução da Moringa na Europa e a publicidade feita nas tarifas comerciais internacionais, a Moringa continua a ser um nicho de mercado interessante com potencial de crescimento de cerca de 6 a 10% ao ano. Nos últimos anos, muitas empresas trouxeram produtos de Moringa para o mercado, quer como produtos individuais ou em misturas como outros superalimentos ou como cosméticos. Eles se beneficiam da tendência dos "superalimentos" e do mercado crescente de cosméticos naturais com óleos puros, ou seja, óleos puros. Óleo de Moringa de origem africana. O uso da Moringa como forragem (folhas ou torta) não penetrou no mercado, porém nos países africanos isso se torna cada vez mais interessante.

O tamanho do mercado da UE para Moringa foi de 903 milhões de dólares em 2018 e deverá crescer 6 - 8% durante o período de previsão 2019-2027, para representar 1,89 mil milhões de dólares em 2027. A importação está atualmente estimada em 130 – 160 toneladas (2024), sendo uma parte reexportada para os EUA. O maior mercado são os EUA, seguidos pela Europa. As importações de Angola quase não existem até agora.

O desenvolvimento de novos produtos estimula o mercado introduzindo a Moringa em mistura com outros superalimentos ou penetrando no mercado com pão, esparguete, barras, doces, bebidas e bebidas de Moringa, bem como produtos lácteos mistos.

Os produtores de cosméticos naturais consideram o óleo de Moringa exótico e utilizam-no em loções e cremes para a pele, champôs e outros produtos.

Os produtores angolanos só poderão beneficiar do mercado europeu se puderem oferecer preços competitivos e fornecer Moringa certificada organicamente da UE em alta qualidade e em maiores quantidades. O cumprimento das especificações de compra dos importadores da UE deve ser respeitado.

No entanto, Angola tem vastas terras férteis favoráveis disponíveis onde a Moringa crescerá perfeitamente, uma vez que a água para irrigação está principalmente disponível. A falta de conhecimento para produzir e processar Moringa organicamente é um desafio, mas o conhecimento está disponível noutros países da vizinhança e por especialistas internacionais para superar esta falta. O mesmo se aplica à implementação de sistemas de qualidade e de transporte logístico.

Atualmente, os importadores da UE importam quase apenas folhas de Moringa em bruto e óleo a granel e não produtos acabados. Os produtos de Moringa embalados em embalagens finais em Angola carecem, muitas vezes, de embalagens, design e rotulagem adequados e atrativos. No entanto, já existem alguns exemplos de que as embalagens adequadas estão disponíveis, mas raramente. O objectivo deveria ser deixar o máximo da cadeia de valor em Angola. Para os importadores isto também poderá ser uma vantagem, uma vez que a mão-de-obra para processar e embalar na embalagem final é cara na Europa e Angola tem aqui uma vantagem em termos de custos.
A falta de acesso ao capital e os investimentos necessários na expansão, certificação, agricultura biológica e promoção das exportações devem ser ultrapassados para permitir um negócio económico sustentável com a Moringa.

No entanto, o mercado local e regional em Angola e nos países vizinhos proporciona oportunidades de ganhos rápidos e a possibilidade de exportar Moringa para a UE em maiores quantidades levará tempo e é um objectivo de médio a longo prazo.

Os produtores e transformadores angolanos de Moringa necessitarão do apoio de outros intervenientes para superar os desafios na sua cadeia de valor.
O apoio de ONG, defensores da Moringa, associações de agricultores, bem como o apoio da investigação agrícola local e de especialistas internacionais em Moringa são necessários para estabelecer uma formação adequada em todas as áreas.
Existem em Angola laboratórios analíticos locais que trabalham a um nível profissional elevado para garantir o controlo de qualidade.
O Ministério da Agricultura e Florestas está disposto a apoiar e criar um ambiente favorável às exportações de Moringa, fornecendo procedimentos para normas de conformidade e segurança alimentar.
Os bancos podem promover investimentos através de programas especiais.
As iniciativas do governo holandês podem apoiar a transferência de conhecimentos e as missões de entrada no mercado.
A Apex pode apoiar a exportação de Moringa para a UE.

O objectivo deste estudo é determinar a viabilidade, viabilidade económica e sustentabilidade da produção de Moringa (orgânica) em Angola para exportação para os Países Baixos/UE, bem como para o mercado local.
Este relatório descreve os mercados, a produção e processamento existentes ao longo da cadeia de valor, os requisitos legais da UE, a situação da Moringa em Angola para aumentar a sensibilização e as oportunidades e dá recomendações para desenvolver ainda mais o sector da Moringa em Angola.

Este estudo descreve 5 recomendações a curto e médio/longo prazo para aumentar a produção, processamento e vendas de Moringa. Estes são:

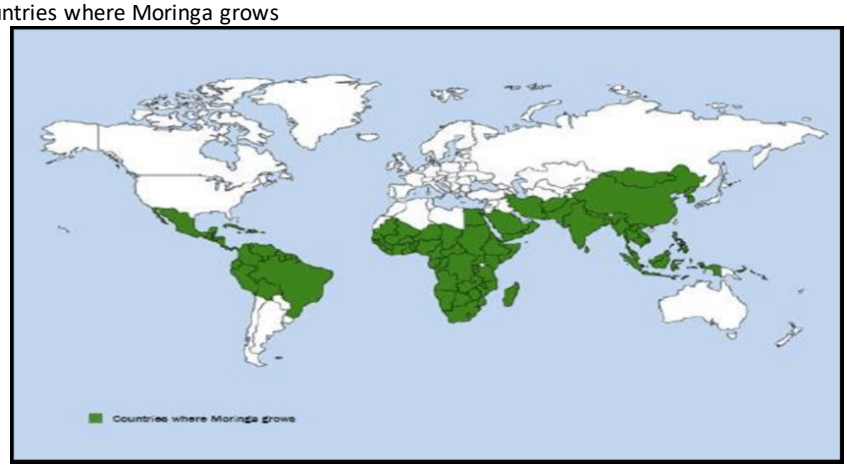
1. Apoiar a criação de uma unidade de produção de sementes de Moringa e recolher as sementes de Moringa localmente ou de países vizinhos em 2025
2. Criar um pequeno grupo de defensores da Moringa dispostos a incorporar PME seleccionados de agricultores de Moringa – começar com um conceito de Escola na Machamba do Agricultor para formação em Moringa e transferência de conhecimentos em 2025
3. Criação de um grupo de trabalho Moringa dentro do Agroportal Angola em 2025
4. Apoiar um stand de exposição numa feira agrícola em Angola em 2026
5. Convidar produtores de Moringa seleccionados para participarem numa Missão de Entrada no Mercado de Moringa fora de Angola para 2027

Em suma, as condições básicas para cultivar e transformar a Moringa em Angola existem e são muito favoráveis.

2.0 Introduction

Food supplements and other health foods are becoming more and more interesting in the European market which is also the trend in the Netherlands.
Moringa oleifera is classified as healthy foods and became popular in the northern hemisphere. Demand for such products is forecast to grow in the coming years and the main drivers are growing demand for immune-boosting food supplements, plant-based protein, natural energy products and weight management.
Intensive scientific evaluation started about 15 years ago and the results shows that this plant is rich in vitamins, minerals and antioxidants. Moringa originally from India grows today in subtropical countries around the equator. Due to cold climate conditions the production in Europe is not possible and therefore Moringa must be imported.
In Angola the Moringa sector is underdeveloped and mostly not organized. Individual farmers are experimenting with Moringa but the number of Moringa farmers is still very limited. However, few companies and organizations started already to plant Moringa professionally, process it and Moringa products can be found on the Angolan market.
The import of Moringa to the Netherlands and other European countries is still very limited. The demand for high quality Moringa is bigger than the current supply possibilities. For Angola and other African countries this is a chance to produce and to export.
European buyers and Angolan producers need detailed information about the feasibility to developing Moringa exports to the European market.
Dutch investors and NGOs interested to support the development of Moringa in Angola could also benefit from such information.
The goal of this study is to determine the feasibility, economic viability and sustainability of producing (organic) Moringa in Angola for export to the Netherlands/ EU as well as for the local market.
This report describes markets, existing production and processing along the value chain, EU legal requirements, situation of Moringa in Angola to raise awareness and opportunities and gives recommendations to further develop the Moringa sector in Angola.
The Dutch Enterprise Agency (RVO) commissioned this study to promote trade and investment between Angola and the Netherlands.
This study was conducted by AWG projects, training and consulting being specialized on natural ingredients from African origin.

Figure 1: Countries where Moringa grows



Source : https://www.researchgate.net/figure/World-map-showing-countries-where-Moringa-is-extensively-grown-green_fig1_279978825

3.0 Moringa product definition

Moringa oleifera originally comes from the sub-Himalayan regions of Northern India and is spread now across subtropical zones in Africa, Asia, the Pacific Islands and South America. The tree is cultivated but also grows wild in many areas of the world.

In Europe Moringa has got several Nos in the harmonised system which means tax No to facility the import into the European Union. Harmonised Nos are available for leaf powder, Moringa seed oil Moringa pods and Moringa extracts. For other parts of Moringa these are to date not existing because they are currently not imported.

The CAS Registry Number is a unique identification number, assigned by the Chemical Abstracts Service (CAS) in the US to every chemical substance described in the open scientific literature, in order to index the substance in the CAS Registry

The European Community number (EC number) is a unique seven-digit identifier that was assigned to substances for regulatory purposes within the European Union by the European Commission.

The above-mentioned Nos show that Moringa is recognized and analysed in a standard way. However not all parts of Moringa have standardized Nos because so far not all parts are imported and used in the EU.

