

HIGH PRIORITY RESEARCH AREAS (CROPS)
Punjab Agricultural Research Board (PARB)

Theme-1: Enhancing Productivity on Sustainable Basis of Major Farming Systems (35%)
A. Crop Sector
Sub-theme 1A.1: Rice-wheat System:
1A.1.1 Improve productivity of the rice-wheat system by identifying gene sources, developing transgenic, and open pollinated cultivars to enhance yield potential and to control wheat diseases including Karnal bunt & rusts and bacterial leaf blight in rice
1A.1.2. Reduce time conflict between rice & wheat by developing early maturing Basmati varieties, and management practices.
1A.1.3. Improve salt tolerance in rice and wheat
1A.1.4. Improve sustainability of the rice-wheat system through crop rotation.
1A.1.5. Develop economically viable labor saving technologies for rice and wheat
1A.1.6. Breeding of wheat varieties for high grain yield, and ability to withstand against devastating effects of climate change like excessive heat, drought, erratic rains, windstorms, frost etc.
1A.1.7. Improve sustainability of the rice-wheat system through crop rotation and induction of pulses in the system.
1A.1.8. Crop diversification in rice-wheat cropping zones with inclusion of pulses, vegetables and oil seeds crops.
1A.1.9. Development of hybrid rice varieties both in coarse and basmati background to meet the challenges of low yield.
1A.1.10. Development of climate resilient rice varieties resistant to drought, salinity, high temperature and flood.
Sub-theme 1A.2: Cotton-wheat System:
1A.2.1. Improve productivity of the cotton-wheat system by identifying gene sources, developing transgenic, and open pollinated cultivars to enhance yield potential and to control/manage rusts, karnal bunt, and high temperature at maturity in wheat and Cotton Leaf Curl Virus disease, bollworms, & mealy bug in cotton.
1A.2.2. Reduce time conflict between cotton & wheat by developing early maturing cotton varieties, and management practices.
1A.2.3 Improve sustainability of the cotton-wheat system through developing early maturing cotton varieties, and management practices.
1A.2.4 Popularization of Pulses in cotton wheat system for sustaining productivity of the system.
1A.2.5 Import of diverse germplasm to widen genetic base in Cotton
1A.2.6 Development of heat tolerant cotton variety(s) to cope with heat stress/high temperature.
1A.2.7 Improving germination of cotton seed.
1A.2.8 Development of drought tolerant & short duration (early maturing) varieties of cotton.
Sub-theme 1A.3: Mixed-cropping System
1A.3.1. Develop high yielding varieties of sugarcane having high sucrose and good rationing.
1A.3.2. Develop appropriate management practices for weed control in sugarcane, maize, oilseeds & vegetable.
1A.3.3. Develop genotypes of wheat and sugar cane tolerant to salinity and sodicity.

