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Ethiopian Institute of Agricultural Research (EIAR)



Ethiopian Institute of Agricultural Research

Food Science and Nutrition Research Directorate

MERSC Workshop

Mulate Zerihun

EIAR- HQ

March 30-31, 2021

Adama, Ethiopia



Presentation Outline

1. FSND Strategy development process

2. Background

3. Vision, Mission and Goal

4. Objectives

5. Research Programs and thematic areas

6. Capacities



FSND Strategy development process

Analyze the restructuring

- Current Global/ Environment
- Driving Forces
- Value Chain
- Future focuses

Existing strategic plan ?



Develop strategy scenarios

New strategic Focus

Vision

Key strategies

Supporting strategies

Participants

MOA
AAU
EPHI
EIAR
IFPRI
Private sector

Strategy options

- Scenarios/Alternative
- Profit improvement
- Growth
- Alliance
- Impact
- Sustainability
- Food Security
- Nutrition Security
- GDP

Editing/evaluation process

Draft strategy

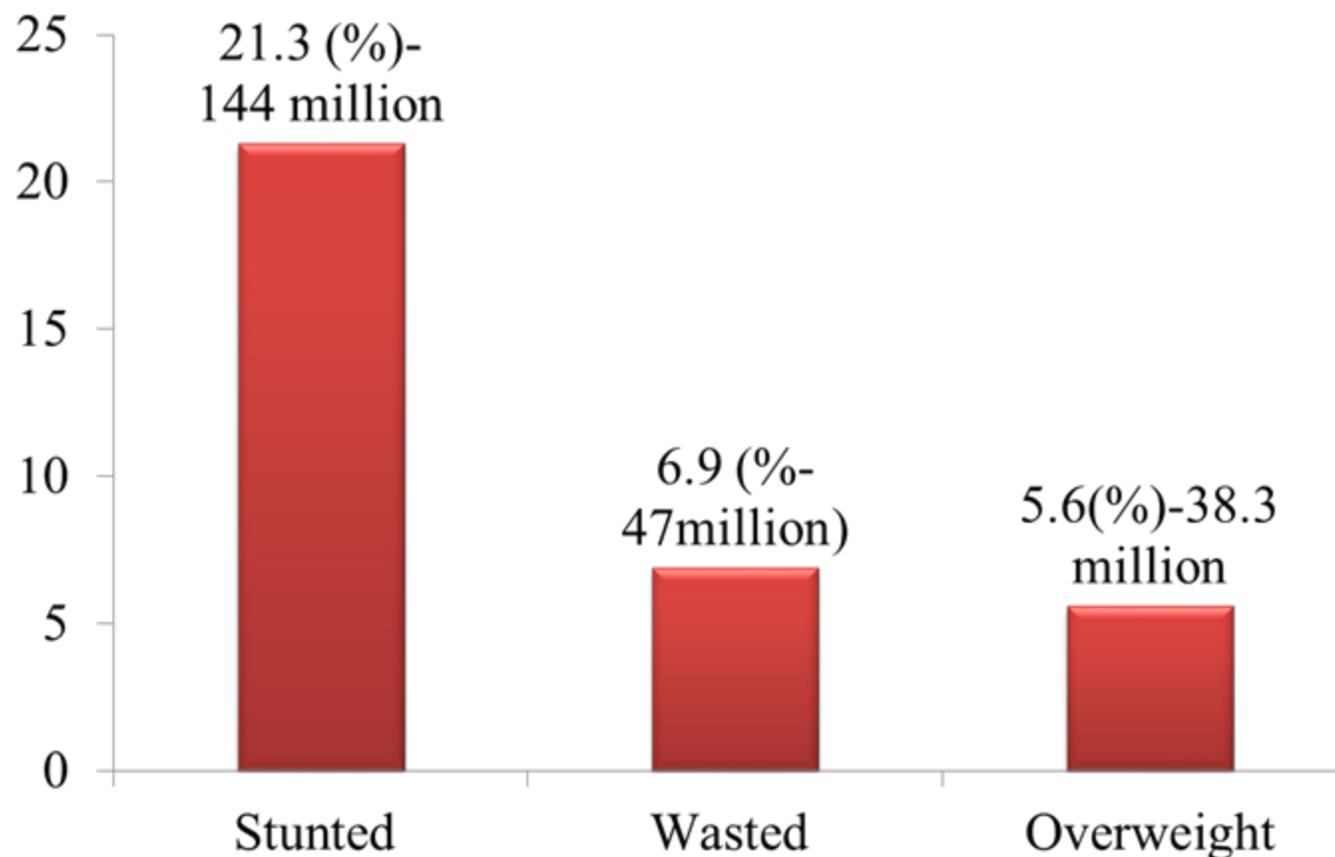
Strategic action plans

Strategic objectives



Background

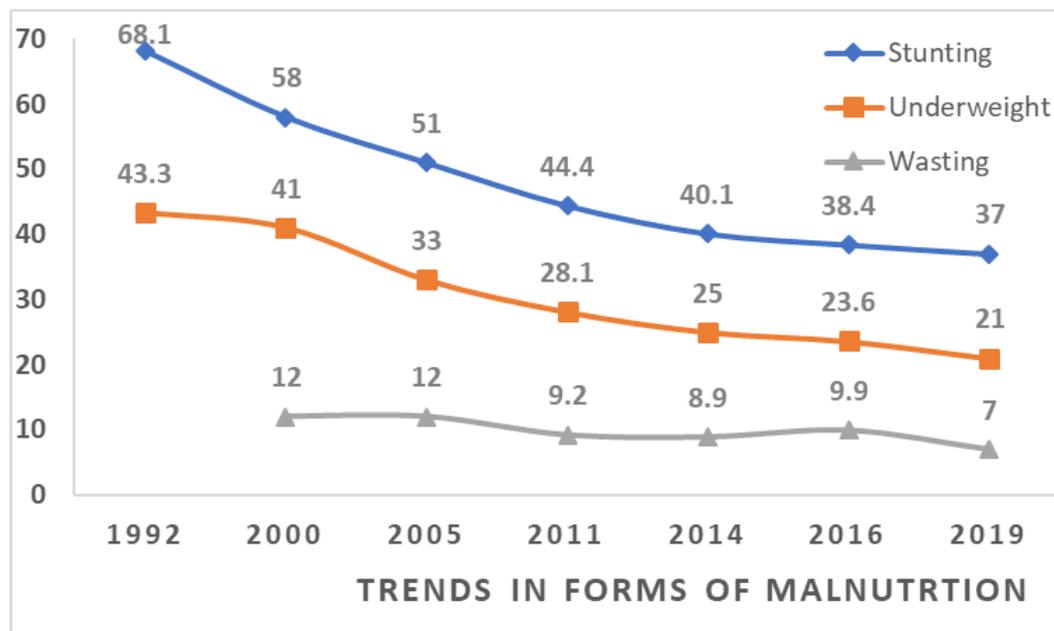
- ❑ Food insecurity is among the most formidable challenges that the third world countries are facing.
- ❑ An estimated 26% of the world's population experienced hunger or did not have regular access to nutrient-rich and sufficient food in 2019 (FAO, IFAD, UNICEF, WFP and WHO, 2020)



