3.3. Environmental Research, Development, and Management Research Area

a. Water pollution

Surface and ground water are threatened worldwide by pollution, resulting from increased human activities is threatening the nearby lakes, rivers, spring and wetlands. It is threatening the nearby lakes, rivers, spring and wetlands. A major concern of the presence of polluting elements in the aquatic environment is related to the negative health effects they may cause in humans, animals, and plants. Research components are:

- o water pollution assessment,
- o Estimation of pollution level and extent,
- o Assessment of pollutant dynamics in water bodies
- o Studying methods to reduce pollution of water resources

b. Mismanagement of Solid and liquid Waste

The situation of inadequate waste management is pervasive in many developing countries. It is one of the largest environmental challenges that society has faced. In lower-income countries, as well as poorer parts of middle-income nations, about30 to 50% solid waste produced in urban areas is left uncollected. Poor waste management practices, such as dumping of waste in water bodies and uncontrolled dump sites, aggravates the problems across the country. Research components under this problem may emphasize on: Research components are:

- o Urban solid waste management (plastics, electronics, others)
- o Urban liquid waste treatment and management

3.4. Climate Change and Its Management Research area

a. Climate Change Adaptation and Mitigation

The Intergovernmental Panel on Climate Change (IPCC) defines adaptation as adjustments in ecological, social or economic systems in response to actual or expected climatic stimuli and their effects. It includes adjustments to moderate harm from, or to benefit from, current climate variability as well as anticipated climate change. The climate change mitigation, on the other hand, will produce rapid discovery of the scientific knowledge base needed to quantify the potential for purposeful carbon sequestration/ GHGs removals, and will be a critical component of future climate change mitigation programs and will contribute to efforts to slow the increase in atmospheric greenhouse gas concentrations. Research components are:

- o Development of resilient farming systems
- o Advance understanding of the opportunities and challenges of implementing adaptation
- o Create effective and innovative approaches to measure and value the monetary and nonmonetary aspects of short- and long- term adaptations and mal-adaptations and compare these across groups, sectors, regions and timeframes
- o Investigate a range of evaluation criteria for prioritizing adaptation decisions
- o Conduct Studies on communication, participation and capacity Building for CCA
- o Research into mitigation options in agriculture and forestry, and other land use (AFOLU),
- o Development of production systems with enhanced carbon sequestration
- o Agro-forestry - investigation of the potential for low-rainfall tree species to be integrated into farming systems
- o Development of technologies for the production of bio-energy and other bio-products from agricultural and forest biomass
- o Examination of soil carbon dynamics in forests
- o Development of improved models of sequestration for dry-land forest species and mixed species re-vegetation
- o Development of acceptable methods for inclusion of wood products in carbon trading schemes, acknowledging their important role in continuing carbon sequestered during forest growth.

Conducting Technology