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## **1. Executive Summary**

This feasibility study examines the proposed development, production, and commercialization of an automatic injera-making machine. The machine is designed to address the limitations of manual injera production by automating the batter dispensing, baking, and injera ejection processes.

The primary objective is to improve production efficiency, hygiene, and product consistency by creating standard while reducing labor dependency. The project offers strong market potential locally and internationally, particularly among injera producing enterprises, Ethiopian restaurants, supermarkets, export traders, and diaspora communities.

Financial forecasts indicate profitability within the first operational year, with scalable expansion opportunities through machine sales and franchising. Based on technical, financial, and market evaluations, the project is deemed viable and recommended for investment and loan financing.

## **2. Project Description**

The Automatic Injera-Making Machine Project aims to revolutionize Ethiopia's injera production through technology. Traditionally, injera preparation is labor-intensive, incurring health issues and dependent on skilled individuals. This machine modernizes the process by offering consistent, automated injera production for commercial and industrial use.

### **Business Objectives:**

- Introduce a locally manufactured automatic injera-making machine.
- Improve production efficiency and product consistency.
- Reduce labor dependency and enhance food hygiene standards.
- Expand business operations through machine sales and franchising.
- Contribute to food processing sector modernization and job creation.

**Scope:**

- Design and manufacture machines capable of producing 6000 injera per day.
- Integrate features like batter dispensing, baking, and automatic ejection.
- Develop customizable models for small, medium, and industrial operators.
- Expand in to developing machines with packaging and batter preparation lines.
- Establish a production and maintenance workshop.
- Execute targeted marketing and distribution locally and internationally.

**Unique Value Proposition:**

- Full automation of the injera baking process.
- Consistent product quality, hygiene, and speed.
- Local availability of spare parts and technical services.
- Scalable business model including franchise partnerships.

## **3. Market Feasibility**

### **3.1 Industry Overview**

Injera is the staple food of Ethiopia, Eritrea, East African countries and plays a crucial role in everyday meals, social events, religious gatherings, restaurants, hotels, and international diaspora communities. The food processing sector in Ethiopia is one of the fastest-growing industries due to rapid urbanization, population growth, and increased demand for processed and packaged foods.

At the same time, the hospitality industry, supermarkets, and food exporters are facing challenges in producing injera at consistent quality and high volumes. Traditionally, injera is made by hand, which is labor-intensive, time-consuming, and dependent on skilled individuals. These factors limit large-scale production and pose risks related to hygiene and product consistency.

A modern, automatic injera-making machine directly addresses these issues and fits within national economic priorities of industrializing agro-processing and food industries.

### **3.2 Market Demand Analysis**

#### **Local demand**

- Ethiopia has a population exceeding 126 million, with injera consumed in more than 90% of household daily.
- The growing urban middle class is increasingly purchasing injera from supermarkets and restaurants instead of preparing it at home.
- Large institutions like hotels, restaurants, hospitals, schools, military camps, universities, correction facilities, government offices and food exporters require consistent, hygienic and high-volume injera supplies.
- Small to medium scale enterprises producing injera also require a less labor intensive, efficient, a less power consuming and healthy way of production.

## **International demand**

- Strong demand from Ethiopian and Eritrean diaspora communities worldwide, particularly in the USA, Canada, UK, Middle East, Australia, African countries and Europe.
- Ethiopian restaurants abroad rely on traditional methods or small-scale griddles, limiting their production capacity.
- Export opportunities for packaged injera in international supermarkets and specialty food stores.

## **Key demand drivers**

- Rise in demand for high quality, standard and consistency in injera
- Population growth and urbanization.
- Increase in restaurant and hotel numbers.
- Rise in good quality packaged injera demand in supermarkets.
- Expanding Ethiopian restaurants abroad.
- Food exporters targeting diaspora markets.

