ASCI
Agriculture Skill Council of India

ENVIRONMENTAL SCAN 2019

MIND THE GAP

WHAT IS E-SCAN?

The environmental scan is a dynamic document which captures & analyses latest industry intelligence to provide insights about the emerging factors affecting workforce development & how training system responds to it. It identifies existing & emerging skill gaps & training requirements. It also provides real time advice regarding workforce needs & priorities and guides in bridging gaps.

NEED OF E-SCAN?

The scan operates as an early warning system topotentially significant issues and helps in setting the agendas and priorities. Also, it directs in allocation of funding and establishment of QPs & NOS.

Practical implications of E-Scan

It helps policy makers to take decision on Skill development in this sector. It will facilitate Sector Skill council deliberations on future direction setting and broader promotional activities.

KEY BENEFICIARIES OF E-SCAN

- Policy makers
- Agriculture based industries
- Training providers

ENVIRONMENTAL SCAN

2019

MIND THE GAP

Agriculture Skill Council of India

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INTRODUCTION AND KEY MESSAGES FROM THE CHAIR

Mr. Sanjeev Asthana
Chairman
Agriculture Skill Council of India

INTRODUCTION AND KEY MESSAGES FROM THE CHAIR

MESSAGE

Indian Agriculture sector is facing two unprecedented challenges. Firstly, we need to exponentially raise productivity levels through less inputs and also to share our knowledge, policies with millions of small farmers so that they achieve sustainability. Our industry is set to afford India a remarkable level of economic growth and food security in a world struggling to feed itself.

This is the primary year's environmental scan which addresses on different qualities and shortcomings at global and household levels in Agriculture industry covering over the esteem chains in a wide range. It is a test that will require an essential re-considering our current preparing framework, its degree and reason, venture models and administrations – change that won't be accomplished by tinkering at the edges of existing arrangement.

2050 is the frequently cited year we will achieve 'top humankind' - a total populace of about 9.1 billion that will request a 70% for every penny increment of nourishment, bolster and fiber yield. 2030 is presently viewed as the due date by while existing nourishment creation levels must increment by 50% for each penny from a direction of decreasing assets ... less water, less arable land, less supplements, lessening non-renewable energy sources, and a more flighty and hotter atmosphere. Any of these issues in separation requires extraordinary change to the way we get things done, yet together and against a scenery of lessening carbon emanations we are as a few analysts have brought up, quickly heading into 'the ideal tempest of deficiencies'.

Agribusiness supply chains are currently immovably in the period where customer orientation and social obligation are the superseding main thrusts. Once commanded by makers, worldwide grocery store chains now use prompt and intense ability to source products around the world, making rivalry between providers wild and delisting a persistent danger. Coordinated effort of the inventory network to 'co-develop' new items is currently observed as the main superior procedure for economical upper hand. It's reasonable from our discussions around the nation and over the parts that our kin see maintainability and the occasions falling from that test as extraordinary. Quantum shifts required in innovation, science, our practices, how we cooperate, and most particularly the abilities of our kin, are beginning to be viewed as tantamount to the immense modern and horticultural upsets.

Our framework's total concentrate on boosting the achievement of full capabilities is inconsistent with the horticulture and unified sub-culture, where learning is formative, socially implanted and happens over a lifetime. Preparing in disconnection, may not work. Another approach that utilizations preparing to drive the dissemination of research discoveries, new practice and advancement into the workforce is required. One that assembles venture capacity and comprehension of abilities use,

vocation ways and significant employment outline; and grasps the key segments of viable workforce advancement under one framework and one lucid strategy.

Supportability of a talented workforce will require a continuous concentrate on building the ability of individual endeavors. We should perceive the profound association of co-found ventures inside the districts and that lone through coordinated effort and shared hazard will we have the capacity to develop and hold strong skilled labor pools.

Expertise inside neighborhood governments and shires and their separate business groups must be bolstered through very much organized middle people in the event that we are to drive gross roots solutions for fascination and maintenance – an approach we know works following the mind-boggling support produced by our 2016 employment summits through MSDE.

