

## Russia's Highest Honour

Prime Minister Narendra Modi was officially presented with Russia's highest civilian honor, the Order of St Andrew the Apostle the First-Called, by Russian President Vladimir Putin at a ceremony in St Catherine's Hall of the Moscow Kremlin. Notably, the award was bestowed on PM Modi in the year 2019, but he received it physically recently.

This prestigious honor recognizes Modi's efforts in enhancing bilateral ties between Russia and India, spanning economic cooperation, defense collaboration, and cultural exchange. The award underscores Modi's leadership in strengthening the Special and Privileged Strategic Partnership between the two nations. It also acknowledges his role in promoting peace and stability on the global stage, as well as his commitment to mutual interests such as energy, technology, and space exploration.

## DIGITAL AGRICULTURE

■ GOURAV SABHARWAL

Digital agriculture refers to the integration of advanced technologies and digital tools into traditional farming practices to enhance productivity, sustainability, and efficiency in food production. This innovative approach leverages a variety of technologies such as precision farming, data analytics, Internet of Things (IoT), artificial intelligence (AI), and robotics to transform agriculture into a more data-driven and technologically sophisticated industry. Precision farming is a key component of digital agriculture, involving the use of GPS technology, sensors, and drones to collect detailed information about soil conditions, crop health, and weather patterns. This data is then analysed to make informed decisions on resource management, optimizing the use of water, fertilizers, and pesticides. By precisely tailoring inputs to specific areas of a field, farmers can reduce waste and improve overall efficiency. The Internet of Things plays a crucial role in digital agriculture by connecting various devices and sensors on the farm. Smart sensors placed in the field continuously monitor and collect realtime data on soil moisture, temperature, and crop growth. This information is transmitted to a central system, allowing farmers to monitor and manage their crops remotely. IoT also enables the automation of certain tasks, such as irrigation and pest control, leading to more sustainable farming practices. Artificial intelligence is another key element in digital agriculture. Machine learning algorithms analyse vast amounts of data to identify patterns and make predictions. Farmers can use AI-powered tools to optimize planting schedules, predict disease outbreaks, and even assess the quality of crops. This helps farmers make data-driven decisions that enhance productivity and reduce risks. Robotics is making significant contributions to digital agriculture by automating labour-intensive tasks. Autonomous tractors, drones, and robotic harvesters can perform various functions such as planting, spraying, and harvesting crops. This not only reduces the workload on farmers but also ensures precision and efficiency in operations. Robotics can also address labour shortages in agriculture, especially in regions where there is a declining workforce. Data analytics is a crucial aspect of digital agriculture, helping farmers gain insights from large datasets. By analysing historical and real-time data, farmers can identify trends, optimize resource allocation, and make informed decisions. This data-driven approach enables continuous improvement in farming practices, leading to higher yields and profitability. The adoption of digital agriculture has the potential to address several challenges facing the agricultural sector, including the need to feed a growing global population, climate change impacts, and resource constraints. By harnessing the power of digital, farmers can enhance their decision-making processes, optimize resource use, and improve overall sustainability. Additionally, digital agriculture promotes the integration of environmentally friendly practices, reducing the environmental footprint of farming activities.

### Introduction

The term digital agriculture refers to the use of computers and other electronic devices in farming and other agricultural endeavours. Digital agriculture enables farmers and other stakeholders in the agriculture value chain to increase food production using advanced technologies incorporated into a single system. Digital agriculture is a database that contains various information about cultivation, from soil conditions to market assessments, as well as optimal decision operations that aid in making the best choices throughout several agricultural production and distribution processes. A digital agriculture system is a crucial tool for managing agricultural risks. It can assess climate change risks, create a revenue protection policy, and produce a soil quality management program.

### Importance of Digital Agriculture

Farmers rely on cutting-edge technologies to collect and analyse data from their farms to maximize their harvests.

