



International  
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Drivers and constraints  
for occupational safety  
and health improvement  
in the global textile supply  
chain from Madagascar

A case study







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## Foreword

Everyone is entitled to work without risk to their safety and health. Safe and healthy work is a fundamental human right and a foundation of sustainable development. Yet each year, 2.78 million workers die and another 374 million suffer from occupational accidents and diseases. In addition to incalculable human suffering, the economic value of lost workdays is equivalent to almost 4 per cent of the world's annual GDP. Emissions from chemical and biological substances and other harmful effects of work processes damage not only workers' health but also the food, soil, water and air around us. These environmental risks contribute to climate change, which in turn is harmful to workers' health. Urgent measures are needed to address these risks.

This is why the International Labour Organization (ILO), through its Safety + Health for All Flagship Programme, is seeking to establish an occupational safety and health (OSH) culture by designing and implementing effective local solutions that can be replicated at global level. A clean, safe and healthy workplace unquestionably helps to promote decent work.

These concerns are also gradually receiving attention in international political forums, one example being the *Statement on Safer and Healthier Workplaces* adopted by the G20 Summit in 2014. That commitment was underscored at Ankara in 2015 in a Ministerial Declaration reiterating the determination of the G20 to improve OSH in their countries and throughout the world. In addition, the establishment of the Vision Zero Fund (VZF), a G7 initiative supported by the G20 and administered by the ILO, demonstrates the international community's commitment to OSH in global supply chains.

In Madagascar, a project implemented by the ILO under its Safety + Health Flagship Programme for All, through funding provided to the VZF by France, aims to improve the safety and health of workers operating in the global supply chains for cotton and lychees.

The present study, carried out in the framework of that project, identifies the drivers and constraints affecting OSH in the textile supply chain and shows how OSH can be improved at the different entry points into the sector: cotton cultivation, ginning and cleaning, spinning, weaving and garment manufacturing.

Once the results of this study and the ensuing recommendations have undergone tripartite validation at national level, a new VZF-funded project will work with national, regional and sectoral stakeholders and institutions to promote safety and health for all workers in the sector. The long-term objective is to achieve a sustainable reduction in work-related deaths, accidents and diseases and create a culture of prevention in the textile supply chain in Madagascar.



Coffi Agossou  
Director  
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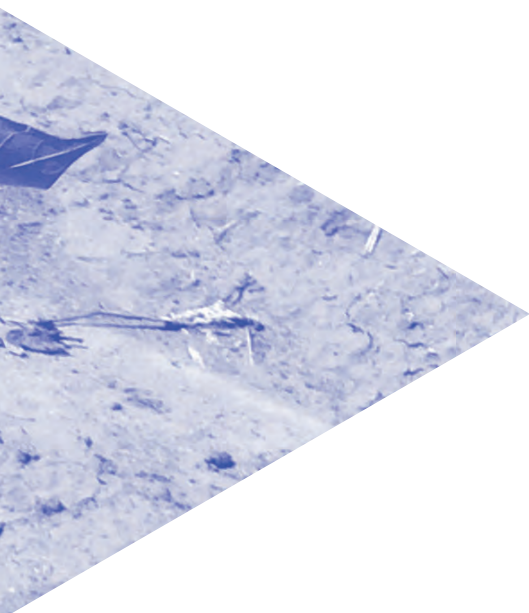
## | Acknowledgements

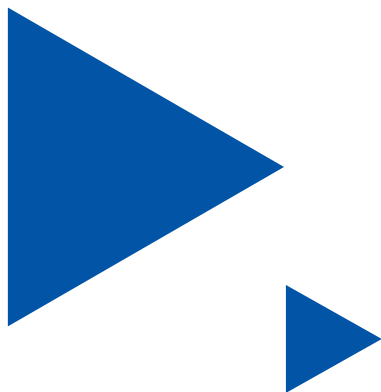
This case study was carried out by Fetra Henri Rasolonjatovoarivelo (consultant) with the support of Andrew Christian and Frédéric Laisné-Auer (ILO), Technical Specialists on Labour Inspection and Occupational Safety and Health, Lauréat Rasolofoniainarison, Vision Zero Fund National Project Coordinator (ILO), and Lou Tessier, Health Protection Specialist (ILO).

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The author is responsible for the content and the opinions expressed in this publication. The content does not reflect the official position of the ILO.







# Table of contents

Executive summary .....	12
Introduction .....	16
<b>1. The textile supply chain in Madagascar .....</b>	<b>21</b>
1.1 Market and product.....	21
Product .....	21
Market .....	22
1.2 Structure of the supply chain.....	23
Cotton seed production .....	23
Cotton ginning .....	27
Spinning and weaving .....	28
Manufacturing .....	29
1.3 Institutional environment of the supply chain in Madagascar .....	32
1.4 Legal and regulatory framework .....	33
<b>2. Drivers and constraints for occupational safety and health improvement .....</b>	<b>35</b>
<b>3. Opportunities to improve competitiveness and OSH .....</b>	<b>39</b>
3.1 Vulnerability profiles for occupational risk .....	39
Farmers and agricultural workers .....	40
Ginning factory workers .....	42
Workers in spinning and weaving factories .....	44
Workers in export-oriented manufacturing .....	46
Workers in non-export manufacturing .....	50
Workers in subcontracting factories .....	51
3.2 Possible intervention models .....	53
References .....	54

## | List of figures

Figure 1.	Cotton plant ready for harvest
Figure 2.	Map of Madagascar showing the Atsimo Andrefana region
Figure 3.	Mapping the main actors in the textile supply chain in Madagascar
Figure 4.	Numbers and locations of EPZ companies in the textile industry in Antananarivo
Figure 5.	Ginning in a factory
Figure 6.	Unloading cotton seed
Figure 7.	Pressing and packing fibre into bales
Figure 8.	Bales in storage
Figure 9.	Spinning and weaving mill machinery
Figure 10.	Female worker engaged in stain removal

## | List of tables

Table 1.	Practical differences between irrigated and rainfed crop systems
Table 2.	Main characteristics of the different types of cotton production
Table 3.	Distribution of producers by operator
Table 4.	Operator profiles (ginning factories)



## | Abbreviations and acronyms

BCI	Better Cotton Initiative
CNAPS	Caisse Nationale de Prévoyance Sociale (National Social Security Fund)
dB	decibel
EPZ	export processing zone (zone franche)
ha	hectare
ILO	International Labour Organization
OSH	occupational safety and health
PPE	personal protective equipment
VZF	Vision Zero Fund



## Executive summary

It is estimated that more than 173,000 people work in the textile supply chain in Madagascar, of whom over 50,000 are employed in the cotton fields and over 120,000 in export-oriented factories. The textile supply chain can be divided into six stages: cotton seed cultivation, ginning to produce cotton fibre, spinning, fabric production, manufacturing, and local and international marketing.

The manufacture of garments for export is expanding rapidly, and textiles accounted for 20 per cent of all national exports in 2017. However, cotton production, most of it for export, has fallen significantly owing to water shortages and the increasing onslaught from insects.

Cotton production and ginning are seasonal activities in which most jobs are temporary. Workers employed for spinning have open-ended contracts, while weaving is done by temporary and permanent workers. Among export-oriented manufacturing companies, 76.7 per cent are licensed companies with export processing zone status and are estimated to employ more than 110,000 temporary and permanent workers. Of these, 71 per cent are women; they occupy 85 per cent of temporary posts, which are often unskilled. Some manufacturers subcontract a part of their production to formal and informal enterprises. Their outsourcing needs vary, and it is reported that most production contracts do not exceed a few months. There is little information available on informal subcontractors and it is difficult to estimate the number of workers involved or the length of their annual employment.

### Vulnerability profiles for occupational risk

#### Farmers and agricultural workers

The occupational risks identified for cotton production are related to: exposure to insecticides, contact with animals, exposure to ultraviolet rays, high temperatures, use of cutting tools, exposure to cotton dust, awkward working postures, repetitive movements, handling of heavy loads, the presence of highly flammable cotton seed in dwellings, mosquito bites and movement over uneven ground.

Farmers, their families and agricultural workers are vulnerable to occupational risks. Workers have little knowledge of such risks and farmers lack the resources to take preventive action. In the event of occupational accidents or diseases, they are not covered by social security. Lack of information, the seasonal nature of the activities and the distances to service points mitigate against affiliation to the Caisse Nationale de Prévoyance Sociale (CNAPS, National Social Security Fund) and occupational health services.

#### Ginning factory workers

The occupational risks identified for cotton ginning factories are related to: repetitive movements, awkward working postures, handling of heavy loads, exposure to cotton dust, working at heights, obsolete electrical systems which may catch fire, exposure to ultraviolet rays, high temperatures, contact with moving

parts and machinery leading to possible crush injuries, and vehicle movements near factories. Seasonal workers are given no training and are not registered with an occupational health service, factors which enhance their vulnerability to the occupational risks they face.

### Workers in spinning and weaving factories

The occupational risks observed in spinning/weaving factories are related to: exposure to dust and particles from cotton and synthetic fibres, working at heights, handling of heavy loads, awkward working postures, falling heavy objects, contact with rotating parts, bright lighting, obsolete electrical systems and the presence of flammable materials (fibres and yarns). There are reports that occupational safety and health (OSH) policies and committees have been introduced in some factories. Risk assessments and internal checks are carried out in preparation for external audits. However, it seems that workers remain largely unaware of any actions taken.

### Workers in export-oriented manufacturing

The occupational risks identified for export-oriented factories are related to: exposure to chemical products, the rapid work rate, the workload and pressure imposed by production supervisors, working at heights, repetitive movements, awkward working postures, handling of heavy loads, exposure to noise, slippery floors, travel by public transport, needle injuries and contact with cutting tools and with machines that can cause crush injuries.

Although a number of steps have been taken to prevent occupational accidents and diseases in factories, it is evident that action to raise workers' awareness and provide them with information has been ineffective and that inappropriate changes have been made following unwarranted recommendations by external auditors.

There are differences between permanent and temporary workers. The interviews with workers revealed that the personal protective equipment (PPE) issued to temporary workers differs in quality, they do not receive the same training and they are less involved in OSH-related activities.

In addition, the rapid work rate generated by a system geared to production targets affects temporary workers in particular. Moreover, most factories do not register their temporary workers with the CNAPS and occupational health services. This affects mainly women, who fill 85 per cent of temporary jobs.

### Workers in subcontracting enterprises

The occupational risks here vary according to the size of subcontractor, the tools used and the operations performed. On the whole, the risks identified during the visits are the same as those observed in garment factories. However, subcontractor workloads are heavier and working hours longer. During periods of high demand, the ergonomic and psychosocial risks are greater and workers face increased exposure to all the identified risks.

## Drivers and constraints for OSH improvement

A variety of factors encourage or constrain the adoption of measures to ensure safe and healthy working conditions in the textile supply chain in Madagascar:

**Increasing demand for socially responsible products:** Demand is on the increase for textile and cotton products which are certified and conform to OSH standards. In practice, however, there are limitations. In garment manufacturing, the auditors can lack competence in OSH-related matters and subcontractors' capacities are limited. It can also be difficult to ensure the traceability of the activities subcontracted to informal enterprises. In cotton cultivation, producers have begun to introduce the Better Cotton Initiative (BCI), a private initiative which promotes better standards in cotton farming. However, some producers report difficulties in complying with the standards for applying hazardous (crop protection) chemicals owing to increasing insect attacks and the cost of purchasing PPE.

**Support for rural development:** Farmers engaged in BCI cotton production are supported by the Integrated Growth Poles and Corridor Project (PIC2) funded by the World Bank, which aims to increase economic opportunities based on private sector expansion, and by the Conseil Interprofessionnel du Coton (Interprofessional Cotton Council), the decision-making body that regulates the cotton industry.

With support from these partners, producers have taken initiatives to identify and prioritize occupational risks. Producers and workers have been trained in minimum OSH standards and in how to set up protection schemes which match local conditions and producers' capacities. In 2017, these training and information activities reached 30 per cent of producers.

**OSH legal and regulatory framework:**

A number of laws and decrees regulate OSH in Madagascar, but their application remains limited. This constraint may be explained partly by a lack of knowledge among enterprises and workers, the seasonal and temporary nature of the work and the limitations of supervisory bodies.

**Limited capacities of supporting institutions:**

Labour inspectors have only limited resources for ensuring compliance with OSH legislation. This most affects their operations in rural regions, areas far from the capital, and informal enterprises.

As for the prevention and compensation of occupational accidents and diseases, the local infrastructures for support are insufficient.

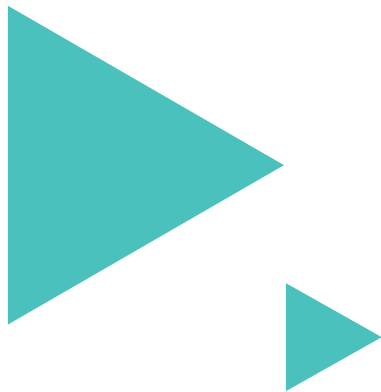
The coverage and quality of occupational health services are poor.