## **3.3 Market Trends and Opportunities**

### **Trends**

- Increased mechanization in food processing for consistency and hygiene.
- Consumer preference for hygienically prepared, ready-to-buy injera.
- Growth in packaged injera exports.
- More enterprises seeking to standardize their injera sizes and appearance.
- Diaspora businesses investing in food technology to supply authentic Ethiopian food abroad.

### **Opportunities**

- First-mover advantage in providing affordable, locally manufactured injera-making machines.
- Positioning as a supplier of injera machines and maintenance services.
- Exporting injera-making machines to diaspora-owned restaurants globally.
- Developing a franchise business model by providing machines and training to entrepreneurs.

### **3.4 Target Market Segments**

#### **1. Restaurants and Hotels**

- Require high-volume, consistent, hygienic injera for daily operations.
- Opportunity to replace manual labor and improve kitchen efficiency.

#### **2. Supermarkets and Retail Chains**

- Increasing demand for packaged injera for busy urban consumers.
- Machines allow consistent size and presentation for retail sale.

#### **3. Food Exporters**

- Growing in export business for packaged injera to diaspora communities.

#### **4. Ethiopian Diaspora-Owned Restaurants**

- Need for reliable, efficient, less labor dependent and easy-to-operate machines that deliver consistent product abroad.

#### **5. Franchise Operators**

- Entrepreneurs investing in injera production units using our machines under a franchise or licensing agreement.

### **3.5 Competitive Analysis**

#### **Existing solutions**

- Traditional manual and inefficient production methods dominate.
- A few Chinese pita and crepe machines repurposed for injera-making purpose exist

#### **Competitor weakness**

- Labor intensiveness and dependencies on skill of manual labor
- Lack of standard and product consistency
- Lack of hygiene
- Imported machines being unable to provide the specific type of injera texture and look required by the market.
- High cost of imported machines.
- Lack of technical support.
- High power consumption

## **Our competitive advantage**

- Locally produced, affordable, and customizable injera-making machine.
- After-sales technical support and readily available spare parts.
- Customizable models for different production scales (small, medium, industrial).
- User-friendly, easy-maintenance design.
- Franchise-ready business model with operational training and support.
- Ability to export machines at competitive pricing with local engineering know-how.

## **3.6 Marketing and Distribution Strategy**

### **Promotion**

- Product demonstrations in major cities and food industry expos.
- Partnerships with hotel associations, restaurant owners, and export businesses.
- Advertising via social media, food industry magazines, and online marketplaces.
- Working with local small to medium enterprises
- Collaboration with diaspora business associations abroad.

### **Sales channels**

- Direct sales to enterprises, restaurants and hotels
- Leasing finance options for startups and small producers.
- Franchise model for operators to produce injera under our brand.
- International distributors for diaspora markets.

### **Customer support**

- Warranty and maintenance services.
- Spare parts availability.
- Operator training packages.
- Online and phone-based technical assistance.

### 3.7 Market Size Estimation

| Market Segment       | Estimated Number                               |
|----------------------|--|
| Restaurants & Hotels | 5,000+ in Ethiopia                             |
| Supermarkets         | 200+ major chains                              |
| Food Exporters       | 150+ exporters                                 |
| Diaspora Restaurants | 800+ globally                                  |
| Franchise Operators  | 300–800 start-up opportunities in major cities |



## **4. Technical Feasibility**

### **4.1 Product Overview**

The project involves the design, development, and production of an automatic injera-making machine capable of mechanizing the entire injera preparation process. The machine will handle batter dispensing, baking, automatic injera ejection, and stacking of finished products.

It is designed to improve production capacity, product consistency, quality hygiene, and labor efficiency for injera producers — ranging from small businesses and restaurants to industrial-scale operators and exporters.