Digital agricultural technologies can monitor factors such as moisture, nutrient trends, soil composition, and wind patterns of arable land. The digital agriculture system collects data accurately (such as weather information) using external sources. The combined data is examined and interpreted to help the farmer make better decisions. Robotics and advanced equipment quickly put these decisions into action with greater accuracy, and farmers can receive real-time feedback on the effects of their actions. Accurate weather predictions, yield mapping, variable-rate applications (of water, herbicides, and fertilizers), and GPS guiding systems are all components of digital agriculture.

### GIS & Remote Sensing Techniques in Agriculture

A geographic information system (GIS) is a computer-based tool for capturing, storing, checking, and displaying data related to positions on Earth's surface. It was used back in 1854 (without computers) to map a disease outbreak in the City of London. The first Geographical Information System (GIS) was developed in the early 1960s by the Canadians to store geospatial data and produce maps for the Canadian Land Inventory. This data provided an indication of the land's capability to support agriculture, wildlife, forestry and recreational activities. Over the past few decades, Remote sensing and GIS has grown exponentially in many sectors of visualization, monitoring, management and potential development. Remote sensing and GIS technology enable agencies to get reliable information of natural and manmade features and interpret appropriately phenomenon occurring over the earth's surface without making any physical contact.

Since the World GIS day has already been celebrated on November 2021, it is a great time to appreciate just how much this technology has influenced the productivity of farmers, agriculture specialists and environmentalists alike. Therefore, GIS has become indispensable for mapping agricultural activities. The Agricultural Geographic Information System Laboratory (AGIS) developed at the University of California, Davis, is deeply involved in the advancement of the agriculture/GIS relationship. This AGIS lab researches the effects a watershed area has on soil nutrients, the use and movement of pesticides on crops, mapping water use and availability in rural agricultural areas as well as cities, tracking potential plant diseases, and expanding the GIS capabilities to cover the entire state. In addition to expanding the potential uses of GIS, the AGIS Laboratory is dedicated to disseminating the information they gather to local farmers, wineries, and city officials to help promote healthy change in behaviours that affect the agricultural outputs of California. With the permeation of technology in the global culture, it is possible that in a few years GIS could be available to rural farmers in the developing world to help them grow better crops, feed their families, and produce enough food to ship to neighbouring areas. Farmers in severeweather prone areas (like flood plains or drought zones) would be able to predict what this weather could do to crops, could move fields to better geographic locations, and know how to irrigate based on local water resources and weather patterns. The world food crisis could be alleviated by the use of GIS.

■ DR. PARVEEN KUMAR

Whether sky is the limit for ICAR or it is just another starting line to attain another feat in the series of its accomplishments; only time will answer this. The story of rise of Indian Council of Agricultural Research (ICAR), an institute set up in the colonial era to revive farm sector in the country is phenomenal, unmatched and unparallel. The ICAR came into existence on July 16, 1929 as the Imperial Council of Agricultural Research when it was established as a registered society under the Societies Registration Act, 1860 in pursuance of the report of the Royal Commission on Agriculture. In March 1946, the word 'Imperial' was replaced with 'Indian' and hence the present day nomenclature 'Indian Agricultural Research Institute'. Slowly and Steadily, ICAR grew into one of the largest network of agricultural research, extension and educational institutes in the world. The Indian Council of Agricultural Research (ICAR) right now stands tall and unmatched. Its contribution in ensuring food and nutritional security in the country is unparallel. As an apex body, the Council is responsible for coordinating, guiding and managing research and education in agriculture including horticulture, fisheries and animal sciences in the entire country. With about 113 ICAR institutes, 731 Krishi Vigyan Kendras' and 74 agricultural universities spread across the length and breadth of the country, it is one of the largest national agricultural systems in the world. Having played an indispensable role in bringing green revolution in the country, ICAR is now all out to accomplish the target set under Sustainable Development Goals specifically the goal of Achieving Zero Hunger by 2030. Besides ensuring food and nutritional security, it is also playing a major role in promoting excellence in higher education in agriculture and related sectors; engaged in cutting edge areas of various frontiers of science with the ultimate aim of utilizing it for the welfare of mankind.