**Prospects for improving OSH**

On the basis of these drivers and constraints and the vulnerability profiles for occupational risk, a consultation was held with the various stakeholders in the value chain, resulting in the following set of primary objectives for improving OSH at all levels in the chain:

- ▶ strengthen coordination among supporting institutions, employers and workers' organizations;
- ▶ integrate OSH into existing initiatives on productivity and competitiveness (certification programmes and cooperation for sectoral development);
- ▶ strengthen the capacities of the supporting institutions to provide OSH services, in particular to address the needs of vulnerable workers;
- ▶ develop strategies to ensure that the services provided by supporting institutions (the Labour Inspectorate, CNAPS and occupational health services) reach seasonal and informal workers;
- ▶ develop and promote a system to ensure the safe handling of chemical products throughout the chain;
- ▶ train employers and workers in risk management at every production stage in the chain.





## Introduction

This case study was carried out as part of a project on occupational safety and health in sectors linked to global supply chains, financed by the Vision Zero Fund (VZF) in Madagascar. The project supports the efforts of actors in the textile and lychee supply chains to reduce occupational accidents and diseases and promote safety and health in the workplace. The project is implemented by the ILO (International Labour Organization) as a contribution to its Safety + Health for All Flagship Project and its programme of action for 2017–2021 on decent work in global supply chains.

In each supply chain selected for the project, a case study was carried out of the drivers and constraints for improving occupational safety and health (OSH), with a view to identifying opportunities for intervention. The methodology used was developed by the ILO during a joint project with the European Union on OSH in global supply chains, and is adapted from the Market Systems for Decent Work Approach. The methodology comprises four stages: supply chain selection, chain mapping, chain analysis and intervention design<sup>1</sup>.

The criteria for selecting the textile supply chain in Madagascar included the following:

- ▶ strong sectoral integration into global supply chains and the overall market situation;
- ▶ the large number of jobs in the local supply chain;
- ▶ the existence of sizeable risk factors affecting workers' safety and health at different stages in the supply chain;

- ▶ the existence of organized structures in the supply chain (sectoral bodies, platforms bringing together stakeholders, unions and associations) and the sector's national economic and political importance;
- ▶ the potential to capitalize on and replicate interventions in other developing countries.

Once the supply chain had been selected, mapping was undertaken in order to produce a detailed classification of the actors and their institutional and market environment. This stage was followed by a thorough qualitative analysis to understand the underlying causes leading to the development of the drivers and constraints for improving OSH. The analysis drew on the experiences of the various actors involved and on a study of the institutional environment and the market. The methodology identified vulnerability profiles for every production stage, including occupational risks and vulnerability factors such as access to social protection and employment status. Finally, intervention models were developed with the stakeholders in the supply chain.

The study and the interventions were developed in a participatory process comprising the following stages:

- ▶ initial documentary research covering scientific and technical publications, the existing legislation and the available data and information on the institutional and market environment in the supply chain and on the global market;

<sup>1</sup> For more details of this methodology, see *Occupational Safety and Health in Global Value Chains Starterkit. Assessment of drivers and constraints for OSH improvement in global value chains and intervention design. Guide for implementers*, ILO, 2018, [https://www.ilo.org/safework/projects/WCMS\\_635157/lang--en/index.htm](https://www.ilo.org/safework/projects/WCMS_635157/lang--en/index.htm).

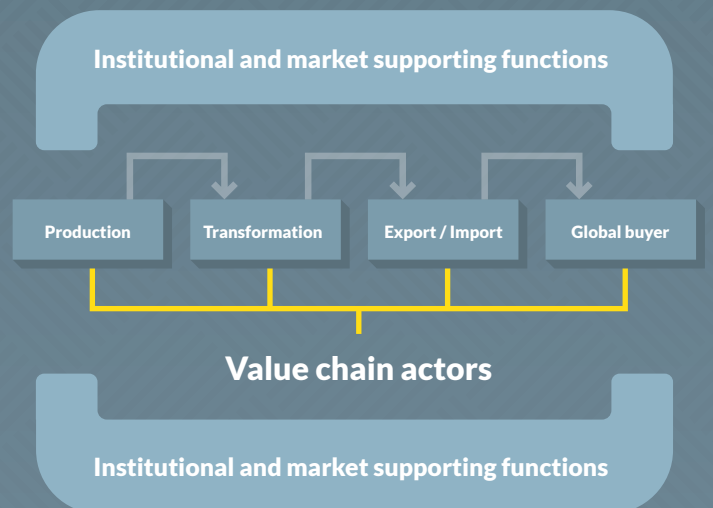
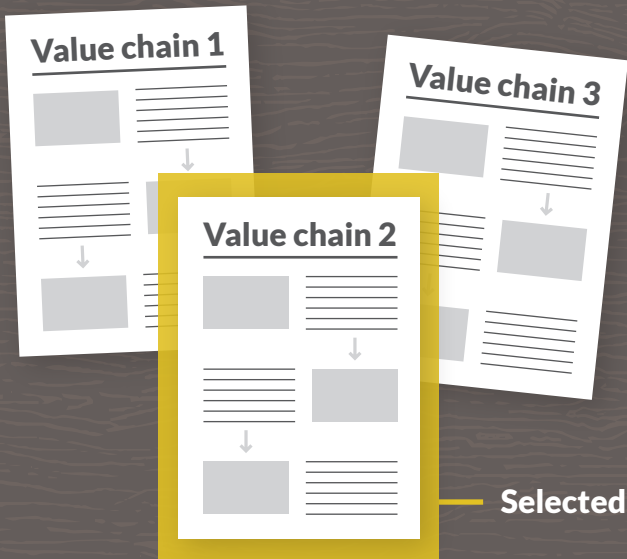


- ▶ field research based on semi-structured qualitative interviews with individuals and focus groups representing the main actors in the supply chain (agricultural producers, workers and employers) and the institutional and market environment in Madagascar (the Ministère du Travail, de l'Emploi, de la Fonction Publique et des Lois Sociales (Ministry of Labour, Employment, the Civil Service and Social Legislation), the Inspection du Travail (Labour Inspectorate), occupational health services, the CNAPS prevention service, technical and financial partners for development, employers' organizations, workers' organizations, certification bodies, auditors and the Comité interministériel du coton (Inter-ministerial Committee for Cotton)). Workplaces and working methods were observed on farms and at ginning, spinning, weaving and garment factories. The participating farmers and factories included 21 small and medium-sized cotton producers from seven different municipalities, five large cotton farms, one spinning factory and Madagascar's four existing ginning factories. Appendix 1 provides details of the sample of garment enterprises which took part;
  - ▶ a consultative workshop with the key actors in the supply chain and its institutional and market environment. On the basis of the results of the first two stages of research, workshop participants developed intervention models for improving OSH in the textile supply chain.
- This case study provides the results of the three research stages described above.

# | Step 1: Selection



# | Step 2: Mapping



## | Step 3: Analysis



## | Step 4: Intervention design



### Interventions for sustainable improvement of occupational safety and health outcomes

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_





# 1 | The textile supply chain in Madagascar

## 1.1 Market and product

### Product

Cotton is the plant fibre that surrounds the seeds of the cotton plant. Growing it requires highly specific climatic conditions in terms of heat, water quantity and soil quality: temperatures of between 12°C and 15°C to germinate the seeds, over 700 mm of rain during the growing cycle, sunny days during the ripening process and a dry spell at the end of the growth cycle to prevent the fibre rotting.

Figure 1. Cotton plant ready for harvest



Source: author, 2018

Cotton is grown to obtain products that are mainly employed in the textile, food and cosmetics industries. The fibre is used to make fabrics, bedclothes and cotton wool. Among other uses, the seeds produce edible oil, the tiny bristles on their surface are used in making varnish, the hulls are used for fuel and whole cotton seed for animal feed.

Cotton has been grown in Madagascar since the late 1950s. The main production area is in the Atsimo Andrefana region in the island's south-west. The cotton growing season lasts five months, between December and April, and harvesting begins in May and ends in September. Cotton is a perennial plant which is usually grown as an annual, mainly to limit the damage caused by parasites.

Figure 2. Map of Madagascar showing the Atsimo Andrefana region



Source: Wikipedia, 2008

Ninety per cent of Madagascar's cotton fibre is exported. The few local weaving concerns import most of the cotton yarns that they use to make fabrics. Likewise, most textile manufacturers import fabrics and other products which they then process.

Over the past 10 years, the great majority of textile products made in Madagascar have been exported. The products made available on the global market vary widely, but they can be grouped into five categories: hosiery; woven fabrics; jeans, underwear and lingerie; workwear; and haute couture. A large number of the enterprises with export processing zones (EPZ) status focus on specialist clothing and/or haute couture, which have higher added value<sup>2</sup>.

## Market

In 2017, the global value of cotton imports was estimated to be US\$ 49,554,130. The main importers were China, Bangladesh, Viet Nam, Turkey, Indonesia, Italy, the Republic of Korea, India and Germany. Together these accounted for 61 per cent of import value. Although the cotton market experienced an average decline of 11 per cent between 2013 and 2016, the trend was reversed from 2016 to 2017, with growth of 10 per cent. Increased demand was observed mainly in Pakistan, Egypt, Turkey, Cambodia, Bangladesh and Viet Nam (ITC, no date).

The main cotton producers are India, China, the United States and Brazil. These four countries account for almost all global production, while Madagascar represents 0.1 per cent of market share and ranks seventy-seventh in the world for cotton exports (ITC, no date).

In clothing and clothing accessories, including hosiery, the estimated value of global imports in 2017 was US\$ 402,354,498. The main importers were the United States, Germany, Japan, the United Kingdom, France, Italy, Spain, the Netherlands, Canada and the Republic of Korea. The main suppliers were China, Bangladesh and Viet Nam. Madagascar ranks fifty-fifth in the world for exports of clothing and hosiery accessories and forty-fourth globally for exports of clothing and non-hosiery accessories.

The garment manufacturing industry in Madagascar is growing and becoming more

2 Act No.2007-037 of 14 January 2008 on export processing zones and companies with export processing zone status provides incentives to national or foreign investors investing in export-oriented activities. Companies which register to be part of this scheme benefit from a range of tax, customs and VAT incentives. They do not need to be located in specific zones, although EPZ zones are geographical areas in which several companies with EPZ status are located.

competitive in the global market. Over the past five years, the country has exceeded the average market growth rate. Textiles accounted for 20 per cent of all national exports in 2017, with a total value of US\$ 566,367 (ITC, no date). Clothing and clothing accessories, including hosiery, represented 93 per cent of the textile products exported and 18 per cent of all Malagasy exports.

Clothing and hosiery exported from Madagascar go mainly to Germany (33.2 per cent), the United States (16.6 per cent), the United Kingdom (14 per cent), South Africa (12.8 per cent), France (7.5 per cent), Spain (4.7 per cent) and the Netherlands (3.3 per cent). Since the country regained trade privileges under the US African Growth and Opportunity Act (AGOA) in 2014, the value of its exports to the United States has increased significantly, with growth of 32 per cent between 2016 and 2017.

The market for clothing and accessories apart from hosiery is less diversified. In all, 89.8 per cent of their export value is focused on France (58.9 per cent), the United States (25.1 per cent) and South Africa (5.8 per cent). In the past five years, exports to the United States have risen by 78 per cent.

While the clothing industry in Madagascar is expanding, exports of cotton have declined steadily since 2014, at an average annual rate of 5 per cent. In 2017, cotton represented 1.01 per cent of national exports, with a value of US\$ 28,845. Importing countries include Mauritius, India and Pakistan. Benefiting from its proximity, Mauritius buys 89 per cent of the cotton exported by Madagascar.

## 1.2 Structure of the supply chain

The supply chain varies according to the type of product and the intended market. It can be divided into the following stages:

- i. cotton seed cultivation,
- ii. ginning to produce cotton fibre,
- iii. spinning and other forms of processing,

iv. fabric-making,

v. manufacturing, and

vi. local and international marketing.

Madagascar exports most of its cotton fibre production, which is partly explained by its very small number of spinning and weaving factories. There remains only one domestic enterprise engaged in spinning yarns, which it then processes into products destined mainly for the domestic market. Madagascar has three industrial weaving companies.

Most manufacturing enterprises import the fabrics that they process, although some take in local supplies from one of the three industrial weaving concerns. Madagascar imported 56,733 tonnes of fabric (cotton: 20 per cent, synthetic: 80 per cent) in 2017. China is the leading supplier of cotton and synthetic fabric. There are also companies which import accessories (such as bobbins and buttons) and fabrics to supply non-export enterprises.

Virtually all the clothing and clothing accessories produced in Madagascar are exported. The manufacturing enterprises subcontract certain tasks to formal and informal enterprises.

One large formal manufacturing enterprise manages to survive by selling products on the domestic market, thanks to the diversity of its product lines. It makes bedclothes, upholstery fabric, household linens, garments, and hygiene products such as cotton wool. Its clients are mainly clothing shops, hotels, restaurants, pharmacies and public institutions such as the army, hospitals and health centres.

Where the export of textile products is concerned, there is little intermediation in the distribution circuit. EPZ companies enjoy direct access to major markets and distribution networks without having to involve trading companies or similar intermediaries. The client base of Malagasy EPZ companies essentially comprises major American and European clothing brands, including mass distributors. These major brands strongly influence the structure of the chain and the processes used in making textile products.

### Cotton seed production

Cotton farmers are spread across 28 municipalities in the Atsimo Andrefana region. The total area under cotton cultivation is some 21,473 hectares. In the 2017–2018 season the

number of farmers increased to 7,495 compared with 6,956 in 2016–2017. The majority of farmers are in the following ten municipalities: Ankililoaka (24 per cent), Soahazo (12 per cent), Analamisampy (11 per cent), Ankilimalinika (8 per cent), Milenaka (5 per cent), Ankazoabo (5 per cent), Tsianisiha (4 per cent), Maromiandra (4 per cent), Andamasiny Vineta (3 per cent) and Marofoty (3 per cent) (CIC, 2018).

