Working Paper 3

Proposed Topics for the 2023 Technical Seminar

DRIVING SUSTAINABILITY THROUGH
INNOVATION AND LEADERSHIP

29 November – 1 December 2022

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Recommendation from the Secretariat of the

International Cotton Advisory Committee

November 2022

The following topics are proposed for the 2023 Technical Seminar of the ICAC Plenary Meeting:

1. Women in cotton production and processing: challenges of equity
2. Recent technological innovations as gamechangers on cotton farms
3. Climate-smart technologies for cotton production

Women in cotton production and processing: challenges of equity

Agriculture is believed to have evolved largely due to women, as they may have been responsible for the earliest domestication of crop plants. A study conducted by the International Trade Centre (ITC) showed that women across the world are mostly employed in cotton farms for picking, catering, planting, and field management. According to ICAC data, globally, women own 39.3% of land for cotton farms and may constitute 60% to 70% of the work force on cotton farms in developing countries. The ITC study points out that women are paid less than men and these gender-based wage disparities are observed in many countries. About 75% of garment workers globally are women, yet they are often underrepresented in leadership positions in their workplaces and communities. The world is becoming increasingly aware of the fact that empowered women not only empower society, but also catalyse its growth. A study by the DFID (2010) showed that the total agricultural output of Africa could increase by up to 20% if women's access to agricultural inputs were equal to that of men. Although women play uch a pivotal role in cotton production and processing, their contribution is often overlooked in social, economic, and political spheres. Women are far less empowered than men because they face structural barriers that limit their access to land, information, finance, infrastructure, technologies and markets. This technical seminar will discuss ways to mainstream gender equity and women empowerment in cotton production.

Recent technological innovations as gamechangers on cotton farms

Scientific advancements in the past few years have led to innovations in all fields including agriculture and cotton production. Technological innovations hold the key to progress in agricultural productivity and sustainability. Innovations that are establishing themselves as game-changers relate to communication technologies; mobile farm applications; social media platforms; virtual reality training modules; weather prediction and forecasting; robotics-based machinery

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(especially for small holders), drone-mediated crop monitoring and pesticide application; remote sensing and management; sensors and decision support systems for pest management and nutrient management; cloud computing; digital technologies to access global and local information on soils; weather; inputs and markets; biotechnology; genetic engineering; genome editing; marker-assisted breeding and CRISPR-CAS for improved crop varieties; biofertilisers and biopesticides; rapid diagnostic kits to detect pests, diseases; nutrient deficiencies and GM crops; nanotechnologies to enhance fertiliser-use-efficiency; water-use efficiency and pesticide-use-efficiency; micro-irrigation; irrigation water ATM technologies; laser levelling, structured water; biochar; enhanced carbon sequestration techniques; rapid soil testing kits; precision farming; and regenerative technologies. The technical seminar will highlight the latest technological innovations that could have a game-changing impact on cotton farming in large-scale and small-holder farms across the world.

Climate-smart technologies for cotton production

The UN Climate Change Conference of the Parties (COP26) held in Glasgow, Scotland in November 2021, asked countries to come forward with 'emission reduction targets for 2030' that align with reaching net-zero emissions by 2050 to keep 1.5 degrees or less of global warming within reach. Cotton production practices emit greenhouse gases (GHGs) mainly comprised of carbon dioxide (CO_2), nitrous oxide (N_2O) and methane (CH_4) that cause global warming. GHGs are emitted mainly from the use of agrochemicals, and consumption of fuel and energy used for farm machinery, irrigation and transport. Different crop-production systems emit different levels of GHGs. Research showed that the GHG emissions from cotton farms were 2.37 tonnes of carbon dioxide equivalents (CO_2eq) per tonne of lint produced in Pakistan, 1.60 tonnes in Australia, 1.47 tonnes in Iran, 2.93 tonnes in China, India, Pakistan, Tajikistan and Turkey and 1.7 tonnes of CO_2eq per tonne of lint in the United States of America. Thus, the total global annual emissions from cotton farms may be estimated to be 57.2 million tonnes of CO_2eq GHGs. Recent studies have shown that several climate-smart technologies have the potential to reduce GHG emissions and enhance carbon sequestration while concomitantly resulting in improvement of sustainable crop productivity. For example, a recent report (Cotton Leads, 2019) highlights the potential of 'zero-till' technology-based cotton crop biomass in capturing CO_2 to show that '*an acre of no-till cotton actually stores 150 kg more of atmospheric carbon than it emits during cotton production, meaning that cotton's contribution to the carbon equation is net negative'*. The technical seminar will discuss the latest developments in climate-smart technologies such as 'climate-resilient, drought-tolerant cotton varieties', regenerative agriculture, biochar, nano-technologies for input-use-efficiency, biological alternatives to synthetic chemical fertilisers, biodiversity conservation-based pest management, and government policies to promote climate-smart technologies and reward carbon-farming.