The ICAR as an apex body reports to the Department of Agricultural Research and Education (DARE), Ministry of Agriculture and Farmers Welfare (MoA & FW) Government of India. The Union Minister of Agriculture serves as its president. Presently Mr. Shiv Raj Singh Chauhan in his capacity as Union Minister for Agriculture and Farmers' Welfare is the president of this auspicious body. The ICAR has its headquarters at New Delhi. The Director General (DG) ICAR is the ex-officio Secretary of DARE.

■ DR. BANARSI LAL

Every year International Year of Cooperatives is celebrated on 6th of July across the globe. This year the theme of International Year of Cooperative is "Cooperatives Building a Better Future for All". Cooperatives have the opportunity to showcase their current and historical contributions to building a sustainable future, accelerating efforts to implement the Sustainable Development Goals by 2030. The Indian economy in the past, presently and in future will remain predominantly depend on rural development because very high proportion of the Indian population live in rural areas. In 1901, 89 per cent of its total population was living in the village while in 2021 around 65 per cent still live in the rural areas. It is expected that by the turn of 21st century at least 50 per cent of population would be living in the rural areas. About two-third of its workforce is engaged in agriculture in rural areas. Agriculture contributes around 17 per cent of India's gross domestic product. In agrarian country like India rural development is must for national development. In order to improve the quality of life of rural people, rural development is must. This requires a sustainable increase in the access of each and every individual to the basic necessities of life. Also every individual self-respect is must. The political, economic and social freedom is also must for the rural people.

Development is the cherished goal of every individual, family, community and nation. Hence, it is the prime responsibility of every nation to initiate and sustain the process of development. Development is influenced by the multiple factors such as natural resources, technologies, human resources, different programmes, policies etc. The role of different institutions and organisations is well recognised for the rural development. They help in the rural development by way of provision of inputs, services, by influencing investments and savings etc. There is positive correlation

■ SURJIT SINGH FLORA

This strategy may benefit toddlers, teens, and the elderly, according to University of Waterloo researchers Canada.

Here are some of Gurleen Flora my daughter's recent drawings.

Throughout history, the development and legacy of human civilizations can be traced solely through the artistic accomplishments of each era. Art has beautifully captured the rich history of civilizations across the globe through a variety of mediums, such as statues, pictures, utensils, coins, toys, jewelry, weapons, and clothes. Art has a significant impact on enhancing the beauty of life. Drawing and painting have enormous significance in fostering children's holistic development, which includes their mental, cognitive, and imaginative growth. This fosters the artistic growth of the child's entire character. Drawing organizes the world, from the smallest objects like a needle to larger ones like a plane.

Drawing subjects improves children's imagination, art aesthetics, accurate measurement,

Presently Prof. (Dr.) Himanshu Pathak is Secretary DARE and DG, ICAR.

**HISTORY OF ICAR:** Formerly known as 'Imperial Council of Agricultural Research', ICAR was borne out of the recommendations of Royal Commission on Agriculture set up by the British government in 1926 and was headed by Lord Lilingthov. It submitted its report in 1928 and recommended setting up of Imperial Council of Agricultural Research to promote, guide and coordinate agricultural research in the country. The then Imperial Council of Agricultural Research was established on 16 July 1929 as a registered society under the Societies Registration Act, 1860 in pursuance of the report of the Royal Commission on Agriculture. In March 1946, the word 'Imperial' was replaced with 'Indian' and hence the present day nomenclature 'Indian Agricultural Research Institute'. In 1965 Dr. B. P. Pal was appointed as the first Director General of ICAR and he is the person credited with initiating All India Coordinated Research Projects (AICRPs) in the country that paved the way for conducting demonstrations at farmer fields all across the country.

