

SECTOR STUDY PROCESSED MANGO



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This document is part of the mango sector study. This study explores the technical and economic feasibility of different processing and waste valorisation activities. The other chapters are available here: resources.colead

Contents

1	WHAT IS MANGO PICKLE/ACHAR?	2
1.1	Quality and standards specifications	3
1.2	Recipe	3
1.3	Shelf life	3
1.4	Food safety	3
1.5	Softness	4
1.6	Variety	4
2	DEMAND	5
2.1	End market	5
2.2	Market trends	5
2.2.1	Healthier oils	5
2.2.2	Increasing cost of oils	5
2.2.3	Garlic free	5
3	SUPPLY	6
3.1	How does the product reach the end market, what is the value chain structure?	6
3.2	Seasonality, variety and availability	7
3.3	Technology, processes and techniques	7
3.3.1	Step 1: Reception and washing	7
3.3.2	Step 2: Preparation (peeling, slicing)	7
3.3.3	Step 3: Seasoning	7
3.3.4	Step 4: Filling and pickling	8
3.4	Ingredients for success	8
3.4.1	Competitive production	8
3.4.2	Spice quality	8
3.4.3	Professional high-pressure management	9
3.4.4	Shelf-life management	9
3.4.5	Semi-sterile packing and packaging equipment	9
4	Issues and opportunities	10

1. What is mango pickle/achar?

Mango pickle is a traditional Indian condiment. It is prepared with fresh mangoes, spices and typically oil, and is enjoyed as a side dish. As Indians have migrated, so too has their cuisine. As a result, mango pickle can be enjoyed in many countries, but notably in those countries with big Indian populations.

Each mango pickle supplier uses a similar process but tweaks the recipe and ingredients to achieve a slightly different product. It can be made with different fruits and vegetables, can be seasoned using a variety of spices, or even made with different types of oils. Some brands are experimenting with olive oil, for both mango and other pickles.

Figure 1. Different types of mango pickle available on the global market



Different intensities



With and without garlic, ginger and other spices



Without oil, or with alternate types of oil



Chunky



With other vegetables

Source: images sourced from brands' own websites and online retail stores.

Mango pickle is typically sold in glass or plastic jars. Plastic is more common in the developing world, especially in home industry production. Large catering packs are also available ranging from 1 kg to packs of several kilograms. These can be glass jars or plastic buckets.

1.1 Quality and standards specifications

The mango pickle market is split into two distinct parts – a formal market and an informal home industries segment. The formal market caters to local supermarkets and for export. Home industries supply product directly to shoppers or to small informal markets. As a result of this split there are two different quality standards.

First, for products destined for supermarkets or export, companies are investing in building brands and have a higher standard to meet. This is due to the demands of supermarket buyers and those customers in Europe and the USA who themselves are subject to higher food safety standards. Policing of these standards is also more likely in the formal market. Therefore, mango pickle producers producing for the formal market tend to be hazard analysis and critical control point (HACCP) and British Retail Consortium (BRC) certified. This is certainly required for export.

Mango pickle sold in less formal markets in Africa tends to be unregulated. Shoppers then rely on the processor to have made a pickle that is both delicious and safe to eat.

1.2 Recipe

Recipes play an important part in pickle production.

Home cooks have leeway to produce recipes that are not consistent. Indeed, it is expected that they will leave their personal stamp on each batch. However, this is not the case in the formal market. Factories develop standard recipes, then work towards achieving a similar flavour and texture from season to season. This requires skilled product developers as there are many variations in the intensity of the spiciness of the chillis from season to season, and flavour and texture differences also occur with mangoes.

1.3 Shelf life

Pickle is fundamentally a preservation method. So the recipes need to extend the shelf life. The selection of mangoes is important. Immature mangoes provide the right acidity. Then the mangoes are steeped in salt, before finally being bottled in oil. Such recipes all preserve product and ensure that mango pickle has an expected shelf life of 18–24 months.