1A.3.4. Improve productivity in maize by developing high-yielding hybrids with heat & drought tolerance.
1A.3.5. Develop appropriate and economically viable labor saving technologies in sugar cane, pulses and maize.
1A.3.6. High yield/multi-cut and improved quality fodder for summer (sorghum, millets) under irrigated environment.
1A.3.7. Development of better nutritive fodder varieties with good fodder yield.
1A.3.8. Development of improved seed production technology of fodder crop.
1A.3.9. Development of technology for mechanical cutting of fodder crops to save the labor and time.
1A.3.10. Identification of fodders and fodder varieties with low hydrocyanic acid contents.
1A.3.11. Testing and evaluation for development of site specific sugarcane varieties.
1A.3.12. Improvement in productivity of sugarcane cropping system through developing later maturing varieties and to increase the profitability of growers and sugar mills.
1A.3.13. Accelerated development of maize hybrids through Doubled Haploid (DH) Technique
1A.3.14. Develop Genetically modified maize hybrids tolerant to insects and herbicides.
1A.3.15. Development of high yielding, short duration, heat & drought tolerant Sunflower hybrids & canola varieties.
Sub-theme 1A.4: Low-input Intensity and Rainfed System
1A.4.1. Develop high-yielding, and low input responsive varieties of wheat and maize.
1A.4.2. Develop high-yielding, disease resistant, (blight in chickpea and lentil and wilt in chickpea, yellow mosaic virus UrdBeanCrickle Virus and Cercospora Leaf Spot in mungbean) varieties of Pulses.
1A.4.3. Develop climate resilient varieties to address drought and temperature extremities at reproductive stage of pulses crops.
1A.4.4. Developing high yielding, drought, heat & salt tolerant, low input responsive and herbicide resistant groundnut and pulses varieties.
1A.4.5. Develop high-yielding varieties of sorghum and millet.
1A.4.6. Crop rotation research in rainfed areas.
1A.4.7. High yield/ multi-cut and improved quality fodder.
1A.4.8. Protocol for establishment of certified mother plants of fruits (Olive, Peaches, Grapes, Stone fruits, etc.)
1A.4.9. Fodderpreservation techniques like hay, silage, etc.
1A.4.10. Research on forages fortification for better production.
1A.4.11. Develop economically viable labor saving technologies for groundnut, pulses and wheat.
1A.4.12. Development of high-yielding, disease resistant and insect/pest tolerant varieties of Pulses.
1A.4.13. Development of climate resilient pulse varieties.
1A.4.14. Integrated weed management in pulses.
Sub-theme 1A.5: Peri-urban production system
A.5.1 Develop high yielding vegetable hybrids/varieties (especially in tomatoes, potatoes and chillies) tolerant to heat and frost.
1A.5.2. Integrated pest control methods, including resistant varieties of vegetables grown in peri-urban areas especially in given below:

Crop	Insects	Disease
Potatoes	Mites, whitefly, jassid, armyworm, aphids	Viruses, lateblight, Rhizoctonia, common scab, Fusarium wilt, Mycoplasma
Onions	Thrips	Downy mildew, purple blotch
Cucurbits	Red pumpkin beetle, fruit fly	Powdery and downy mildews, anthracnose, wilt
Peas	-	Wilt and powdery mildew
Chilies	Helicoverpa, sucking pests	Root and collar rot, viruses
Tomatoes	Helicoverpa, sucking pests	Phytophthora blight, viruses, wilt
Okra	Earis sp. Sucking pests, shoot borer	Wilt, viruses, Meloidogynespp.
Brinjal	Fruit and shoot borer, sucking pests, red mites	Root and collar rot, Meloidogyne spp. Leaf spots
Bittergourd	Fruit fly	Myrothecium leaf spot and seed borne diseases
Cabbage	Cabbage top borer, armyworm, cabbage butter fly and semi looper	Cabbage stem and head rot, downy mildew

1A.5.3. Development of potato varieties with improved shelf life to be kept for a longer period of time at ambient temperature to address the higher rates of cold stores in prevailing energy crisis.

1A.5.4. Develop suitable technologies for enhancing food quality and reducing seasonality through tunnel, protected, hydroponic and greenhouse cultivation.

1A.5.5. Documenting food quality such as pesticide(s) residue, heavy metal contamination and mycotoxins in major fruits and vegetables, and develop remedial technologies and measures.

1A.5.6. Develop technologies for safe use of sewerage water and biosolids.

Theme-2: Promoting Diversification and Commercialization in Agriculture (15%)

A. Crop Sector

Sub-theme- 2A.1: Improving Profitability of Horticultural and Medicinal Plants

2A.1.1. Develop improved propagation techniques, especially through tissue culture in fruits (date palm, mango (for rootstock), guava,), and floriculture crops (bulb plants, foliage plants) for mass multiplication to improve nursery/ seedling plant quality.

2A.1.2. Control of decline and sudden death in citrus, mango and guava.

2A.1.3. Control of economic pests in horticulturecrops (especially in citrus, guava, mango, date palm, and lichi).