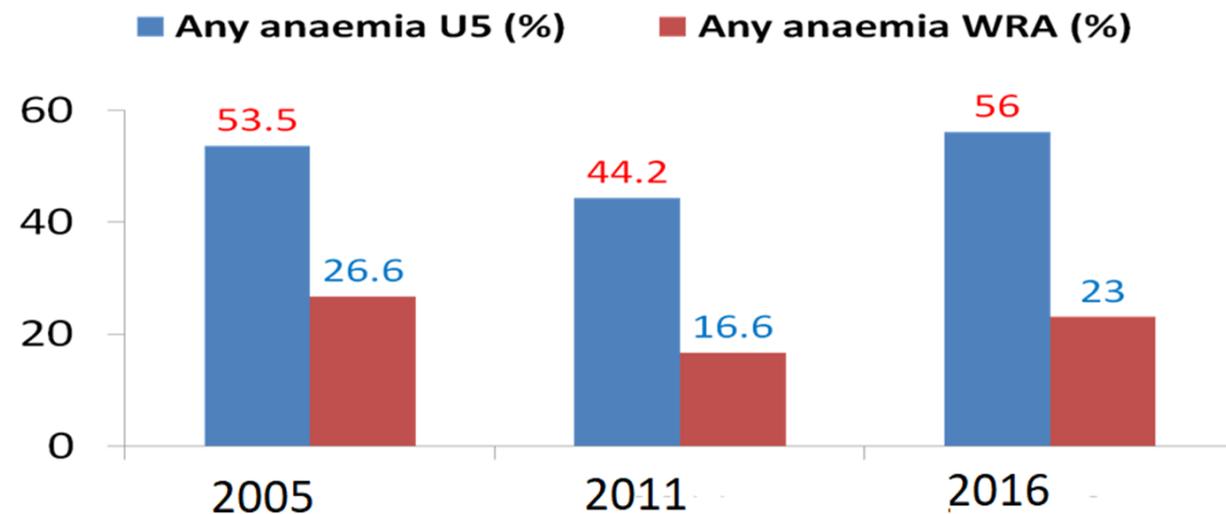


Background...

- ❑ Ethiopia has been facing significant problem of nutrition insecurity
 - ❑ Under nutrition
 - Stunting, wasting and micronutrient deficiencies (anemia)
 - ❑ Over nutrition
 - Overweight, obesity & related non communicable diseases (diabetes, high blood pressure)



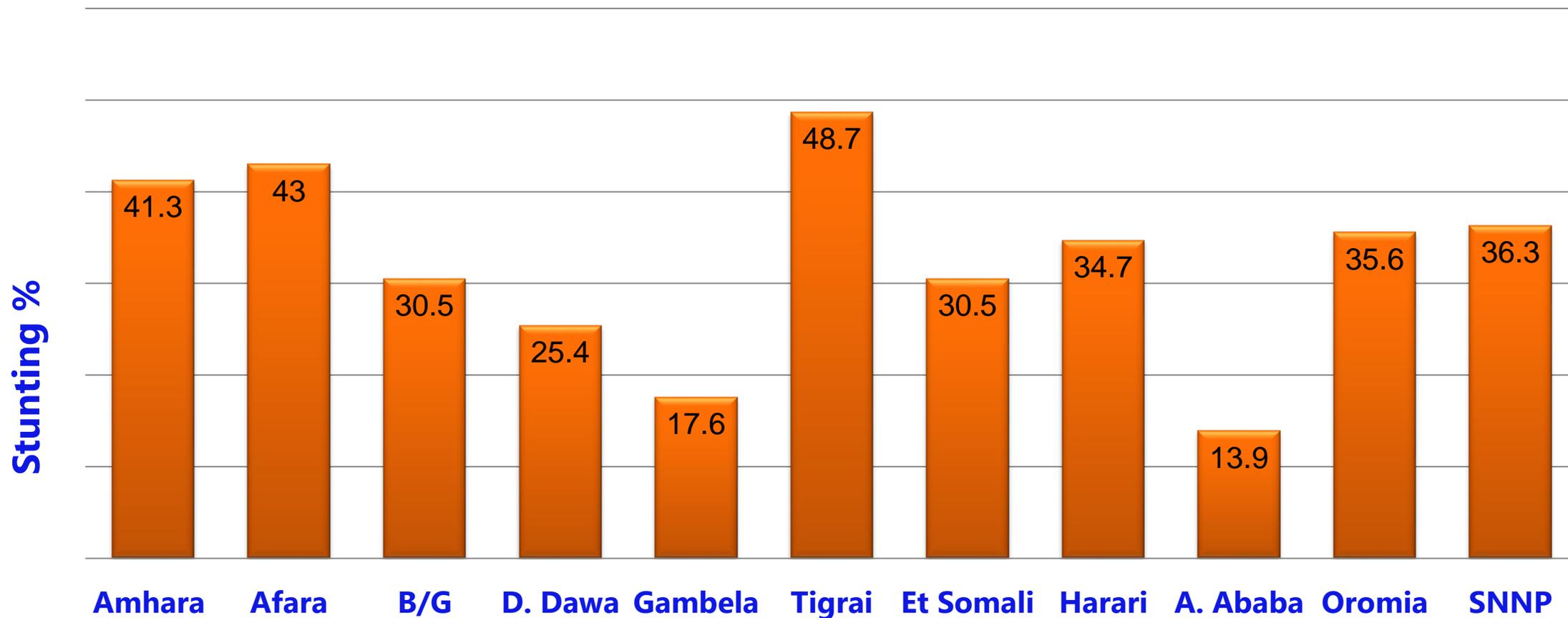
Source EDHS, 2019





Background...

