

Bangladesh Academy of Sciences
BAS-USDA Endowment Program

List of Thematic Research Areas for the 6th Phase

A. Crops

1. Gene editing using CRISPR Cas9 technique to increase crop productivity through drought tolerance, disease resistance and mineral nutrition
2. Structuring of crops and cropping systems to escape flash flood in haor areas
3. Management of major emerging pests and diseases
4. Up-scaling of climate smart agriculture (CSA) practices for abiotic stress tolerance
5. Promoting nanotechnology application in agriculture

B. Natural Resources

1. IPNS for sustainable productivity in highly intensive cropping areas
2. Productivity enhancement in degraded soils in the coast, char and active floodplains
3. Achieving Land Degradation Neutrality (LDN) target through Sustainable Land Management (SLM) practices
4. Soil carbon assessment up to 1m depth of soils in terrace, hill and floodplains (Ganges and Brahmaputra Floodplains)
5. Conservation of soil and water resources
6. Management of heavy metal contaminated soil and water in the industrial areas
7. GHG emission and mitigation in wetland rice field
8. Microbial diversity in fragile ecosystems (coasts, haors and barinds)
9. Scaling-up of proven marine technologies and practices
10. Soil microbial profile in different AEZs of Bangladesh

C. Livestock

1. Hotspot-based demonstration and upscaling of good practices for vector-borne parasitic disease prevention in dairy animals
2. Mapping and on-farm preventions of livestock manure management-based zoonosis in women in Bangladesh
3. Total-mixed-ration (TMR)-based business model upscaling and demonstration for dairy and beef production
4. Quantification of productive and reproductive yield gaps in animals at farmers' level

5. Soil and water pollutant sources and progression to foods of livestock origins
6. Variance quantifications between ruminants` role as climate change drivers or defenders
7. Value-added rumen enteric methane inhibitors for ruminants` productivity enhancement

D. Fisheries

1. Conservation and scaling-up of Threatened aquatic organisms
2. Productivity enhancement of quality fish and shrimp production
3. Impact of sea level rise on fisheries resources
4. Intensive production and rearing of crab fry
5. Diversification and value addition of fish products and by-products
6. Use of modern techniques in the development of aquaculture practices

E. Farm mechanization

1. Promotion of solar pump irrigation at farm level
2. Preparedness for artificial intelligence for agricultural mechanization
3. Performance efficiency of agricultural implements being used at farm level

F. Socio-economics and Marketing

1. Scaling up of management practices for on-farm and off-farm processing for export of horticultural commodities and other farm products
2. Commercialization and value chain of crop, livestock and fish products

G. Health and Nutrition

1. Efficacy of herbal medicine for treatment of microbial diseases
2. Integrated One Health Approach - *Human, Animal and Environment* including non-communicable and communicable diseases and antimicrobial resistance
3. Assessment and management of nutritional deficiency in human