Inability to act won't just turn into an issue of aptitudes shortage, it will leave our industry and our country all inclusive uncovered both monetarily and climatically. Two issues specifically speak to ranges where earnest activity is required:

1. Change of current strategy settings to empower conveyance of incremental 'building squares' of abilities and where proper, full capabilities. At exactly that point will the framework have the capacity to help the level of up skilling and developing of learning now required over the whole farming workforce.

2. Change of people in general financing model for preparing. The financing model needs to help benefits along the length of the aptitudes and workforce improvement continuum, and be prepared to do successfully adjusting rustic and provincial India.

ASCI is plainly in a remarkable period. Its test won't be met by industry, the preparation framework or governments in disconnection. The appropriate response lies in solid industry authority, collaboration with and crosswise over governments and a national arrangement structure which perceives the centrality of our districts.

Agriculture Skill Council of India will keep on advocating the requirement for a Regional Agriculture Skills and Workforce Development Strategy to recognize the boundaries and answers for manageable development of our workforce, and as a methods for giving guidance to the some well-meaning however unique projects and activities that work in this space.

Overview of Agriculture & Allied Sectors in Indian Economy

Agriculture is the main driving force of Indian Economy and is the primary source of livelihood for 58% of India's population. In past years, the hardworking farmers supported by government initiatives have produced agricultural commodities in record quantities. In FY18, the gross value added by agriculture, forestry and fishing is estimated at Rs. 18.53 trillion (18.53 lakh crores).

India, the resource rich country is the 10th largest arable land resources in the world. 15 major climates in the world exists in India with 20 agro - climatic regions. Also, India is home to 46 out of 60 soil types in the world. India stands first in production and is among 15 leading exporters of agricultural products in the world. Agricultural exports reached US $ 38.21 billion (3821 crores) in FY18 and US $ 34.31 billion (3431 crores) during April 2018- February 2019. The agricultural export policy 2018 aims to increase exports to US $ 60 billion (6000 crores) by 2022. India is 10th largest exporter of agricultural products as per WTO trade data 2016.

The Indian agricultural sector is expected to generate better momentum in upcoming years due to Government Initiatives & Investments in the sector.

Agriculture Machinery & Agricultural services segments have together attracted a foreign direct investment (FDI) equity inflow of US $ 91.62. million (9.16 crores) in the year 2016-2017 as per Government of India records.

» Budget Allocation

Budget allocation to agricultural sector has seen a raise of 144%, i.e. from 56700 crores in the 2018-19 budget to 140764 crores in the current budget. Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) is launched to guarantee income support to the vulnerable farmers (with cultivable land up to 2 hectares) of the country at a rate of Rs 6000 per year. Around 120 million (12 crore) farmers will avail benefit from this programme. The crop loan to farmers increased to Rs. 11.68 lakh crores in the year 2018-2019. Also the allocation to Rashtriya Gokul Mission has been increased. To enhance the production of cows and for the genetic upgradation of cow resources, setting up of 'Rashtriya Kamdhenu Aayog' has been proposed.

India being the second largest fish producing nation in the world accounts for 6.3% of global production. To pay more attention to the fisheries sector, which provide livelihood to 1.45 crore people, a separate 'Department of Fisheries' has been created within the newly created Ministry of Fisheries, Animal Husbandry & Dariying. Farmers pursuing livelihood in Animal husbandry & fisheries & availing loan under KCC scheme has been offered 2% interest subvention & 3% interest subvention on timely repayment.