Regional distribution of Stunting in Ethiopia



EDHS, 2019



Background...

- **Despite remarkable progress in the last decade, the burden of malnutrition in Ethiopia is still high.**
- **In Ethiopia, the estimated national annual cost of undernutrition US\$55.5million which is 16.5 percent of Ethiopia's GDP(Global Panel, 2016).**
- **Reducing child undernutrition rates to half the current levels by 2025 could reduce losses by ETB 70.9 billion.**
- **Therefore, the growing concern for nutritional and food security and great emphasis on consumer needs as well as stiff competition in food marketing has opened a host of challenges and opportunities**



Background...

Cause of malnutrition





Background...

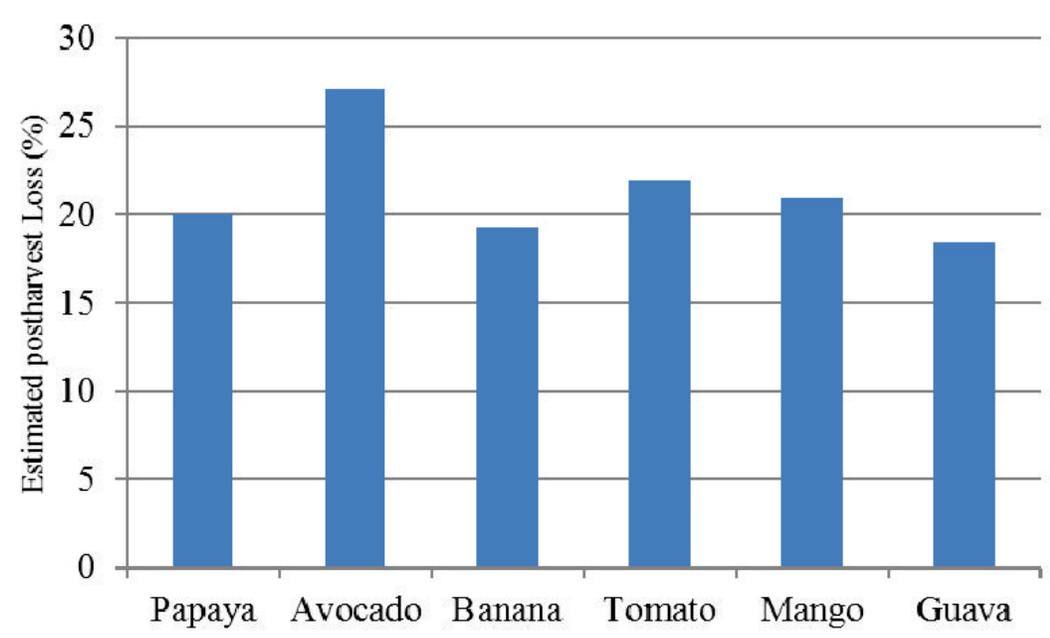
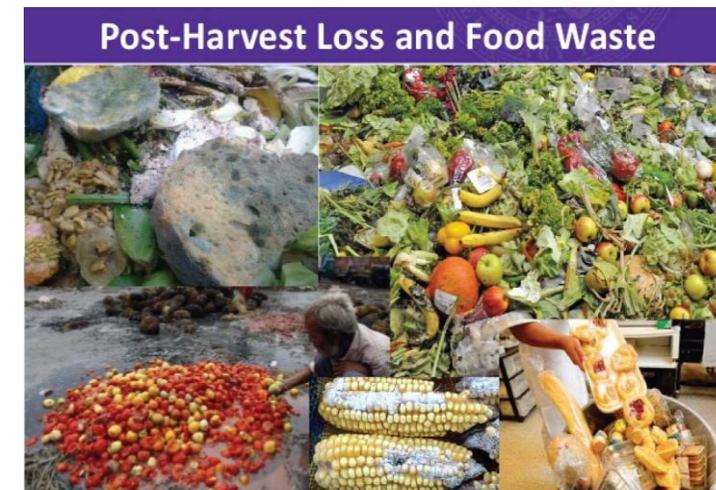
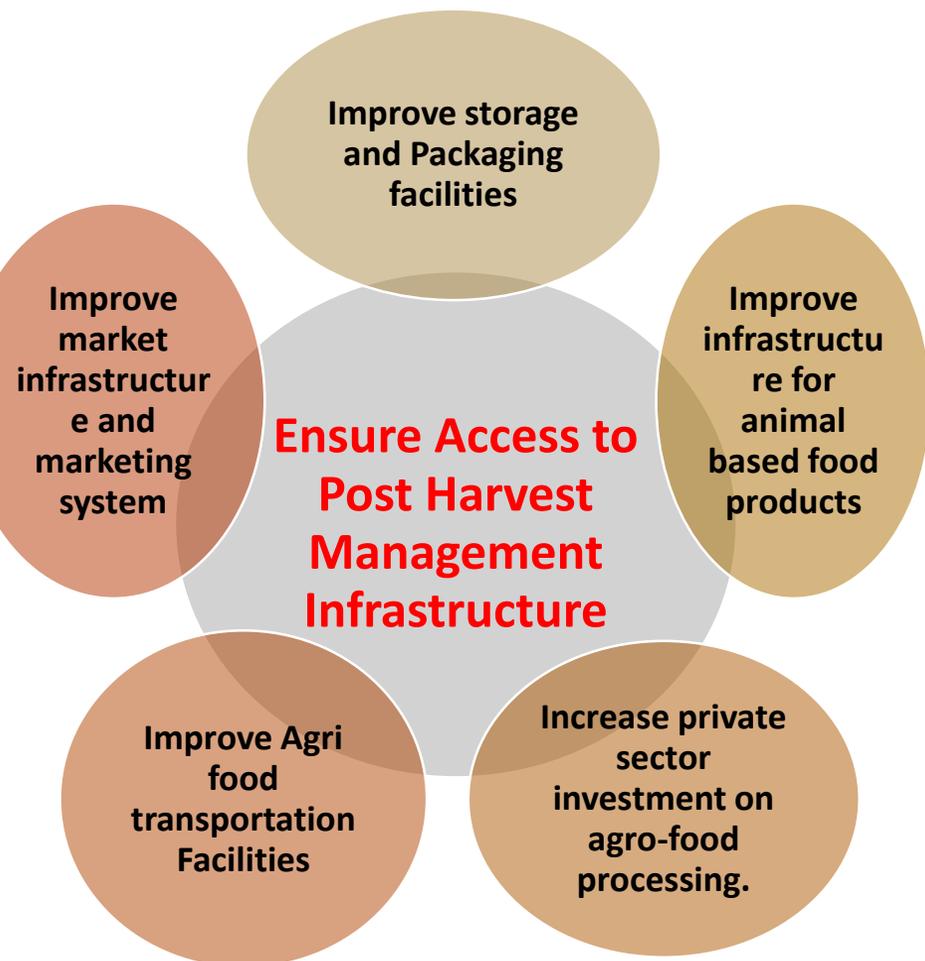
Low dietary diversity