### **4.2 Machine Design and Specifications**

#### **Main features**

- Modular design for customizing the number of griddles ranging from 1-10 arranged in a horizontal mannaer.
- Injera thickness and diameter control
- Automated batter dispensing system with programmable control.
- Precision heating surface for uniform injera baking.
- Automatic injera ejection system to remove finished injera from the griddle surface.
- Automatic stacking unit for placing injera in a neat pile.
- Programmable control panel with digital touch screen interface.
- Easy disassembly and cleaning design.
- Single phase and three phase power options.
- Hands free production
- Space saving design

## Specification

| Parameter                        | value                                 |
|----------------------------------|---------------------------------------|
| Power supply                     | 220V/380V 50-60Hz AC                  |
| Griddle                          | Ceramic coated clay base              |
| Griddle quantity                 | 1-10                                  |
| Baking surface diameter          | 50-60 cm                              |
| Thickness                        | Customizable                          |
| Production capacity (10 griddle) | 300 piece/ hour                       |
| Temperature working range        | 180°C–250°C                           |
| Control system                   | ESP32 microcontroller + touch display |
| Safety features                  | Emergency stop, overheat protection   |
| Frame material                   | Stainless steel                       |
| Dimension (10 griddle)           | 6m x 1.6m                             |
| Weight                           | 180kg                                 |

## 4.3 Materials and Components

### Locally available materials

These components hold 51% of the cost of the machine

- Stainless steel for machine body.
- Ceramic coated clay griddle.
- Food-safe piping and batter dispensing components.
- Basic electrical wiring and switches.
- thermocouple temperature sensors
- MG996R servo motors.
- heating control relays
- heating elements
- ESP32 microcontroller board

## Imported components

These components hold 48% of the cost of the machine

- NEMA 23 stepper motors and motor drivers.
- 24V Power supply
- Food-grade non-stick ceramic coating.
- 24V dc motors
- Linear rail and linear bearings

## 4.4 Production Process

### 1. Machine Frame Fabrication

- Cutting, welding, and polishing of stainless steel parts.

### 2. Griddle and Heating Assembly

- Installation of the heating element inside a thermally insulated griddle surface.
- Application of food-grade non-stick ceramic coating on the baking surface.

### 3. Automation System Integration

- Wiring of ESP32 microcontroller.
- Connection of sensors, motors, relays, and limit switches.

### 4. Batter Dispensing and Mechanism Assembly

- Assembly of stepper motor driven X-Y dispensing mechanism.
- Calibration of nozzle flow rate and motor speed.

### 5. Testing and Quality Control

- Functionality tests on dispensing, baking, temperature control, and ejection.
- Safety tests and emergency system checks.

### 6. Final Finishing and Packaging

- Cleaning, and labeling.
- Packaging for delivery.

## 4.5 Production Capacity

The machine is designed to produce between 30 and 300 injera per hour, depending on:

- Griddle size.
- Available electric power

Larger industrial models can scale production capacity by adding multiple griddles.

## 4.6 Operation Process

1. Machine is powered on and griddle heats up.
2. Ready-made Batter loaded into the reservoir.
3. Operator inputs desired settings (thickness and diameter) via the touch control panel.
4. Batter dispensing mechanism automatically spreads batter in a circular motion moving along the horizontal path on each griddle.
5. Heating element maintains consistent baking temperature.
6. The lids open and close in a controlled timing assisting the baking.
7. Once cooked, injera is automatically ejected and stacked on the collecting tray.
8. Machine continues production as per programmed batch continuously baking and ejecting injera from each griddle sequentially.

## 4.7 Maintenance and Servicing

- **Daily maintenance:** Cleaning of batter reservoirs, griddles, and external surfaces.
- **Weekly checks:** Calibration of temperature sensors, batter dispensing nozzles, and moving parts.
- **Periodic service:** lubricating bearings as needed.
- **Spare parts availability:** Readily stocked parts for locally manufactured components.