Two crop systems are employed: rainfed and irrigated. The choice of system depends mainly on the available water source. The rainfed system is practised in the north, while irrigated crops are grown in the Bas Fiherenana area, where the river is used to irrigate the fields. Table 1 shows how the production stages vary according to the crop system in use. The growing season lasts from September to May and harvesting generally takes place from May to September.

**Table 1.** Practical differences between irrigated and rainfed crop systems

	Production stage	Irrigated system	Rainfed system
1	Maintaining and preparing channels and dams: clearing blocked channels and rebuilding dykes and dams	X	
2	Soil preparation: clearing, ploughing (working the soil to soften it) and furrowing (making furrows to allow water to circulate in the cotton fields)	X	X
3	Sowing: preparing and sorting seeds, preparing seedbeds and holes, transporting seeds to the fields, marking lines, placing stakes and depositing seeds	X	X
4	Irrigation (during the growing season irrigation channels are opened twice)	X	
5	Weed removal (2–3 times before the harvest)	X	X
6	Thinning (removing some parts at the base of the cotton plant to stimulate growth)	X	X
7	Re-furrowing (re-making furrows to ensure that the fields are well irrigated)	X	
8	Insect treatment (spraying insecticide)	X	X
9	Harvesting (1–3 times per season: consists of removing the cotton from the bolls and placing it in sacks)	X	X
10	Transportation and storage for collection by operators	X	X

Source: author, 2018

Cotton seed production in the Atsimo Andrefana region has fallen considerably in recent years, from 12,000 tonnes in 2015 to 5,400 tonnes in 2017 (CIC, 2018). This can be explained by several interdependent factors: (i) insufficient rain and water for growing cotton and spraying insecticides; (ii) increased attacks by insects, especially the jassid or cotton leafhopper (*Jacobiella facialis*), which multiplies rapidly in dry conditions; and (iii) farmers' difficulties in obtaining inputs (seeds and pesticides), the prices of which have increased owing to growing demand that exceeds supply. A lack of suitable

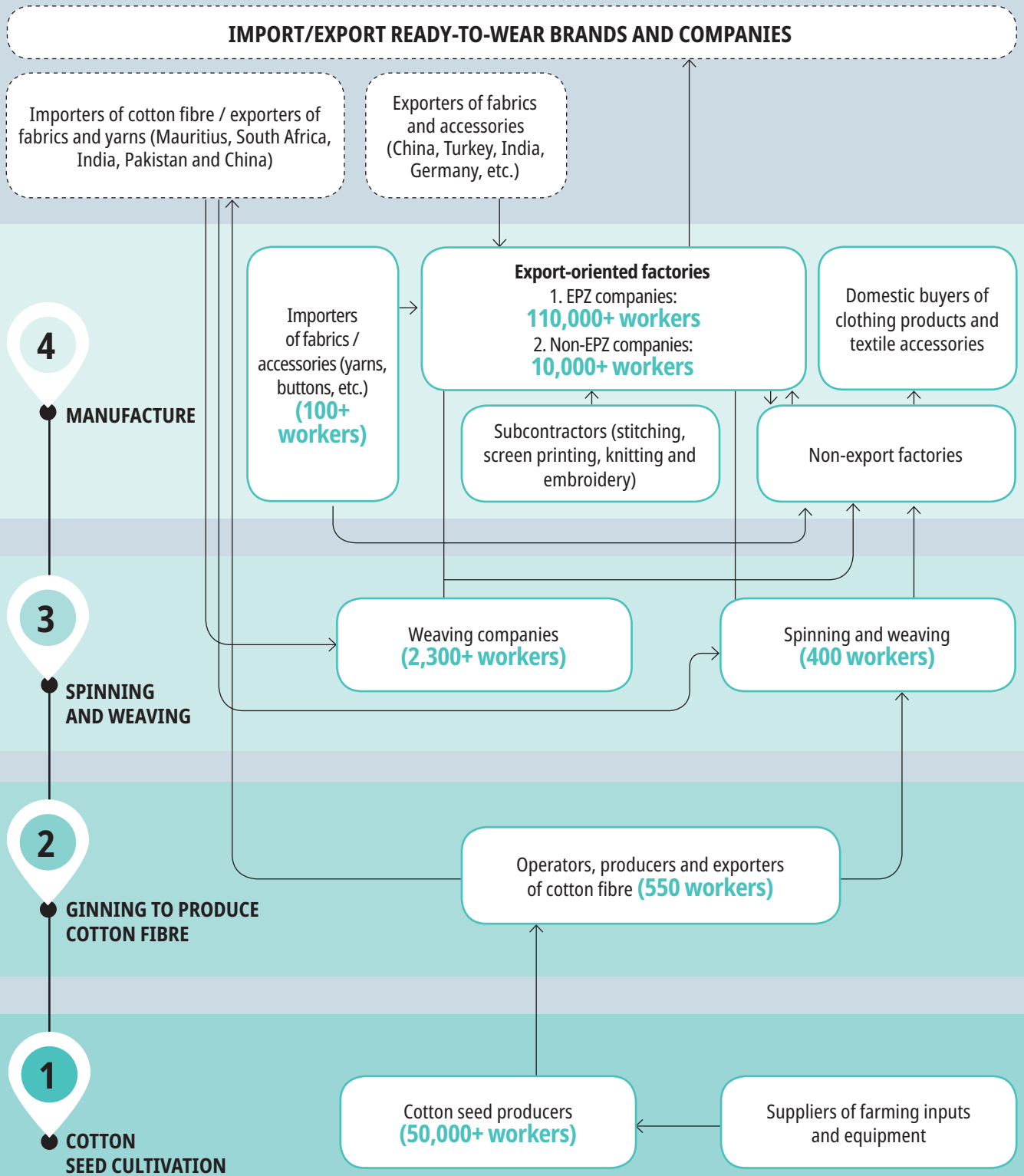
safe warehousing space leads some producers to store chemical products and harvested cotton seed in their homes. When storage area are not clean, the quality of the cotton is affected.

There are three types of production: family-based, animal-drawn and mechanized. Most production is animal-drawn (72 per cent) and family-based (13 per cent). Since 2017 there have been fewer and fewer mechanized producers. They have reduced their cultivated area because of inadequate rainfall and attacks by insects.<sup>3</sup>

3 Source: interviews with producers (2018).



Figure 3. Mapping the main actors in the textile supply chain in Madagascar



**Supporting functions:**

Ministry of Labour,  
 Ministry of Agriculture,  
 Ministry of Industry,  
 Ministry for Trade,  
 workers' organizations,  
 employers' organizations,  
 National Social Security Fund,

capital O,  
 occupational health services,  
 World Bank,  
 French Development Agency,  
 Interministerial Committee on Cotton,  
 Interprofessional Cotton Council,  
 certification bodies, etc.

**Table 2.** Main characteristics of the different types of cotton production

Type	Family-based	Animal-drawn	Mechanized
<b>Cultivated area (ha)</b>	Less than 10 ha	Between 10 and 50 ha	More than 50 ha
<b>Workforce</b>	100% members of the farmer's family	50% members of the farmer's family 50% agricultural workers	25% members of the farmer's family 75% agricultural workers
<b>Production tools</b>	<i>Angady</i> (excavator), sickle, axe	<i>Angady</i> (excavator), sickle, axe, ox-drawn plough, manual weeding implement	Tractor-drawn ploughs and tools (e.g. furrow-maker), mechanical weeding tool, tractor-trailer for transportation

Source: author, from interviews with producers, 2018

The producers are contracted to operator-exporters approved by the Inter-ministerial Committee on Cotton, which buy the cotton seed and then separate the fibre and the seed. There are four approved operator-exporters, namely the cooperative KFBMH and the companies MSG, Tian Li Agri and Indosuma.

Details of the producers affiliated to each operator are shown in table 3. It will be noted that expected cotton seed production was 3.5 times greater than actual production. From 2016 to 2018, despite an increase in the sown area, actual total production fell.

**Table 3.** Distribution of producers by operator

	Total	Operator A	Operator B	Operator C	Operator D
No. of producers	7,495	6,358	962	157	18
Sown areas (ha)	21,473.43	16,275.09	3,833.34	590	775
Productive areas (ha)	19,445.83	14,247.49	3,833.34	590	775
Expected production (kg)	17,368,259	12,361,586	3,641,673	590,000	775,000
Average expected yield (kg/ha)	954	867	950	1,000	1,000
Actual production (kg)	4, 891,829	3,332,028	808,160	354,241	397,400

Source: data supplied by the Interprofessional Cotton Council (2018)

## Jobs

It is estimated that cotton seed production generates work for over 50,000 people. Since this is a seasonal activity, most jobs are temporary. Labour is mainly needed for soil clearing and preparation, crop maintenance (manual weeding and thinning) and harvesting.

On farms operating family-based and animal-drawn production, the labour force comprises mainly family members, but also daily-paid workers. Family members do not receive a fixed income. Mechanized farms generally employ 20 or more agricultural workers comprising daily-paid workers, labourers and seasonal workers.

Daily-paid workers are used mainly for crop maintenance activities such as weeding and thinning or to fill urgent temporary

requirements. They receive between 4,000 and 5,000 Malagasy ariary (MGA) per day.

Labourers are taken on to perform a predetermined task, usually soil preparation (tilling, clearing, furrowing), maintenance and processing. They are paid a set amount, either all on completion or part in advance with the rest on completion. They receive an average of MGA 3,705 per day.

Seasonal workers generally return to the same farmer every year to perform labour-intensive work (sowing, weeding and harvesting). During the harvest, they are paid per kilogram of cotton seed (MGA 100 to 120 per kilogram for the first picking, MGA 150 per kilogram for the second picking and MGA 200 per kilogram for the third).

This increase is explained by the fact that the bolls become gradually scarcer and thus more time-consuming to locate.

The different types of worker involved in cotton seed production are paid less than the minimum legal agricultural wage of MGA 1,065 per hour or MGA 8,521 for an eight-hour working day.

### Costs and revenues

The average production cost per tonne is MGA 808,703. The main outgoings are agricultural workers' wages (61 per cent), seed purchase (19 per cent) and pesticides (17 per cent) (CIC, 2018). The purchase price is discussed before the start of the harvest and depends on production costs and the global market price of cotton fibre. The Interprofessional Cotton Council (CIC, 2018) calculated that in 2018, the average gross margin per tonne of cotton seed was MGA 391,300, for an average sale price of MGA 1,200,000 per tonne. The average gross margin in family-based production was estimated to be MGA 102,136 per

hectare, and in animal-drawn production MGA 119,536 per hectare.

### Cotton ginning

The four operators that collect cotton seed from producers then gin it to separate the fibre from the seed. All of the fibre produced by the ginning enterprises is exported, mostly to a single spinning company in Mauritius, which is also the major shareholder in one of the Malagasy ginning companies. Less than one tenth of cotton production goes into the local textile industry. Only the fibre produced by the cooperative (operator B below) is processed in Madagascar.

Ginning commences in May and finishes in September. The factories may finish earlier if cotton seed production is low. In 2018, one operator reported having to subcontract its ginning to another company because the expected cotton seed production was below the minimum processing capacity of its factory.

**Table 4.** Operator profiles (ginning factories)

Operator	Operator A	Operator B	Operator C	Operator D
<b>Legal status</b>	<b>Private company</b>	<b>Cooperative</b>	<b>Private company</b>	<b>Private company</b>
Number of employees	140	50	103	250
Number of temporary employees for ginning	90	50	50	80
Activities	Ginning, export	Ginning, local sales	Ginning, export	Ginning, edible oil production, export
Processing capacity	Over 100 tonnes per day	10 to 20 tonnes per day	50 tonnes per day	Not known
Length of ginning activities	3–4 months	4–5 months	3–4 months	4 months

Source: interviews with management, 2018

The operator collects the cotton seed from the producers, a task made difficult and costly by the fact that the latter are located in areas that are hard to reach and where the roads are in poor condition. Some operators have installed local collection points where producers can deliver their cotton seed directly.

Ginning is carried out in three stages: (i) several days of drying out in the open air and sun to reduce moisture content; (ii) ginning to separate the fibres and seeds; and (iii) additional cleaning to remove any remaining fibres. The seeds obtained after separation from the fibres are dried in the sun then stored awaiting sale. The seeds are used by producers for sowing.

Ginning takes place on machines of differing processing capacity. Workers load cotton seeds into the machine hopper and monitor the mechanical fibre separation process.

The ginned fibres are then compressed mechanically into bales, sealed manually with plastic and given an overall protective coating. The cotton bales are then moved to storage areas before being exported or sent to weaving factories.

Cotton is exported throughout the year, but mostly in the third quarter. Operators can easily change export buyer since demand is greater than world supply.

Operators are facing a reduction in the supply of cotton seed. With less cotton seed available, they buy without regard for quality, and the sorting they then carry out prior to ginning generates waste, which constitutes a loss for them.

There is also unfair competition among actors, a problem commonly known as “kilaboly”. This is a practice in which producers renege on their contractual understandings with operators. Normally, both parties conclude agreements under which the operator supplies the inputs needed to produce cotton seed (seed, fertilizer, insecticides, processing equipment) in exchange for an undertaking by the producer to sell the products at a prearranged price. In practice, given the drop in production caused by water shortages and attacks from insects, a number of producers fail to honour their commitments and instead sell to the operator that bids highest. The operators then have the problem of recovering the advance payments they made at the beginning of the season.