2A.1.4. Control of fruit fly, leaf minor, canker & scab in citrus.
2A.1.5. Transfer of technology to farmers regarding nursery development for production of true to type Guava, pomegranate, citrus, mango and Jamun plants.
2A.1.6. Standardization of asexual propagation technique for production of true to type nursery plants of Jamun.
2A.1.7. Variety development of Guava, Pomegranate and Jamun through selection.
2A.1.8. Development of production technology for High Density Plantation of Guava in the context of nutrient management, mechanized canopy management, plant protection measures etc.
2A.1.9. Disease management of Guava (Anthracnose, Dieback, Quick decline) and pomegranate (Bacterial blight).
2A.1.10. Identifying appropriate integrated pest management (IPM) approaches to reduce production cost, protect environment, improve product quality, and protect environment especially in important fruits and vegetables of the Punjab.
2A.1.11. Development of IPM strategies of Fruit fly on Citrus, Guava and Mango.
2A.1.12. Development of IPM modules of Brinjal (mite, jassid, fruit borer, whitefly).
2A.1.13. Development of IPM modules of Cabbage insect pests i.e., armyworm, diamond back moth).
2A.1.14. Seasonal dynamics and management of jassid on okra.
2A.1.15. Development of IPM modules of Tomato leaf miner and fruit borer).
2A.1.16. Integrated Pest management (IPM) for olive, grapes and peaches.
2A.1.17. Identification of indigenous mango germplasm resistant to pests.
2A.1.18. Novel approaches for management of physiological disorder in mango.
2A.1.19. Develop cropping pattern and Integrated Nutrient Management methodologies to decrease nutrient depletion in soil under climate change scenario in mango orchards & organic mango production.
2A.1.20. Identification of indigenous vegetable germplasm especially in tomatoes, potatoes, chilies, and cucurbits to enhance productivity, improve nutrient contents, enhance consumer acceptability and create tolerance to biotic and abiotic stresses.
2A.1.21. Develop suitable, economically viable, and socially acceptable machines for mechanical planting, pruning, weed management and harvesting of fruits and vegetables.
2A.1.22. Identification of water saving practices and technologies, and disease free seeds and seedling for important horticultural crops.
2A.1.23. Development of appropriate management practices for increasing fertilizer and pesticide use efficiency.
2A.1.24. Control of fruit drop in horticultural crops, especially in citrus and mango.
2A.1.25. Identification of appropriate intercropping systems for young orchards.
2A.1.26. Identification of high value medicinal plants and develop appropriate production technology suitable for commercialized local production.
2A.1.27. Introduction of durum wheat for export purposes.
2A.1.28. Mechanization in field operations like sowing, harvesting, thrashing, grading etc.
2A.1.29. Exploring the possible diversification and adoption of climate resilient new fruits and crops (including medicinal plants, Quinoa, Camelina, fruit plants, cut-flowers, sisal etc.)
2A.1.30. Standardization/propagation techniques & production of disease free citrus plants under controlled condition.
2A.1.31. Development of new research approaches/methodologies.

2A.1.32. Detection of association and management of different plant parasitic nematodes of Vegetables and Fruit plants.

Sub-theme 2A.2: Improvement in Productivity of Pulses in irrigated areas

2A.2.1. Improve the responsiveness of pulses to different inputs, especially water and fertilizers so that they can be grown in the intensive cultivation systems.

2A.2.2. Improve productivity of major pulses (gram, lentil, mung bean, urdbean) in irrigated areas by developing high yielding varieties and develop resistance against following diseases and insects.

Crop	Insects	Diseases
Gram	Cut worm, pod borer, armyworm,	Blight, wilt, root rot,
Lentil	Cut worm, pod borer	Blight, wilt, root rot, grey mold, rust
Mungbeans	Asponella bug, stored grain pests	Cercospora leaf spot, mungbean yellow mosaic virus
Urdbean/Black gram	Army worm	Urdbean leaf crinkle virus, mungbean yellow mosaic virus

2A.2.3. Identification of indigenous pulses and other un-conventional crops for their protein contents to mitigate malnutrition.