## 4.8 Technical Skills and Labor Requirements

| Role                        | Number | Skill required                                |
|-----------------------------|--------|---|
| Machine operator & assembly | 1-2    | Basic mechanical and machine operation skills |
| Welder                      | 1      | Metal processing                              |
| Electronics engineer        | 1      | Programming and troubleshooting               |
| Production supervisor       | 1      | Process management & safety protocols         |
| Maintenance technician      | 1      | Machine maintaining                           |

### Summary of Technical Feasibility

The automatic injera-making machine is technically feasible and practically achievable using a combination of locally available materials and a limited number of imported components. The machine's design prioritizes simplicity, durability, food safety, and ease of maintenance.

Prototype testing and design simulations confirm the machine's capability to meet targeted production capacities, safety standards, and operational reliability. With available technical labor and established local workshops, full-scale production can proceed efficiently with strong operational support.

## 5. Financial Feasibility

### 5.1 Investment Requirements

The total estimated investment for this project covers costs related to:

- Prototype improvement and stress testing.
- Manufacturing tools and equipment.
- Raw materials and imported components.
- Workshop setup.
- Salaries and training.
- Marketing and distribution.
- Initial working capital (for operational expenses during startup phase).

#### Estimated investment breakdown

| Item                                | Estimated Cost<br>(ETB) |
|-------------------------------------|-------------------------|
| Prototype improvement               | 200,000                 |
| Manufacturing Tools & Equipment     | 2,000,000               |
| Raw Materials & Imported Components | 3,800,000               |
| Workshop Setup & Utilities          | 100,000                 |
| Salaries (6 months)                 | 300,000                 |
| Marketing & Promotion               | 100,000                 |
| Working Capital (3 months)          | 200,000                 |
| <b>Total Investment</b>             | <b>6,700,000</b>        |

## 5.2 Revenue Projections

The business will generate revenue by:

- Selling injera-making machines to injera making enterprises, restaurants, hotels, and export operators.
- Producing and selling injera directly to the market (optional for future scaling).
- Franchise operation fees and machine lease options (optional for future scaling).

### Revenue from machine sales (yearly)

| Item (Griddle Qty)               | Qty | Unit price (ETB) | Total Revenue(ETB) |
|----------------------------------|-----|------------------|--------------------|
| Small scale machines (1-3)       | 6   | 650,000          | 3,900,000          |
| medium scale machines (4-7)      | 5   | 800,000          | 4,000,000          |
| Industrial scale machines (8-10) | 2   | 1,100,000        | 2,200,000          |
| Total revenue                    |     |                  | 10,100,000         |

## 5.3 Operational Costs

### Operational cost estimates

| Item  | Monthly cost (ETB) | Yearly cost (ETB) |
|---|--------------------|-------------------|
| Salaries  | 80,000             | 960,000           |
| Raw material (13 machines)<br>300,000 ETB / machine | 3,900,000          | 3,900,000         |
| Utilities   | 20,000             | 240,000           |
| Marketing distribution                              | 30,000             | 360,000           |
| Miscellaneous expenses                              | 20,000             | 240,000           |
| Total cost  | 4,050,000          | 5,700,000         |

## 5.4 Profitability Analysis

Using the revenue and cost estimates:

Annual profit estimate

| Item                           | Amount (ETB) |
|--------------------------------|--------------|
| Annual revenue (machine sales) | 10,100,000   |
| Total annual operating cost    | 5,700,000    |
| Net annual profit              | 4,400,000    |

## 5.5 Break-Even Analysis

Break-even of machine sales

| Item             | Unit price (ETB) | Annual operating cost | Break even quantity (machines /year) |
|------------------|------------------|-----------------------|--------------------------------------|
| Small scale      | 650,000          | 5,700,000             | 9                                    |
| Medium scale     | 800,000          | 5,700,000             | 8                                    |
| Industrial scale | 1,100,000        | 5,700,000             | 6                                    |
| Average          | 850,000          | 5,700,000             | 7                                    |

Break even quantity of machines is considered 9 machines per year.