### Jobs

Together, these four companies provide jobs for more than 550 workers per year. Most workers hired for ginning are temporary, taken on from May to September. Factory workers generally have a written contract lasting up to six months and work for eight hours per day, five days per week, for a fixed monthly wage. Night work is done at only one of the four factories. Permanent posts are reserved for management and a few factory supervisors and technicians. Non-supervisory workers are paid the minimum legal non-agricultural wage of MGA 168,019, except at one factory, which pays less than the legal minimum.

### Costs and revenues

It requires 2.7 kg of cotton seed to produce 1 kg of fibre. On the basis of the figures provided by the operators, the cost of producing one tonne of fibre was calculated to be MGA 4,900,000. The purchase of cotton seed accounts for 60.67 per cent of total production cost. Given that the market price is MGA 5,153,280 per tonne, the average gross margin per tonne of fibre produced is MGA 253,280 (4.9 per cent).

### Spinning and weaving

In Madagascar, a limited number of actors are involved in producing cotton yarn and making

fabrics. The three weaving companies still active are EPZ companies and members of the Group of EPZ Companies and Partners. They sell their products mainly to domestic buyers and supply a number of export-oriented companies. It is easy for fabric companies to change buyer, since demand from manufacturers exceeds local supply.

In view of factors such as the low national production of cotton fibre and the policies of the export-oriented cotton companies, very little spinning is done in Madagascar. Only one enterprise still spins cotton for its own weaving needs. The time and cost involved in transporting cotton fibre to the factory impose a constraint on the enterprise (a journey of two to three days is required if there are no accidents).

The spinning industry in Madagascar is also affected by interruptions to the power supply from the national electricity and water distributor, which causes damage to its machinery.

Because the demand for yarn cannot be met, the spinning company, like the weaving companies, imports both cotton and synthetic yarns, mainly from China, Mauritius, India and Pakistan. Since 2015, Madagascar has imported on average 4,322 tonnes of cotton yarn per year.<sup>4</sup> These raw materials are transported from the port of Tamatave to Antananarivo and Antsirabe. The journey takes two to four days if there are no accidents.

The production of cotton yarns and fabrics involves the following stages:

- i. **Reception.** Bales of cotton fibre from the operators are delivered by lorry to the factory, where workers climb onto the lorry, unload the bales onto a pallet truck and move them into storage ready for spinning.
- ii. **Cleaning.** The bales are broken open by workers in order to air the compressed fibres. A team performs a quality control before the fibre is loaded into a machine, which then peels, cleans and mixes the fibre.
- iii. **Carding.** The fibres are beaten and carded in order to separate them before being drawn together to form slivers (long bundles of fibre). Machine operators monitor the process and ensure the smooth operation of the machines.

4 Calculation based on the ITC *Trade Map* database, available at: <https://www.trademap.org/Index.aspx>.

- iv. Stretching and spinning.** The slivers are combined and drawn out, then passed through devices (roving frames and combing machines) which stretch, twist and spool them. At this stage, the fibres are straightened individually by a series of rollers under pressure. The strands obtained are then fed onto a spinning frame to produce cotton yarn. Machine operators monitor the process and ensure the smooth operation of their machines.
- v. Winding.** At this stage, the yarn is wound onto a cone or bobbin. Machine operators monitor the process.
- vi. Dyeing.** The yarn then proceeds to the dyeing hall. Product preparers and machine operators are responsible for this task. The yarn and the colouring products are prepared by the workers, after which the operation is mechanized.
- vii. Weaving.** The yarn is prepared and transferred as warp and weft onto the loom. These operations are mechanized and monitoring is carried out by machine operators.
- viii. Quality control.** The fabrics obtained are checked for faults by machine operators before being stored.

### Jobs

It is estimated that spinning and weaving provide more than 2,700 jobs per year in Madagascar. In spinning, the machine operators and a section head are employed under open-ended contracts and have more than five years of experience. Weaving is performed by temporary and permanent workers.

### Manufacturing

There are two large groups of actors involved in manufacturing textile products. The first group are legally constituted companies. The second group comprises a multitude of actors and small informal production units which

gravitate around the formal enterprises. It is difficult to identify and enumerate these informal enterprises, which sometimes subcontract from export-oriented companies. These subcontractors are isolated and there is little contact between them, which limits the opportunities to exchange information.

Manufacturing companies fall into the following categories:

- ▶ EPZ companies, either foreign- or Malagasy-owned. These are by definition export-oriented and enjoy the tax arrangements and benefits specific to the EPZ scheme;
- ▶ Export-oriented companies without EPZ status;
- ▶ Non-export companies, either foreign- or Malagasy-owned;
- ▶ Legally constituted and informal subcontractors.<sup>5</sup>

It was found that in 2017, a total of 423 formal enterprises declared themselves to be wholly or partly active in the textile sector.<sup>6</sup> Among these, 102 were licensed EPZ companies and 41 were members of the Group of EPZ Companies and Partners. It is estimated that 76.7 per cent of export-oriented manufacturing companies are licensed EPZ companies.<sup>7</sup>

Almost half (49.1 per cent) of EPZ companies are subsidiaries of multinational companies and the other half are independent firms which have direct trading contracts with importers. The main investors are Mauritian, Chinese and French. Malagasy textile companies account for 10 per cent of EPZ companies.

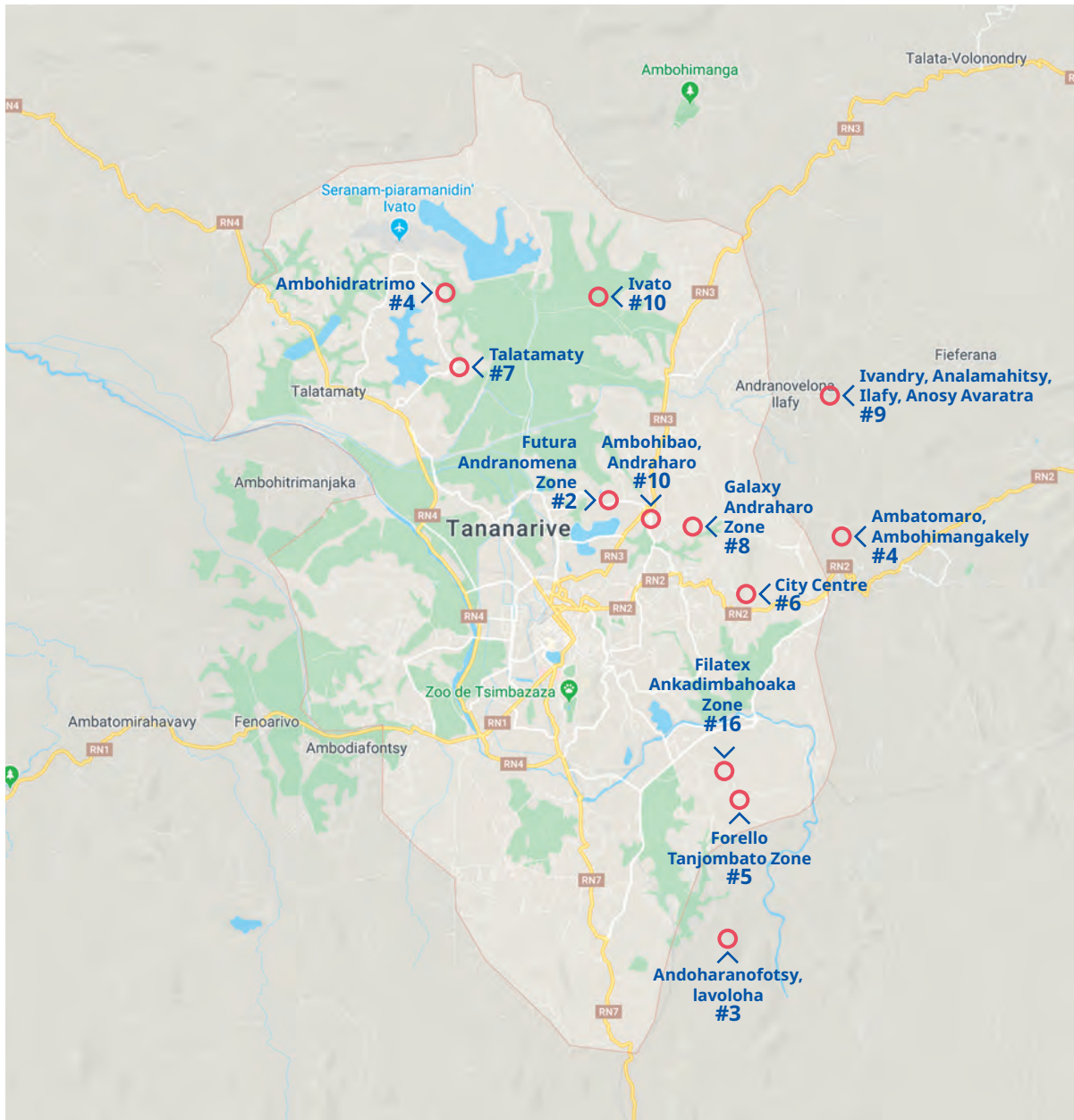
The majority of manufacturing companies are located in the outskirts of Antananarivo, the capital of Madagascar. They are spread across several industrial zones (Filatex, Forello, Galaxy and Futura) and districts of Antananarivo. The availability of labour, and especially of water and electricity, are what determine this choice. Only four EPZ companies are located in Antsirabe.

5 Article 50 of Act No. 2003-044 on the Labour Code: "A subcontractor is a natural or legal person which concludes a written contract with an enterprise for the execution of a specific task or the provision of specific services at a fixed price. The subcontractor shall recruit the staff necessary to complete the task."

6 Data on the number of staff employed by manufacturers in Madagascar are incomplete and out of date. Data from the Institut National de la Statistique (National Statistics Institute), the Ministry for Industry and the Economic Development Board of Madagascar for 2017 were cross-referenced in order to obtain the number of formal textile enterprises in Madagascar.

7 According to 2017 data from the National Statistics Institute, the Ministry for Industry and the Economic Development Board of Madagascar.

Figure 4. Numbers and locations of EPZ companies in the textile industry in Antananarivo



Source: Economic Development Board of Madagascar, 2017

The operations performed in the factories vary from one company to another. They can include dyeing, pressing, cutting, stitching, assembly (sewing and knitting), attaching accessories (buttons, labels, fasteners, screen printing and embroidery), checking and quality control, washing-out (jeans), washing, stain removal, wrapping and packaging (completion). The support operations performed in the factories comprise: unloading of raw materials (mainly rolls of fabric), loading for export forwarding, transport, machine care and maintenance, and other administrative and logistical activities.

Contracts between export companies and importers are renewed annually. Prices, quantities to be delivered and quality requirements are also reviewed yearly. Changing a buyer is difficult since the parent companies carry out the trade negotiations and client acquisition.

Multinationals' subsidiaries are completely dependent on advice and direction from their parent companies. Fabrics are generally sent pre-cut by import companies and then assembled in Madagascar for re-export. Multinationals often impose certification requirements.

The subsidiaries undergo compliance checks carried out by the parent company. The requirements must be fulfilled to ensure renewal of the contract.

Some export-oriented manufacturing companies subcontract a part of their production. The main outsourced activities are stitching, knitting, screen printing and embroidery. According to the interviews conducted with 15 subcontracting enterprises, most of their work involves stitching and embroidery using machines. The subcontractors are legally constituted enterprises employing 50 to 200 workers, or informal enterprises. No study has yet been made of textile subcontractors in Madagascar and no statistics on their numbers are available.

Subcontracting needs vary according to the requirements of the parent companies and importers. In most cases (73 per cent) the contracts are fixed-term and do not exceed two months. The subcontractors' work does not generally last more than a total of eight months in a year.<sup>8</sup> Since they receive training from export-oriented manufacturers to make products that sometimes involve complex assembly techniques, the costs involved in changing partner are high. Subcontractors lack the resources to find new clients. They are particularly dependent on the export-oriented manufacturers.

In most cases, export-oriented EPZ companies subcontract to legally constituted companies via a written or unwritten contract. The materials for processing are supplied directly by the export companies. A deadline is set at the start of the contract. Sometimes the subcontractor is provided with equipment or machinery, in which case the exporter trains the subcontractor's employees in its use, and sometimes also in production techniques. Knitting and screen printing require special machinery and trained staff.

Export companies without EPZ status subcontract to one-person enterprises located mainly in their owners' homes. The main activity here is embroidery. There is no contract between the parties, who agree on a price for each item produced. The subcontractors supply the tools and machinery, while the clients provide the fabric and yarns.

## Jobs

Export-oriented and non-export manufacturing companies employ senior and other managers, engineers, quality controllers, line managers, machine operators (sewing and knitting), *petites mains*<sup>9</sup> for stitching, security staff and cleaners. They sign written contracts with their permanent and temporary workers.

Export-oriented manufacturing companies with EPZ status are estimated to employ over 110,000 workers per year, while those without such status employ more than 10,000 workers. Visits made to some export-oriented manufacturers revealed that operator posts account for 60 per cent of the workforce. The majority of the workforce in export-oriented factories is female – over 80 per cent.<sup>10</sup>

The number and types of worker and their working conditions in subcontracting enterprises vary greatly from one to another, making it difficult to estimate their numbers. Generally, there are permanent managers in charge of administration and finance, as well as production staff and machinists (operators) and *petites mains*, most of whom are temporary or day workers without a written contract.