**MOTTO OF ICAR:** The motto of ICAR is 'Agri-search with Human Touch'.

**FEATHERS IN THE CAP:** The research and technological interventions developed by the ICAR system in the country has enabled the country to increase the production of food grains by 5.6 times, horticultural crops by 10.5 times, fish by 16.8 times, milk by 10.4 times and eggs by 52.9 times since 1950-51 to 2017-18, thus making a visible impact on the national food and nutritional security. The production has gone up from 50 million tonnes in 1950-51 to about 350 million tonnes at present. The country is the largest producer of pulses, spices, milk, tea, cashew, jute, banana, jackfruit (FAO). It is now second in production of wheat, Paddy, Fruits and Vegetables and 4th largest producer of Oilseeds. It is also largest producer and second largest exporter of cotton. In pulses too, the country is the largest producer of pulses with 25% of the global produce and 27% of the global consumption. If we talk of the livestock, the country has the largest livestock population, 31% of world livestock population with 22% of global milk produce. The country also stands at fifth position in fishing employing 14.5 million peoples in the country. It is the second largest producer of silk being the only country to produce all four types of silk with Mulberry accounting for about 71% of the total, Eri (17.8%), Muga (1%), Tropical and

## Foundation Day: July 16 ICAR: Sky is the Limit

Temperate Tsar (9.8%). The horticulture production has exceeded food grains production, increased by 30% in last 5 years. It is also among the top honey producing countries ranked 8th with production of 64.9 thousand tonnes (FAO).

The ICAR is also credited with the initiating first All India Coordinated Research Project AICRP ON Maize in 1957. The first National Gene Bank was established by ICAR in 1996 at New Delhi and launching of National Agriculture Technology Project (NATP) in 1998 and National Agricultural Innovation Project (NAIP) in 20025. In 2006, ICAR developed a vaccine against bird flu. The vaccine was developed at the High Security Animal Disease Laboratory, Bhopal, the only facility in the country to conduct tests for the H5N1 variant of bird flu. It was entrusted with the task of developing a vaccine by the ICAR after the Avian Influenza outbreak in February. In 2011, ICAR scientists were the first in the world to sequence the pigeon pea genome. It was an indigenous effort by 31 scientists led by Dr. Nagendra Kumar Singh of National Research Center for Plant Biotechnology (NRCPB). The country witnessed a record production of crops even during the Covid-19 pandemic.

**ICAR: AGRICULTURAL RESEARCH SERVICE (ARS)**

For recruitment to various institutes under ICAR, the ICAR has also an Agricultural Scientists Recruitment Board (ASRB). The ASRB headed by a Chairman conducts all India competitive examination Agricultural Research Service (ARS), to recruit posts in the ARS of Indian Council of Agricultural Research. Besides, ASRB also conducts National Eligibility Tests (NET) in different disciplines for candidates to make them eligible for various teaching, research and extension posts in different state universities. For admission into the agricultural universities recognized by ICAR, it also conducts an All India Entrance Examination for Agriculture (AIEEA).

**ICAR Awards:** To promote farming and to motivate the farming community in the country, ICAR has also constituted many awards which are given to farmers and scientists who have done exceptional in agriculture or allied fields. These awards include Choudhary Devi Lal Outstanding All-India Coordinated Research Project Award, Raffi Ahmed Kidwai Award, Fakhruddin Ali Ahmed Award for Tribal Areas, Hari Om Ashram Trust Award, Jawaharlal Nehru Award for outstanding doctoral thesis research,

Vasant Rao Naik Award, Lal Bahadur Shastri Young Scientist Award, Bharat Ratna Dr C Subramaniam Outstanding Teacher Award, Punjab Rao Deshmukh Woman Agricultural Scientist Award, Choudhary Charan Singh Award for Excellence in Journalism in Agricultural Research and Development, N.G. Ranga Farmer Award for Diversified Agriculture, Jagjivan Ram Kisan Puruskar, Swamy Sahajanand Saraswati Extension Scientist/ Worker Award, ICAR Award for Outstanding Multidisciplinary Team Research in Agriculture and Allied Sciences, National Krishi Vigyan Kendra Award, Dr Rajendra Prasad Puruskar for Technical Books in Hindi in The Field of Agriculture and Allied Sciences and Udayan Pandit Award for excellence in fruit growing.