- **Inadequate production/productivity**
- **Diversification to provide more nutrients dense foods has been very limited**
 - **Limited availability of diversified foods**
 - **High price for nutrient dense food**
- **Postharvest loss (>30%)**
 - **Poor handling system**
 - **Inadequate food processing technologies**
- **Poor food safety and quality:**
 - **Adulteration, Misbranding, mycotoxin and residue**



Background...

Postharvest losses





Background...

Food safety issues

- Issues of aflatoxin in the grains, microbes and other such toxins in the food grains make the food unsafe for human and sometimes even for animal consumption.
- Many food safety issue problems occur in the country frequently starting from adulteration of staple foods to mycotoxins contamination of export goods.
- Many rejections and recalls have been done from abroad on our food export commodity. Most of the crops have a safety issue during post-harvest handling and storage.



Waste discharge @Adama City-Heavy metals

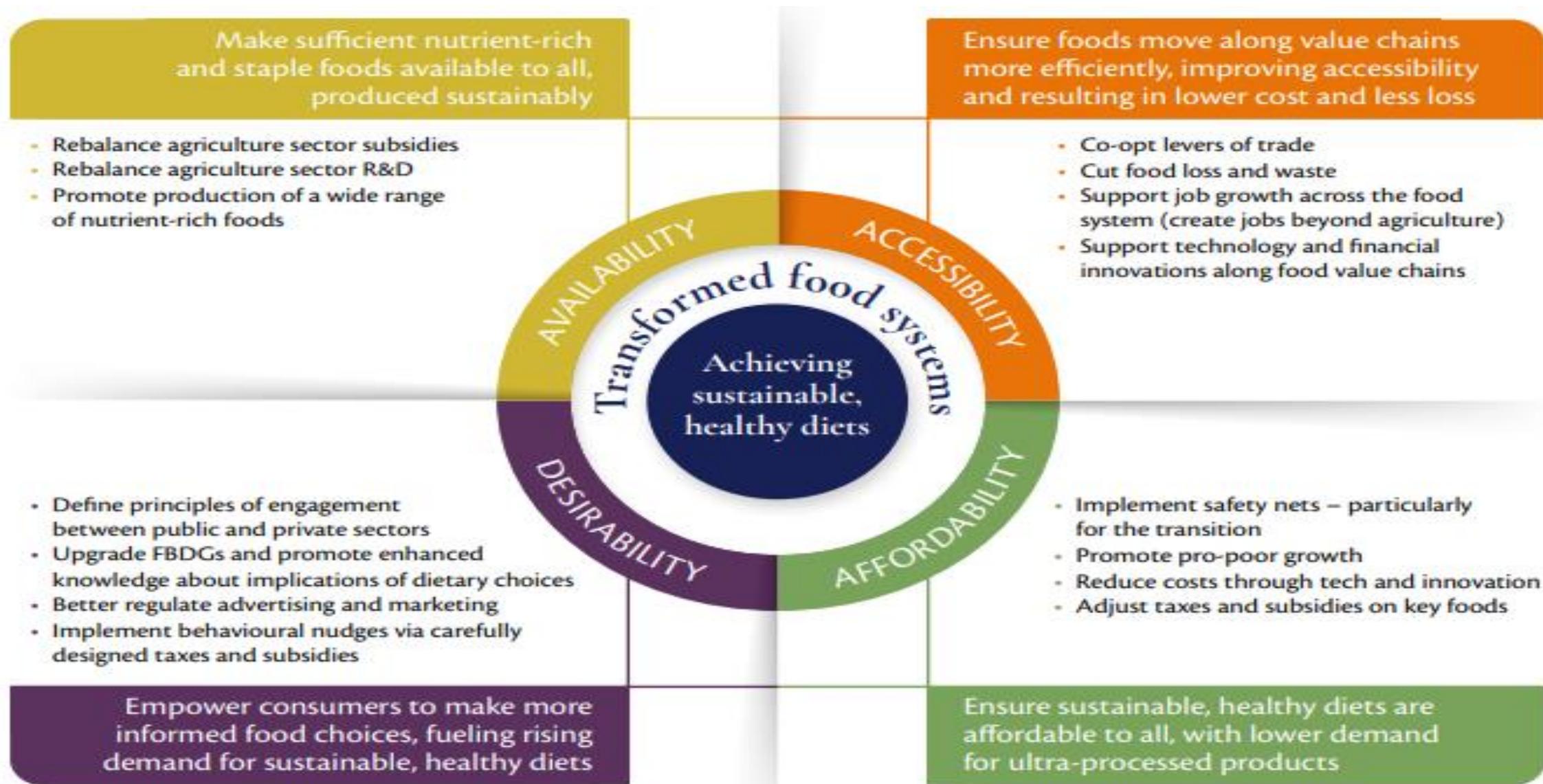


Aflatoxin in ground nut and red pepper@ Harar & SNNP





Intervention: Agriculture and food systems nutrition – sensitive



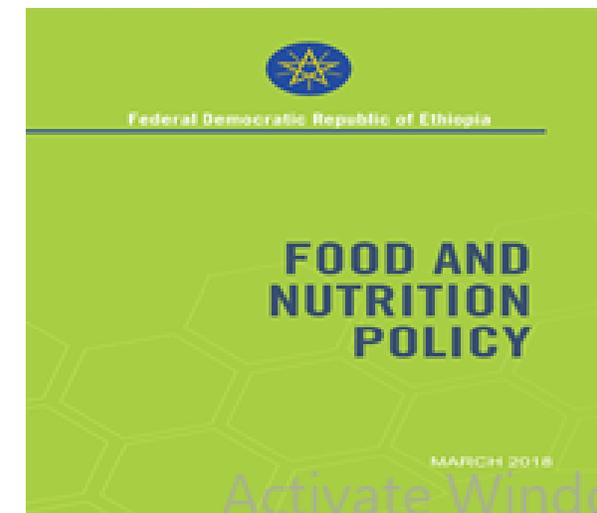
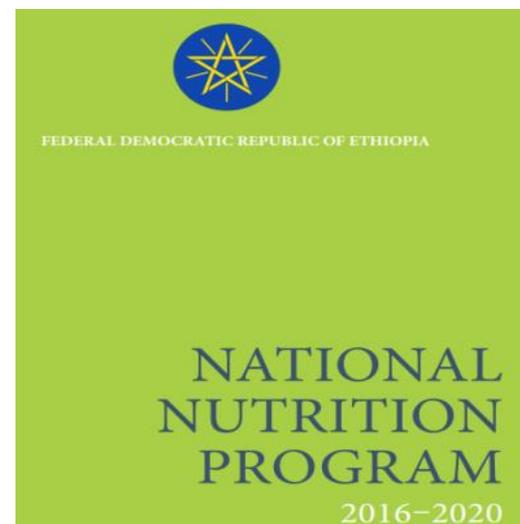
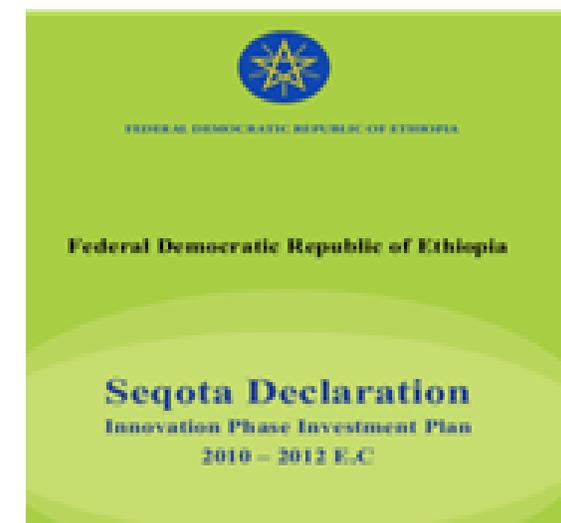
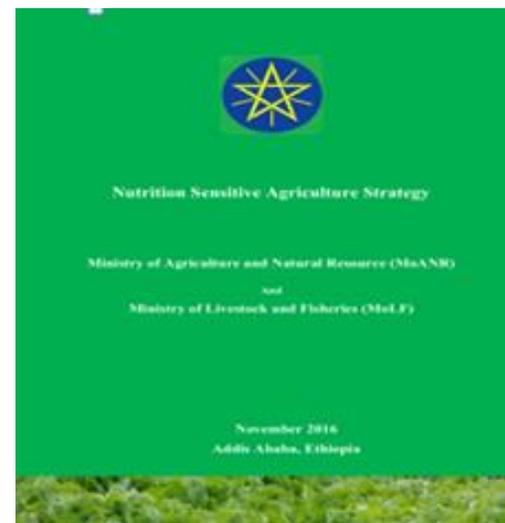


Background...

Policy landscapes

Ethiopian government has developed strategies

- National Nutrition Program I & II
 - Nutrition Sensitive Agriculture Strategy
 - National Food Security Strategy
 - National Food Fortification Strategy
 - Nation School Health and Nutrition Strategy
 - Sekota Declaration - end child under-nutrition by 2030 in Ethiopia
 - National Food and Nutrition Policy –endorsed
 - National food and nutrition strategy in progress
 - Transformation of Ethiopian food system
- Sustainable agricultural practices
 - Double agricultural production
 - Sustainable food systems
 - Resilient agricultural practices





Background...