Both exporters and subcontractors often renew fixed-term contracts on a consecutive basis.

## Production constraints and costs

All industries in Madagascar are constrained by interruptions to the power supply from the national water and electricity distributor. This instability causes damage to machinery and delays in production. In addition, the poor state of the road network affects delivery times (two to four days between the port of Tamatave and Antananarivo) and the costs of transporting raw materials and finished products.

At the beginning of 2018, the textile industry in Madagascar was also hit by problems at the port of Tamatave, which led to delays in production and delivery. Some factories had to close or send their products by air.

The equipment and machinery used, for example, in stitching and screen printing, are costly to maintain. Madagascar has no service providers or suppliers to ensure the care and maintenance of the industrial machinery used in its textile industry. Companies have to resort to foreign providers for such services.<sup>11</sup>

8 Source: interviews with management (2018).

9 Workers hired temporarily to carry out small adjustments such as thread removal and embroidery.

10 Source: interviews with management (2018).

11 Source: interviews with management (2018).



### 1.3 Institutional environment of the supply chain in Madagascar

The institutional environment of the supply chain includes both publicly and privately provided supporting functions:

- ▶ The Ministère de l'Agriculture, de l'Élevage et de la Pêche (Ministry of Agriculture, Stockbreeding and Fishing) oversees cotton cultivation and the use of insecticides and pesticides.
  - ▶ The Ministère de l'Industrie et du Développement du secteur privé (Ministry of Industry and development of the private sector) approves licences for EPZ companies.
  - ▶ The Ministère du Travail, de l'Emploi, de la Fonction Publique et des Lois Sociales (Ministry of Labour, Employment, the Civil Service and Social Legislation) monitors and ensures compliance with labour law.
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- ▶ The Caisse Nationale de Prévoyance Sociale (CNAPS, National Social Security Fund), is charged with, inter alia, paying compensation to members in the event of occupational accidents or diseases leading to disability, and reimbursing the costs of treatment, functional rehabilitation, vocational rehabilitation and redeployment.
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- ▶ Occupational health services: In the Atsimo Andrefana region, the Organization Médicale Interentreprise de Toliara (Toliara Interenterprise Medical Organization) provides occupational health service for the workers of ginning companies. In Antsirabe and Antananarivo, various occupational health services provide services for affiliated companies.
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- ▶ The Inter-ministerial Committee on Cotton, which comprises representatives from the Ministry of Agriculture, Stockbreeding and Fishing, the found Ministère de l'Économie et des Finances (Ministry for the Economy and Finances) and the Ministère de l'Industrie et du Développement du secteur privé (Ministry of Industry and development of the private sector). This is the decision-making body responsible for regulating the cotton industry through the grant, suspension and withdrawal of licences and the control and monitoring of the cotton harvest.
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- ▶ The Interprofessional Cotton Council, which operates in the Atsimo Andrefana region, supports the Inter-ministerial Committee on Cotton. It is made up of the producers', carriers' and operators' associations. The Council's aim is to ensure the sustainability of the cotton industry. It carries out regular monitoring and supervision of stakeholders, gives advice, and reports to the Inter-ministerial Committee to enable it to take necessary measures.

The supporting institutions also include organizations which represent the interests of their member enterprises. The following groups were identified in the textile sector:

- ▶ the Syndicat des Industries de Madagascar (Madagascar Union of Industries);
- ▶ the Group of EPZ Companies and Partners;
- ▶ the Groupement des entreprises de Madagascar (Grouping of companies from Madagascar);
- ▶ the Entreprendre au Féminin – Océan Indien (a network of business women);
- ▶ the Groupement des Femmes Entrepreneurs de Madagascar (Group of Women Entrepreneurs of Madagascar).

The Conférence des Travailleurs de Madagascar (Workers' Conference of Madagascar) brings together several workers' unions (FISEMA, SEKRIMA, FISEMARE, etc.).

Other partners provide technical and financial support to the textile industry in Madagascar:

- ▶ The World Bank finances the Integrated Growth Poles and Corridor Project (PIC2), which seeks to promote economic growth based on private sector development in three target regions including Atsimo Andrefana. Under this project, the Inter-ministerial Committee on Cotton was established and Inter-ministerial Decree No. 20208/2016 concerning the organization of the cotton industry in the Atsimo Andrefana region came into force in 2016.
- ▶ Between 2015 and 2017, the Agence Française de Développement (French Development

Agency), through its Trade Capacity-building Programme, supported the Textile Mada cluster (an association of professionals in textiles, fashion, clothing and accessories) and other intermediaries including local market and export-oriented small and medium-sized enterprises, in collaboration with the International Trade Board of Madagascar.

## 1.4 Legal and regulatory framework

Various laws and decrees set out the rights and obligations pertaining to OSH and working conditions, as well as the tasks and responsibilities of the relevant institutions. The following are the main pieces of legislation:

- ▶ the Labour Code Act No. 2003-044 of 28 July 2004;
- ▶ the Social Security Code Act No. 94-026 of 17 November 1994;
- ▶ Act No. 94-027 of 18 November 1994 on the Occupational Health, Safety and Environment Code;
- ▶ Decree No. 2005-728 on the organization and functions of works councils;
- ▶ Decree No. 2003-1162 of 17 December 2003 organizing occupational health services;
- ▶ Act No. 2007-037 of 14 January 2008 on export processing zones and companies with export processing zone status stipulates that the provisions of the Labour Code apply to EPZ companies in every respect that is not contrary to the provisions of the Act (Article 5(6)). In addition, every EPZ enterprise is required to pay to the relevant organizations the social contributions stipulated in the Labour Code and the Social Security Code (Article 5(4)).







## 2 Drivers and constraints for occupational safety and health improvement

### Growing demand for socially responsible products

Growing demand is evident for cotton and textile products which are certified as socially responsible. The regulations that must be met in order to obtain such certification often include requirements relating to occupational safety and health.

Clothing importers increasingly require that the rights of workers in export-oriented factories be respected. The various types of certification impose comparable standards regarding the elimination of hazardous chemicals and the introduction of working conditions which safeguard workers' safety and health.

Under pressure from their clients, manufacturers must put in place management systems aimed at bringing all their factories into compliance with certification requirements. This mainly consists of annual assessment through external audits. However, it was noted that auditors' recommendations are sometimes inappropriate when set against the occupational risks. In addition, external auditors do not always speak Malagasy, which can make it difficult to obtain information from workers. Auditors base their work mainly on the available documentation.

Another consideration is that the world market remains highly competitive, which causes high volatility, low predictability and generally low profit margins. Competition is keen at all levels and actors are constantly seeking to reduce costs. There is frequent recourse to informal subcontracting, which makes traceability difficult, apart from the fact that these actors have low financial capacity.

In cotton production, there is increased demand for cotton fibre bearing the label of the Better Cotton Initiative (BCI). Production of BCI cotton increased significantly from 2011 to 2017, when it represented 14 per cent of global production (BCI, 2018).

One of the steps required to produce BCI cotton is the assessment and control of occupational risks involved in production. The requirements also cover the wearing of PPE during the preparation and use of pesticides, compliance with international OSH standards, first aid training for employees, accessible first aid kits and transportation to take injured employees to a medical centre.

Producers in Madagascar have begun to introduce BCI cotton cultivation. In 2017, the initiative covered 2,106 farmers accounting for 41 per cent of the total cotton production area. However, the increased onslaught from insects makes it difficult to comply with the BCI requirements on the use of hazardous chemicals for crop protection. It is also difficult for BCI cotton producers to convince their neighbours to avoid the excessive spraying of insecticides in their fields. Some producers cannot afford the additional costs of protecting workers, for example by purchasing PPE, while it was said that the sale price obtained for BCI cotton seed was not any higher than that produced in the conventional manner.

Last, BCI cotton requires a continuous improvement plan to be formulated but it was reported that agricultural workers have not been involved in preparing such plans.

As for production of **organic cotton**, it is not possible in the current climatic conditions in the Atsimo Andrefana region, given the shortage of water and the reliance on insecticides to eliminate pests.

## Support for rural development

BCI cotton producers enjoy the support of the Integrated Growth Poles and Corridor Project (PIC2), the Interprofessional Cotton Council and a ginning company. An annual training programme, free to producers, has been devised to strengthen capacity. In 2017, a total of 2,106 producers made up 91 training groups.<sup>12</sup>

On the ground, officials promote collaboration and communication among the members of the initiative, including workers. These officials provide training and ensure that systems are put in place to document risk assessments and the main risk reduction measures to be taken.

Producers identified and prioritized the occupational risks relating to cotton growing with support and training from the abovementioned partners. Action plans were then devised in order to train producers (2,106) and workers (an estimated 11,000 in 2018) in the basic OSH regulations and in introducing the means of protection best suited to local conditions and capacities. The main topics for the training were integrated pest management, the wearing of PPE, safe and secure storage of pesticides in isolated places, and means of transporting chemicals in order to prevent contamination.

These support services do not as yet extend to the entire cotton production area. In 2017, the training and information activities reached 30 per cent of producers.

Producers taking part in the initiative who were interviewed said that they needed more information, training and support to ensure the effective implementation of BCI requirements.

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12 Source: interview with the CIC (2018).

## Legal and regulatory framework for OSH

The main laws and decrees relating to OSH are listed in section 1.4 above. However, this legislation is not yet widely enforced. This constraint is explained partly by the fact that enterprises and workers are not familiar with it (especially cotton producers), by the seasonal and informal nature of the jobs in the supply chain and by the limitations of the supervisory bodies, which are described below.

## Limited capacities of supporting institutions

The capacities of labour inspectors are still too limited to ensure compliance with OSH legislation. There are insufficient human and material resources to mount OSH inspections, and inspectors' activities are confined to mediating, issuing overtime work permits

and checking employment contracts. These restrictions particularly affect inspectors' ability to operate in rural regions and those far from the capital, and at informal enterprises. Workers on cotton farms and in ginning and garment factories reported never having witnessed a visit by an inspector. In the Atsimo Andrefana region, owing to the informal nature of the activities and the location of the cotton fields far from the town centre, supervisory activities are very scarce.

Concerning the prevention of and compensation for occupational accidents and diseases, the CNAPS and occupational health services are poorly represented at the local level. Access to good-quality services is limited, whether the enterprise is in Toliara, Antananarivo or Antsirabe.

In the Atsimo Andrefana region, the only interregional CNAPS office is in the town of Toliara. This makes it difficult for producers far from the town to report occupational accidents and apply for the compensation to which they are entitled.

The coverage and quality of occupational health services are also poor. Some workers preferred to consult independent physicians, stating that the prescriptions issued by physicians working in these services do not address sick workers' needs. In the Atsimo Andrefana region, the only occupational health service is located in Toliara. The cotton-producing areas are far away, more than 80 km from the town, in isolated areas where the roads are in very poor condition.





# 3 | Opportunities to improve competitiveness and OSH

## 3.1 Vulnerability profiles for occupational risk

OSH risk assessment in context makes it easier to appreciate the extent and understand the causes of the vulnerability faced by different categories of worker. The methodology explored the following aspects to evaluate OSH-related vulnerabilities:

- ▶ **Exposure** identifies occupational risks by activity and evaluates their severity and probability of occurrence.

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- ▶ **Sensitivity** identifies the specific characteristics of workers' employment situations which are linked to their exposure to occupational risks and influence OSH outcomes. In particular, the following factors are identified and analysed: whether an occupational risk management system exists in the workplace; whether the workplace offers access to information and training on occupational risk control measures; whether an employment situation is linked to differential access to prevention, promotion and protection where OSH is concerned; and whether the status of an enterprise or farm is linked to differential access to compliance checks by the relevant institutions (such as labour inspection and social security inspection).

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- ▶ **Coping capacity** identifies the strategies and resources available to workers to deal with the consequences of exposure to occupational risks. In particular, this involves assessing access to health services and compensation in the event of an occupational accident or disease.

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## Farmers and agricultural workers

Cotton growing operations vary according to the type of production (irrigated or rainfed). The tools used vary according to farm size (family-based, animal-drawn or mechanized). The present analysis is confined to small producers in the family-based and animal-drawn categories. It should also be noted that the observations were carried out in April, and thus some tasks (soil preparation, pesticide application and crop maintenance) could not be observed.

### a. Occupational risks

#### Ergonomic

Certain tasks and activities in cotton seed production entail ergonomic risks resulting from **awkward working postures and repetitive movements**:

- ▶ Crop maintenance activities (manual weeding, thinning and re-furrowing) require five to six hours of rapid repetitive arm and back movement every day and can lead to musculoskeletal disorders of the upper limbs.
- ▶ On small farms, planting is carried out manually at ground level, necessitating alternation between standing and crouching for six to seven hours daily. The operation is conducted at high speed, mainly by temporary women workers. It was reported that the intensity and repetitiveness of this task, performed for at least two weeks at a time, leads to muscular cramps, fatigue and musculoskeletal disorders.
- ▶ Harvesting is carried out manually while standing or crouching for eight to nine hours per day, which can cause musculoskeletal disorders in the lumbar region and lower limbs.

There are also ergonomic risks involved in handling heavy loads, which can result in musculoskeletal disorders of the back. During planting, those with no ox and cart carry on their heads sacks of seed weighing an average of 30 kg over an average distance of 7 to 8 km to the fields. To apply insecticide to his fields, a farmer carries on his back a full spraying device weighing 10 to 15 kg for 20 minutes continuously, for a total of 1.5 hours per day. After every harvest, farmers carry bags filled with cotton seed (10 to 15 kg) for an average distance of 6 km.