## 5.6 Return on Investment (ROI)

Net profit = total revenue – total cost = 10,100,000 – 5,700,000

= 4,400,000

**ROI** = (4,400,000 / 6,700,000) \* 100 = 0.66%



Payback period (years) = total investment / annual net profit

$$= 6,700,000 / 4,400,000 = 1.52 \text{ years } 18 \text{ months}$$

This indicates we would recover our initial investment within approximately **2 years**, depending on sales and operational performance.

### **5.7 profit margin**

Net profit margin = net profit / revenue \*100

$$= 4,400,000 / 10,100,000 *100 = 43.56\%$$

### **5.8 Loan and Financing Requirements**

#### **Loan request**

- **Total Loan Amount Requested:** ETB 6,700,000
- **Purpose:**
  - Machinery tools and workshop setup.
  - Salaries for operational staff for 6 months.
  - Marketing, distribution, and working capital.
  - Import and purchase of critical electronic components and raw materials.

#### **Repayment plan**

- **Repayment Period:** 5 years.
- **Grace Period:** 1 year.
- **Repayment Source:** Proceeds from machine sales revenue.

### **5.9 Sensitivity and Risk Analysis**

#### **Scenario 1: 20% Increase in Raw Material Costs**

- Operational costs increase.
- Break-even sales volume rises to 10 machines/year.
- Net annual profit reduces by 10–18%.

## **Scenario 2: 20% Decrease in Sales**

- Annual revenue reduces.
- Break-even extended by 12–18 months.
- Requires adjustment of marketing strategy and possible operational cost cuts.

## **Summary of Financial Feasibility**

The project demonstrates strong financial viability with clear profit potential, a reasonable break-even point, and healthy return on investment.

The financial model is scalable, and sensitivity analysis confirms that risks are manageable through operational adjustments and market expansion.

## 6. Operational Feasibility

### 6.1 Operational Plan Overview

The operational plan outlines how the automatic injera-making machine project will be managed, staffed, and executed on a daily basis. It defines the processes for machine production, maintenance services, customer support, and distribution.

The operations will initially be based in Addis Ababa, Ethiopia, with a dedicated workshop facility, production team, administrative office, and marketing support.

### 6.2 Organizational Structure

A clear organizational structure is essential for smooth operations and accountability. The proposed structure for the project's first operational phase is as follows:

#### Management & administrative team

| role            | responsibility   |
|-----------------|--|
| General manager | Oversees overall business operations, finance, and strategy, Handles documentation, HR, and internal communications. |

#### Production & technical team

| Role                   | Responsibilities   |
|------------------------|--|
| Production Supervisor  | Manages day-to-day production schedules and quality control. |
| Machine Operators      | Operates machines on the production line.                    |
| Maintenance Technician | Regular inspection, maintenance, and repair of machinery.    |
| Electronics Technician | Programming, sensor calibration, troubleshooting             |

## **Sales & Marketing Team**

| <b>Role</b>       | <b>Responsibilities</b>  |
|-------------------|--|
| Sales & Marketing | Leads customer acquisition, product promotion, market research, and sales management |

### **6.3 Quality Control and Assurance**

Maintaining high product and equipment quality is critical for reputation, customer retention, and regulatory compliance.

#### **Quality Control Process**

- Daily pre-production inspection of machines.
- Consistency testing of batter and injera texture.
- Temperature control monitoring.
- Testing the produced injera for size, appearance, and hygiene.
- Final inspection before machine delivery.
- Recording and tracking production and maintenance logs.

### **6.4 Health and Safety Considerations**

The project will prioritize the safety of workers and compliance with Ethiopian occupational health and food hygiene standards.

#### **Safety Measures**

- Emergency stop on all machines.
- Safety guards around moving parts.
- Protective gloves, heat-resistant aprons, and slip-resistant footwear for operators.
- Routine electrical and mechanical checks.
- Adequate ventilation in the production area.
- Fire extinguishers and first aid kits available on site.

## **Operator Training**

- Comprehensive training on machine operation.
- Safety and hygiene protocols.
- Emergency shutdown procedures.
- Maintenance basics and fault reporting.