Despite having attained too much, there should be no room for complacency. As ICAR has been in its tenth decade having upgraded itself from a national institute to an institute of international repute, there are still some areas where ICAR has to focus. India still needs outside support for meeting its domestic consumption of pulses and oilseeds. There is need to reduce dependence on imports, increase production of healthy foods and also increase production of pulses and oilseeds. Their production needs to be increased by research and increased cultivation. About 60 per cent of our requirement of oilseeds is imported. As such, we have to emphasize on developing new varieties of pulses and oilseeds and increase their area under cultivation to achieve self sufficiency in pulses and oilseeds.

Indian Council of Agricultural Research (ICAR) has contributed immensely in the progress of agriculture in the country during the last nine decades. Former Agriculture and Farmers' Welfare minister, Dr. Narendra Singh Tomar, in his address on ICAR foundation day had acknowledged that today India is surplus in food grains production due to the research contribution of the scientists and hard work of the farmers. As we celebrate 96th ICAR foundation day, it is time to celebrate its achievements as well as to critically analyze the threats like Climate change, Desertification, and Degradation of resources that are looming large over the agricultural sector in the country and to come forward with cutting edge technologies, appropriate strategies and actions to combat all these challenges.

(The writer is writes on agriculture and social issues)

# Cooperatives Building a Better Future for All

between different organisations and level of rural development. In fact, all developed countries are well organised and all developing countries are either not organised or poorly organised. Lack of appropriate organisations is one of the most serious hurdles on the pace and level of rural development in India. There is a need to design and launch appropriate organisations for the rural development in the country.

India has achieved self-sufficiency in the food grain production and milk production-the two important ingredients for the vegetarian diet. These two things have been achieved due to green revolution launched in the late sixties and white revolution launched in the early seventies. In 1950-51 the food grain production in the country was only 51 million tonnes which has increased to 329.6 million tonnes in 2022-23. Now India has emerged as the leading milk producer in the world leaving behind the United States of America. Now the per capita availability of food grains in our country is 514 gnn per day. Currently the milk production in our country has increased to 230.58 million tonnes. Presently the per capita availability of milk in India is 459 ml/day. Per hectare yield rates of the major crops have also reasonably increased. Rapid urbanisation, change in food habits from consumption of food grains to milk and milk products, fruits and vegetables are new challenges to the Indian agriculture. Although India has made an impressive progress in the food grain production and milk production, the achievements in the poverty eradication and improving the life expectancy have been dismal. . It has been observed that development in India is both encouraging and discouraging and there is need to enhance both. So, it is necessary to identify the determinants of development and implement them to achieve the desired level development.

There are many organizations which are working in agriculture and rural development in our country. They include public, compa-

nies, co-operatives, partnerships ,charitable societies, trusts, institutions etc. All these organisations work together to cater the needs of the rural people. Rural development should be considered as the joint venture of public, private, co-operative, corporate. A systematic and balance approach is needed for the development of rural India. Although government makes efforts for the development of the rural development but government alone cannot solve all the rural problems. Co-operatives, voluntary organisations, corporations and private all can play their role for the rural development by complementing the activities of the government. The role of government should be to define the role of other agencies, coordinate and regulate their activities and provide certain facilities and services which are not provided by the other agencies. It is necessary that rural people should be organised within an institutional structure that gives them access to the national, political, economic and social system. In our country, co-operatives are the most commonly found form of people's organisations.

Co-operation has been stressed in all the religions of the world. Co-operation is manifest in countless social activities performed by the man for attaining the common goal. A co-operative is generally observed as socio-economic organisation that can fulfil both social and economic objectives of its members. A co-operative has certain values and principles of its own which distinguish it from other organisations.

Economic, social and moral are three dimensions of co-operatives. The motto of co-operation, "Each for all and all for each", signifies loyalty, trust and faith. A co-operative is democratic institution of the members, for the members and by the members. Co-operatives have more advantage as compared to the other forms of organisations in involving the people, in mobilising the resources and power for achieving the goals, in developing the local leaders by the democratic process, marketing

etc. All these advantages help co-operatives in improving their competitive position. Even Gandhiji considered co-operation as a great instrument for the rural development. He suggested the specific roles of co-operatives in the agricultural sector and promoted the co-operative farming and thereby suggested for further fragmentation of land holdings. He suggested the weavers and spinners co-operatives, credit co-operatives and dairy co-operatives. Pt. Jawahar Lal Nehru, the first Prime Minister of India had a strong favour of co-operatives. Sardar Vallabhai Patel, the first Deputy Prime Minister and Home Minister of India, had a great faith in co-operation as a means of promoting farmers well-being. He guided and assisted for the Kheda District Co-operative Milk Producers Union Limited popularly known as Amul.