Table 1: Classifications of moringa products

Moringa leaf powder	
Harmonised System	0712.9090 (Other dried vegetables, whole, cut, sliced, broken or in powder)
Moringa seed oil	
CAS no.	93165-54-9 (Extractives and their physically modified derivatives such as tinctures, concretes, absolutes, essential oils, oleoresins, terpenes, terpene-free fractions, distillates, residues, etc., obtained from Moringa oleifera, Moringaceae.)
European Community Number	296-941-1 (Extractives and their physically modified derivatives such as tinctures, concretes, absolutes, essential oils, oleoresins, terpenes, terpene-free fractions, distillates, residues, etc., obtained from Moringa oleifera, Moringaceae.)
Harmonised System	1515.90 (Other fixed vegetable fats and oils (including jojoba oil) and their fractions, whether or not refined, but not chemically modified)
Moringa pods	
Harmonised System	0708.90 (Other Leguminous vegetables, shelled or unshelled, fresh or chilled)
Moringa extract	
CAS no.	93165-54-9 (Extractives and their physically modified derivatives such as tinctures, concretes, absolutes, essential oils, oleoresins, terpenes, terpene-free fractions, distillates, residues, etc., obtained from Moringa oleifera, Moringaceae.)
European Community Number	296-941-1 (Extractives and their physically modified derivatives such as tinctures, concretes, absolutes, essential oils, oleoresins, terpenes, terpene-free fractions, distillates, residues, etc., obtained from Moringa oleifera, Moringaceae.)
Harmonised System	3301 (Essential oils (terpeneless or not), including concretes and absolutes; resinoids; extracted oleoresins; concentrates of essential oils in fats, in fixed oils, in waxes or the like, obtained by enfleurage or maceration; terpenic by-products of the deterpenation of essential oils; aqueous distillates and aqueous solutions of essential oils)

Source: Profound study Zambian Moringa
http://thisisprofound.com/wp-content/uploads/2018/06/Opportunities-for-Zambian-moringa.pdf

4.0 Potential uses of Moringa worldwide

Basically, all parts of Moringa can be used. To date mostly Moringa leaves, Moringa powder as well as Moringa seed oil are in the focus, but other parts of Moringa have only a local importance and in future may come on to the market.
In the following the different parts of the trees are described for its use and the processing method:

Leaves • Use as vegetable, for herbal teas, food supplements, cosmetics and growth regulator • The leaves are used fresh, dried and as powder • Processing is done as drying and milling	
Roots • Use as spicy root powder, fresh or dried • Processing is done as drying and milling	
Unripe pods – drumsticks • Uses mainly fresh as unripe pods • Seldomly processing as drying	
Seeds • The fresh and the dried seeds are used as mouth freshener and for digestion enhancement and is raw material for Moring oil • The oil is used as cocking oil, as cosmetic or in the ayurvedically medicine (India) • The seed shells are used in the Biofuel production • De-shelled kernels can be mostly cold pressed for oil • The press cake which remains after pressing can be used as fodder in animal feed • The seeds mainly milled can be used as water purification	
Bark • The bark can be used as fibre source • The gum exudate is a potential natural polymer for food innovation. It has synthetic suspending and binding agent properties	
Stems, branches and twigs • Mostly used fresh or dried for animal feed	
Other uses • In many African countries Moringa is used as fence and as boundaries or land.	

4.1 Uses in cosmetics

https://ec.europa.eu/growth/tools-databases/cosing/

European manufactures of cosmetics refer to the Cosing data base which is an information-only database that provides a distinction between ingredients and substances. A registration in Cosing confirms that scientific institutions and companies have investigated and tested the function of the ingredient. It means that Moringa for use in cosmetic has been approved.

In this data base the Moring products as seed, bark and leaf extract as well seed and oil extract are described with function in skin conditioning, abrasive and emollient.

4.1.1. Fatty acids composition of Moringa oil

The cosmetics industry in the Netherlands and other European countries are interested to use Moringa oil and Moringa extracts in their cosmetics. Moringa has very high oleic acid which is omega-9, the content is around 70%. On top of this the behenic fatty acid is interesting. In skincare, behenic acid has lubricant, emollient, and soothing properties, which help to restore the skin's natural oils and improve overall levels of hydration.

Table 2: Fatty acid composition in Moringa and other plant-based oils

Fatty acids (%)		Moringa	Almond	Apricot	Avocado	Jojoba	Rosehip	Palm	Marula	Baobab
Myristic	C14:0	0.1					0.1-0.3	0.5-6		
Palmitic	C16:0	3.5-6.9	3-9	3-6	12-20	< 3	3.4 - 4.4	35-48	9-12	18-30
Palmitoleic	C16:1	1.1	< 2	< 1.4	2-10	< 1	0.1-0.18		0.05-0.15	
Margaric	C17.0									
Stearic	C18:0	4.3-8.3	0.5-3	< 2	0.1-2	< 1	1.5-2.5	3-7	5-8	2-8
Oleic	C18:1	67-76	60-75	55-70	55-75	5-15	14-16	35-50	70-78	30-40
Linoleic	C18:2	0.4-3.5	20-30	20-35	9-17	< 5	43-46	6-13	4-7	24-34
Linolenic	C18:3	0.1	0.4	< 1	0.1-2	< 1	31-34		0.1-0.6	1-3
Arachidic	C20:0	3.72	0.2	< 1		< 0.5	0.1 - 0.9		0.3-0.7	
Eicosenoic	C20:1	2.3-2.6	0.2			65-80	< 0.5		0.1-0.5	
Behenic	C22:0	6.7-9	0.2			< 0.5	< 0.4			
Erucic	C22:1		0.1			10-20			0.1-0.5	

Source: Profound Moringa Zambia study
http://thisisprofound.com/wp-content/uploads/2018/06/Opportunities-for-Zambian-moringa.pdf

4.2 Uses in medicines

Even though Moringa is part and described as the Ayurveda health and medicine treatment in India for numerous applications it is not allowed and permitted to promote Moringa as a pharmaceutical in the Netherlands and other European countries. In this regard medicinal

claims are forbidden to put on the product label. For example, it is not allowed to write that Moringa oil cures neurodermatitis or psoriasis.

However, scientific research on medicinal effects of Moringa have been done or are being carried out. Indications shows effects against cancer, lowering blood pressure or several skin diseases.
Moringa has isoflavones which are phytochemicals that are structurally like estrogens and bind to the same receptors in the female body. In this way, the body's sharply declining hormone production can be compensated for during menopause.

In case sufficient medical studies and an official pharmacological registration would be done in Europe we might expect Moringa to be registered as pharmaceutical in one other the other mentioned indications (cancer, lowering blood pressure, skin diseases. However, it is assumed that this process will take another 5 years to complete the necessary studies as pharmaceutical.

4.3 Uses in food and food supplements

Currently only fresh or dried leaves and powder as well as pods (with seeds) are allowed in the Netherlands and other European countries as food and food supplements. Also, Moringa oil recently is not restricted by Novel food regulation.

https://ec.europa.eu/food/food-feed-portal/screen/novel-food-catalogue/search

4.4 Uses in animal feeds

Moringa cake after oil extraction can be used as animal feed as well as fresh and dried moringa leaves, stems and twigs.

4.5 Uses as water treatment

Numerous studies have shown that Moringa oleifera can effectively treat sewage water, with significant reductions in turbidity, total solids, total suspended solids, total dissolved solids, hardness, chloride, fluoride, sulfate, inorganic phosphorus, and Chemical oxygen demand levels. COD is the measure of the capacity of water to consume oxygen during the decomposition of organic matter in the water.

Up to now there is no commercial process of Moringa water purification in place mainly due to current cheap chemical processes.

Some of the important publications are listed here:

Moringa as a household water purification method – community perception and pilot study in Guinea-Bissau

- https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-022-14344-w

Water purification improvement using moringa oleifera seed extract pastes for coagulation follow scoria filtration

- https://www.sciencedirect.com/science/article/pii/S2405844023046285

Moringa oleifera and Other Local seeds in Water Purification in Developing Countries

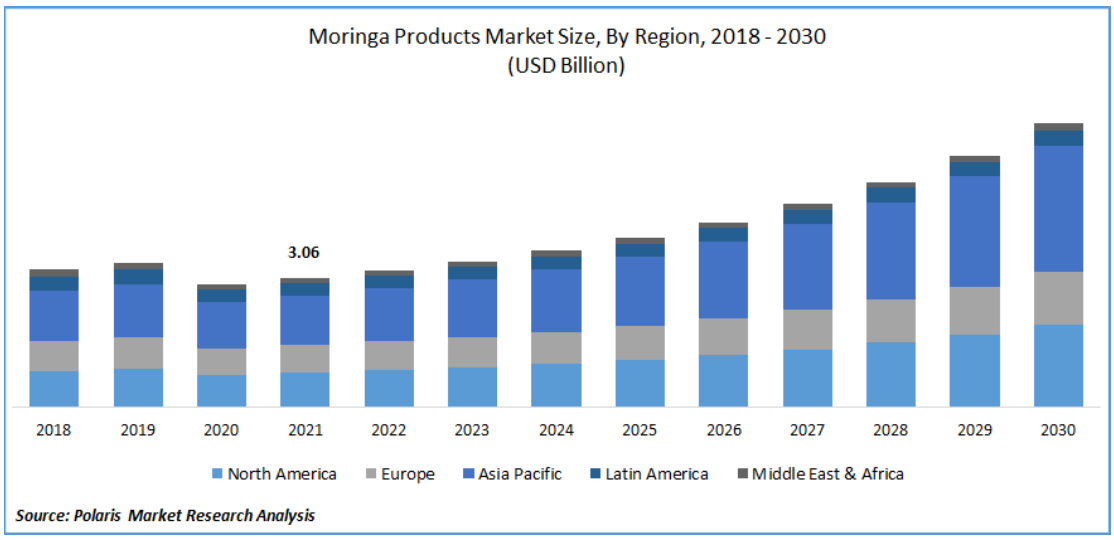
- https://www.researchgate.net/publication/255484408_Moringa_oleifera_and_Other_Local_seeds_in_Water_Purification_in_Developing_Countries

5.0 The Market potential for Moringa

5.1 Worldwide

The Polaris Market Research values the Moringa product market size at 3.06 billion US$ in 2021 with a growing tendency. The date 2022 – 2030 are forecasts. As to now the real data for 2023 and 2024 is not yet available.
Asia Pacific and North America are the biggest markets followed by Europe, Latin America and Middle East & Africa.
The graphic below shows that the North American and the Asia Pacific markets who the strongest growths. In Asia, India is the largest producer and but also the largest consumer at least from Moringa drum sticks concerns.
For African producers the most interesting export markets are Europe, North America and Japan.
However, besides export markets the local and regional market are interesting for African producers and is often underestimated and not explored.

Figure 2: Moringa Products Market Size by region 2018 - 2030



https://www.polarismarketresearch.com/industry-analysis/moringa-ingredients-market

It is expected that the revenue forecast in 2030 grows to 6.70 billion US$. That means a growth rate of about 9% per year.

5.2 Europe

The Europe Moringa products market is accounted to 903 million US $ in 2018 and is expected to grow 8.7 % per year during the forecast period 2019 – 2027, to account to 1.89 billion US$ by 2027. The indicated data is a bit lower than in the above-mentioned Polaris worldwide graph.
https://www.businessmarketinsights.com/reports/europe-moringa-products-market

As outlined in the CBI "The European market potential for Moringa" study, Europe is an attractive market for Moringa suppliers in developing countries. The market exists for dried Moringa leaves, Moringa powder and Moringa oil. There is a very small niche market for Moringa dried flowers which provides a nice herbal tea flavour.
However, it must be pointed out that the European market absorbs to more than 90% only Moringa which is organically certified. The market for non-certified Moringa is steadily shrinking and will most like disappear in the next 2 years.

Only recently the market in EU is growing for Moringa oil since the natural cosmetic industry has observed that natural oils from Africa have interesting fatty acids (i.e. Behenic acid) which are rare and have favourable characteristics for skin products.

The EU Moringa demand is mostly for dried leaves, leaf powder and seed oil. To date the other Moringa products like root powder, bark and others have not yet penetrated substantially the market. The market is obviously to date too small. However, sporadically fresh leaves and root powder can be found in Africa/Asia shops.