Sub-theme 2A.3: Improvement in profitability of commercial crops

2A.3.1. Improve the competitiveness of sugar beet as a sugar crop by developing appropriate varieties, production technologies and harvesting & processing machines.

2A.3.2. Improve the competitiveness of sunflower, sesame, linseed, castor and canola by developing high-yielding hybrids/ varieties with better oil contents and quality.

2A.3.3. Development of high yielding and disease resistant varieties in sesame and soybean.

2A.3.4. Research on intercropping of Rapeseed & Mustard in sugarcane and other crops.

Sub-theme 2A.4: Mechanization for diversification, enhance efficiency, and commercialization

2A.4.1. Exact technologies for precision agriculture.

2A.4.2. Develop economically viable seed drills/planters, harvesting, threshing and processing machines, especially for pulses, vegetable and oilseeds.

2A.4.3. Develop economically viable and socially acceptable machines for fodder harvesting, mechanical transplanting for vegetables and rapeseed swath and pickup header.

2A.4.4. Development of cotton variety suitable for mechanical picking to resolve the issue of picking (labour shortage).

2A.4.5. Crop diversification and introduction of high value crops for economic utilization of salt affected soils.

2A.4.6. Mechanization of farming particularly focusing small land holding farmers.

2A.4.7. Development of technology/machinery for effective residue management and improving soil nutrient use ability.

Theme-3: Conserving Resources and Protecting Environment (25%)
A. Crop sector
Sub-theme 3A.1: Soil, fertilizers, pesticides and land
3A.1.1. Develop cropping pattern and integrated nutrient management methodologies to decrease nutrient depletion in soil and enhance organic matter contents.
3A.1.2. Develop nutrient efficient varieties, especially in wheat, cotton, sugarcane, rice, maize oilseeds and vegetables.
3A.1.3. Improve fertilizers use efficiency through liquid and band placement.
3A.1.4. Develop fertilizer use recommendations for different cropping systems and Agro-ecological Zone basis.
3A.1.5. Develop appropriate technologies to reduce soil erosion, desertification, soil compaction, and salinity & sodicity.
3A.1.6. Research on developing efficient methods for composting.
3A.1.7. Standardization of spraying techniques.
3A.1.8. Developing alternatives of chemicals used in crops and livestock sector for improving health and productivity.
3A.1.9. Development and validation of IPM models of different pests in various crops (especially in cotton and vegetables where maximum pesticide is used).
3A.1.10. Develop standards for the use of additives in spray mixtures to reduce pesticide Doses.
3A.1.11. Develop better land use options for Thal and Cholistan areas (crops, plants, grasses, small ruminant, etc.)
3A.1.12. Organic matter improvement through various methods like crop rotation, crop diversity, crop residue management and leguminous crops.
3A.1.13. Improvement in water-holding capacity and structural stability of a sandy soil.
3A.1.14. Digitizing of all farmers soil related data in Punjab and site specific fertilizers recommendations.
3A.1.15. Refining the general fertilizer recommendations based on soil fertility index in different soils and cropping systems.
3A.1.16. Carbon sequestration for mitigating the effect of climate change.
3A.1.17. Crop rotation and tillage effects on soil organic carbon and nitrogen.
3A.1.18. Nutrients dynamics in soil irrigated with industrial/sewage water.
3A.1.19. Research on Development and use of bio-fertilizers especially for stress agriculture.
3A.1.20. Use of bacterial biotechnology in the enhancement of fertilizer use efficiency through slow releasing bacteria.
3A.1.21. Bio-pesticides and bio-weedicides (Research on using different types of bacteria for the control of pests especially weeds).
3A.1.22. Bio-degradation of various herbicides, insecticides and fungicides.
3A.1.23. Incorporation of diseases resistance with special emphasis on up-coming threats of new diseases like wheat blast and blights.
3A.1.24. Evaluation of genetic resistance level of Wheat against karnal bunt, Sugarcane against red rot, Rice against brown leaf spot, Gram against blight, Potato against scab.
3A.1.25. Chemical control studies of, Karnal bunt of wheat, Red rot of sugarcane, Brown leaf spot of rice, Blight of gram, Scab of potato, Powdery and downy mildew of cucurbits.
3A.1.26. Effect of seed treatment on Wheat and canola.

