Foundation for Agrarian Studies

The Role of Modern Science and Technology in Advancing Agriculture

The development and application of science and technology have historically played a pivotal role in transforming agricultural productive forces, shaping the trajectory of food production and distribution. From the Green Revolution to the more recent advent of genetically modified crops, gene editing, and precision farming, technological advance has increased agricultural yields significantly.

In addition to enhancing productivity and thereby food security, modern biotechnology contributes to the achievement of multiple objectives in agriculture and related fields. These include climate resilience and sustainability, adaptation to different agro-ecological regimes, improved nutritional quality, disease and pest resistance, and accelerated crop processes.

Agriculture needs constant advance, both to meet new challenges of climate change and ecological pressures and to provide improved nutrition for the malnourished – at least one billion people – with a sustainable footprint. Continuous progress in agricultural science and technology is necessary if agriculture is to meet these needs by, say, 2050, when the population of the world is projected to be 9.7 billion from the present 8 billion.

Science and technology are the products of the collective labour and knowledge of humanity. In the present world, however, the overwhelming bulk of the products of this collective effort are owned by capital, while society and the people at large must deal with the consequences and risks arising from the commoditisation and appropriation of scientific knowledge. A particularly stark example of the increasing concentration of scientific research in the private sector is in the field of agriculture and genetic engineering technologies. In addition, the relations of production at different levels – the global level, the level of national economies, and in different agricultural production systems – prevent income-poor cultivators in different parts of the world from realising the full potential and benefits of modern biotechnology. To achieve genuine food security, public investment in science and technology must be encouraged, ensuring that innovations are accessible to all.

The scientific research agenda of sustainable agriculture is also sought to be diverted towards a number of "alternatives" to science. These range from the glorification of subsistence production with low inputs and low productivity to welcoming obscurantist initiatives such as zero budget natural farming.

Immense changes are now happening in the science of food production and in the application of science and technology to agriculture and allied activities. It is a matter of great urgency that progressive social scientists recognise – and analyse – the potentially emancipatory impact of the scientific and technological revolution on the lives and livelihoods of the working people in rural areas across the world while ensuring that the benefits of this advance are made available to the peasant masses. The conference will discuss the socio-economic implications of technological adoption in agriculture.

The Foundation invites papers on scientific and technological transformations in agriculture, fisheries, animal resources, and related fields; biotechnology and agricultural advancement; digital technologies and agricultural advancement; problems of scale in agricultural and rural production and scientific assessments of approaches to sustainability (such as zero budget natural farming).