About 15 years ago Moringa started to have awareness in Europe but still today a small number of consumers are aware of Moringa. However, private companies selling Moringa as well as public institutions have invested in making Moringa more aware in EU.

Currently the use of Moringa dried leaves or Moringa extracts as a fodder in animal husbandry is under research. The research for medical properties (i.e. cancer treatment) is ongoing and further market opportunities of both mentioned areas for Moringa in EU can be expected in future.

According to industry sources the volume for Moringa leaf powder imported to EU is 130 – 160 tonnes (2023). The demand is increasing since the awareness has risen.
However, we need to face the fact, that imported mentioned tons into the EU are not 100% consumed in the EU. Since for example US companies are also sourcing from EU importers own estimation would be that up to 20% are further distributed to the US or other countries. There are estimated figures available, but Germany and the Netherlands seems to be the biggest importers of Moringa from African origin followed by France, UK and Spain.
Looking to Eastern Europe, opportunities for Moringa are rising in Poland.

Below an overview is listed of Moringa imports estimated in the mentioned CBI study and own estimation:

Table 3: Moringa imports into Europe (CBI study and own estimation from 2024)

Country	***CBI study (tons dried Moringa)***	***Own estimation (tons dried Moringa)***	***Growth rate***	***comments***
Germany	50 – 60	100	5 – 6%	Min 50 tons are imported but further sold to US companies; Moringa oil 500 – 1000 L
UK	20 – 30	40	3%	
France	15 – 20	20	6 %	Growing interest of Moringa oil by large cosmetic producing companies. However mostly

				not directly importing, they use other EU companies
Netherlands	-	30	5%	Most of the Moringa is re-exported to other EU and non-EU markets; Moringa oil import starts slowly but steady
Italy	-	20	5%	Only few tons are imported directly; most is purchase from other importers in Germany and Netherlands
Spain	-	10	5%	Own small production in Tenerife but expensive and non-competitive

Comparing the growth rates of CBI and own estimation (5-6%) with "Polaris" and "business market inside" data (8-9%) a difference of few % can be seen. However, even 5 – 6% growth is attractive.
Recent information from the BIOFACH 2025 shows that the demand is higher than the numbers given above. Challenge is that there is no sufficient availability of high quality Moringa, because production is lower than the amount importers say to be willing to buy.

5.3 The Netherlands

The Dutch market for Moringa remains still a niche market which is not fully developed. In this regard the German, UK and French markets were exposed to Moringa earlier. Own estimations as above mentioned would see the current imports of Moringa with quantities of 30 tons per year. However partly re-exported to the US or other EU countries. This is in line with other plant-based products where the Netherlands are an important market to re-export products to outside. The re-export aspect could be important for Angola to supply the Netherlands with by far more Moringa than would be consumed in the Dutch market.

5.4 Africa

The Moringa market possibility within an African country and regionally with other neighbouring countries is by far underestimated.

Except Morocco, Libya, Tunisia and Algeria, all other African countries are cultivating Moringa or Moringa grows wild.

In most African countries the opinion of farmers is that Moringa has the biggest commercial chances only in EU/US export markets. Several NGOs having promoted Moringa cultivation did contributed to this image in the last 15 years. Recent findings in the CBI Moringa Burkina Faso study concludes the opposite. The market possibilities within the African continent are quite attractive and not yet exploited.

The traditional knowledge of Moringa is spread out mainly locally and mostly elder people have inherited verbal knowledge of Moringa. The younger generation often does not know what Moringa is. On top of this the latest research on the good ingredients of vitamins, minerals and antioxidants are not widely known. Initiatives to make information of Moringa available to the public are highly recommended. Proposals for Angola will be done in the recommendation section.

The Moringa production for export started some years ago, but still no big quantities per co-operation or Farm (<3 tons per year).

5.5 Trends and Segments

The trend for Moringa remains in the food supplement market whereby consumers are highly interested in in healthy nutrition and healthy lifestyle. The Corona pandemia showed that the demand for healthy immune boosting products suddenly increased, which was also the case for Moringa based products.
According to africrops! the main customers for Moringa are women elder than 40 years and older people living health conscious.

Consumers value Moringa for the high nutritional values like vitamins, minerals, antioxidants, essential fatty acids, protein and fibres.

The trend for the so-called superfoods where also Moringa belongs to is still present and according to own estimation this will continue also in the future. The started movement to consume food from organic origin as well as the vegetarian and vegan trend ensures that food supplements like Moringa will stay for long time and the risk that Moringa will go out of fashion is low.

Moringa is solid component of the Ayurveda medicine in India. In EU medicinal claims for Moringa are still not allowed because of missing medical studies to support a proper registration as pharmacy. Even though it is known the Moringa oil for example can effectively treat skin diseases it is forbidden to put claims like this on the label.

In the Netherlands and Europe, Moringa is part of smoothies, drinks, pasta, cereal bars, capsules and compacts. However, consumers often do not know on how to consume Moringa. As known the taste of Moringa leaves and powders takes getting used to. New innovative recipes as developed for example developed by africrops! support the consumption of Moringa. All major Moringa importers in EU search for long term business relationship with Moringa partners. Once Moringa partners produce high quality Moringa matching the Purchase specification of a buyer a long-lasting purchase is mostly guaranteed.
New product developments in Moringa can support and stimulate the business and sales of Moringa. Major food providers play an important role to create now Moringa products and launches them on the market.

5.5.1 Nutritional value of Moringa

The high nutritional values of Moringa have been described in many publications as a summary there are high concentrations of:

- Vitamin A, B, C
- Minerals like Calcium, potassium, Selenium and Phosphorus
- Sulphur containing amino acids, methionine and cystine
- Essential faddy acids as Omega-3 and omega-6
- Antioxidants
- Protein
- Fibre

Source and more information: www.sciencedirect.com/science/article/pii/S2213453016300362

5.5.2 Examples of food supplements with Moringa in the Dutch and European market

Hanjou: Moringa capsules	
Mattisson: Moringa blad powder	
Maharishi Aryurveda tablets	
africrops!: Moringa tablets	

5.5.3 Examples for Herbal teas

Moriveda: Moringa herbal tea leaves	

Jacob Hooy: Moringa herbal tea leaves	
Van Bruggen Thee: Moringa herbal tea leaves	

5.5.4 Other Moringa mixed products

Aduna: Moringa bar	
Bali kitchen: Moringa noodles	

5.5.5 Moringa cosmetics

Ooh!: Anti oxidant face oil	
africrops!: Moringa care oil	

Neobio: Moringa shampoo	
Body shop: Moringa hand cream	
Lush: Magical Moringa facial moisturizer	

5.6 Prices for Moringa in EU i.e. The Netherlands

5.6.1 Dried leaves

The import price ex farm for large quantity of Moringa i.e. > 5 tons remains as in the past around 4 – 6 Euro/kg. Smaller amounts in specific markets may provide higher prices like 10 Euro/kg. It very much depends on the individual negotiation between producer and importer. Due to the shortage of Moringa some importers accept ex farm incoterm for the beginning of the business collaboration but later negotiate only FOB respectively CIF prices.

Prices in Dutch respectively other European web shops and retail market vary between 6,79 Euro – over 10 Euro / 100g Moringa tea leaves.

5.6.2 Powder

The prices for Moringa powder remain much the same as dried leaves may be only a bit higher.

5.6.3 Oil

The import price for Moringa in large volume (500l) remain 20 – 30 Euro/litre, however for smaller amount would count for 40 – 50 Euro/litre. Prices in Dutch respectively other European web shops and retail market are around 25 Euro for 100ml Moringa oil.

5.6.4 Flowers

The market for Moringa Flowers is very small even though the flower tea has an excellent flavour.

The retail prices are around 18 Euro/100gr Moringa dried flowers.

5.7 Market possibilities for Moringa bulk and final packaging

Currently the market for Moringa in the Netherlands and other European countries is mainly in bulk. Only limited market for Moringa final products from African origin. This is mainly due to the fact the packaging material, design and the label does not correspond to the market requirements in Europe.
This may change as the company Nutriboty from Angola has shown. Their products are packed in high quality design and packaging material having entered already the Portuguese market. For Angolan Moringa producers it might be easier to produce final products in Portugal due to long existing relationships between the two countries.

5.8 Main importers for Moringa in Europe

In Europe there are currently 24 Moringa importers in 5 European countries. All of them import Moringa leaves, Moringa powder and Moringa seed oil in bulk. To date import of finished product does not take place. The biggest importer is Worlée with a potential of 150 tons (2024) of Moringa products bulk per year. However, most of the product does not stay in the EU but is exported to the US market.
These importers are partly processing Moringa into own brands but also sell bulk to other companies processing and packaging into final product for retail sales.

More information on main EU Moringa importers is given in Annex 12.1

6.0 EU legal requirements for Moringa (quality and certification)

Generally, the consumer preference is to buy products with organic certification according to EU standard. There is almost no market left for conventional Moringa. The new EU Organic Regulation 2018/848 has been in effect since 01.01.2022, describing the requirements of the organic label at all stages of the value chain.

It is advised that organizations and companies from Angola wanting to export to EU to undergo an organic certification process.
So far there is no accredited certification body in Angola, however Control Union, Ecocert and AgriCert will send auditors to Angola to perform the audit which is a prerequisite for obtaining the certificate.
Since the auditor is not allowed to prepare for certification it is advised to involve a certification specialist.

Moringa for supplements, fortification, herbal teas and other foods must be safe for human consumption and packaged safely to enter the European market. Angolan exporters must have a food safety management system in place to become successful in the Netherlands. Buyers demand proof of product's safety and proof that the product meets their quality requirements before they will buy. Certification for compliance with ISO 22000 or higher standards is strongly recommended.

Food safety is a key issue in European Union food legislation. The General Food Law is the legislative framework for food safety in the European Union.

To guarantee food safety and to allow appropriate action in cases of unsafe food, food products must be traceable throughout the entire supply chain. Every company must have a traceability system in place with information on their supplier of each lot of products. When all companies do this, the product becomes traceable from consumer back to the producer.

Important for the control of food safety hazards throughout the whole supply chain is the implementation of food safety management based on Hazard Analysis Critical Control Points (HACCP) principles (already included in ISO 22000).

An example of a product and purchase specification from an EU Moringa importer is given in Annex 12.2

The specification includes the requirements for Moringa to be met in view of appearance, pesticides, heavy metals, microbiology, mycotoxins, the storage conditions and the price indication.

7.0 Competitive advantages and disadvantages of Moringa from Angola in the EU i.e. Dutch market

The largest producer of Moringa is still India where the tree has a long tradition in cultivating, consumption and where the tree originally comes from. However, Moringa is consumed mainly as the unripe drum sticks which is cocked as a vegetable. The production of leaves and oil was developed mainly because the international market required these. The prices are comparatively low often <4 Euro FOB. However, the image of Indian Moringa is suffering from the fact that in organically certified leaves unacceptable traces of pesticides were found. This is a chance for African i.e. Angolan producers to provide the market with high quality Moringa. In the meantime, the general image of African Moringa is the better one in comparison to the Asian one.