1.4 Food safety

The processing, packaging and storage should be under strict food safety rules. Export of mango pickles requires at least HACCP certification. There is, however, no certification requirement in most African countries.

Packaging plays an important role in food safety. Some home industry producers might use jam jars that have been cleaned and readied for use in pickling. However, most larger factories purchase new glass or plastic containers. It is important when sourcing packaging that you look for a pack that can preserve the aroma of the spices, guard against light, moisture and air (which cause the oil to go rancid faster), has a good seal to prevent air entering, and should be grease, oil and acid resistant.

1. What is mango pickle/achar?

1.5 Softness

An enjoyable mango pickle has a soft texture. This means that the mango must be picked at about two to three weeks after fruiting so the fruit is still immature and the pip is soft (before the seed shell hardens). This is crucial. But it also means that the production season for mango pickle is usually very short. Home industry suppliers tend to supply product only during the season.

Larger suppliers can store and produce pickle year-round. The shelf life allows them to store enough product to last the year.

1.6 Variety

Though more than a thousand mango varieties exist, not all are suitable for making mango pickle.

In India, Rumani (apple mango) variety is recommended for mango pickle. In South Africa, home industry producers tend to use local varieties. Conversely, the larger producers prefer to source Tommy Atkins or Sensation. Pickling varieties should be acidic, fibrous and firm.



2. Demand

2.1 End market

Mango pickle as a category is still too small to track. However, we can learn something by looking at the distribution of the product. Mango pickle seems to have greater success in markets where there is a large Indian diaspora. The USA, South Africa, the UAE, Australia and the UK all have distribution in major national retailers, in small ethnic food shops and in webstores.

Newer markets are also developing. This is largely from a few large brands that supply and distribute product via distributors and their own teams around the world. In Africa, South Africa is arguably the largest market for pickles, followed by Kenya.

In countries where mango pickle is well established, there are opportunities to supply product to the food services sector – hotels, restaurants and caterers.



Figure 2. Mango pickle in bulk packaging (11)
Source: Brand's own website.

2.2 Market trends

2.2.1 Healthier oils

This is an ideal format for Middle Eastern cuisine and for health-conscious shoppers looking to control their oil intake. As a result, processors have introduced oil-free mango pickle.

At the other end of the spectrum, processors are also introducing olive oil as a replacement for cheap seed oils such as sunflower oil, rapeseed oil and cotton seed oil. Olive oil allows mango pickle companies to claim health benefits such as being a therapeutic product, or that consumers can eat it without guilt.



Figure 3. Healthy oils
Source: www.unsplash.com

2.2.2 Increasing cost of oils

Oil is an important ingredient in mango pickle recipes. The growing cost of seed oils, especially sunflower oil, will undoubtedly put pressure on processors – in both the formal and informal markets. Price increases are thus very likely.

2.2.3 Garlic free

Garlic is a common ingredient added to pickles for flavour. However, Ayurvedic ways of eating discourage garlic in foods. Garlic free also allows processors to reach customers who simply do not like the flavour. Garlic-free mango pickle is thus being retailed in larger markets as a novel flavour.