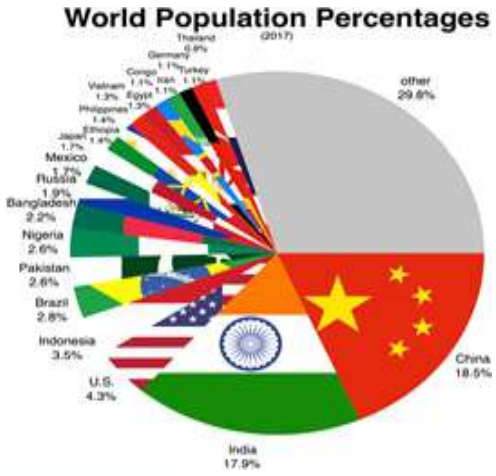
SECTION-1
LATEST INDUSTRY INTELLIGENCE

Section 1 - Latest Industry Intelligence
Macro Environment

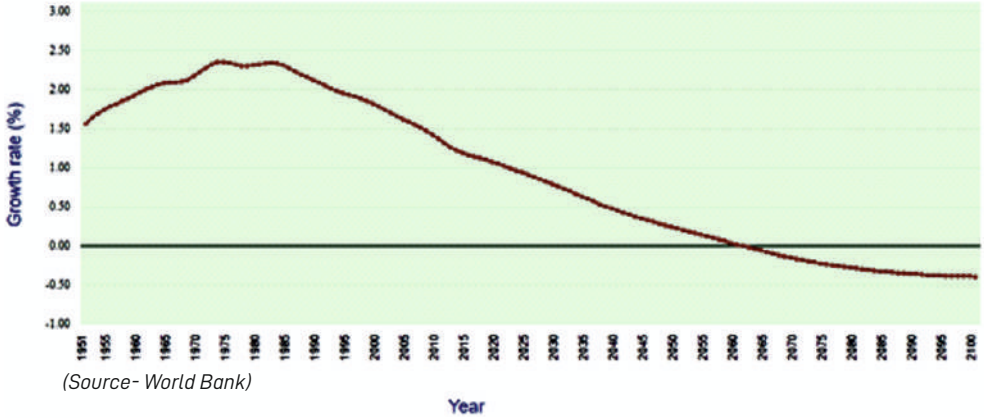
'Broad factors and emerging trends beyond agriculture and which sit at an international and national level. Impact may be direct or indirect but will have a bearing on the skills and workforce development needs of the industry'.

» Population Wave

World population has exceeded 7.71 billion in February 2019 & continues its growth at an alarming rate. India being the second populous country in the world holds a population of 1.36 billion accounting 17.9% of world's population. Only 2.4% of the world's land area is occupied by India. The growth rate of India is more than China. It is predicted that India will surpass China in the upcoming years. Ironically, India is the first country to adopt Family planning way back in 1952. Population of India has increased 3.35 times since Independence. India holds a population density of 455 people per sq.km. Uttar Pradesh & Sikkim are the most & least populous states in India respectively. Population outburst can create intense crisis like climate change, shortage of food, severe energy emergency etc. It can result in fierce competition between states, communities & even families for nation's limited resources. A Country's person will be an asset for the economic development of the nation, if he is enabled to sustain his livelihood. Increasing population is leading to the fragmentation of land holdings which ultimately results in lowering of soil productivity. Eminent agricultural scientist M.S Swaminathan warned that 'the situation is deteriorating rapidly & entire farming sector is heading for a total collapse if no rapid remedial measures are taken'.



Population growth rate of India



(Source- World Bank)

Economy

The driving force:

India is one of the fastest growing economies in the world. In the year 2018-19, the GDP of India reached 7.3%. Labour forces in India is expected to touch 160-170 M in the year 2020 as per the study by ASSOCHAM. Due to the increase in the rate of population there has been proportional increase in the labour and higher education enrolment. India's gross domestic product (GDP) is expected to reach US$ 6 trillion by FY27 and achieve upper-middle income status on the back of digitization, globalization, favourable demographics, and reforms.

India's revenue receipts are estimated to touch Rs 28-30 trillion (US$ 385-412 billion) by 2019, owing to Government's measures to strengthen infrastructure and reforms like demonetization and Goods and Services Tax (GST). India is also focusing on renewable sources to generate energy. It is planning to achieve 40 per cent of its energy from non-fossil sources by 2030 which is currently 30 per cent and also have plans to increase its renewable energy capacity from to 175 GW by 2022. India is expected to be the third largest consumer economy as its consumption may triple to US$ 4 trillion by 2025, owing to shift in consumer behaviour and expenditure pattern, according to a Boston Consulting Group (BCG) report; and is estimated to surpass USA to become the second largest economy in terms of purchasing power parity (PPP) by the year 2040, according to a report by Price water house Coopers.