Importers of Moringa are currently facing the problem that Moringa in large quantity (> 10 tons of Moringa powder or 500 l of Moringa oil) is hardly to get. This is a chance for Angola to step in because larger virgin land with favourable growing conditions is existing. However, the Angolan market needs to be made fit in view of producing large quantities in high quality and organically certified. The market in the Netherlands and EU is existing. A challenge is to produce Moringa in the range of 4 – 6 Euro per kg dried leaves or powder ex farm. Only when producing in large quantities with optimizes production and processing methods this price provides economically success to Angolan farmers.

Main African competitors are South Africa, Mozambique, Kenya. However, there is sufficient overall demand worldwide to absorb the rising demand. Recent information from the largest Moringa dried leaf importer WORLÉE show that in 2024 they had a demand for 150 tons of Moringa dried leaves which could not be matched due to not sufficient Moringa producers worldwide having organic EU certification. Most of their demand comes from the US.
The African Moringa Hub (https://africamoringahub.org/) mainly operating in South Africa is a strong supporter to promote Moringa from African origin. Angolan Moringa players should participate here for the future. This organization helps also to first develop locally and regionally and then to target the EU market i.e. Dutch market.

Risk analysis for Angolan Moringa producers:

- According to experiences from other African countries (i.e. Burkina Faso, Tanzania or Kenya) Moringa for leaf production to be exported to EU should be produced at min 5 ha for the start expanding to 10 ha to ensure min 5 – 10 tons dried Moringa leaves per year (1-ton minimum dried Moringa leaves per ha should be the objective. This applies for the export market.
- The pre-requisite to achieve this result is water availability (irrigation equipment needed).
- On top of this sufficient organic fertilizer and organic pesticides should be available. Normally these must be produced on the own farm and respective knowledge must be available (training in organic farming).
- From the experience in other African countries only larger farmers with sufficient capital for investment in irrigation, transport to processing, drying facilities, storage and packaging will participate in export process.
- The challenge would be to convince a larger farmer to cooperate with several small-scale farmers around the farm supplying Moringa fresh leaves for processing. The challenge is here to ensure that all small-scale farmers work according to the same quality standards. This needs to be ensured by a quality manager of the larger farm.
- Main challenge is the EU organic certification process which requires a yearly budget of around 3000 Euro for the certificate + at the beginning consulting for certification preparation.
- However, targeting the local and regional market is more attractive for small holder farmers since organic certification EU process is not required and ex farm prices are higher for Moringa leaves. Experiences from other African countries show that 8 – 10 Euro per kg dried leaves/powder can be achieved in comparison to 4 -6 Euro for the export market.
- In any case it is recommended that small scale farmers form a co-operative to increase the total volume of Moringa production and to share equipment (transport, drying equipment, mill, storage, packaging).
- To produce Moringa according to organic farming rules has no negative effect on climate change. In contrary it contributes to fertile and healthy soils. In case less rain over the year is forecasted because of the climate change an irrigation system needs to be in place. In case of more and heavy rainfalls are forecasted a good drainage (sandy soils, water ditches) must be ensured.

8.0 Moringa in Angola

The Angolan economy was long time driven by the petrol oil sector and investments in the agricultural sector were low. However, due to the Russo-Ukrainian War and Lourenco's government that started in 2017, the Angolan government made efforts to diversify the Angolan economy with agricultural focus. Programs like Production Support, Export Diversification and Import substitution Programs (PRODESI) were launched with the aim to support the implementation of entrepreneurial support and enhance business competitiveness. On top of this the Commercial Agriculture Development Project (CADP) was launched.

However still the Angola's agricultural resources remain underutilized and agriculture accounts for only 12 percent of the GDP. Estimations show that 68% of Angola's workforce is employed in the sector. Angola has vast land available and only a small area like 8 – 14 % is under cultivation.

Angola has enormous untapped potential, and the agro-climatic conditions are perfect for growing high yields, land and water are available, and the infrastructure is good. These conditions are also favourite for the cultivation of the Moringa tree. The regions Huambo, Kwanza Norte (Alto DONDO) and Lubango, seems very appropriate after first evaluation.
Since the demand of Moringa locally, regionally and for Export (Europe, North America, Asia) is growing and cannot be cultivated in the Northern Hemisphere a significant potential for income generation and nutrition security for Angolan farmers can be created.

However, the Moringa sector in Angola is still underdeveloped and unorganized.

8.1 Current status of growing

Apart from few companies and organizations Moringa mostly grows wild all over the country. Moringa is traditionally known and mostly used as fresh vegetable (leaves) in cocked dishes but also as animal fodder but rather unstructured.
Currently there are about 3 companies and organizations which are already advanced or have the intention to produce and to market Moringa in larger volumes. These are:

TERRAGANDO
https://www.companiess.com/terragando_de_maria_teresa_juliao_gando_info2184467.html
This company is managed by Sra Teresa Ganto Conmenta and is based in Kwanza Norte (Alto Dondo). They are specialized in the production of herbs and, they started with Moringa. Currently they have 3 ha but wanted to expand to 10 ha in 2025. Terragando is already exporting to Portugal where they have a customer. The Export is done FOB (incoterm: Free on board). In Angola they are supplying herbal pharmacies and herbal clinics with their Moringa dried leaves.

NUTRIBOTY
https://nutriboty.co.ao
Nutriboty was founded in 2018 and is specialized on herbal products and essential oils for the beauty and nutria supplements sector. Currently they have 5 ha of Moringa in Southern Angola (Lugando), have cooperations with 50 farmers for any kind of herbal production (rosemary, lavender and lemon balm) and are organically certified according to EU law by AGRICERT (Portuguese certifier).
Nutriboty is selling their products online and have a shop in Luanda city centre. They grow, process and pack there Moringa leaves in final packaging and are available in more than 50 pharmacies and all major supermarkets (tea boxes and loose leaves) in Angola.

Fazenda Mungo
https://www.fazendamungo.com/
The Fazenda Mungo in the Huambo region was created by Mr Chris Masters and besides Avocado production also Moringa is planted recently with the intention of have a professional larger production and processing and to involve small scale farmers to participate.

8.2 Moringa value chain in Angola

From experience in other African countries, the Moringa value chain can be described as follows and has 3 major parts like production, collection & processing and distribution and consumption (see graph 3). For Angola we have basically two situations:

8.2.1 Small holder farmers:

They produce Moringa fresh leaves, dry them into the sun, mill the leaves manually, pack the product and sell it onto the local market. Also, fresh Moringa leaves are sold on the local markets directly by themselves. A cooperation with a processor to dry, to mill, or to pack is almost not existing.

The market potential for Moringa products in Angola is assumed to be far bigger than the current situation. Exact market figures are not available. This is because the level of awareness for Moringa as food, food additive and cosmetic in Angola is low. Also, at small holder farmer level not much is known about Moringa.
Once the awareness is increased the market size locally will also increase.
For small holder farmers more Moringa products can be made available.
These are:

- Moringa fresh leaves: As a vegetable for cooking or fresh salad
- Moringa dried leaves: For cooking, tea (also in combination with other herbs)
- Moringa powder from dried leaves: As food additive for cooking and smoothies
- Moringa dried flowers: For tea
- Moringa fresh root: As a spice
- Moringa dried root powder: As a spice
- Moringa seeds (entire seeds or deshelled): As mouth refresher,
- Moringa seed oil: As cooking oil, as cosmetic oil (skin)
- Moringa seedlings: For fencing and for house gardening
- Moringa bark: To produce antiseptic solutions for hygiene
- Moringa press cake (from oil pressing): As fodder for animal husbandry

8.2.2 Few large commercial Moringa companies

As already mentioned above, Angola has very few larger companies dealing with Moringa. They have either all value chain steps as mentioned in graph 3 under one roof or produce, process and package in bulk.

They mainly deal with Moringa dried powder and Moringa oil.

8.3 Business case study from Burkina Faso

Since production and processing at small holder level is not much developed in Angola the example from Burkina Faso Moringa project may support to understand the steps in the value chain. Here the different steps in the value chain (Graph 3) are evaluated with details on investment needed, operating cost, turnover and margin.

The below mentioned information was done by AGRODEV company in Burkina Faso.

Moringa seed farmer (breeding)
The quality of the seeds is a pre-requisite to have good germination and homogeneous plants. The seed farmer selects lines adapted to the different productions and develops the introduction of new improved varieties. The crops are only intended for seed production and are isolated from other Moringa crops to avoid any cross-pollination. The seeds are sorted, calibrated and then packaged.

- **Investment needed** (experiences from Burkina Faso, AGRODEV): 4.600 Euro (seeds, building material, organic fertilizer etc.)
- **Operating cost**: 4.900 Euro (rental cost land for 1ha land, labor cost harvest + maintenance, organic fertilization + protection, packaging material etc.)
- **Turnover from 1.5ha** :1500 kg quality seeds = 22.800 Euro (15,20 Euro per kg)
- **Margin:** 360%

Moringa nursery farmer
The nursery farmer raises homogeneous plants in polyethylene containers and has perfect mastery of the use of substrate and the care to be given to young plants. This type of plant ensures recovery rates of over 95% and very good homogeneity of the plantations.

- **Investment needed**: 2.000 Euro (small garden tools, sprayers, fencing, plastic foil containers etc.)
- **Operating cost:** 3.100 Euro (rental cost land, labor cost, maintenance, fertilizer + crop protection, packaging, seeds etc.)
- **Turnover:** 8570 Euro (18750 Moringa seedlings sold 0,46 Euro per seedling)
- **Margin:** per plant 75%

Moringa leaf producer - Semi-intensive non-irrigated cultivation (10,000 plants/ha).
This is an activity for agricultural producers who have a perfect mastery of the technical itinerary.
Harvests are made every 40 days during the cold/rainy season (5 harvests) and reach yields of 6 to 9 tons/ha fresh Moringa leaves per year.

- **Investment needed:** 7.700 Euro per ha (small garden tools, sprayers, fencing, transport, etc.)
- **Operating cost:** 2500 Euro (rental cost land, labor cost, maintenance, fertilizer + crop protection, packaging, seeds etc.)
- **Turnover:** 2750 Euro (9.000 kg fresh leaves sold per 0,30 Euro per kg)
- **Margin:** 11% (margin will be higher when own land available)

Moringa leaf producer - Semi-intensive irrigated cultivation (25,000 plants/ha)
Gravity or drip irrigation allows harvests throughout the year. Harvests are made every 40 days (8-9 harvests) and reach yields of 25 to 30 tons/ha per year.

- **Investment needed:** 17.500 Euro per ha (small garden tools, sprayers, fencing, transport, irrigation equipment etc.)
- **Operating cost:** 7.300 Euro (rental cost land, labor cost, maintenance, fertilizer + crop protection, packaging, seeds, repairs, energy etc.)
- **Turnover:** 8.400 Euro (27.500 kg fresh leaves sold per 0,30 Euro per kg)
- **Margin:** 15% (margin will be higher when own land available

Processor Moringa leaf dryer
The processor receives the fresh leaves, performs the qualitative sorting, washing and drying of the leaves (With a heat source). This type of drying can be a diversification for mango dryers and allows large quantities of leaves to be dried in the best possible conditions.