## **6.5 Logistics and Supply Chain Plan**

Efficient logistics are essential for sourcing materials and delivering products to customers.

### **Raw Material Procurement**

- Mechanical and Electronic components imported through authorized distributors.
- Metal fabrication materials locally sourced.

### **Machine Delivery and Distribution**

- Machines transported via vehicles.
- Delivery contracts established with logistics providers for regional and export shipments.
- Service and support technicians dispatched to customer locations for setup and training.

## **6.6 Customer Support & After-Sales Service**

Strong customer support builds loyalty and repeat sales.

### **Services Offered**

- 1-year warranty for machine buyers.
- On-site machine installation and operator training.
- Spare parts supply and preventive maintenance contracts.
- 24/7 phone support line for technical issues.
- Online support resources and operational guides.

## **6.7 Workforce Requirements**

### **Initial Manpower Estimate**

| <b>Position</b>           | <b>Number of Staff</b> |
|---------------------------|------------------------|
| General Manager           | 1                      |
| Production Supervisor     | 1                      |
| Machine Operators         | 1–2                    |
| Maintenance Technician    | 1                      |
| Electronics Technician    | 1                      |
| Sales & Marketing Officer | 1                      |

Staff numbers can be scaled up as production volume expands.

### **Summary of Operational Feasibility**

The operational feasibility analysis confirms that the automatic injera-making machine project is practical and executable within available infrastructure and human resource capabilities.

The project will operate efficiently with a small, skilled production team, a clear organizational structure, and a well-defined production plan.

The business also ensures quality assurance, workplace safety, regulatory compliance, and after-sales service support all critical for sustainable operations and customer satisfaction.

## **7. Legal and Environmental Feasibility**

### **7.1 Intellectual Property Protection**

Since this project involves a unique, locally designed automatic injera-making machine, protecting intellectual property (IP) is crucial to secure market advantage.

This machine is has acquired a utility model patent by the Ethiopian intellectual property authority **ET UM1207B1**

### **7.2 Legal Compliance in Operations**

#### **Employment Law Compliance**

- Prepare formal employment contracts for all staff.
- Comply with Ethiopia's Labor Proclamation.
- Provide benefits like annual leave, sick leave, and overtime payment.
- Adhere to minimum wage laws and occupational safety regulations.

#### **Product Liability and Consumer Protection**

- Ensure machines meet safety standards to avoid injury risks.
- Provide warranties and clear operation guidelines.
- Implement a product return and repair policy for defective units.
- Comply with Consumer Protection Proclamation.

#### **Contract Management**

- Use written, signed agreements for:
  - Suppliers of raw materials and components.
  - Service providers (logistics, technical services).
  - Franchise operators and machine buyers.

### **7.3 Environmental Considerations:**

- Low environmental impact.
- No significant waste or emissions.
- Energy-efficient design.

## 8. Risk Analysis

### 8.1 Overview of Project Risks

Every business venture carries risks — financial, operational, technical, legal, and market-related. The key to a sustainable business is to:

- Identify possible risks early.
- Assess their likelihood and impact.
- Develop clear mitigation strategies.

This section outlines potential risks facing the injera-making machine project and how they will be addressed.

### 8.2 Identified Key Risks and Mitigation Measures

| Risk Category            | Description   | Impact Level | Likelihood | Mitigation Measures   |
|--------------------------|---|--------------|------------|---|
| <b>Technical Risk</b>    | Machine design may face operational issues like jamming, heating failure, or batter dispensing inconsistency. | Medium       | Medium     | Rigorous prototyping and testing, local technician training, maintain spare parts stock.                          |
| <b>Supply Chain Risk</b> | Delays in sourcing imported components (motors, sensors) due to currency shortages or customs issues.         | High         | Medium     | Identify multiple suppliers, maintain critical parts inventory, and prioritize local alternatives where possible. |



