

Annex 01: Priority Research Focus Areas

Applications are expected ONLY from the following identified priority research focus areas.

1. Chicken productivity improvements in eastern Ethiopia

- Specific type of new chicken breed/line development.
- Complete package on available feed resources or high nutrient density poultry diet; and their feeding strategies for the new breed.
- Productivity enhancement of indigenous chicken breeds with complete packages.
- Development of Urban suited packages/technologies.

2. Evaluation and improvement of khat (*Catha edulis*) production, productivity, and marketing along the value chain

- Characterization and selection of Khat varieties growing in eastern Ethiopia.
- Identification and management of major khat pests (diseases, insect pests, nematodes, weeds).
- Improvement of Khat management practices (irrigation, nutrition, etc.).
- Evaluate types of agricultural chemical pesticides used, their impact, and their residue level.
- Chemistry and pharmacology of khat.
- Postharvest handling practices along the products value chain.
- People's (users & non-users) attitudes, farmers' perceptions, social & cultural values of khat.
- Main actors involved in the khat supply chain; marketing and its export performance.
- Social and political economy of khat.
- Socioeconomic and health aspects of khat chewing.

3. Integrated soil fertility management (ISFM) for enhancing soil health and productivity of smallholder farmers in eastern Ethiopia

- Characterize soil fertility status of potential highland and lowland crop-producing areas.
- Develop site- and crop-specific fertilizers (blended) test and devise recommendations based on the ATA-EthioSIS.
- Identify and devise crop-based fertilizer types and recommendation rates.

- Integrate blended and organic fertilizers in combination with the right cultivars and other agronomic practices.
- Improve soil moisture and plant nutrient retention capacity of agricultural soil through selected climate-smart soil and water conservation practices (mainly conservation and organic farming).
- Evaluate soil salinity and agricultural water quality suitable for major crops.
- Improve the physical, chemical, and biological attributes of soils.

4. One health approach: Interventions for the management of emerging/re-emerging infectious diseases (Dengue and Chikungunya) in eastern Ethiopia

- Minimize the burden of emerging/re-emerging infectious diseases.
- Molecular/genomic epidemiology of Dengue and Chikungunya.
- Spatial epidemiology (mapping and modeling) Dengue and Chikungunya.
- Integrated vector control/management: molecular and behavioral characterization, drug resistance, and control strategies.
- Explore environmental factors favoring the endemicity of emerging/re-emerging infectious diseases (Dengue and Chikungunya).
- Improvement of early diagnosis of Dengue/Chikungunya infection in newborn and pregnant mothers.

5. Cattle production and herd health improvements in Eastern Ethiopia

- Production and reproduction enhancement through reproductive technology.
- Developing products for the production of disease prevention and control.
- Devising treatment protocols for the production of disease.
- Enhancing herd health management practices.
- Utilizing alternative cattle feed sources and developing feeding strategies.

6. Enhancing the development of veterinary biologicals and non-biologicals against selected livestock diseases

- Developing veterinary drugs, vaccines, enzymes, probiotics, diagnostic kits, etc.
- Microbial field strain identification circulating among livestock for possible use in vaccine development.
- Evaluation of immunogenicity.

- Efficacy evaluations for veterinary drugs and non-drug products at the laboratory and field level.

7. An integrated approach to agri-food systems (end-to-end food systems research from production to fork and beyond) to address food and nutrition security in eastern Ethiopia

- Innovations/new perspectives in agri-food systems:
 - ✓ Improvement of the food postharvest handling and marketing system of high value and/or nutrient-dense crops, such as onions, mangoes, potatoes, etc., in eastern Ethiopia along the value chain.
 - ✓ Agro-food processing technologies development and adoption for sustainable food and nutrition security (postharvest technologies, processing technologies, quality and safety management and monitoring, food processing firm's technology gap assessment and solutions, etc.).
 - ✓ Development, fortification and promotion of nutritionally rich food products.

8. Development of sustainable agricultural mechanization for the low-land farming and/or smallholder agriculture in Eastern Hararghe

- Design, development and performance evaluations of agricultural machinery (agricultural mechanization packages *viz.* harvesters, threshers, sowing, tillage, planting, and processing machinery, sensors, automation, etc.).
- Agricultural water resources utilization and water-saving irrigation systems and/or equipment in agricultural mechanization (low-cost, alternative and efficient farm water sprinkler).

9. Indigenous knowledge and their roles in reestablishing societal value and creating intra-/inter-regional networking in peacebuilding processes.

- Indigenous conflict resolution mechanism in Eastern Ethiopia.
- Security-development nexus and the challenges in eastern Ethiopia.
- Youth, adults, women as well as elders in regional security/ integration.
- Population mobility, inter/intra integration and the role of governments in Eastern Ethiopia.
- Endogenous knowledge in creating a non-violent community and establishing a peaceful society.
- Social mobilization, crime, women protection, and adult education.

10. Socio-political, economic and administrative related affairs with regard to Dire Dawa City Administration Charter and & Harari National Regional State constitution.

- Studying the constitutional law of the regional state and administration council in its political context (fiscal power, administrative jurisdiction, people's rights for administration and the power of the City Council), as well as a comparative perspective in the light of the national constitution and others.

11. Cross-border trade and transboundary cooperation in eastern Ethiopia

- A multi-agency approach to combating and/in tackling the unlawful cross-border trade in high-value animals, food, and pharmaceutical supplies: market protection, consumer fraud, and public health implications
- Assess cross-border trade's political, economic, and public-health implications.
- Cross-cutting issue of cross-border trade and Ethiopian government policy (policy Implications) - linking cross-border trade and ministerial offices (Ministry of Health and Ministry of Trade and Regional Integration).
- Looking for options for formalizing and expanding cross-border trade and thus promote sustainable economic development in eastern Ethiopia's border region: cooperation, increased trade and employment opportunities, and easier exchange.

12. Nanotechnology in applications in healthcare

- Nanomedicine in screening, early diagnosis and treatment of prevalent infectious diseases and chronic diseases such as cancers in eastern Ethiopia.
- Novel nanosystems for the diagnosis, imaging, and treatment of various diseases.

13. Biotechnology applications in agriculture

- Biotechnology in agriculture: for biopesticide production, biofertilizer development; synthesis of plant growth hormone; tissue culture for economically important and high value crops (fruits and vegetables).
- Development of technologies for climate change adaptive genetic resources from biological aspects.