- **Investment needed:** 1.900 Euro to dry 6 tons dried leaves per ha (dryer oven, energy basic equipment etc.)
- **Operating cost:** 16.800 Euro (rental cost proportionally, labor cost, maintenance, energy gas, water, packaging etc.)
- **Turnover:** 20.150 Euro (6.000kg – per kg 3,35 Euro)
- **Margin:**20% (margin will be higher when own location available)

Moringa seed farmer – irrigated plants (seeds to be sold to press oil)
The trees are intended exclusively to produce seeds with a density of
800 plants/ha. A perfect mastery of the technical itinerary allows 2 annual harvests with yields of 4 to 6 tons/ha per year from the 3rd year.

- **Investment needed**: 5.500 Euro per ha (small garden tools, transport, seeds, irrigation equipment etc.
- **Operating cost:** 2.800 Euro per ha (labor cost, maintenance, water, de-shelling, pruning)
- **Turnover:** 4570 Euro per ha (5000kg – per kg 0,90 Euro)
- **Margin**: 61%

Processor – oil pressing
The oil mills have a complete extraction line: Sorting, hulling, crushing, pressing, filtration, cooling. To be competitive, they have an extraction rate of over 35%, cold pressing and using their residues (cake) as flocculent or as animal feed.

- **Investment needed:** 115.000 Euro based on 125.000 L Oil per year (oil pressing equipment, packaging, oil containers etc.)
- **Operating cost:** 451.000 Euro (rent building, transport, labor, seeds, oil containers, packaging material etc.)
- **Turnover:** 805.000 Euro (125.000 l oil – per L 6,10 Euro + press cake 235.000 kg – 0,19 Euro per kg)
- **Margin:** 78%

Processing Packaging
The processing unit receives the dried leaves and the oil. It has a processing laboratory that meets international food standards and packages the finished products in varied and attractive packaging.

- **Investment needed**: 1.100 Euro for 6 tons dried leaves per year (labor, packaging machines, electrical installation etc.)
- **Operating cost**: 22.400 Euro (labor, packaging material, maintenance etc.)
- **Turnover:** 25.600 Euro (6.000 kg – per kg 4,25 Euro)
- **Margin**: 14%

The information from Burkina Faso shows that a Moringa seed farmer (breeding) and a Moringa nursery farmer have quite attractive margins.

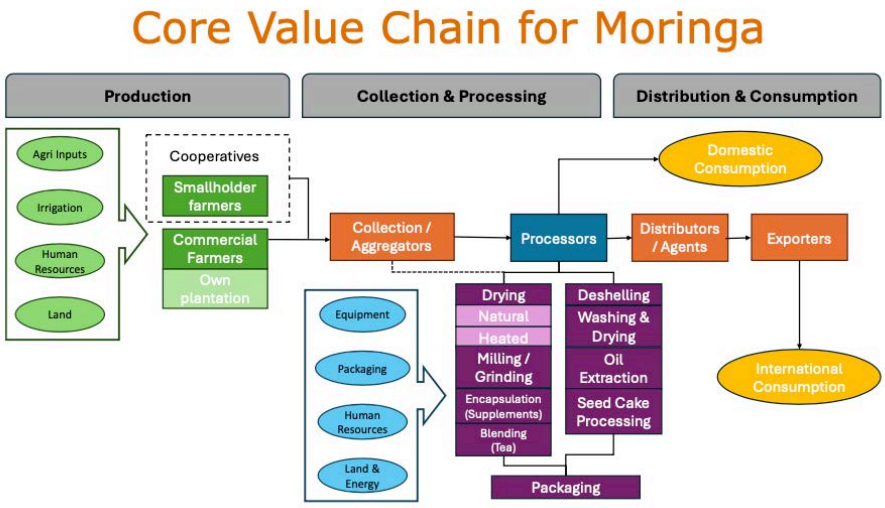
Another conclusion is that Moringa producers should try to get the processing steps washing and drying under one roof to increase the overall margin.

8.4 Estimation of production cost for Moringa powder

Also, here since no data is available the information from 8 Moringa producers from Burkina Faso may help to give an orientation of the production cost for Moringa powder (production and processing drying + milling):

- 2,30 Euro per kg (farmer producing on 10 ha)
- 5,00 Euro per kg (farmer producing on 3 ha).

Figure 3: Core Value Chain for Moringa



Source: BDS study CBI Moringa Project Burkina Faso

8.5 Moringa production

Moringa grows in many areas, is robust but requires a sandier soil with good drainage. Waterlogging leads to immediate death of the plant. Cold conditions (<5 degrees C) for several days lead to defoliation but plant will recover when temperatures are rising again.

There are different schemes of cultivating Moringa depending on what part of Moringa to produce. For leave production a more intensive cultivation method is required with dense planting and for seeds production a larger spacing. The main reason to have more dense planting for leaves is that Moringa is constantly pruned and cut to have leaves. The tree for this purpose will not get higher that 1 – 1.5m. For the seed production the Moringa tree needs to be grown without pruning till seeds can be harvested. So, the tree can reach easily 3 – 4 m.

Direct seeding or transplanting from a nursery is possible. However recent practical experiences show that direct planting is recommended because generally good germination and less labour involvement.

Intensive production requires high labour and fertilizer/plant protection input in comparison to the agroforestry and low intensity production.
A recommendation to go for intensive or semi-intensive or extensive Agroforestry system depends on labour availability and land available for production. The more labour is available the more intense the planting can be.

In Angola Fazenda Mungo and Terragando plants 50x50 cm to 50x100cm, whereby Nutriboty is planting 100x400cm to let a tractor pass.

Cultivating Moringa according to organic principles and organic farming is recommend. As said the export market requires these days only organically certified Moringa.

The Moringa leaves can be harvested in 1 – 2 weeks interval, normally after 3 months in an intensive production. However, also in 6 weeks interval during the main growing season for semi- intensive and agroforestry systems are possible. It is recommended to use only the young bright green leaves. They have the highest nutrient content.

Yellow leaves must be removed.

Important are the hygienic harvest conditions.

Table 4: Cultivation techniques of Moringa

Product	Cultivation technique	details
leaves	Intensive production	Spacing: 10cm x 10cm to 20cm x 20cm Density: 1million plants/ha Requires more maintenance skills
leaves	Semi-intensive production	Spacing: 50cm x 1m Good results with less maintenance
leaves	agroforestry	Spacing: 2 – 4m distance between rows. Orientation: East – West
Fruit/seeds/pods	Low intensity production	Spacing: 2.5m x 2.5m

Source: Muller and Rebelo, 2011

In Angola the frequency of harvests in 15 days at Nutriboty, every third month at Terragando and Fazenda Mungo.

NB: a full training program on production of Moringa and good agricultural practice (GAP) is available with the Moringa expert.

8.6 Moringa collection & processing

Moringa tree at Terragando

For Moringa leaf processing the ideal situation is if the drying facility is nearby the field. The general recommendation is to start drying around 1 h after harvesting because the rotting process in Moringa starts rapidly. Small scale Moringa farmers which normally have no own drying facility should access a processor which is not too far away.

There are natural drying systems or more sophisticated solar or gas systems. In any case the temperature should not be higher than 45 degrees C to obtain a high-quality product. Preferred are solar systems in a closed environment (container or room) with temperature and ventilation control.

Tunnel drying system

In Angola Terragando is drying the Moringa leaves natural without any heating system. This natural type of drying provides a good quality; however, the prerequisite is dry weather with low relative humidity. The drying should not exceed 2 days to achieve less then 10% of humidity in the dried leaves.

NUTRIBOTY has a professional drying system with pre-ventilation dryer
pre-ventilation system at Nutriboty

8.7 Moringa local usage

In rural areas of Angola Moringa leaves are mainly used fresh for cooking as a vegetable. Also, sun dried leaves and seldom dried flowers are used as tea. The seeds are used as mouths freshener and for digestion. Moringa oil occasionally is used for cooking and skin moistening. Moringa leaves are also used for fodder production in animal husbandry.

In urban developed areas the Moringa products of Nutriboty and Terragando are used by health-conscious people.

There is large potential to make Moringa products more known in Angola with advertising and more local production.

8.8 Role of stakeholders

To develop the Moringa sector in Angola relevant stakeholders are important to back up any activity to push the activity forward. Important stakeholders in Angola are:

Secretary State of Agriculture Mr Castro Camarada (Secretário de Estado p/ Agricultura e Pecuária)

- Till now Moringa in the ministry was not included in any priority activity in Angola but he promised to support in future.
- Regular meeting would be advised to keep the State Secretary up to date and to know what the ministry can contribute to stimulate the Moringa business.

- The Ministry may conduct own trainings or a symposium on Moringa where Moringa experts could be invited to hold speeches.
- The ministry could be advised to set up an own Moringa initiative or finance a Moringa Pavillion at an Angolan fair.

Vice Governeur Angelino Elavoko for Humabo region (Vice-Gobernador para o Sector Politico, Social e Económico)

- Is already very supportive in any activity.
- The Vice Governeur can be invited to local trainings on Moringa production and processing or can organize local symposiums and meetings on Moringa.

AIPEX Mr Jerónimo Pengola / Board member Export (Administrador Executivo)

- Is available to support potential export of Moringa
- In particular when Moringa farmers have developed to produce large quantity and wish to export AIPEX can support.

Vice rector Professor Dr. João Cardoso, Faculty of Agriculture

- Is interested to include Moringa into applied research activities
- Can invite Moringa expert to do a lecture on Moringa and outlining Business Cases to the students.
- Can support local practical research on Moringa cultivation by Bachelor or Master Thesis of students.

Dr. Venâncio Samuel, Dr. Glória Cisneros Universidade do Huambo Faculty of Health

- Both are interested to include Moringa in their research for health aspects of Moringa
- Can invite Moringa expert to do a lecture on Moringa and outlining health and nutrition aspect.
- Can support local practical research on Moringa health benefits by Bachelor or Master Thesis of students.
- Can publish local research on Moringa.

Prof Dr Samuel Victorino / Vice Rector Universidade Jean Piaget

- Has involved scientist from natural science departments to get their interest in Moringa
- Can invite Moringa expert to do a lecture on Moringa and outlining Business Cases to the students.
- Can support local practical research on Moringa cultivation by Bachelor or Master Thesis of students.
- Can publish local research on Moringa.

8.9 Rules and regulations

- An entrepreneur in Angola wishing to trade moringa in the formal market must register the business at GUE (Guiché único da empresa; https://gue.gov.ao/portal/) and obtain a tax identification number.
- Retail chains in Angola require a certificate of analysis from recognized lab

8.10 Export requirements

- A phytosanitary certificate necessary for export
- Companies wanting to export Moringa to EU must have an import permit for example from the Netherlands.