3A.1.27. Development of rice varieties resistant to diseases and insects especially BLB, Blast, grain discoloration, Bakanees and hoppers.
3A.1.28. Biological control based IPM of Rice plant hoppers.
3A.1.29. Sustainable management of insect pests (Whitefly, Jassid, Dusky Cotton Bug, Pink bollworm) in cotton to overcome the insect pest problem.
3A.1.30. Control of CLCuV and Wilting in cotton.
3A.1.31. Incorporation of Glyphosate resistant gene in cotton to combat the problem of weed infestation in cotton.
3A.1.32. Development of disease management strategies against Twig and stem blight of cotton, Decline of citrus, Decline of guava, White mold of lucern and berseem, Anthracnose of lucern and berseem.
3A.1.33. Disease management of bacterial diseases of, Pomegranate and Cotton.
3A.1.34. Identification and rearing of parasitoids of cotton Whitefly.
3A.1.35. Effect of spray, seed treatment and granules on Sugarcane Whitefly and pyrilla
3A.1.36. Integrated management approaches for early shoot borer, whitefly and pyrilla as are emerging threats for sugarcane crop.
3A.1.37. Identifying appropriate Integrated Pest Management (spray, seed treatment and granule application) in maize and sorghum.
3A.1.38. Identification and management of plant viruses of Chilies, Cucurbits and Pulses.
3A.1.39. Development of insect resistant varieties i.e. stored grain pests in grams, lentil, mung bean and black gram and sucking insect pest resistant varieties in lentil, mung bean and black gram.
3A.1.40. Production of organic fertilizer from urban waste.
3A.1.41. Management of brackish water for sustainable soil health and crop production.
3A.1.42. Integrated nutrients management under different cropping system for economical crop production in salt affected soils and efficient use of nutrients.
Sub-theme 3A.2: Water use Efficiency
3A.2.1. Research on alternatives of flood irrigation at farm level by on farm storage, sprinkler irrigation and trickle irrigation and develop optimum input and management schemes for crops, fruits and vegetable.
3A.2.2. Improve water use efficiency by adapting direct seeding in rice and furrow-bed system in other crops.
3A.2.3. Develop rain water harvesting and conservation technologies for rainfed and dry Regions.
3A.2.4. Determination of optimum water requirements under alternative irrigation technologies of different crops/fruits grown under different soil types in different zones.
3A.2.5. Exploring the appropriate resource conservation technologies for site specific nutrient management, efficient irrigation management through aerobic rice cultivation techniques, bed planting, ridge sowing and effective weed control in rice wheat cropping system.
3A.2.6. Research on irrigation improvement & water saving.
Sub-theme 3AB.3: Environmental Efficiency of Crop and Livestock Production
3AB.3.1. Management of pollinators particularly honeybees for sustainable agriculture crop yields of cross pollinated crops (sunflower, alfalfa, berseem) and for cucurbites in tunnels.
3AB.3.2. Studies on fate and pathway(s) of agrochemicals particularly pesticides in soil, water, and food chain including livestock products and environment.
3AB.3.3. Documenting the impact of pesticides and livestock production in close proximity