Figure 4. Garlic
Source: Shutterstock

3. Supply

3.1 How does the product reach the end market, what is the value chain structure?

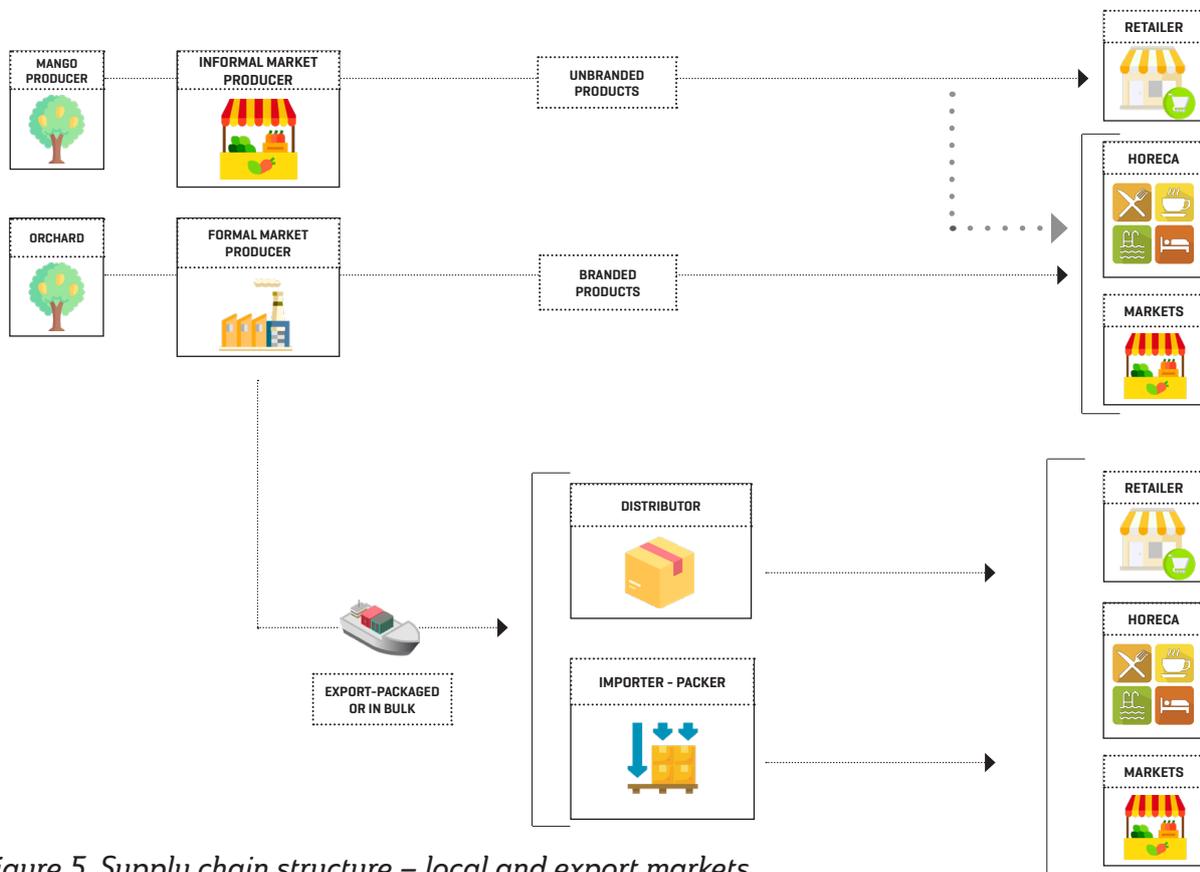


Figure 5. Supply chain structure – local and export markets

India is the largest supplier of mango pickle globally. It is no surprise then that there are several examples of Indian companies that have managed to distribute mango pickle in Europe, the USA, the UAE and other countries. Brands such as Ashoka, Telegu and Priya's Foods have distribution in large retailers such as Walmart in the USA, Tesco in the UK and Carrefour in the UAE.

A few brands traded globally are Patak's, a UK brand from AB World Foods, Ashok's & Telegu from India (trade under the company name) and Mother's Recipe Foods from Indian Continental Marketing. These brands have local distribution arms that enable distribution in key retailers. They also supply product via their own webstores and online shopping stores such as Amazon.

Growing interest in exotic foods has created interest in investing in exotic foods brands. AB Foods, a UK-based company, has invested in Patak's, an Indian food ingredients company. This is one of the largest suppliers of Indian flavours, sauces and pickles in western markets. Mango pickles are just some of their products.

While many of these companies produce and export under their own names, in at least one case there is a question of whether they ship product from India in bulk and then repack in Europe. This would assist significantly in managing shipping costs.

Typically, these larger brands compete against home-industry-scale producers, some who are building some degree of recognisability.