9.0 Challenges in Angolan Moringa sector

9.1 Knowledge on growing, processing and packaging

In Angola there are only a few organizations and companies growing Moringa leaves in a more professional way. Since the future for Moringa business is only in the organic sector potential producers need to have substantial know how in organic farming, organic fertilizing and organic pest management. Important is also yield increases per ha to make Moringa profitable. This related know how is mostly not existing so far.
For Moringa seeds and oil production a collection system like done at Nutriboty can be more developed. In certain areas Moringa grows wild and once per year the seeds can be harvested. A nearby processing is not necessary.

Cooperatives involving small scale Moringa farmers are almost not existing. On top of this all-involved farmers must work under the same production procedures to ensure homogeneous quality of Moringa. The set up of an internal control system is almost not known.

Only very few larger actors like Fazenda Mungo or Nutriboty have started to involve small scale farmers under their production hut and ensuring that the produced Moringa leaves are centrally processed.

Packaging material for bulk Moringa products (leaves, powder and oil) are available locally. However high-quality packaging material for final products must be imported from EU or China.

Moringa seeds are only informally available in very small quantities. In case of more demand to grow Moringa the seed sector must be developed and for the start also Moringa seeds need to be imported.

9.2 Quality Management Systems & Quality analytics

Moringa leaves are very susceptible to be infested by Microbes which can occur during growing, harvesting, transporting, processing and packaging. It is therefore necessary to have strict quality rules and measures in place to avoid infestation. For example, in the past it has happened that Moringa dried leaves were supplied to European importers which were infested by E. coli or salmonella. This Moringa had to be refused.
A set up of a quality system is recommended with guidance and handling rules for growing, harvesting, transporting and processing and packaging.

European importers normally provide a specification with all details on maximum residue levels for microbes and pesticides. Compiled specifications are available for training and distributing to Moringa producers. These are available for Moringa leaves + powder as well as for Moringa oil.

The availability of an analytics laboratory which can analyse Moringa according to the importer specification is often a challenge in most African countries. The samples normally are sent to European laboratories or South Africa. Fortunately, Angola is here advanced and has a local laboratory Eco Sapien (www.ecosapien.co.ao). They can provide all necessary lab services at competitive prices). Also, other European laboratories like SGS and Eurofins are providing services, but samples need to be sent by post to Europe or South Africa.

9.3 Organic certification

9.3.1 Certification bodies

As stated already the market for conventional Moringa (leaves and oil) in Europe is very limited and will completely disappear in future. Almost all importers are requiring an organic certification according to EU standard. This related audit and the issue of such a certificate can only be provided by an organization or company being accredited for this service at EU level.
So far there is no organization or company in Angola itself providing this service. However, certification bodies like Agricert, Ecocert and Control Union can send auditors from abroad to perform the audit and process all steps to obtain the organic certification certificate.
Important to know is that due to the segregation of duties an auditor is not allowed to prepare the companies or organization for the audit. It is therefore recommended to have specialized consultants for this service or to implement a Quality Management position being responsible for this task.

9.3.2 Individual and group certification for cooperatives

Organic certification be done for an individual company or organization but also for a cooperative with numerous farmers (outgrower scheme). The prerequisite is that the farmers organize themselves in a cooperative or are attached to a company. In this case a collaboration contract needs to be set up.

The cost for organic certification for one crop and one company is around 3000 Euro and the audit must take place every year which means that the certification is normally valid for 12 months.

9.4 Other certifications

9.4.1 HACCP

The Hazard Analysis and Critical Control Points (HACCP) certification instantly demonstrates to customers the commitment to producing or trading safe food. This evidence-based approach can be particularly beneficial when there are inspections by regulatory authorities or stakeholders.

It is recommended that Moringa producers in particular processors familiarize with the HACCP regulations and process. The first step could be an own analysis for critical points where infestation or impurities in the Moringa processing step can occur. Later, a HACCP certification is recommended.

European importers mostly do not require a HACCP certification at the beginning of a cooperation if the organization or company can prove that they have done an internal evaluation of the HACCP process. However, on a medium term a certification is recommended.

9.4.2 Local certification requirements

A local organic certification does not exist in Angola.

9.5 Food safety in out-grower schemes

As already mentioned, the Moringa leaves must be dried soon after harvest. Normally latest 1h after to prevent microorganisms to develop which influence the quality of Moringa. Small scale farmers are often far away from the next processing possibility (drying). Infrastructure and the lack of vehicles create more challenges. Local sun-dried systems often provide not the expected high-quality results and farmers are mostly not aware of the strict quality requirements in the EU.

9.6 Access to capital

In Angola loans from banks are available as well as micro finance systems. The usual prerequisites are business plans and other supporting documents. In general, this process is slow and involves a lot of administration time.

9.7 Promotion for export

Even 15 years after Moringa became more known in the EU, US and Japan there potential Moringa buyers are still often unaware of Moringa and its positive nutritional effects and opportunities in the cosmetic sector. There is still a need on education about the positive effects in the use of Moringa besides quality and price levels.
Potential Netherlands and other EU customers for Moringa are mostly not aware of Moringa production possibilities in Angola. They concentrate on the established Moringa sources in Asia and other African countries where Moringa is produced in medium size quantity.
Angolan potential exporters should get in touch with the EU markets to promote their Moringa products. The Angolan development bodies and export promoting agencies like APEX should support this process

10.0 Recommendations

The overall recommendation is to start with Moringa production on a larger scale with more Moringa farmers in Angola. The overall conditions from soil, climate, infrastructure and the availability of sharing know how from other African countries are good. Whereby a step-by-step approach is recommended:

1st objective (short term) is to develop the local market by producing more Moringa products in a more professional way and supporting the awareness of Moringa as a food supplement and as a cosmetic oil

2nd objective (medium term) is to contribute to regional market activities in neighbouring African countries. The demand here is often underestimated.

3rd objective (long term) is to produce Moringa in large quantity with the highest quality possible to be ready to enter the EU and US market. This requires organic certification.

In the following 5 recommendations are proposed supporting the above-mentioned objectives.

10.1 Support the set-up of a Moringa seed production unit and collect Moringa seeds locally or from neighbouring countries in 2025

The first thing to support a Moringa initiative in Angola is to make sure that Moringa seed are available for farmers to purchase. For the start one Moringa farmer can be identified starting producing seeds, however this will take at least one year to have first seeds. In the meantime, Moringa seeds can be collected throughout the country and at the same time seeds can be purchased from neighbouring countries like Malawi or Mozambique.

10.1.1 Activities

- Select several partners growing already Moringa (i.e. Fazenda Mungo, Terragano or Nutriboty).
- Start producing Moringa seeds on 5 ha. Get new Moringa varieties from India selected for either high leaf amount or higher seeds amount.
- Collect Moringa seeds from other areas of Angola and purchase seeds from neighbouring countries. This activity can be facilitated by one of the already producing Moringa farmers.
- Make Moringa seeds available for Famers to purchase.
- Moringa expert to train the selected partner in the following modules:
    - Principles of organic farming (IFOAM organics international www.ifoam.bio), compost making, organic fertilization, organic pesticides
    - Moringa cultivation methods (intensive, semi-intensive, expensive, Agroforestry systems)
    - Both training modules give very special training to seed production and what is needed to produce in high quality and quantity
- The Embassy of the Netherlands and RVO could support this initiative financially.

10.2 Create a small group of Moringa champions willing to incorporate selected SME Moringa farmers – start with a Farmer Field School concept for Moringa training and know how transfer - 2025

It is proposed that the very few larger Moringa producers (Fazenda Mungo, Terragando and Nutriboty) cooperate as Moringa Champions and incorporate selected SME Moringa farmers under their roof. The SMEs will agree to produce Moringa in a standardized and in high quality. The produced fresh Moringa leaves or seeds will be sold to the Moringa champions for further processing and packaging.
The whole process will be supported by a Farmer Field School concept to ensure standardized high-quality production. For the beginning it is recommended to have one Farmer Field School of 3 days at one Moringa champion.
The Farmer Field School concept was developed about 30 years ago in Indonesia. A group of about 20 – 30 farmers are brought together on a regular basis for 2-3 days to receive intensive

practical trainings. The training should take place on a farm having already Moringa production and possibly processing in place. After the training the farmers go back to their farms and practice what they have learned. After some time, they come again together for the next training session, share experiences and open questions are answered by the trainer. It is recommended to have Farmer Field Schools at least in 3 areas in Angola, where Moringa activities are taking place already.
Local heads of communities may help in the selection process of the participants.
The university of Huambo could be invited to participate in the Farmer Field School.

10.2.1 Activities

- Select larger Moringa farmers who have interest to be a Moringa Champion.
- Select SME Moringa farmers having interest to get in partnership with a Moringa Champion and work and produce Moringa under their business roof. The fresh Moringa leaves will be purchased by the Moringa champion.
- Request help from local heads of communities to support the selection process for participation.
- Train the SME on the farm of the Moringa champion for 3 days – Farmer Field School concept
- Create a curriculum for 3 days Moringa training by an identified local trainer who will be supported by international Moringa expert (train the trainer concept)
- Invite the university of Huambo to participate in the Farmer Field school.
- Know how transfer on all relevant modules from Moringa expert to local trainer or trainers:

  Production:
  - Principles of organic farming (IFOAM organics international www.ifoam.bio), compost making, organic fertilization, organic pesticides
  - Moringa cultivation methods (intensive, semi-intensive, expensive, Agroforestry systems)

  Collection and processing:
  - Harvesting methods and transport to processing, washing methods
  - Drying systems (leaves) – natural, solar, gaz, tunnel dryers, pre-ventilation systems
  - Milling systems and granulation aspects
  - Seed oil pressing methods, deshelling, machines and processes
  - Packaging bulk for dried leaves, powder and oil
  - Packaging final product for dried leaves, powder, oil and mix products

  Distribution and consumption
  - Domestic, regional and international distribution channels
  - Incoterms and export processes

10.3 Creation of a Moringa working group within the Agroportal Angola - 2025

In quite some African countries local Moringa Associations were set up and they work with different success. All is dependent of active members leading the association. For the beginning the objective to set up a Moringa Association in Angola might be too ambitious and it is

therefore recommended to start with a Moringa working group under the Agroportal (https://agroportal.ao/) initiative which is already established and well working.
The Moringa working group can publish regularly news from the Moringa sector in Angola providing a network for interested farmers and can make Moringa training modules available.

10.3.1 Activities

- Talk to the management of Agroportal if they would be interested to incorporate a Moringa working group under their roof.
- Identify working group members
- Set up a sub-website for Moringa in the Agroportal
- Fill the sub-website with content and place all relevant training modules onto the website
- International Moringa expert can advise and facilitate this process
- Contact and learn from other Moringa Associations in Africa
- Participate and be part of the NGO African Moringa Hub (www.africamoringahub.org)
- Organize yearly Moringa Days to support networking and collaboration of producers, processors and buyers.
- Know how transfer on all relevant modules from Moringa expert to the Moringa working group:
    - Production, collection & processing and distribution & consumption modules as above mentioned
    - Additionally:
      Certifications and QM systems
        - Implementation of organic certification (individual and group)
        - Set up of QM systems + chemical analytics interpretation
        - HACCP certification
        - Local required certifications
        - Overview of customer specifications
    - Market knowledge, customer overview and competition
        - Market for Moringa worldwide, EU, regional and local
        - Customer overview – local, regional, international
        - Competition overview
        - Negotiation skills improvement
        - Cost calculation and financing
- The training modules are mostly the same as used for the Farmer Field School
- The Embassy of the Netherlands and RVO could support this initiative financially and could support the organization of such an initiative and potentially link to other initiatives to provide synergies.