of humans on environment including human/animal health.
3AB.3.4. Developing technologies for reducing pesticides and heavy metals residues in different food commodities including livestock products and Monitoring of pesticide residues & heavy metals in human food chain and daily usable commodities.
3AB.3.5. Technologies for crop and livestock residue management for the conservation/ protection of environment.
3AB.3.6. Identification of the persistent organic pollutants (POPs)
Theme-4: Improving International Competitiveness through Improved Value Chain and Value Addition (15%)
AB. Crop and Livestock Sectors
Sub-theme 4AB.1: Linking small farmers with efficient market system and value addition
4AB.1.1. Development of starter culture, stabilizers, etc from local sources.
4AB.1.2. Development of Standards for safe processing of milk, meat (especially for Buffalo and Cattle), and fruits and vegetable products.
4AB.1.3. Development of processing and preservation techniques for various livestock, cereals, and horticultural products for long life/storage and improved quality.
4AB.1.4. Development of new products and by-products from various livestock, cereals, and horticultural commodities.
4AB.1.5. Documenting contaminants (pesticides, veterinary drugs, toxins, heavy metals, etc.) in livestock and horticultural products and develop technologies to reduce the contaminants.
4AB.1.6. Analysis of value chain of major fruits (citrus, mango,), vegetables (tomato, onion, garlic, chillies) and livestock products (milk, meat, yogurt, leather) and develop technologies/data to overcome constraints at different food chain level.
4AB.1.7. Assess contractual arrangements in different food production and marketing (sugarcane, mango, citrus, certain vegetables, livestock and fisheries products, etc.) and suggest ways to improve these arrangements for the fair share of all parties.
4AB.1.8. Development of cheap, good quality packaging material for livestock and horticulture products for increasing their shelf life.
4AB.1.9. Evaluation of nutraceutical value and development of socially acceptable foods from indigenous vegetables and milk.
4AB.1.10. Bio-fortification on Zn & Fe in maize, wheat and rice crops.
4AB.1.11. Vegetable breeding for nutritional quality.
4AB.1.12. Development of vegetables seed production technology and especially Okra and Carrot to improve their seed germination.
4AB.1.13. Inter cropping (vegetables into vegetables and vegetables into other crops or Orchards)
4AB.1.14. To address the hidden hunger through development of bio-fortified rice like Fe, Zn etc enriched rice and production of rice free from heavy metals and pesticides.
4AB.1.15. To standardize the organic rice production technology for easy adoption by the rice growers without sacrificing yield.
4AB.1.16. Development of low hydro cyanic acid (HCN) fodder varieties especially in sorghum.
4AB.1.17. Development of high yielding bio-fortified maize hybrids e.g. QPM etc. to eliminate malnutrition problems
4AB.1.18. Establishment of database of pulses, maize, fruits, vegetable & fodder crops with respect to nutrition

Sub-theme: 4AB.2: Reducing postharvest losses and value-addition
4A.2.1. Develop technologies for enhancing shelf life of fruits (especially in mango, citrus and guava), vegetables (especially in tomatoes, green chillies, okra, cucurbits and spinach), and livestock products (milk, meat).
4A.2.2. Development and evaluation of batch and continuous dryers for sunflower, seed cotton, groundnut, corn, paddy, canola etc.
4AB.2.3. Develop technologies for harvesting, pre-cooling, handling, storage and transportation of perishables (including livestock products) and grains to reduce postharvest losses.
4AB.2.4. Develop technologies for home-based and commercial drying (such as solar-cum gas fired dryer), processing and preservation of fruits and vegetables, and livestock products
4AB.2.5. Assessment of post-harvest losses in major fruits (especially in guava, mango, citrus, datepalm, grapes, Peaches, melons), major vegetables (especially tomatoes, potatoes, okra, chillies, cucurbits) and livestock products (milk, yougart, meat, etc.) at various market levels, and identify the strategies to control these losses where these as they occur.
4AB.2.6. Standardization of various value added products for fruits (grapes, peaches, mango, citrus) vegetables (tomato, potato) and cereal crops.
4AB.2.7. Research on value addition aspects like potato flour and starch extraction technology from un marketable (under size and de shaped) potatoes.
4AB.2.8. Value addition & post-harvest management of Date palm through processing/ standardization of drying technique.
4AB.2.9. Improvement in the protocol for existing Hot Water Treatment facilities to control the quarantine pest.
4AB.2.10. Integrated post-harvest management to enhance marketable period of fruits and vegetables.
4AB.2.11. Indicators markers of safe processed foods and anti-nutritional factors for consumers.
4AB.2.12. Development of low cost adulteration detection kits especially milk.
4AB.2.13. Assessment of antioxidant potential of commonly consumed fruits and vegetables
Sub-theme 4AB.3: Taping new emerging markets
4AB.3.1. Develop technologies for economically viable sprout production from different crops like sesame, mungbean etc. for local and export market.
4AB.3.2. Study domestic and international markets demand for fruits, vegetables, essential oils, livestock and fisheries products, and develop technologies to meet these demands.
4AB.3.3. Analysis of value chain of niche products and suggest technological and policy measures to overcome the major constraints for entering into the niche market.
4AB.3.4. Develop techniques to control sanitary pests in crops and animals.
4AB.3.5. Develop alternative sustainable and environmentally friendly production and marketing technologies to make organic farming an economically viable option.
4AB.3.6. Develop technologies for production of economical bio-fuels.
4AB.3.7. Generating durum wheat value chain for Pakistan.
4AB.3.8. Development of basmati rice varieties as per demand/scenario of international market having average grain length > 8 mm with yield potential of 60 mounds per acre.