#### Physical

**Exposure to ultraviolet rays:** Workers have no protection against the sun while they spend four hours per day maintaining dykes, six hours per day preparing soil and sowing, or seven to eight hours per day harvesting. Headaches, eyesight problems, dehydration and heatstroke were reported.

**Exposure to high temperatures:** Work in the cotton fields is carried out in the hot season, when the average temperature is 26°C to 28°C. Sowing, maintenance and harvesting are done at the hottest times of day between 11 a.m. and 2 p.m. This work at high temperature leads to dehydration and can cause sunstroke. In the regions, this hazard is made worse by limited access to drinking water.

#### Biological

**Mosquito bites:** Farmers and agricultural workers are vulnerable to mosquito bites when preparing the soil and carrying out crop maintenance (between 4 a.m. and 6 a.m.). In Madagascar, mosquito bites transmit dengue fever and malaria. The risk is lower after the plants have been treated with insecticides.

**Exposure to cotton dust:** The cotton seed that they store in their homes exposes farmers and their families to cotton dust. This exposure lasts for one to two months on average. Some farmers without storage premises even prefer to keep cotton seed in their bedroom for fear of theft. Breathing in the cotton dust can cause chronic bronchitis or emphysema. Exposure to the dust also entails a risk of exposure to chemical inputs used to treat the cotton.

#### Cuts

Dyke maintenance, soil preparation, seeding and crop maintenance are carried out with cutting tools (including ploughshares, the *angady* (excavator) screw and the slats of manual weeding implements). The farmers and workers handle these tools at home, during transportation, while working, and during rinsing and sharpening. The tools are kept sharp and can cause serious injuries.

#### Exposure to animals

In ox-drawn production, the animals are used for soil preparation and transport. Farmers and workers are in contact with the animals before, during and after these activities. The animals can make unexpected movements which cause injuries, and there is also a risk of zoonotic infection.



## Fire

Cotton seed is highly flammable. The farmers use candles and oil lamps to light their homes, with the attendant risk that stored cotton seed will catch fire.

## Falling over

Workers reported a risk of tripping and falling during crop spraying, as the terrain in the growing area is often steep.

## Chemical

This risk arises from exposure to insecticides<sup>13</sup> in the fields during spraying and in homes where the containers and cotton fibres are stored. Agricultural workers, farmers and their families spend around two months in particularly close contact with insecticides, which are applied every 10 days. The workers prepare the product by mixing it with water, then apply it with spraying devices which they later wash without wearing PPE. The products are inhaled and may come into contact with the skin. Some workers reported feeling sick while spraying in the fields, leading to falls in some cases. Coughing and eyesight problems are very frequent during the treatment period between February and April.<sup>14</sup> Workers reported not taking a shower or changing their clothes after spraying – owing to the water shortage, they simply washed their hands. The stench of insecticide is reported in villages near farms during a rainy spell.

Although there is a treatment facility for chemical product containers in Toliara, farmers do not practise proper container management. They store them in or near their homes.

In the cotton fields, children aged from 14 to 16 years can be found helping their parents prepare the soil and maintain the crop. From the interviews held with workers, it emerged that the average age of workers on the farms is 17 to 36 years.

## b. Risk sensitivity

Agricultural workers receive no training on health and safety risks, working methods or

precautions against occupational accidents and diseases. Their knowledge of the risks is limited.

Despite the fact that farmers are aware of such risks and dangers, they lack the knowledge and resources to take preventive action. For example, they cannot afford to buy protective gear and proper equipment. The operators of ginning factories distribute PPE (masks, gloves and boots), but not in sufficient quantity to cover all of the region's producers.

It was reported that producers who belong to BCI cotton production training groups are less exposed to chemical products. They have received training in integrated pest management based on numbers of pests observed, enabling them to reduce the quantity and frequency of application of insecticides. PPE (gloves and masks) has also been distributed.

Producers registered with the BCI have also received training and support on accident prevention during tilling, crop maintenance, plant health treatment and harvesting.

## c. Coping capacity

Smallholders, their families and agricultural workers (seasonal workers, labourers and daily-paid workers) lack the means to deal with the consequences of an occupational accident or disease.

They have no social protection. The fields and villages where farmers and workers live are far from the nearest health centres, and medical evacuation is difficult if a serious accident happens. During the interviews, 65 per cent of producers stated that the nearest health centre was 45 minutes away on foot. Motorized transport is rare.

Owing to the seasonal nature of their activities, their financial capacities and the lack of information, farmers do not register any of their workers with the CNAPS or the Toliara Interenterprise Medical Organization.

13 The choice of insecticide depends on the insects identified, the farmer's purchasing power, the level of infestation and the damage to the crop. The most frequently used chemicals are cypermethrin, lambda-cyhalo, thiodicarb, dimethoate, chlorpyrifos, carbosulfan, acetamiprid, emamectin and permethrin.

14 Source: interviews with producers (2018).

## Ginning factory workers

### a. Occupational risks

#### Ergonomic

Workers are exposed to ergonomic risks linked to **repetitive movements, awkward working postures and the handling of heavy loads**, which can trigger musculoskeletal disorders. To load and unload the lorries, workers repeatedly lift, carry and put down sacks full of cotton seed weighing an average of 30 kg. These tasks are performed by seasonal workers for over four hours per day. Observation of cotton fibre packaging at one factory revealed that seasonal workers repeatedly lift and move bales weighing 230 kg while in uncomfortable positions – it takes two or three employees to carry one bale manually. Some workers use pallet trucks to make carrying easier. Male workers are normally given the task of handling heavy loads. Some employees said that they experienced fatigue and backache at the end of a working day.

#### Physical

**Exposure to ultraviolet rays:** Seasonal workers are exposed to the sun when outside; some

of them are naked to the waist. Exposure to ultraviolet rays can lead to skin burns and other disorders.

**Exposure to high temperatures:** Factory work is performed at high temperatures (over 27°C between midday and 2 p.m.), which can cause dehydration, eyesight problems, loss of balance and dizziness. Workers in ginning factories are not provided with water.

#### Biological

**Exposure to cotton dust:** Handling cotton seed from unloading to packing generates airborne particles which cluster inside the factory. Every worker is exposed to them. Collective and individual control measures, such as masks, are either insufficient or inappropriate. Some workers reported feeling uncomfortable when wearing PPE. Others cover their mouths and noses with a piece of fabric. The workers reported the onset of respiratory problems, especially coughs, after a period spent working in the ginning factory. Exposure to cotton dust also entails risk from the chemical inputs used to treat the cotton.

Figure 5. Ginning in a factory



Source: Author, 2018

#### Falling from height

Cotton seed delivery lorries are around 4 metres high. Seasonal workers must climb onto the lorries to unload the cotton and can sustain serious injuries, usually multiple fractures, if they fall. Furthermore, maintenance work on ginning machinery is done at heights of 8 to 10 metres by service technicians. In some factories stairs are not fitted with guard rails and their dust-covered surfaces are slippery.

#### Electrical fires

In one factory the electrical system was found to be obsolete and liable to trigger short circuits and fires, a situation made more serious by the highly flammable nature of cotton fibre.

Figure 6. Unloading cotton seed



Source: author, 2018

### Machinery

At one factory it was noted that workers could come into contact with moving parts without any collective protection. Ginning machine belts are not protected and can cause serious injury

(crushing, cuts and burns). This particularly affects seasonal workers. The hydraulic presses used to pack the fibres also pose the risk of crush injury.

Figure 7. Pressing and packing fibre into bales



Source: author, 2018

### Vehicle movements

Vehicle movements outside factories during loading and unloading expose all workers to the risk of possibly fatal crush injuries.

### b. Risk sensitivity

Seasonal workers hired for ginning operations receive no training. According to interviews held with workers, seasonal labourers are not registered with an occupational health service and thus do not receive any preventive

occupational health services. This situation increases worker's sensitivity to the risks identified in the ginning factories.

Although some workers (administration, technical staff and supervisors) are registered with an occupational health service (the Toliara Interenterprise Medical Organization), the service does not carry out visits to assess working capacity or surveillance of workers' health. This is explained by the distance from the service to the factories, which are more than 12 km from Toliara.<sup>15</sup> Only one enterprise has its own occupational health service on factory

15 Source: interviews with the Toliara Interenterprise Medical Organization and management (2018).

premises. The centre is open 24 hours, 7 days a week.

OSH policy initiatives have been taken by three-quarters of ginning factories, with the aim of protecting workers' safety and health, complying with the relevant laws and regulations and ensuring that workers are consulted and their health monitored by occupational physicians.

The management of the factories have framed an OSH policy but not passed it on to the workers, who stated in interviews that they were unaware of the existence of such a document.

Internal risk identifications and assessments were performed by 75 per cent of ginning companies.<sup>16</sup> These enabled them to identify the risks of fire, injury from ginning machinery, falls from height and musculoskeletal disorders.

Following these assessments, the main action taken was to make fire extinguishers and first aid kits available in the factories. The results of the assessments were documented and made available to consult, but workers did not appear to be aware of them. Some said that they had

been trained to use extinguishers. Evacuation plans and emergency exits were displayed and marked out in 75 per cent of ginning factories.

There seems to have been no follow-up action to the measures put in place at the four factories. No training or continuous assessment was planned or undertaken. Extinguishers are not checked regularly. Emergency escape routes are blocked by bales of cotton fibre. None of the factories has an OSH officer or an appointed OSH committee.

### c. Coping capacity

According to the workers interviewed, all categories of worker in the ginning factories are registered with the CNAPS. Only one of the four factories does not register its seasonal workers with the CNAPS.

The seasonal workers not registered with the CNAPS or an occupational health service (the Toliara Interenterprise Medical Organization) cannot afford to pay medical fees in the event of sickness or accident.<sup>17</sup>

### d. Main roles and related social benefits at three ginning factories

Role	Type of contract	Working hours	Remuneration	Social security
Administration	Open-ended, written	8 hours per day	Fixed monthly wage	Registered with the CNAPS and the Toliara Interenterprise Medical Organization Paid annual and sick leave
Factory technician	Open-ended and fixed-term, written	6 to 8 hours per day	Fixed monthly wage	Registered with the CNAPS and the Toliara Interenterprise Medical Organization
Field supervisors	Open-ended and fixed-term, written	Variable; contracted to work 8 hours per day	Fixed monthly wage	Registered with the CNAPS and the Toliara Interenterprise Medical Organization Paid annual and sick leave
Factory workers	Fixed-term, maximum 6 months	8 hours per day	Fixed monthly wage	Registered with the CNAPS

Some ginning factories have no staff trained in first aid, although first aid kits are available. However, the contact details of the emergency services are displayed for workers. Vehicles are also available to evacuate workers at 75 per cent of factories.

### Workers in spinning and weaving factories

The information below is based on interviews conducted with workers and management at one spinning and weaving factory. It was not possible to observe operations as the visit took place during a power cut.

<sup>16</sup> Source: interview with management (2018).

<sup>17</sup> Source: interviews with workers (2018).

It is important to note that in three of the factories, weaving is done almost exclusively by men. Spinning and weaving generally involve an eight-hour working day. The work is divided into day and night shifts, and women do not work at night. The companies provide transport for night workers.<sup>18</sup>

**a. Occupational risks**

**Ergonomic**

**Handling heavy loads:** Cotton and synthetic fibres destined for the storage area are unloaded manually from the lorries by two or three workers in bales weighing 230 kg, which they then move by pallet truck. The work is done at high speed to ensure that space is freed up quickly.

**Awkward working postures:** Machine operators (carding, stretching, winding and weaving) stand continuously to ensure that their machines work smoothly, which can lead to musculoskeletal disorders.

**Biological**

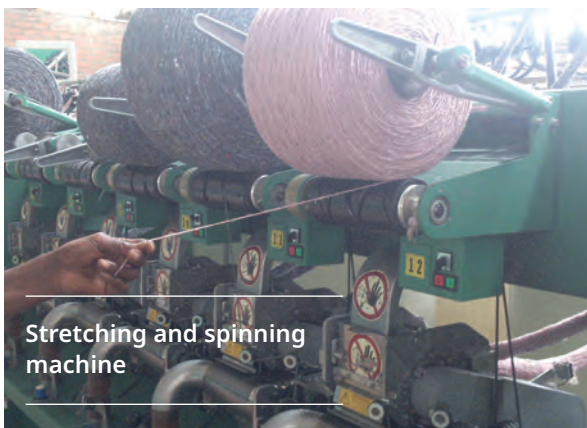
**Exposure to dust and particles:** Cotton and synthetic fibre particles are everywhere during the spinning process – the ground and machinery are covered in dust. The worst exposed workers are those in the storage area and machine operators.

Figure 8. Bales in storage



Source: author, 2018

Figure 9. Spinning and weaving mill machinery



Source: author, 2018

18 Source: interviews with management and workers (2018).

Exposure to cotton dust also entails risk of exposure to chemical inputs used to treat the cotton.

### Crushing by falling objects

Bales of fibre weighing 230 kg are stored on top of one another and may fall on workers.

### Machinery

The rotating parts (transmission belts) of most machines are not fitted with collective protection equipment. Contact with these parts can cause serious, even fatal injuries. Machine operators are the most exposed.

### Falling from height

The steps used to monitor the stretching and spinning machine are not fitted with a guard rail, and falls (from 1.5 m) can cause serious injury. The workers most exposed are the machine operators assigned to this task.