10.4 Support an exhibition booth at an agricultural fair in Angola in 2026

The activities ongoing with Moringa could be presented at an agricultural fair in Angola i.e.

- Feira Agropecuária da Huíla in Lubango
- Feira Internacional da Benguela
- FILDA Feira Internacional de Luanda

Since the organization of a booth requires quite some capacities and financial resources the Agroportal could be asked if the Moringa working group could exhibit at their booth provided they are exhibiting.

10.4.1 Activities

- Agree on the participation in one agricultural fair for 2026.
- Agree with Agroportal that the Moringa working group can exhibit under their roof.
- Prepare Moringa Video show and brochure.
- Moringa expert can support all activities and share experiences from other national, regional and international fairs where Moringa was exhibited
- The Embassy of the Netherlands and RVO could support this initiative financially.

10.5 Invite selected Moringa producers to participate in a Moringa Market Entry Mission outside Angola for 2027

For those Moringa producers respectively processors having the aim to export Moringa i.e. to Europe, could be invited to participate to a Market Entry Mission. In Europe the most important relevant fairs for Moringa would be:

For Moringa leaves and powder:

- BIOFACH (requires organic certification)
- ANUGA
- Food ingredients /Natural ingredients
- SIAL

For Moringa oil:

- In-cosmetics
- Vivanes

At the fair own Moringa products in bulk as samples and final products can be exhibited and negotiation meetings can be organized with potential customers (Match Making).
The organization of such a Market Entry Mission could be done in collaboration with RVO, CBI or Profound.

10.5.1 Activities

- Decide on who to participate in such a Market Entry Mission (≈ 5 companies)
- Decide where to participate (Biofach recommended)
- Negotiate with RVO, CBI or Profound to participate under their roof.
- Register in time for participation and booth
- Moringa expert can organize and facilitate the entire Market Entry Mission
- The Embassy of the Netherlands and RVO could support this initiative financially.

11.0 Opportunities for stakeholders

11.1 Producers and exporters

- The information in the feasibility study could help to build a successful Moringa business
- Small scale farmers are advised either to form a Moringa cooperative or to align with a bigger producer/company (Moringa champion) work under the same roof

- Start first with building the local and regional market and only when high Moringa quality is ensured together with a higher production capacity (>5tons dried Moringa per year) contact the EU importers, get their purchase specification and start cooperation
- EU importers require EU organic certification and prepare very well for the audit
- Visit one of the international trade fairs in Europe as listed in this report.

11.2 Importers

- Contact AWG projects or RVO Netherlands to link to Angolan Moringa producers and get support to establish a sustainable long term business relationship with them.
- There are few importers available which might provide a pre-finance with a purchase order.

11.3 Investors

- The forecast for Moringa is bright and the market grows fast locally, regionally and for export. Due to this fact there are investment opportunities in the Angolan Moringa sector.

11.4 NGO's

- Can use the business cases for Moringa powder and Moringa oil to submit proposals for funding to establish out-grower's schemes. All training material is available to train the trainers.
- Producers should elaborate the possibility to get grants for projects. European foundations are ready to support Moringa projects provided the project provides support income generations for small holder farmers or cooperatives. Also, if the project supports youth, handicap, or other people in difficult life situation grants may be provided to the project.

12. Annex

12.1 Annex: Main Moringa importers in the EU

Netherlands

- Z company (https://www.z-company.nl/)
  - Based in Eindhoven
  - Import of organic certified products like Moringa powder only bulk and small quantities

- Moringa's finest (https://www.moringasfinest.nl/)
  - Based in Oosteind
  - Import of organic certified products. Moringa powder, dried leaves, oil and seeds; also fresh Moring leaves
  - Only bulk and small quantities

- Kraatje (https://www.kraatje.eu)
  - Based in Eindhoven
  - Import of organic certified products, Moringa powder
  - Only bulk and small quantities

- Prime green (https://primegreentrade.com)
  - Based in Rotterdam
  - Import of organic certified products, mainly Moringa oil
  - Only bulk and medium size quantities

- Symphonio (https://www.symfonio.bio/en/symfonio-2/)
  - Based in Nijkerk
  - Wanted to start with Moringa in their bulk portfolio

Germany

- africrops! GmbH (https://africrops.com/en/)
  - Based in Berlin
  - Import of organic certified products, dried leaves, powder, oil, dried flowers, seeds
  - Only bulk and large quantities

- Beringer & Co. GmbH (https://www.ab-im-export.de/)
  - Based in Güstro
  - Import of conventional and organic products, powder and oil
  - Only bulk and smaller quantities

- bioSim e.K. (http://biosim-online.de/biohandel/)
  - based in Weilheim
  - Import of organic certified products, dried leaves, powder
  - Only bulk and mainly small imports from Tanzania

- Worlee Naturprodukte GmbH (https://www.worlee.de/en)
  - Based in Hamburg
  - Import of conventional and organic products, dried leaves, powder, oil
  - Only bulk and very large quantities

- Senyana GmbH (https://www.companyhouse.de/Senyana-GmbH-Berlin)
  - Based in Berlin
  - Import of organic certified Moringa
  - Only smaller quantities

- Aakansha Naturprodukte GmbH (https://www.aakansha-naturprodukte.com/)
  - Based in Hamburg
  - Import of organic certified Moringa
  - Larger quantities

UK

- Organic herb trading (https://www.organicherbtrading.com/)
  - Based in Milverton
  - Import of organic certified products, dried leaves, powder
  - Only bulk and large quantities

- Nutra Ingredient Ltd (https://nutritioningredients.co.uk/)
  - Based in Brighton
  - Import organic certified products, poweder
  - Only bulk and large quantities

- Minvita Ltd (https://minvita.co.uk/)
  - Based in Greenhill Crescent
  - Import of organi certified products, powder
  - Only bulk and large quantities

- Aduna Superfoods Ltd (https://aduna.com/)
  - Based in London
  - Import of organic certified products, powder, dried leaves, oil
  - Only bulk and large quantities

- Dani Organics (https://www.daniorganics.com/)
  - Based in Hersden
  - Import of organic certified Moringa
  - Only large quantities

- Everyday superfoods (https://everydaysuperfood.co.uk)
  - Based in Luton
  - Import of organic certified Moringa
  - Only large quantities

France

- Moringa and Co (https://www.moringaandco.com/)
  - Based in Toulouse
  - Import of organic certified products, powder, dried leaves, oil
  - Only bulk and small quantities

- LT Labo (https://ltlabo.com/)
  - Based in Gargas
  - Import of organic certified products, powder, oil
  - Only bulk and small quantities

- Nature partage (https://www.nature-partage.com/)
  - Based in Gornac
  - Import of organic certified products, powder
  - Only bulk and small quantities

Italy

- Bioaltech (https://www.bioaltech.com/)
  - Based in Formigine
  - Import of organic certified products, powder
  - Only bulk and small quantities

- RedMoringa (https://redmoringa.it/en)
  - Based in Turin
  - Import of organic certified products, powder, oil
  - Only bulk and small quantities

- Favella (https://favella.it/)
  - Based in Cosenca
  - Import of organic certified products, powder
  - Only bulk and small quantities

Spain

- Robis (https://robis.es/en/)
  - Based in Grenade
  - Import of organic certified products, powder
  - Only bulk and small quantities

12.2 Annex: example Purchase specification

The below mentioned Purchasing specifications are from africrops! GmbH and should serve as a general orientation on how a specification could look like from an EU importer. It contains also explanations and recommendations:

Purchasing specification for organic Moringa leaves and powder

Product description:
Moringa powder is obtained from the dried Moringa leaves (*Moringa oleifera L.*).

No further processes are used, and no preservatives or other additives are added. Moringa powder is pure and untreated.

Moringa powder is suitable for cosmetic and food purposes.

Specifications:

Appearance	Green fine ground powder (1)
Smell/ taste	Spicy, typical Moringa flavour (2)
solubility	Partially soluble in water
Moisture	≤ 7%(3)
Granulometry (4)	≤ 0,3 mm

Pesticides: No Pesticides used for the planting and farming process (conform to § 64 LFGB L 00.00-115 + VO3996/2005); this product meets the BNN values for organic products (BNN, Bundesverband Naturkost Naturwaren) (5)

PAH (polycyclic aromatic hydrocarbons): Below the legal limit according to EU directives (6)

Plastisizers: Below the legal limit according to EU directives (7)

Heavy metals: Below the legal limit according to EU directives (8)

Arsen (As)	max. 0.5 ppm
Cadmium (Cd)	max. 0.1 ppm
Chrom (Cr)	max. 5 ppm
Mercury (Hg)	max. 0.1 ppm
Nickel (Ni)	max. 10 ppm
Lead (Pb)	max. 2 ppm
Antimon (Sb)	max. 0.5 ppm

Microbiology according to ISO 17516: (9)

Total number of aerobic mesophilic bacteria	< 100 cfu/g
Total number of yeasts and molds	< 100 cfu/g
Total number of aerobic mesophilic microorganisms	< 1000 cfu/g
Unspecified microorganisms (also includes gram-negative such as Pluralibacter gergoviae and Burkholderia epacian)	No limit
Salmonella	
Specified Microorganisms	Undetectable in 1g

- Pseudomonas aeruginosa
- Escherichia coli
- Staphylococcus aureus
- Candida albicans

Mycotoxines (toxines of the fungi) (10)

Aflatoxin B1	max. 2 ppb

Aflatoxine Sum out of B1, B2, G1, G2 max. 4 ppb

Storage and stability:
The product has a shelf life of at least 2 years in the originally sealed container. Store in dry, cold and dark storage.

GMO free
does not contain genetically modified organisms (GMOs)

Purchasing price: 4.00 Euro per kg Moringa powder FOB

Explanations:

(1+ 2) **Appearance + smell taste**

Explanation: fresh green color is requested. The smell should be fresh like grass

What to do:

- Only fresh green leaves to be used, no yellow leaves, no branches
- Drying process to be immediately started after harvest (not later that 45 min)
- Drying at max 46 degrees Celsius (we need raw quality)
- Drying process max 2.5 days, after that risk of infection by microbes

(3 + 4) **Moisture**

Explanation: the higher the moisture the higher the risk of microbes.

What to do:

- Please use a hygrometer to measure the moisture after drying. Should not be higher than 7%

(5) **Pesticides**

Explanation: Even smallest amounts of pesticides will be detected in laboratory analyses and prevent a classification as "organic", diminishing the value and the demand for the Moringa powder and leaves

What to do: Only harvest Moringa leaves from areas where no pesticides are used. Even if you do not use pesticides, make sure your immediate neighbor does not use pesticides either.