3.2 Seasonality, variety and availability

Mango pickle has a long shelf life, but the window for sourcing mango is very short. It also means that mango pickle production has a distinct peak when the trees fruit. Later in the year only those companies that can store product are able to supply outside of the peak season.

Many of the same varieties that are in demand for mango pickle are also in demand for dried mango, fresh mango cut into slices, mango juice and other mango products. With these options, farmers and people who own mango trees could get more attractive prices for fresh mango. Sourcing immature mangoes for mango pickle is thus challenging.

Local varieties might be suited to pickle production. Home cooks certainly do use immature local mangoes to produce pickle. However, more needs to be done to evaluate whether this can be done commercially – by sourcing mangoes and then testing them in commercial production. Not enough is known at this point to draw any conclusions.

3.3 Technology, processes and techniques

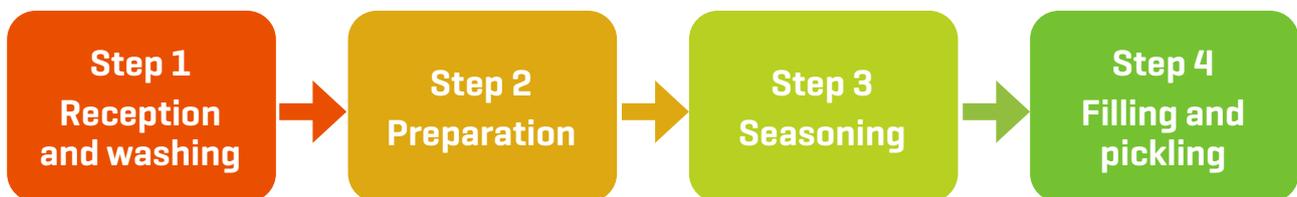


Figure 6. Process for producing mango pickle

3.3.1 Step 1: Reception and washing

Young mangoes are brought directly from the orchards. At the factory gate (or in the kitchen for home industries), they are sorted to ensure that they are young, fresh and do not have noticeable blemishes. Those mangoes that seem older than 3 weeks old are discarded.

The mangoes are then washed with clean water to remove sap, dust and dirt that might have adhered to them during picking. The washing is critical for food-safe mango pickle, and to ensure that the product has adequate shelf life. So, the mangoes tend to be washed at least three times. Mangoes are air-dried after being washed and the stalks are removed.

3.3.2 Step 2: Preparation (peeling, slicing)

In this step, preparation, the young mangoes are sliced or cut into chunks. They are usually left unpeeled and are not grated; however, occasionally the processor might opt to peel and/or grate them.

3.3.3 Step 3: Seasoning

In step 3, seasoning, the cut mangoes are mixed with salt or brine and cured. This may be anywhere from 1 hour to half a day depending on whether a dry or wet pickle is being prepared. The mango is then removed from the brine.

Finally, spices and oil are added to coat the mango pieces. Typically, these account for 5–10% of the recipe; however, the exact measurements depend on the recipe being used. Recipes can be quite different; common ingredients include ginger, garlic, chillis, fenugreek, asafoetida, cumin, turmeric and mustard seeds.

Oil is not used in a dry pickle. A preservative must be used in dry pickles, as oil plays an important role in giving flavour, colour and texture to wet pickle as well as in preservation of the product. Wet, oil-based pickles tend to have longer shelf life and can be stored unrefrigerated. Dry pickles need far more careful handling, preferably refrigeration.

3.3.4 Step 4: Filling and pickling

In this step, bottles, plastic jars, buckets or bulk containers for export can be filled with the seasoned mangoes. Filling can be done by hand or using automated equipment depending on the scale of production. Packages are then sealed, labelled and readied for shipment.

It is important to note that the filling process relies on using containers that are extremely clean. Any contamination will compromise the preservation process. Typically, bottles and jars that have been pre-used (home industries) are washed with boiling water and dried under sunlight, in a microwave or in an oven. Larger factories will flush the jars with steam, even when these are new, unused containers.

On a small scale (up to 20 litres per day), the mango pickle is produced in a well-equipped kitchen.