### Physical

Quality controllers work under strong light to help them identify blemishes in the fabrics. This **high brightness** causes eye strain while working, as well as decreased visual acuity.

### Electrical fire

The raw materials (fibres and yarns) handled during spinning are flammable. Workers also reported that their company's electrical systems were old and obsolete. The risk is highest in the storage area.

## b. Risk sensitivity

OSH policy forms part of the weaving companies' general policies and their policy on social responsibility. In the factories, this OSH policy is formulated by management and made known to the workers via the company noticeboard. The policy is reviewed yearly on the basis of the results of an audit. Compliance officers and OSH committees are in place. The majority (70 per cent) of works council members are workers.

The team responsible for OSH at the enterprise meets monthly to discuss problems and possible corrective action. The team prepares meeting reports and submits them to management for evaluation. At least once per year, the team receives training paid for by the company to strengthen its OSH management capacity.<sup>19</sup> The

training is a certification requirement, assessed during external audits. To prepare for external audits, the teams carry out risk assessments at two factories and internal checks at two factories.

The external audits carried out by certification bodies and clients have led some companies to cut down on their internal risk assessments and await the auditors' recommendations before taking OSH compliance action.<sup>20</sup>

Action taken to inform the workers seem to be ineffective, since they do not understand all the measures put in place. Some workers are not convinced that PPE is useful.<sup>21</sup> They wear it to avoid penalties and pretend to wear it during the audits.

As regards fire safety, emergency exits are signed and escape routes marked on floors and walls. Drills involving all workers are held once per year together with the fire brigade. Fire safety equipment (extinguishers, smoke detectors and fire alarms) is in place and is checked annually.

## c. Coping capacity

Workers in the spinning section are registered with the CNAPS and an occupational health service. The weaving companies state that their permanent and temporary workers are registered with the CNAPS and an occupational health service, both in Antananarivo and Antsirabe.

Two out of the three companies are close to health services. Vehicles are constantly available for an emergency evacuation. Workers are trained in first aid by occupational health service staff.

## Workers in export-oriented manufacturing

### a. Occupational risks

Observations and interviews at export-oriented factories identified the occupational risks described below.

### Chemical

Many chemical products of varying toxicity are used in stain removal, dyeing, washing and washing-out (jeans). Perchloroethylene is one

<sup>19</sup> Source: interviews with management (2018).

<sup>20</sup> Source: interviews with management (2018).

<sup>21</sup> Source: interviews with workers (2018).

of the products used to remove stains. It is the female *petites mains* who are assigned this task.<sup>22</sup> They work in teams for four to five hours, wearing masks fitted with cartridges. However, given the toxicity of perchloroethylene<sup>23</sup> and the length of exposure, these masks are not enough to protect them. The product also comes into contact with their clothing and hair.

In other operations such as dyeing and washing, the risk is highest during product preparation, measurement and mixing, when workers are exposed to very high concentrations but do not use PPE (no gloves, masks, suits, boots or goggles). The products used in dyeing can cause eczema, hives and asthma. This task is assigned to male product preparers.

Figure 10. Female worker engaged in stain removal



Source: author, 2018

### Psychosocial

The workload and pressure imposed by production managers leads to ongoing stress during and after work.<sup>24</sup> Workers have to maintain a high work rate to achieve set targets. This applies to all positions.

### Moving vehicles

Export-oriented companies generally finish work at 4 or 5 p.m. Large numbers of people are moving about at this time, but the supply of “taxi-be” (public transport) is limited. Passengers jostle to mount moving vehicles and accidents are frequent.<sup>25</sup> The coming and going of delivery lorries also present a hazard.

### Falling from height

Fabrics are delivered to factories and placed in racks from 2 to 4 metres high before being processed. Palette trucks and forklifts are generally used. Workers – men – must operate at heights to stow and bring down the materials, and a fall can lead to serious injuries (multiple fractures).

### Ergonomic

Cutting, stitching, button attachment, ironing and packing all involve highly repetitive movements of the upper and lower limbs. The rate of work is high in order to meet production targets and avoid night work, which is rarely performed for safety reasons.<sup>26</sup> Most of these tasks are carried out while standing up, except stitching, which is done while seated.

Workers engaged in manufacturing may perform the same task continuously for eight to ten hours, with a one-hour break for lunch. They sit at workstations which are not always adjustable and adapted for machine operators. Repetitive movements and awkward and sustained working postures can lead to musculoskeletal disorders in the back and upper limbs. Most workers (75 per cent) in these posts are women.

<sup>22</sup> Source: interviews with workers (2018)

<sup>23</sup> According to the toxicological index of the French Institut national de recherche et de sécurité (the National Institute for Research and Safety, the national body for occupational risk prevention), perchloroethylene (synonym: tetrachloroethylene) induces neurological effects under acute or chronic exposure. It irritates the skin and mucous membranes under chronic exposure. Several studies have shown the carcinogenic effects on various organs in men. At very high concentration it can cause coma accompanied by respiratory problems and irregular heartbeat. Cases of hepatitis and renal damage have been described. Fatal cases have been attributed to depression of the central nervous system. The inhalation of lower atmospheric concentrations gives rise to migraines, vertigo, motor coordination problems, irritation of the eyes and upper airways, and nausea. Ingestion is characterized by the appearance of digestive problems (nausea, vomiting, abdominal pain and diarrhoea) and can trigger pneumopathy associated with swallowing, accompanied by a cough and secondary broncho-pulmonary infections. It is also said to affect the liver (cytolysis) and kidneys (proteinuria, hematuria). Cutaneous burns and blisters can appear after extensive prolonged contact with this solvent. Under the same conditions, serious eye damage may be evident (INRS, 2012 a).

<sup>24</sup> Source: interviews with workers (2018).

<sup>25</sup> Source: interviews with workers (2018).

<sup>26</sup> Source: interviews with workers (2018).

Carrying heavy loads also presents a risk. After the products have been wrapped workers, mainly male *petites mains*, must carry full boxes of items weighing more than 50 kg.

#### Exposure to noise

Sewing machine operators are exposed to noise all day. The noise level measured at 85 per cent of companies during visits varied between 81 and 89 dB, continuing for eight hours per day.

#### Slipping, tripping and falling

During washing operations, the floor is constantly wet. Although workers wear rubber boots in 74 per cent of companies, slips are among the main risks reported by workers in these posts. In the stitching departments, it was observed that the floors, for example polished tiles, can be slippery. In addition, when workers are hurrying to leave, falls down the stairs can occur.

#### Cutting

At the cutting station, workers use various machines fitted with sharp blades. It was noted that most workers (64 per cent) at the cutting station were not in the habit of using collective protection and PPE (chainmail gauntlets). Mainly men are assigned to the cutting stations (89 per cent). Although cuts are not frequent, they can cause very serious injury (amputated fingers).

#### Machinery

In companies producing finished items with metal buttons, the operation to attach the buttons caused most reported injuries. The machine exerts pressure on the button to anchor it to the item. The high work rate raises the risk of finger injuries caused by crushing.

#### Needle injuries

Needle injuries from sewing machines are frequent, according to 93 per cent of the workers in the companies visited. The risk is at its highest at the end of the day, according to 70 per cent of workers, because of fatigue and lowered concentration.

### b. Risk sensitivity

The standards which must be complied with in order to gain the certification required by clients have led to the creation of OSH committees at 61 per cent of the export-oriented companies visited and to the appointment of compliance

officers to monitor the working conditions at certified manufacturing companies. This in turn has improved working conditions, for example in respect of access to occupational health services. Factories now have collective protection equipment (such as finger guards) and PPE (such as chainmail gauntlets, masks, long-sleeved gowns, plastic gloves, rubber boots and earplugs). Emergency procedures have been developed and documented at 80 per cent of export-oriented companies. Training is provided for workers in first aid, firefighting and emergency evacuation. A total of 51 per cent of export-oriented manufacturing companies have trained their staff at all levels on the minimum safety rules to be observed in their work.

However, despite the availability of PPE in certain factories, it was noted that there had not been sufficient awareness-raising and provision of information. The workers were still not convinced of the usefulness and importance of PPE.

More than half of export-oriented companies (56 per cent) stated that they had an OSH policy<sup>27</sup> which had been developed by management in response to certification requirements. The document was brought to workers' attention via the company noticeboard, in French and English, and reviewed annually according to the results of external audits. However, most workers have a poor grasp of French, still less English. Risk assessments are carried out once per year, usually before external audits.<sup>28</sup>

It was noted that, in response to purchasers' requirements and auditors' recommendations, certain factories have introduced changes which are inappropriate for the occupational risk, such as wearing earplugs at workstations in areas where there is no noise exposure.

Differences exist between permanent and temporary workers. Interviews with workers revealed that temporary and permanent workers doing the same job were issued with PPE of differing quality. It was also reported that, since temporary workers are not always present, they do not receive the same training and feel excluded from OSH matters. Most factories do not register their temporary workers with the CNAPS and occupational health services.

Moreover, target-led production involves a high pace of work, which affects temporary workers in particular. Some in operator posts or working as *petites mains* said they were paid on a timed

<sup>27</sup> Source: interview with management (2018).

<sup>28</sup> Source: interviews with OSH officers (2018).



or piecework basis. Workers who fail to meet their targets are subject to a series of warnings leading to possible dismissal.

On the whole, workers take few holidays. The interviews identified some with at least two years' service who had never requested leave.

### c. Gender-specific vulnerability

Women account for 71 per cent of jobs in EPZ companies, occupying 85 per cent of temporary posts and 48 per cent of management positions. Tasks related to domestic work continue to be given to women, while those involving technical skills or maintenance are given to men. It was reported that men are more interested in overtime.<sup>29</sup>

Stain removal continues to be a task done exclusively by women, using perchloroethylene, which passes into breast milk (INRS, 2012 a) It

was stated that women performing this work were given health checks more than twice per year.

Studies conducted in 2009 and 2010 (ODRES, IDE-JETRO and GEFP, 2011) charted the distribution of workers by gender and post (table 5). It appears from the interviews carried out for the present study that these data are representative of the current situation. They show more women working in unqualified posts, namely as operators (60.8 per cent versus 51 per cent), *petites mains* (12.3 per cent versus 7 per cent) and quality controllers (6.7 per cent versus 4.1 per cent), while men are more numerous in senior and other management positions (7.8 per cent versus 2.4 per cent; 6.1 per cent versus 4.7 per cent), engineer posts (7 per cent versus 3.4 per cent) and supervisor posts (9.2 per cent versus 4.4 per cent). Companies without EPZ status employ more women than those with it.

**Table 5.** Distribution of workers in EPZ companies by gender and occupation (%)

Occupation	EPZ companies			Non-EPZ companies			Together		
	Men	Women	All	Men	Women	All	Men	Women	All
Senior manager	3.8	0.9	1.2	19.7	6.3	6.9	7.8	2.4	2.7
Other managers	4.5	4.2	3	11.2	6	6.9	6.1	4.7	4.1
Engineers	9.2	3.3	6.6	0.1	3.9	2.7	7	3.4	5.5
Quality controllers	4.4	7.9	5.3	3.1	3.5	3.1	4.1	6.7	4.7
Supervisors	10.2	3.8	5.9	5.9	6	4.6	9.2	4.4	5.5
Operators	54.9	62.8	62.1	39.2	55.5	56.2	51	60.8	60.5
<i>Petites mains</i>	6.1	11.8	10.1	9.6	13.7	12.4	7	12.3	10.7
Others*	6.8	5.3	5.9	11.2	5.2	7.2	7.9	5.2	6.2
<b>TOTAL</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

\*Others: drivers, security staff, cleaners

Source: ODRES, IDE-JETRO and GEFP, 2011

A wage scheme based on output and production targets results in a wage disparity between men and women. The maximum wage paid to men is higher than remuneration for women, which could be due to their relative ability to meet targets. Women's wages are also 8 per cent lower than those of men in workers' posts and 20 per cent lower in management posts.

Regarding maternity leave (14 weeks), the interviews with workers revealed that pregnancy often leads to the employee's constructive dismissal, especially for women who work as operators. Lower production is one reason given for such a dismissal. Workers often conceal pregnancy for fear of being sacked. There were reports of miscarriages occurring during working time, caused by prolonged standing.<sup>30</sup>

<sup>29</sup> Source: interviews with workers (2018).

<sup>30</sup> Source: interviews with workers (2018)

The legal right to breastfeed for one hour per day is respected by most enterprises, which give effect to it in different ways. The following practices are the most frequent:

- ▶ Breastfeeding women are allowed to return home one hour before the factory closes at the end of the afternoon.
- ▶ A breastfeeding room is installed on factory premises, which women are allowed to use from 10 a.m. to 11 a.m. or from midday to 1 p.m.
- ▶ Women are granted one hour for breastfeeding between midday and 2 p.m. outside factory premises.

#### d. Coping capacity

Permanent workers are registered with the CNAPS and occupational health services. However, workers are not completely satisfied with the quality of the services that these institutions provide. They feel that the treatment and prescriptions are inappropriate and ineffective and that the occupational health services favour certain categories of worker.

Some textile companies do not pay regular contributions to the CNAPS, which leads to delays in compensation for workers suffering from occupational accidents or diseases.

Occupational health services are provided either by the interenterprise medical services to which workers belong, located near the factories in Antananarivo and Antsirabe, or by independent in-company medical services established on factory premises, which are either branches of interenterprise medical services located in the factory or independent physicians under contract to the export companies.