Rise in Per Capita Income

Per capita income is primitive indicator of a country's prosperity. India's per capita income has reported a rise of 10% to Rs.10534 per month during FY 2018-19 as per the data of Ministry of Statistics & Programme Implementation. The monthly per capita income was Rs 9580 in 2017-18. Gross National Income raised 11.3% from Rs 169.10 lakh crore in 2017-18 to Rs. 188.17 lakh crore in 2018-19. As per IMF world economic outlook, India ranks 145th among 192 countries in terms of per capita income. Raise in per capita income increases the buying power of consumers which has ultimately resulted in greater demand for quality agricultural products. As consumers are becoming aware of options availing, they can go for diet diversification.

Climatic Variability

The increasing climatic variations in the different parts of India is taking a toll on the agricultural production since decades and it is the need of the hour for India to take necessary mitigation strategies to cope up with the change in order to save the future of the nation. The agricultural systems are facing perilous situations due to the extreme variability in different states adversely affecting the crop production, challenging the risk management strategies and ultimately increasing the food security concerns. In the past decade India has been adversely affected by droughts in districts of Maharashtra, floods in Kerala and cyclones in Odisha and West Bengal. But it stood robust with then implemented mitigation strategies of the government to keep the toll to a minimum. According to a report released by the World Bank for South Asia, India will lose 2.8% of its GDP by 2050 with 1-2% increase in the temperature.

India ranks 14th on the global climatic risk index and third on the global carbon emissions with a contribution of 6.3 % in 2018. A study by the IMF, (2017) finds that for emerging market economies a 1 degree Celsius increase in temperature would reduce agricultural growth by 1.7 percent, and a 100 millimetres reduction in rain would reduce growth by 0.35 percent. An increase in average temperature, a decline in average rainfall and an increase in the number of dry-days are the climatic factors which are reported to have huge impact on farm performance.

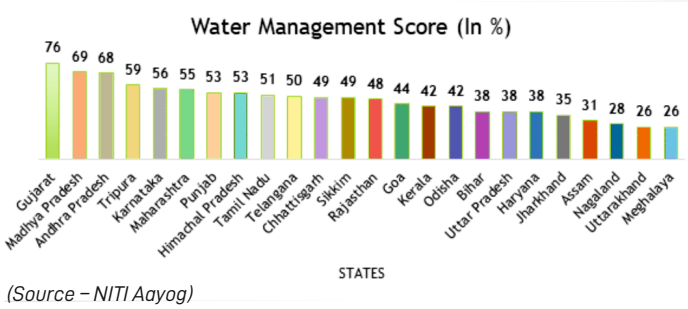
The Climate Smart Agriculture is an approach for transforming and reorienting agricultural production systems and food value chains so that they support sustainable development and can ensure food security under climate change. It is an innovative approach for charting development pathways that can make the agriculture sectors more productive and sustainable and better able to contribute to climate change adaptation and mitigation. It pertains to implementing certain agricultural practices like minimum tillage, different methods of crop establishment, nutrient and irrigation management and residue incorporation etc. in the fields.

» Water Scarcity

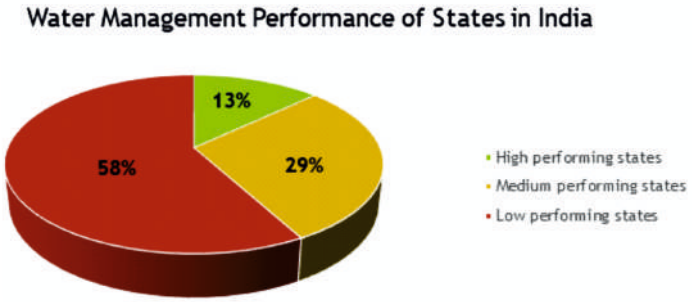
Every drop counts:

Water scarcity has a huge impact on food production. Without water people do not have a means of watering their crops and, therefore, to provide food for the fast-growing population. According to the International water Management Institute, agriculture, which accounts for about 70% of global water withdrawals is constantly competing with domestic, industrial and environmental uses for a scarce water supply. Agriculture utilizes 86% of the available groundwater.

The reservoirs and groundwater are the main sources for refurbishing water depletion. The effects of this scarcity will deprive 40% of Indians from access to pure and drinking water by 2030. At present 600 million Indians are facing water stress. The situation will worsen for water availability by 2050 as the demand for water will increase. This situation can only be dealt with specific measures and water management strategies that needs to framed by the government in order to meet this need.