(6) **PAH (polycyclic aromatic hydrocarbons)**

Explanation: PAKs are known to be cancerogenic and appear when goods are exposed to smoke.

What to do:

- Avoid exposure of the leaves to smoke

(7) **Plasticizers**

Explanation: plastic bags often contain plasticizers, which with the time diffuse into the leaves or powder

What to do:

- Only use food-grade bags

(8) **Heavy metals**

Explanation: sometimes leaves contains a natural high content of heavy metals which is absorbed by the plant. This prevents a classification as "organic", diminishing the value and demand for the leaves. With very high heavy metal measurements the leaves/powder cannot be marketed at all and must be disposed, incurring additional costs.

What to do:

- Source leaves only from areas where there are no detectable levels of heavy metals in the soil.
- Avoid especially areas which are exposed to high levels of pollution, for example through car traffic or industrial waste.

(9) **Microbiology**

Explanation: As Moringa oil is a natural product it is susceptible to various microbiological contaminants such as bacteria, molds and yeasts that diminish the quality of the leaves/powder. These can be easily analyzed and reflect the measures of hygiene taken.

What to do:

- Molds and yeasts often occur when Moringa leaves are not sufficiently dried and stored under humid conditions. Therefore, the dry and hygienic storage is important.
- Escherichia coli and coliform bacteriae are microorganisms which are present in the digestive system of humans and animals. During harvest of Moringa leaves, harvesters need to wash hands regularly. When compost/manure is applied to Moringa, the leaves should not be contaminated. Fertilization must be done well in advance of the harvest (at least 3 months before)

(10) **Mycotoxins (toxins of the fungi)**

Explanation: These are toxins produced by fungi that occur when mold gets into the leaves. These mycotoxins are subsequently found in the leaves and are toxic to humans.

What to do:

- Moringa leaves must be properly dried and stored under dry conditions.

Purchasing specification Moringa oil

Product description:
Moringa oil is obtained from the seeds of the moringa pod (*Moringa oleifera L.*) by cold pressing and mechanical filtering.

No further processes are used, and no preservatives or other additives are added. Moringa oil is pure, untreated cold-pressed oil.

Moringa oil is suitable for cosmetic and food purposes.

Specifications:

Appearance	Liquid, pale-yellow oil (1)	
Smell/ taste	grassy fresh smell; slightly earthy, slightly nutty taste (typical moringa oil) (2)	
solubility	Water insoluble	
content of free fatty acids	≤ 4 mg KOH/g(3)	
Number of peroxids (4)	≤ 1 mEq O2/kg	
Fatty acids (AOCS database fats) (5)	Fatty acid 14:0 16:0 16:1 n7 18:0 cis 18:1 n9 cis 18:2 n6 cis 18:3 n6 cis 18:3 n3 cis 20:1 n9 cis 22:0 24:0	Proportion of (%) 0,1 5 – 6 0,2 – 1 5,8 – 8 66 – 76 0,6 – 3,5 k.a. 0,1 – 0,2 k.a. 5 – 8 0,0 – 5

Pesticides: within the BNN guidelines (BNN = Bundesverband Naturkost Naturwaren) (6)

PAK (polycyclic aromatic hydrocarbons): Below the legal limit according to EU directives (7)

Plastisizers: Below the legal limit according to EU directives (8)

Heavy metals: Below the legal limit according to EU directives (9)

Arsen (As)	max. 0.5 ppm
Cadmium (Cd)	max. 0.1 ppm
Chrom (Cr)	max. 5 ppm
Quecksilber (Hg)	max. 0.1 ppm
Nickel (Ni)	max. 10 ppm
Lead (Pb)	max. 2 ppm
Antimon (Sb)	max. 0.5 ppm

Microbiology according to ISO 17516: (10)

Total number of aerobic mesophilic bacteria	< 100 cfu/g
Total number of yeasts and molds	< 100 cfu/g
Total number of aerobic mesophilic microorganisms	< 1000 cfu/g
Unspecified microorganisms (also includes gram-negative such as Pluralibacter gergoviae and Burkholderia epacian)	No limit

Specified Microorganisms	Undetectable in 1g

- Pseudomonas aeruginosa
- Escherichia coli
- Staphylococcus aureus
- Candida albicans

Mycotoxines (toxines of the fungi) (11)

Aflatoxin B1	max. 2 ppb
Aflatoxine Sum out of B1, B2, G1, G2	max. 4 ppb

Explanation:
It is recommended to label the product as "Moringa Oil". Please note the regulations on cosmetic products.

Storage and stability:
The product has a shelf life of at least 2 years in the originally sealed container. Store in dry, cold and dark storage.

Explanations:

(1+ 2) **Appearance + smell taste**

Explanation: Residues in Moringa oil will make the oil cloudy and create a foul smell in the oil. Exposure to light makes the golden color of oil fade.

What to do:

- In order to prevent residues, it is necessary to filter the oil very well.
- only use de-shelled Moringa seeds.
- The Moringa seeds must be fresh. Seeds being already 5 months old provide a lower quality oil.
- Oil must be filled into airtight, light-proof, food-grade containers right after pressing.
- Containers must be new as they can also be a source of contamination.
- Containers should be filled under Nitrogen gas to prevent oxidation.

(3 + 4) **Content of free fatty acids + number of peroxids**

Explanation: With age of the oil the number of peroxides and content of free fatty acids increases and diminishes the quality of the oil.

What to do:

- Oil must be fresh.
- Oil must be filled into airtight, light-proof, food-grade containers right after pressing for storage.
- Containers should be filled under Nitrogen gas to prevent oxidation.

(5) **Fatty acids**

Explanation: every oil has a specific fatty acid spectrum – it is like a fingerprint for the oil. For Moringa it is in the ranges as indicated.

What to do:

- Do not mix Moringa oil with other oils.

(6) **Pesticides**

Explanation: Even smallest amounts of pesticides will be detected in laboratory analyses and prevent a classification as "organic", diminishing the value and the demand for the oil.

What to do: Only harvest Moringa seeds from areas where no pesticides are used. Even if you do not use pesticides, make sure your immediate neighbor does not use pesticides either.

(7) **PAK (polycyclic aromatic hydrocarbons)**

Explanation: PAKs are known to be cancerogenic and appear when goods are exposed to smoke.

What to do:

- Avoid exposure of the seeds and the oil to smoke

(8) **Plasticizers**

Explanation: plastic containers often contain plasticizers, which with the time diffuse into the oil.

What to do:

- Only use food-grade containers.

(9) **Heavy metals**

Explanation: sometimes soil contains a natural high content of heavy metals which is absorbed by the plant. This prevents a classification as "organic", diminishing the value and demand for the oil. With very high heavy metal measurements the oil cannot be marketed at all and must be disposed, incurring additional costs.

What to do:

- Source seeds only from areas where there are no detectable levels of heavy metals in the soil.
- Avoid especially areas which are exposed to high levels of pollution, for example through car traffic or industrial waste.

(10) **Microbiology**

Explanation: As Moringa oil is a natural product it is susceptible to various microbiological contaminants such as bacteria, molds and yeasts that diminish the quality of the oil. These can be easily analyzed and reflect the measures of hygiene taken.

What to do:

- Molds and yeasts often occur when Moringa seeds are not sufficiently dried and stored under humid conditions. Therefore, the dry and hygienic storage is important.

- Escherichia coli and coliform bacteriae are microorganisms which are present in the digestive system of humans and animals. During harvest of Moringa seeds, harvesters need to wash hands regularly. When compost/manure is applied to Moringa, the leaves/pods should not be contaminated. Fertilization must be done well in advance of the harvest (at least 3 months before)

(11) **Mycotoxins (toxins of the fungi)**

Explanation: These are toxins produced by fungi that occur when mold gets into the seeds. These mycotoxins are subsequently found in the oil and are toxic to humans.

What to do:

- Moringa seeds must not have mold on them.
- Moringa seeds must be properly dried and stored under dry conditions.
- To avoid moisture in the seeds it may be easier to harvest during dry season.

12.3 List of references and relevant websites

Kerver, K. (2018) Opportunities for Zambian moringa - Feasibility of producing moringa in Zambia forexport to the Netherlands
http://thisisprofound.com/wp-content/uploads/2018/06/Opportunities-for-Zambian-moringa.pdf

Bhupendra, K., Neikuozo, C. (2015) Moringa oleifera Lam.: Panacea to several maladies - Countries where Moringa grows
https://www.researchgate.net/figure/World-map-showing-countries-where-Moringa-is-extensively-grown-green_fig1_279978825

Bancessi, A., Teodósio, R., Duarte, E. et al. (2022) Moringa as a household water purification method – community perception and pilot study in Guinea-Bissau.
https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-022-14344-w

Dandesa, B., Abdissa Akuma, D., Alemayehu, E. (2023)
Water purification improvement using moringa oleifera seed extract pastes for coagulation follow scoria filtration
https://www.sciencedirect.com/science/article/pii/S2405844023046285

Sotheeswaran, S., Nand, V. et al. (2011)
Moringa oleifera and Other Local seeds in Water Purification in Developing Countries
https://www.researchgate.net/publication/255484408_Moringa_oleifera_and_Other_Local_seeds_in_Water_Purification_in_Developing_Countries

Polaris Market research – (2022) Moringa Products Market Share, Size, Trends, Industry Analysis Report, By Source (Leaves, Seeds, Roots); By Origin (Organic, Conventional); By Application; By Region; Segment Forecast, 2022 - 2030
https://www.polarismarketresearch.com/industry-analysis/moringa-ingredients-market

Market research report – (2020) Europe Moringa Products Market to 2027 - Regional Analysis and Forecasts by Product (Leaf Powder, Tea, Oil, Seeds, Others); Application (Dietary Supplements, Pharmaceuticals, Cosmetics, Others), and Country.

https://www.businessmarketinsights.com/reports/europe-moringa-products-market

CBI study (2022) The European market potential for moringa
https://www.cbi.eu/market-information/natural-ingredients-health-products/moringa/market-potential

CBI study (2022) Entering the European moringa market
https://www.cbi.eu/market-information/natural-ingredients-health-products/moringa/market-entry

The African Moringa Hub
https://africamoringahub.org

Ojiako F., Adikuru, N., Emenyonu, C. (2011)
Critical issues in investment, production and marketing of Moringa oleifera as an industrial agricultural raw material in Nigeria.
J. Agric. Res. & Dev. 10(2)
https://www.researchgate.net/profile/Frank-Ojiako/publication/266391914_Critical_issues_in_Investment_Production_and_Marketing_of_Moringa_oleifera_as_an_Industrial_Agricultural_raw_material_in_Nigeria/links/543084a90cf27e39fa9e18be/Critical-issues-in-Investment-Production-and-Marketing-of-Moringa-oleifera-as-an-Industrial-Agricultural-raw-material-in-Nigeria.pdf

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