Theme-5: Cross Cutting Issues and Knowledge Based Agriculture Policies (10%)
Sub-theme 5AB.1: Gender, WTO, and Poverty Issues.
5AB.1.1. Impact of WTO on the structure and performance of agriculture production in Punjab in the short and long run.
5AB.1.2. Research on how the WTO can improve comparative advantage to the farmers of the Punjab
5AB.1.3. Impact of WTO on the income disparities and gender in agriculture.
5AB.1.4. Development of agricultural poverty and productivity nexus.
Theme 5.2: Development of new research approaches/methodologies
5A.2.1. Research on Ergonomics.
5AB.2.6. Development of new extension methodologies and approaches.
5AB.2.7. Use of machine vision and robotics in Agriculture.
5AB.2.8. Research on climate change/global warming especially its impact on production of different crops/fruits and livestock products in different areas in the short and long run.
5AB.2.9. Impact assessment methodologies of different projects.
Sub-theme: 5AB.3: Maintenance / Service Research
5A.3.1. Monitoring of resistance to pesticide(s) in important pests of major crops.
5A.3.2. Control of termites.
5A.3.3. Develop appropriate management practices for vertebrate pests.
5B.3.4. Studies on the housing and management systems of animals especially for small ruminants and poultry.
5AB.3.5. Diagnosis, epidemiology and control of emerging and re-emerging infections/ infestations of livestock and pests of crops.
5AB.3.6. Research on emerging sciences like biotechnology, nanotechnology etc for improving productivity in agriculture.
5AB.3.7. Research on control and factors affecting mycotoxin(s) production, especially aflatoxin in agricultural commodities, animal and poultry feed.
5AB.3.8. DNA marker assisted selection for different traits of crops and animals.
5AB.3.9. Studies on the causes and narrowing gaps between the yields of the progressive farmers and the common farmers.
5AB.3.10. Impact analysis of cotton, sugarcane, rice, wheat, citrus, mango, and livestock research carried out at Universities and research institutions.
5AB.3.11. Studies on hygienic quality of food stuffs at vendor's level.
5AB.3.12. Development of low cost diagnostic kits for detection of important diseases of plants, poultry and animals.
5AB.3.13. Development/ improvement of assays/techniques for efficient diagnosis of crops, animal, poultry, and fish diseases.
5AB.3.14. Development of Climate (Drought/Heat) resilient crops using latest tools of Biotechnology (Genomics, Omics, Genetic Engineering etc).
5AB.3.15. Strengthening of Local maize seed industry thorough Public-Private Partnership.
5AB.3.16. Transfer of technology to farmers for economic utilization of salt affected soils and brackish water.
5AB.3.17. GIS and RS based characterization of sub-watershed to identify to potential areas in the region of high value agriculture.
5AB.3.18. Capacity building and research on use of genome editing using CRISPR technology to tailor crops with desirable traits.