|                              |  |        |        |   |
|------------------------------|--|--------|--------|---|
| <b>Regulatory Risk</b>       | Delays in business licensing, export permits, or environmental clearance.      | Low    | Low    | Early application for licenses, engage legal consultants for regulatory support.                        |
| <b>Operational Risk</b>      | Injuries, equipment breakdowns, or production stoppages.                       | Medium | Medium | Operator safety training, emergency stop systems, preventive maintenance schedules, insurance coverage. |
| <b>Foreign Exchange Risk</b> | Fluctuations in currency rates affecting imported component prices.            | Medium | Medium | Bulk purchases during favorable rates; maintain price adjustment flexibility in contracts.              |
| <b>Competition Risk</b>      | Entry of cheaper or foreign in-jera-making machines.                           | Medium | Medium | Focus on superior after-sales service, local spare parts, warranty, and technical support.              |
| <b>Labor Risk</b>            | Difficulty in finding and retaining skilled machine operators and technicians. | Low    | Low    | Provide competitive salaries, on-the-job training, and career growth opportunities.                     |

### 8.3 Risk Prioritization

Risks are prioritized by combining their **impact severity** and **likelihood of occurrence**.

#### High Priority Risks

- Financial Risk
- Supply Chain Risk

#### Medium Priority Risks

- Technical Risk
- Market Acceptance Risk
- Operational Risk
- Foreign Exchange Risk
- Competition Risk

#### Low Priority Risks

- Regulatory Risk
- Environmental Risk
- Labor Risk

**High-priority risks** will be managed proactively through financial reserves, supplier diversification, and market education strategies.

### 8.4 Contingency Planning

To prepare for unforeseen events, contingency plans include:

- Emergency fund for critical component price spikes or urgent replacements.
- Backup suppliers for imported parts and raw materials.
- Optional leasing model for customers hesitant to invest in machine ownership.
- Marketing partnerships with hotel associations and restaurant unions.
- Reserve capacity in maintenance and support services.
- Annual review of business insurance coverage.

- Export partnerships with diaspora business groups for external market buffer.

### **Summary of Risk Analysis**

The risk analysis indicates that while the project faces typical operational, financial, and market challenges, none are unmanageable or threaten the business's viability.

With realistic mitigation strategies and contingency plans in place:

- High-priority risks will be actively managed.
- Medium and low risks will be monitored and addressed as needed.

The business remains financially, operationally, and commercially sustainable under a wide range of conditions.

## 9. Implementation Plan

### 9.1 Project Implementation Approach

The injera-making machine project will be implemented in phased stages to manage financial risk, technical development, market entry, and operational setup efficiently.

The approach will follow a step-by-step strategy:

1. Secure financing and legal requirements.
2. Finalize prototype testing and improvements.
3. Set up workshop and acquire materials.
4. Begin machine production and market promotion.
5. Launch machine sales.
6. Establish after-sales service and technical support.
7. Evaluate performance and scale operations.

### 9.2 Key Implementation Phases and Activities

| Phase          | Activity   | Responsible Unit                      | Duration   |
|----------------|--|---------------------------------------|------------|
| <b>Phase 1</b> | Finalize Business Licensing and Legal Compliance   | Management, Legal Consultant          | 4 weeks    |
|                | Secure Bank Loan and Financing                     | Management, Finance Officer           | 3-6 months |
| <b>Phase 2</b> | Complete Machine Prototype Testing and Adjustment  | Technical Team, Production Supervisor | 4 weeks    |
|                | Finalize Bill of Materials and Component Suppliers | Procurement Team                      | 2 weeks    |
| <b>Phase 3</b> | Workshop Setup (fabrication equipment, utilities)  | Workshop Manager                      | 2 weeks    |