Co-operatives occupy an important position in India's rural economy. India has the largest network of co-operatives in the world. Co-operatives now cover around 98 per cent of India's villages and 67 per cent of rural population, nearly 49 per cent of the rural credit, 60 per cent of total sugar produced and 35 per cent of total fertilizers distributed in the country.

The Indian Farmers Fertilizers Co-operative (IFFCO) and the Krishak Bharati Co-operative (KRIBHCO) are the two co-operative fertilizers plants which manufacture about 21 per cent of the total fertilizers produced in the country. The Anand dairy co-operatives are considered to be the most successful in serving their members and society on large scale.

Co-operatives that are owned and controlled by their members and properly managed can ensure the good quality products at a reasonable price to the consumer. Thus, they help to improve the welfare of both the producers and consumers as has been demonstrated by Anand - pattern dairy co-operatives.

(The writer is Chief Scientist & Head, KVK Reasi, SKUAST-J)

# Encourage kids to doodle and paint to enhance creativity

and observation skills. In primary classes, students do not have knowledge of letters, so they learn to recognize the names of things only through the medium of pictures.

The School Education Board includes geometrical drawing, model drawing or object drawing, imaginative drawing, shape line drawing, letter writing, poster drawing, design, collage making, stenciling, and scales in the drawing curriculum. The curriculum fosters students' imagination, power, and self-expression, enhancing their skills, abilities, and creativity over time. It also serves as a foundation stone for students who will pursue careers in engineering, architecture, draftsmanship, and interior design in the future.

Pictures are easier to remember in our minds than words. Because of this, things that are difficult to remember are remembered more effectively by making images than by making notes. According to University of Waterloo researchers, this technique may benefit children, teens, and the elderly.

While the drawing subject strengthens the students physically, it also connects them with

nature. In primary classes, they feel at one with nature by drawing pictures of beautiful natural scenes such as birds, animals, flowers, and trees. Such feelings also motivate them not to cut down trees and save the polluted environment. In this way, they become sensitive and responsible human beings who think, understand, and feel in the world rather than mere materialistic human beings.

Drawing also plays a special role in learning and understanding other subjects. It makes difficult and boring subjects intriguing and easy to read. Drawings aid in creating images and pictures of various subjects in the field of science, such as flowers, leaves, plants, human organs, digestive systems, and chemistry experiments. Drawing is the only method in social education that allows for the creation of maps, pictures, and graphs. Drawing subjects that teach beautiful penmanship and calligraphy enhance exam marks by bringing beauty to penmanship in all languages. Today's syllabus also allocates separate marks for beautiful writing. Other subjects are incomplete without drawing in the true sense. Schools have long neglected and under-

valued drawing in comparison to other subjects. Currently, there is a pressing need to recruit qualified drawing teachers to fill the vacant posts in the drawing subject, thereby enhancing the future prospects of students.

Many parents think the only appropriate ways to respond to a child's artwork are with compliments or by asking them to tell them what the art is.

My daughter, Gurleen Flora, also loves the art; she's in grade 10. I support and foster her creative spark. Additionally, I encourage her to embrace her creativity by finding inspiration in various sources, such as music, literature, art, or her own life experiences. I enthusiastically share my preferences with her. I am genuinely enthusiastic about art and its creative process. I eagerly ask her to explain the piece. I asked her about her experience making it. I ask about her choice of hue or medium, the emotions her work evokes, and the impact she hopes it has on others. Here are some of Gurleen Flora my daughter's recent drawings.

(The writer is a veteran journalist and freelance writer based in Brampton)