- **To succeed these strategies and policy, a lion's share contribution is expected from the agriculture sector, particularly from the agricultural research system.**
- **Accordingly, contribution from the Ethiopian Institute of Agricultural Researches (EIAR) will be huge as it has a national mandate to coordinate research related to nutrition sensitive agriculture and food.**
- **The EIAR established the Food and Nutrition Research Directorate (FSNRD) in 2018 with the objective of mainstreaming food science and nutrition research into the current food and nutrition policy of the country and to improve the competence of agri-food system actors.**
- **The directorate has developed a research strategy emphasizing on improvement of food processing technologies, food enrichment, value addition, reduction of postharvest loss, and enhancement of food quality and safety. This is aimed to enable the directorate to focus on key strategic issues, deliver expected outputs linked with these issues and upgrade both physical and human capacities to enable the delivery process**



Vision, Mission and Goal

Vision

- **One of the leading food and nutrition research entity in East Africa providing competent technologies, innovations, knowledge and skill that contribute to food and nutrition security**

Mission

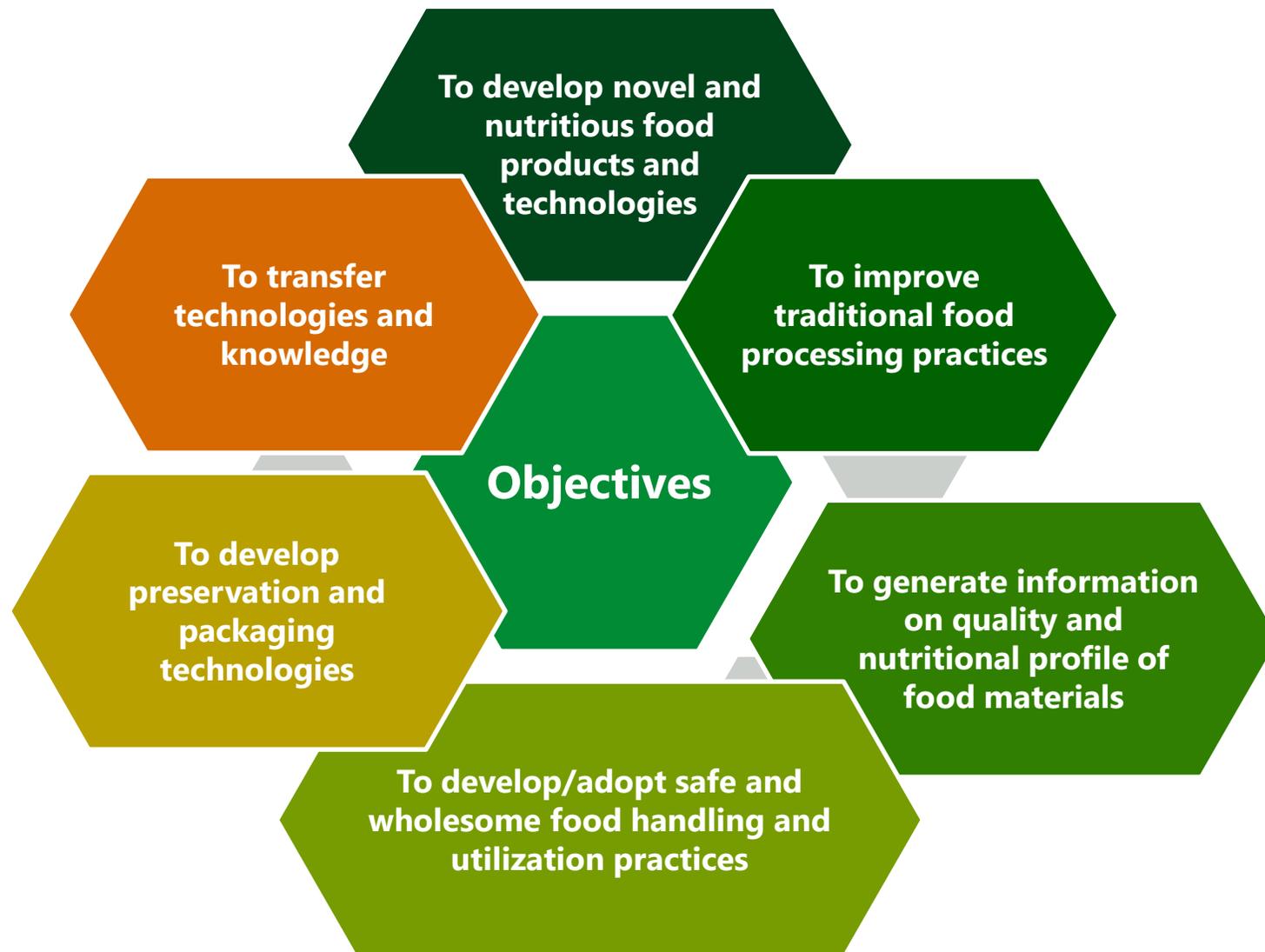
- **To generate, develop, adopt and promote quality and demand driven research outputs that can contribute for postharvest loss reduction, improvement of food processing technologies, food enrichment, value addition, food quality and safety.**

Goal

- **To improve food diversification, processing technologies, food enrichment, quality and safety for reduction of malnutrition and enhanced livelihood**



Objectives





Background...

Food Science and Nutrition Research Directorate



Thematic areas and Strategic Issues

1. Product development
2. Useful Microbes and enzymes
3. By product utilization

- Alternative and innovative food product
- Traditional food products improvement
- Enhancing the use of underutilized plants and animals
- Beneficiary microbes application in foods and beverages
- Enzyme technology for food product
- Study on microbial formulation technologies
- Processing of byproducts for food and ingredients

1. Food characterization
2. Fortification and functional foods
3. Innovative analytical methods

- Profiling of physico-chemical and functional characteristics of food products
- Nutritionally enhanced food product for specific target groups
- Bio-fortified crops nutrient retention
- Health benefiting foods
- Validation and application of non-destructive technique