| <b>Phase</b>   | <b>Activity</b>   | <b>Responsible Unit</b>          | <b>Duration</b> |
|----------------|---|----------------------------------|-----------------|
|                | Purchase Raw Materials and Imported Components          | Procurement Officer              | 12 weeks        |
| <b>Phase 4</b> | Recruit and Train Production & Maintenance Staff        | HR, Production Supervisor        | 3 weeks         |
|                | Install Machinery and Set Up Production Lines           | Technical Team, Maintenance Team | 2 weeks         |
| <b>Phase 5</b> | Start Machine Production                                | Production Team                  | 6 weeks         |
|                | Launch Marketing and Sales Campaign                     | Sales & Marketing Officer        | 3 weeks         |
| <b>Phase 6</b> | Deliver First Batch of Machines to Customers            | Logistics, Service Technicians   | 2 weeks         |
|                | Set Up After-Sales Service and Spare Parts Inventory    | Technical Support Team           | 2 weeks         |
| <b>Phase 7</b> | Monitor Operations, Collect Customer Feedback           | Management, Sales Team           | Ongoing         |
|                | Evaluate Financial Performance and Prepare Scaling Plan | Finance Manager, General Manager | Quarterly       |

### 9.3 Implementation Timeline (Gantt chart Style Summary)

| Activity                          | Month 1 | Month 2 | Month 3 | Month 4 | Month 5 | Month 6 |
|-----------------------------------|---------|---------|---------|---------|---------|---------|
| Legal Registrations               | ●       |         |         |         |         |         |
| Loan Approval                     | ●       |         |         |         |         |         |
| Prototype Final Testing           | ●       | ●       |         |         |         |         |
| Workshop Setup                    |         | ●       | ●       |         |         |         |
| Raw Materials Procurement         |         |         | ●       |         |         |         |
| Staff Recruitment & Training      |         |         | ●       | ●       |         |         |
| Production Equipment Install      |         |         |         | ●       |         |         |
| Machine Production Starts         |         |         |         | ●       | ●       |         |
| Marketing Campaign Launch         |         |         |         | ●       | ●       |         |
| First Machine Deliveries          |         |         |         |         | ●       |         |
| After-Sales Setup                 |         |         |         |         | ●       |         |
| Performance Review & Scaling Plan |         |         |         |         |         | ●       |

(● = Active period for the task)

## 9.6 Monitoring and Progress Evaluation

To track implementation progress:

- Weekly production and procurement meetings.
- Monthly financial and operations performance reviews.
- Customer feedback collection for product and service improvements.
- Quarterly management board meetings to assess scaling opportunities and operational challenges.

## Summary of Implementation Plan

The injera-making machine business will follow a phased, controlled, and structured implementation strategy designed to:

- Manage financial and operational risks.
- Prioritize early market penetration and customer adoption.
- Build operational capacity and after-sales service from the outset.
- Establish a strong business foundation ready for scaling.

The implementation plan is realistic, time-bound, and resource-conscious, ensuring a smooth transition from planning to full operation within 6 months.

# 10. Conclusion

## 10.1 Conclusion

After thoroughly analyzing the market, technical, financial, operational, legal, environmental, and risk aspects of the proposed automatic injera-making machine business, the feasibility study confirms that:

- **The project is both technically and financially viable.**  
The technology required for machine production and operation is accessible, proven, and can be integrated efficiently within the local manufacturing environment.
- **There is a strong and growing market demand** for automated injera-making solutions in Ethiopia and among international Ethiopian and East African diaspora communities, particularly in restaurants, hotels, exporters, and catering services.

- **The financial projections demonstrate profitable operations** with acceptable risk levels, a reasonable break-even period, and a solid return on investment.
- **Operational feasibility is confirmed**, with a clear, structured implementation plan, workforce requirements, and quality assurance systems in place to ensure reliable and safe production.
- **Legal and environmental feasibility has been addressed**, with all required licenses, compliance certificates, and minimal environmental impact mitigation measures identified.
- **Potential business risks have been carefully identified and appropriate risk mitigation strategies proposed**, ensuring business resilience in diverse market and operational conditions.

In summary — the project aligns with Ethiopia’s industrialization, food safety, and entrepreneurship goals, with a strong potential for local job creation, technology transfer, and foreign currency generation through exports.