3.4 Ingredients for success

3.4.1 Competitive production

Mango pickle from home industry suppliers or from Indian companies exporting to the rest of the world all rely on a relatively low cost of production. Indian companies specifically have access to the most extensive mango production in the world and a global hub for spices. As a traditional Indian product, they also have the advantage of being associated with authentic recipes. This makes it possible to produce and export very competitively.

On local markets there might be competition from home industry producers. In this case, large formal factories would need to develop a distribution model and potentially branding that gives an advantage over the home industry producers. This might be food safety, product quality, availability, packaging and pack sizes, or even focus on a different sales channel such as hotels and caterers.

3.4.2 Spice quality

Spices are sourced globally, or from local suppliers. Both have disadvantages when it comes to food safety and contamination. Local suppliers of chilli, ginger or garlic in Africa have been known to use pesticides that are not suitable for export grade products.

On the other hand, imported spices can be contaminated in their country of origin or in handling and shipping. It is important to have control over the quality of the spices used in production. This might mean using reputable suppliers with good quality controls. For larger processors, this could mean heat-treating spices to ensure that they are free of contamination, pesticides, etc.

Contamination can also happen in the factory, especially where spices are bought in bulk, opened and used over several production shifts. In a factory, it is best to source spices in packs that are just large enough for each production batch. This will enable you to open a pack at the start of each shift and limit or prevent cross-contamination. This is also helpful in achieving a consistent product recipe.

3.4.3 Professional high-pressure management

Local formal picklers face stiff competition from home industries in the mango season. The processors are generally well known to their customers and rely on word of mouth to build awareness of their offer. At the same time, they do not have to pay marketing fees, or make allowances for retailer margins. Being able to compete means having very good control over pricing, but more importantly ensuring that you develop a recipe and production process that is highly stable and allows you to make the most of your sales out of the season.

This focus on the off-season provides for a longer sales period in a part of the year when there is virtually no other competition. But it does require a lot of working capital. It means that the processor needs to buy all of their raw materials in a 3-week window, then source packaging and pack over a few weeks or months. All of this money needs to be invested knowing that sales are more likely to dip over the season and that revenues will trickle in over a 9-month period before the next season begins. This model demands excellent cash flow, and organised sourcing and production. Warehouse management needs to be professional so that none of the stock built up in the peak season is lost.

3.4.4 Shelf-life management

Oil-based mango pickle has a shelf life of about 18 months. This is ideal for out-of-season sales. However, when stored under tough conditions, such as high heat and exposure to light, shelf life can be greatly decreased. The expected shelf life would then be 9 months, leaving the factory without sales precisely when they need to prepare for the coming production season. Having good control of warehousing is thus essential to extending the shelf life. Then sales can continue as long as possible throughout the year.

3.4.5 Semi-sterile packing and packaging equipment

The ingredients used in the pickling process all play a role in preservation of the mangoes as a pickle. However, without a clean environment, uncontaminated packaging and raw materials you will not be able to produce a product that has a long shelf life and guarantee food safety and shelf life. This is especially true of the packaging material, which should ideally be sterile.

4. Issues and opportunities

Table 1. Issues and opportunities

Issues	Opportunities
<ul style="list-style-type: none">▪ Seasonality of mangoes and the short production season (3 weeks)▪ Competition for raw materials▪ High working capital requirements, with sales trickling in over the rest of the year▪ Competition from home industries▪ Low familiarity in many African markets▪ Competition from Indian suppliers in the export market▪ A few large brands▪ Rising costs of oils	<ul style="list-style-type: none">▪ Growing interest in ethnic foods▪ Large Indian diaspora introducing Indian foods to new markets▪ Relatively expensive product▪ Innovation opportunities (low oils, spices, etc.)

SECTOR STUDY: PROCESSED MANGO

1. Fresh cut mango
2. Dried mango
3. Mango puree
4. IQF mango
5. **Mango pickle**
6. Mango vinegar
7. Mango butter
8. Mango briquettes
9. Mango based compost



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