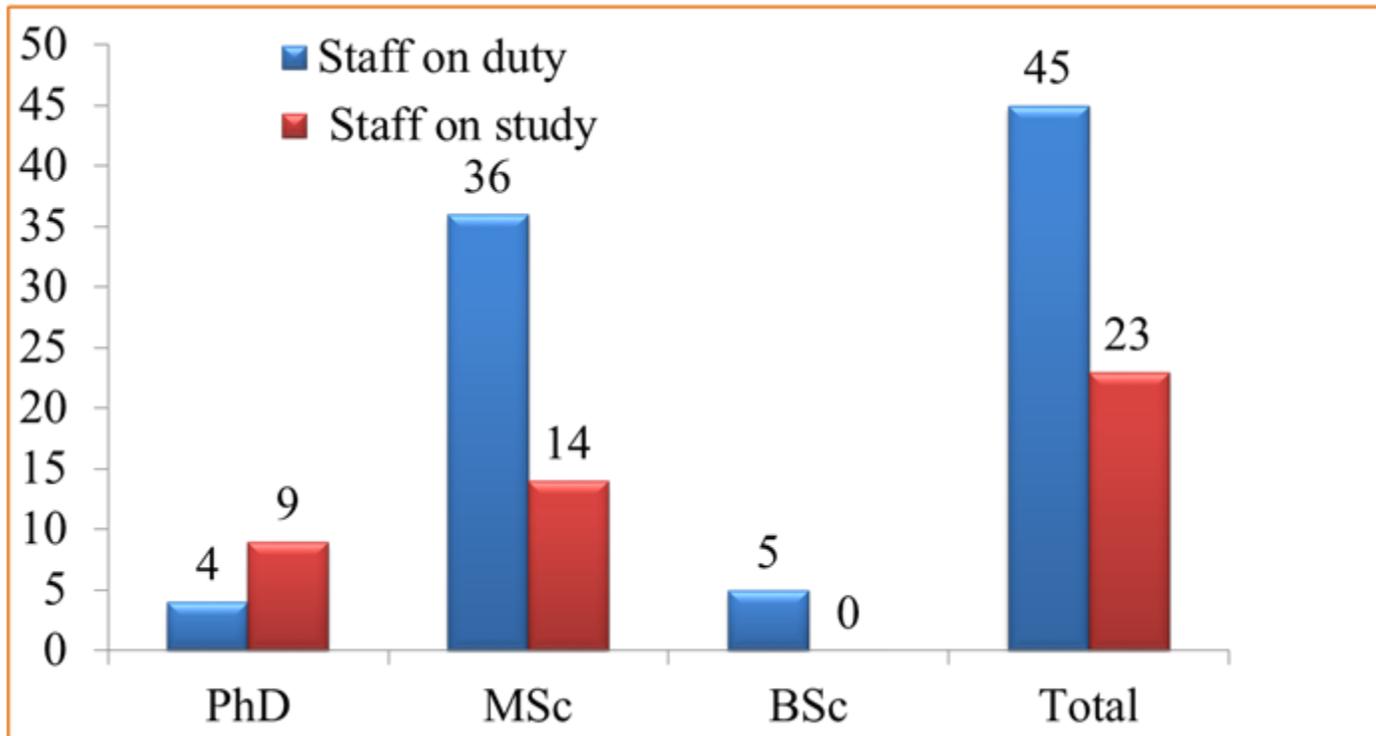
1. Postharvest technologies for quality and safety improvement
2. Chemical and microbial contaminants
3. Shelf-life improvement

- Improved food handling and storage
- Packaging technologies Food pathogens and spoilage
- Heavy metal, residues and mycotoxins
- Food adulterants
- Food preservation technologies



Capacities

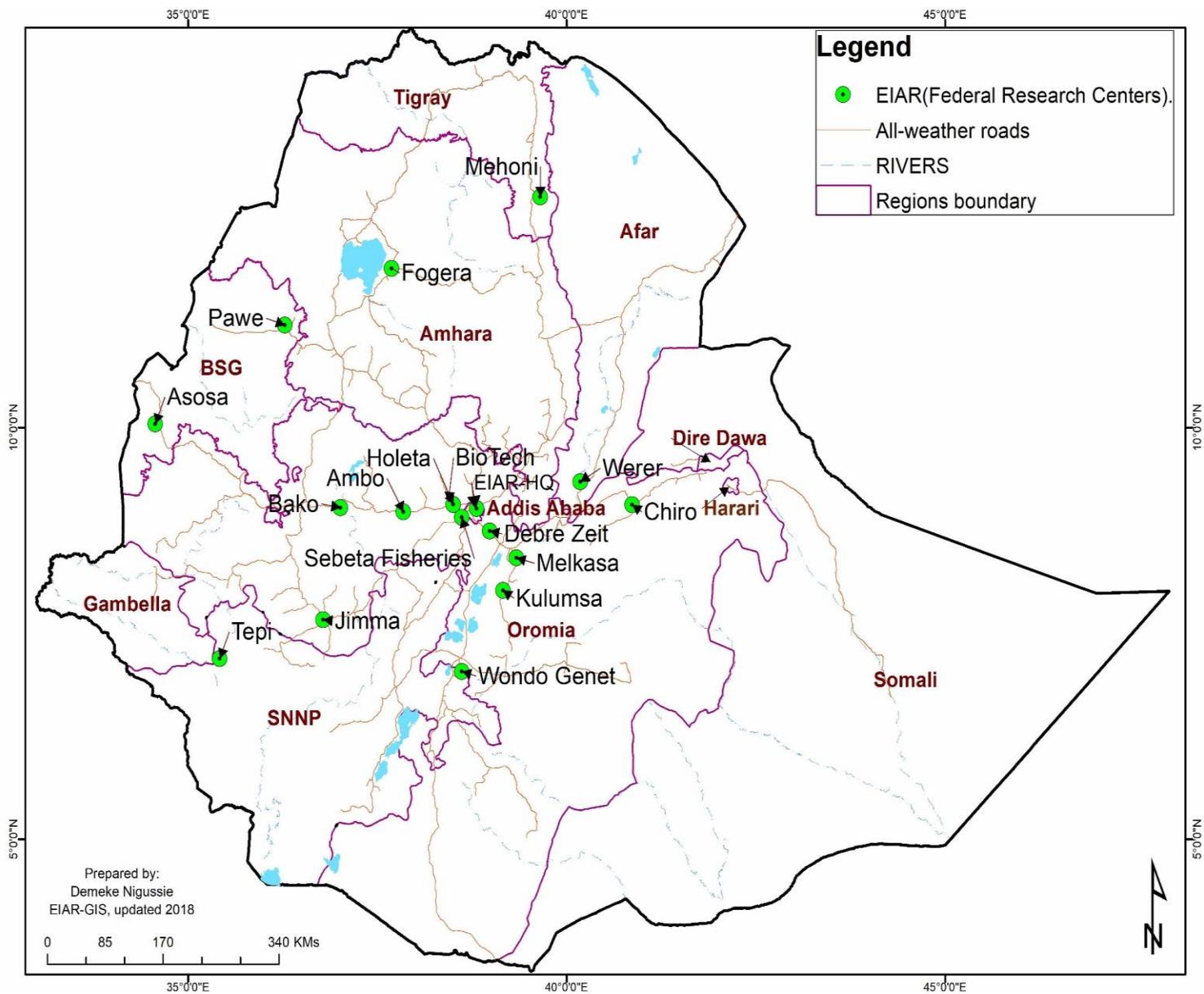
Human Resources (Researchers)