Independent physicians were introduced in response to workers' complaints concerning the quality of the services provided by legally constituted occupational health services.

For emergency evacuations, export-oriented companies use vehicles to transport workers to the nearest health centre or hospital. At 96 per cent of companies visited, the telephone numbers of the fire service and emergency centres are displayed at every workstation together with the names of staff trained in first aid.

## Workers in non-export manufacturing

### a. Occupational risks

The main risks identified in non-export factories are the same as those in export-oriented factories. By contrast, it was found that certain risks are higher in non-export factories or affect different categories of worker. The main differences are as follows:

#### Ergonomic

In some factories, as well as working at non-adjustable workstations, machine operators have little room to work, which restricts their movements.<sup>31</sup>

#### Falling from height

Raw materials are stacked 2 to 4 metres high by teams of two using ladders. Lack of coordination and timing by workers can lead to falls. Labourers and warehousemen are the most susceptible to this risk.

#### Exposure to noise

The working environment is very noisy as old sewing machines are used. In 74 per cent of factories visited, the average noise level was measured at 87 dB.

#### Electrical fires

Electrical systems are obsolete in some factories. Few companies (12 per cent) have differential circuit-breakers, so many workers are exposed to short circuits that can lead to fires.

#### Tripping

The floor is cluttered with electrical wiring or containers filled with fabric or finished items. There is limited space for movement (1 to 1.5 metres). Slippery floors were noted in 46 per cent of companies because of polished tiles.

#### Needle injuries

Most of the machines in use are old and not equipped with finger guards, making pricking more likely.

### b. Risk sensitivity

Only 17 per cent of companies visited stated that they had carried out exercises to identify occupational risks, and only 12 per cent had performed a risk assessment. Preventive measures were in place at 15 per cent of

31 Source: interviews with workers (2018).

companies visited (such as training for workers on risks and their prevention, first aid techniques, installation of fire safety equipment and emergency evacuation drills). No protective equipment was provided and no training programme for workers was envisaged. First aid training was given by the Red Cross in 45 per cent of companies.

Extinguishers were generally available but not checked regularly. First aid kits were available at 41 per cent of companies visited, but the majority stated that they had no staff trained in first aid. Among the companies visited, 24 per cent have appointed OSH officers whose main task is to ensure compliance with legal OSH requirements.

Overtime is not frequent. If orders exceed production capacity, the companies recruit day workers or subcontract some orders to small single-person enterprises.<sup>32</sup> Overtime does not generally exceed 10 hours per week.

Differences relating to type of worker were identified. Machine operators and *petites mains* generally receive no training. Many enterprises hire inexperienced workers as *petites mains*. Workers who were interviewed said that their rights to annual and maternity leave were respected. However, temporary and daily staff do not receive these benefits.

### c. Coping capacity

The registration of workers with the CNAPS and an occupational health service depends on the size of the non-export company. Small one-person enterprises (*entrepreneurs individuels* (EI) and *entreprises unipersonnelles à responsabilité limitée* (EURL)) do not register their employees with the CNAPS or an occupational health service (80 per cent of companies visited). In the event of an occupational accident or disease, workers are not covered. These companies stated that they were unable to pay the contributions. Several criticized the quality of the service provided by the CNAPS and the interenterprise occupational health service.<sup>33</sup> Limited liability companies (*sociétés à responsabilité limitée unipersonnelles* (SARLU) and *sociétés à responsabilité limitée* (SARL)) register their permanent employees with the CNAPS and an occupational health service.

Workers with no coverage lack the financial means to pay medical fees and deal with the adverse effects of their incapacity. The minimum

wage of workers in non-export factories is lower than the legal minimum wage.

Moreover, 57 per cent of non-export manufacturing companies visited are located in outlying districts of Antananarivo, where access in an emergency or in the event of the medical evacuation of a worker is limited, especially for fire brigade vehicles.

## Workers in subcontracting factories

### a. Occupational risks

Occupational risks in subcontracting factories vary according to their size and activities. On the whole, risks identified during visits were almost the same as those observed in non-export factories.

However, it was noted that workloads in subcontracting companies were particularly heavy. During periods of high demand, generally three to four months per year, employees may work for more than 10 hours per day, six days per week. The work is fast paced. At such times, ergonomic and psychosocial risks are greater and workers are also exposed to all the other identified risks.

It was also noted that the machines in use are old and generate a lot of noise and vibration. The noise level was measured at between 89 and 91 dB.

Where packaging and wrapping are concerned, subcontractors generally have no mechanical aids to transport loads. Using trolleys to move loads is difficult owing to the uneven ground and defective wheels. The workers help each other to shift loads manually.

The colouring agents used in dyeing contain auramine and aromatic amine, which are carcinogenic. Dimethylformamide, used as a solvent in fabric treatment, causes severe eye irritation and can harm the foetus (INRS, 2012b).

### b. Risk sensitivity

Working conditions in subcontracting enterprises vary according to their size, the stability of client relationships, the activities carried out and the length of the growing season. Work in subcontracting companies is generally seasonal. Some operate for only two or three months of the year.

<sup>32</sup> Source: interviews with management (2018).

<sup>33</sup> Source: interviews with management (2018).

The financial situation of subcontracting companies constitutes a major constraint on investment to improve working conditions. Prices are fixed at a flat rate by clients. Subcontractors do not have the capacity to negotiate a price that allows them to absorb their ongoing expenses. As a result, no measures are taken to prevent occupational accidents and diseases. Enterprises lack the competent human resources to undertake risk identification and assessment.<sup>34</sup> Only 12 per cent of enterprises visited had any knowledge of labour legislation. Nevertheless, 44 per cent expressed a willingness to improve OSH.

Financial constraints also discourage companies from engaging permanent workers and registering workers with the CNAPS and an occupational health service. The succession of fixed-term contracts complicates the registration of temporary and daily workers. Workers change every year, there is intense competition and retention is difficult.<sup>35</sup> Enterprises also expressed dissatisfaction with the quality of service provided by the CNAPS and occupational health services.

Despite this, 40 per cent of subcontractors visited had put an OSH policy in place at the start of production operations. However, it had not been communicated to workers and had fallen into disuse. Workers are unaware of its existence, and deem it a waste of time as every employee is responsible for his or her own safety and health.<sup>36</sup>

The situation is a little different in legally constituted subcontractors employing more than 50 workers. It was noted that these have in place a documented system of preventive measures, an accident log, first aid kits and documented emergency evacuation procedures. Their staff are trained in first aid by occupational health services.

### c. Gender-specific vulnerability

Only permanent workers benefit from annual and maternity leave<sup>37</sup> – temporary and daily workers receive none. In most enterprises, the wages of operators and *petites mains*, mainly women, are calculated on the basis of each worker's output and hours worked. Any absence means loss of wages. Pregnant women prefer to stop working and return after the child is born so as to avoid any dispute with their employer and minimize work disruption.<sup>38</sup>

### d. Coping capacity

It is difficult for workers in subcontracting factories to deal with occupational accidents and diseases and their after-effects. This low coping capacity arises from their lack of social protection and unstable employment. Their wages do not enable them to save.

Although their workers are not registered with the CNAPS or an occupational health service, some subcontracting enterprises have introduced alternatives to enable their workers to cope with an occupational accident or disease. These include:

- ▶ employers covering the costs of workers' care and consultations with independent physicians;
- ▶ employers paying lump sums directly.

A few enterprises (2 per cent) also attempt to register their workers with the CNAPS and other bodies, despite delays in the payment of contributions.

Evacuating sick and/or injured workers is difficult. Most subcontracting enterprises have no vehicles and are located in districts just outside the centre of Antananarivo, where access is a problem and the roads are in poor condition.

34 Source: interviews with management (2018).

35 Source: interviews with management (2018).

36 Source: interviews with workers (2018).

37 Source: interviews with management (2018).

38 Source: interviews with workers (2018).

## 3.2 Possible intervention models

On the basis of these drivers and constraints and the vulnerability profiles established along the chain, it is possible to set some objectives for improving OSH and productivity at every production stage, particularly those where integration into global supply chains presents the greatest challenge, as in cotton cultivation and processing.

In the course of a consultation with the various stakeholders in the value chain who took part in this study, a set of commonly agreed primary objectives was identified. The interventions for achieving these objectives should produce a positive impact at all levels of the chain. The main objectives are as follows:

- ▶ strengthen coordination among the various supporting institutions, employers and workers' organizations in the chain in order to promote cooperation among stakeholders;
- ▶ integrate OSH into existing initiatives on productivity and competitiveness in various

parts of the industry, such as programmes on certification and cooperation for sectoral development;

- ▶ strengthen the capacities of supporting institutions to meet the needs for OSH services, in particular by addressing the needs of workers in the most vulnerable situations in the chain;
- ▶ develop strategies to ensure that the services provided by supporting institutions, in particular the Labour Inspectorate, the CNAPS and occupational health services, are extended to seasonal and informal workers;
- ▶ develop and promote a system to ensure the safe handling of chemical products throughout the chain;
- ▶ train employers and workers in risk management at every production stage in the chain.



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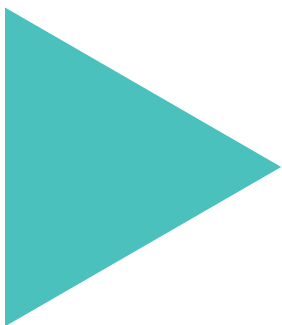
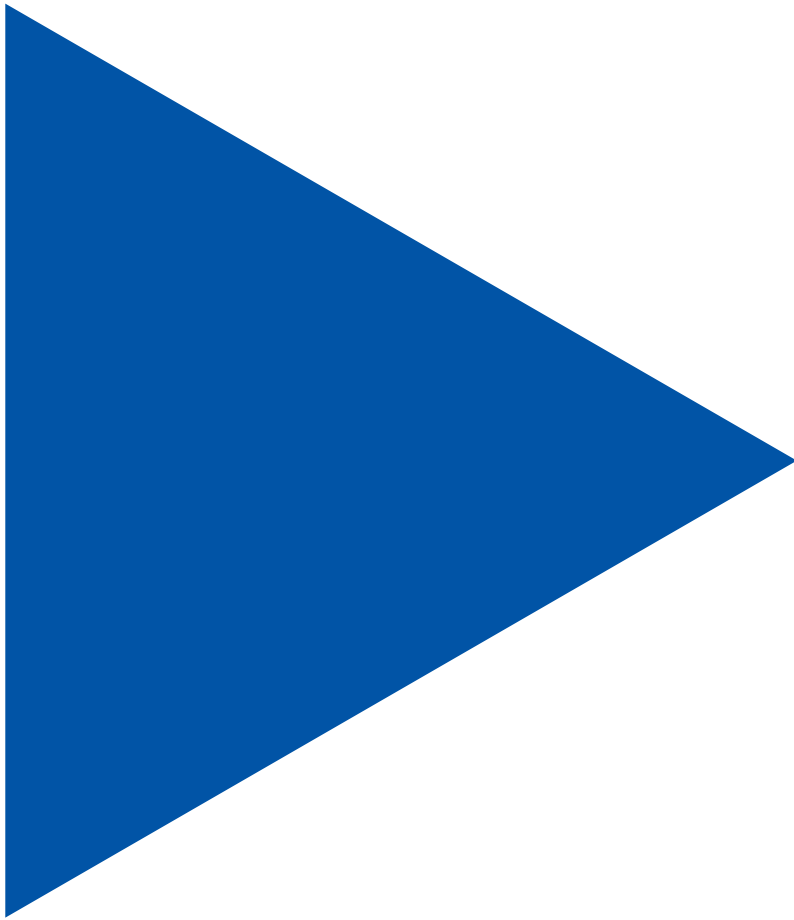
# Appendix 1

## Details of the sample of participating manufacturers

Sample	Category	Status	Nationality	Certification	Size of company
30 enterprises	Exporting manufacturer (12 enterprises)	EPZ enterprise, non-member of the Group of EPZ Companies and Partners (5)	Foreign (4)	Uncertified (5)	>750 employees (2)
					250–750 employees (2)
			Malagasy (1)		<250 employees (1)
		EPZ enterprise, member of the Group of EPZ Companies and Partners (7)	Foreign (6)	Certified (4)	>750 employees (4)
				Uncertified (2)	<250 employees (1)
			Malagasy (1)	Uncertified (1)	250–750 employees (1)
	Manufacturer for local market (10 enterprises)	EPZ enterprise, member of the Group of EPZ Companies and Partners (2)	Foreign (2)	Uncertified (2)	<250 employees (1)
					<30 employees (1)
		Non-EPZ enterprise (8)	Foreign (2)	Certified (1)	<250 employees (1)
				Uncertified (1)	>30 employees (1)
	Malagasy (6)	Uncertified (6)	>30 employees (2)		
			<30 employees (4)		
	Subcontractors (8 companies)	EPZ enterprise, member of the Group of EPZ Companies and Partners (1)	Foreign (1)	Uncertified (8)	<250 employees (1)
		Non-EPZ enterprise (7)	Malagasy (7)		>30 employees (3)







# About the Vision Zero Fund

The Vision Zero Fund (VZF) brings together governments, employers' and workers' organizations, businesses and other stakeholders working towards the goal of zero work-related fatalities, injuries and illnesses in global supply chains. This G7 initiative, supported by the G20, is administered and implemented by the ILO. The VZF is an integral part of the ILO's Safety + Health for All Flagship Programme.

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