- ✓ Food science and nutrition
- ✓ Food engineering /food technology
- ✓ Microbiology
- ✓ Chemistry
- ✓ Post harvest technology
- ✓ Human nutrition



Laboratory capacity



□ Implementing center (7)

- Head quarter
- Holeta
- Melkassa
- Debre Zeit
- Kulumsa
- Sebete
- Wondo Genet



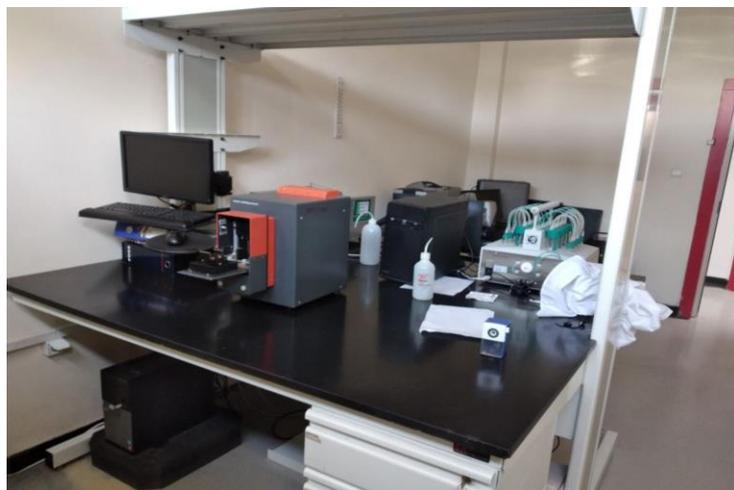
Food Science and Nutrition Laboratory-HQ



Extraction and Proximate



GC and HPLC



NIRS and Dough Processing



ICP-MS and MP-AES



**Textural analysis &
Color**



Food Science and Nutrition Laboratory-W/G





Food Science and Nutrition Laboratory-Kulumsa





Food Science and Nutrition Laboratory-Kulumsa



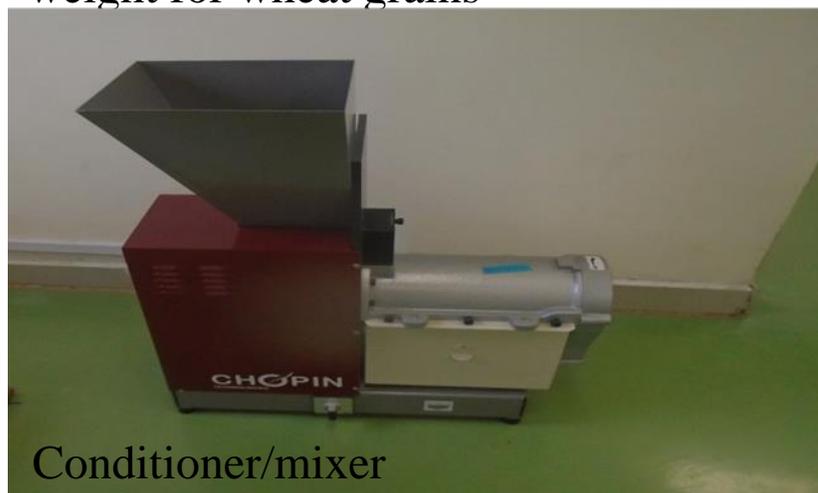
Single Kernel Characterization System:
hardness/softness, moisture, diameter;
weight for wheat grains



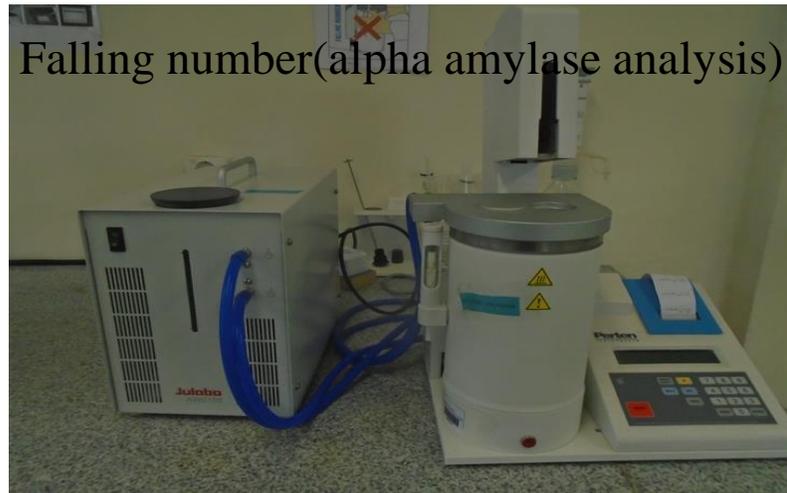
Chopin CD2 laboratory mill



Conditioner/mixer



Conditioner/mixer



Falling number(alpha amylase analysis)



Grain analyzer(NIRS)



Food Science and Nutrition Laboratory-Kulumsa.....



Falling number 1000FN
(alpha amylase analysis)



Visco -amylograph



Texture analysis



Glutomatic system



Food Science and Nutrition Laboratory-MARC





Acknowledgement





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Ethiopian Institute of Agricultural Research (EIAR)



Thank You!