(Source – NITI Aayog)



The CWMI of NITI Aayog is the first step towards strategic water management practices, by gathering information at the state level water resources pertaining to the laws of groundwater exploitation. The index aims to enable data-backed water management practices in the states and measure their performance by a benchmark on their water saving capacity at different levels. The 2017 irrigation statistics shows total area under irrigation to be 64.7 million ha. Irrigation techniques have undergone evolution in the past decade with drip, sprinkler and micro irrigation on the rise.

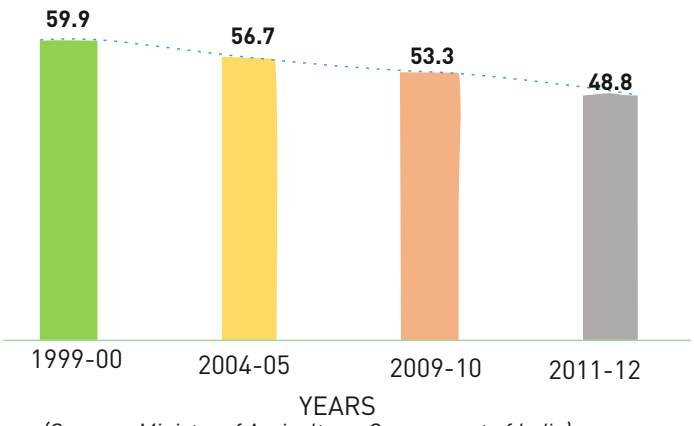
Water scarcity being a major concern demands reduction in wasteful irrigation and adoption of more judicious and efficient irrigation systems. The farmer-water school initiative under the Uttar Pradesh Water restructuring Project (UPWRSP) aims to increase the tactical and strategic approach of farmers towards efficient water management due to groundwater depletion. The water supply in India is going to be a serious challenge due to the growing population which is likely to increase to 1.66 billion by 2050.

Exodus Effect

Exodus effect in Indian agriculture sector is a critical determinant in the shaping government policies. Migration towards urban centres is an increasing phenomenon in India. By 2050 as per estimations, half of the Indian population will be residing in urban areas. It has been observed that as economies progress and move towards development, workforce tends to move away from the primary sectors. Management of urban expansion will be crucial factor for ensuring agricultural growth & food security in future.

Agricultural workforce in India has decreased by around 30.57 million between 2004-05 & 2011-12 but in contrast total workforce has shown an increasing trend. Indian farmers are convinced with fact that urban centres are hub for better education, health & employment avenues. High remuneration & opportunities in other alternative sectors, Seasonality of agricultural work are driving forces of reduction in agricultural workforce. MNREGA, the employment guarantee act which assures employment of 100 days in a financial year is reported to have less tedious & lesser time work compared to the agricultural work. Hence labours choose MNREGA work over agricultural work.

Share of Agri-Labour force in total workforce in India



(Source - Ministry of Agriculture, Government of India)

Gender Sensitisation

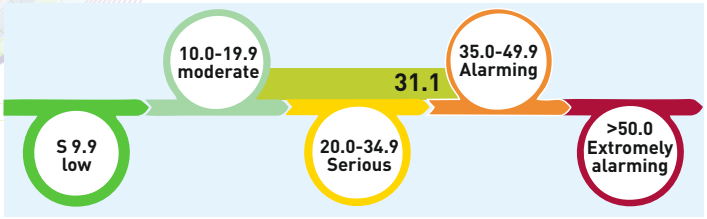
Women constitute 42% of the agriculture labour force in India but own less than 2% of the agriculture land as per recent statistics released by University of Maryland & National Council of Applied Economic Research. Work done by women in agriculture remains invisible. Gender pay gap & stereotyping of job roles are main issues affecting women agriculture workforce. The gender pay gap in India is 34%. Women farmers are deprived of credit facilities, insurance & other benefits because of lack of land ownership. Bridging this gender gap is essential to catalyse the growth of agriculture sector. Almost 78% of women farmers face gender discrimination.

As per FAO 2011 report, if women get access to the same resources as men, then agricultural productivity of each farmland can be increased by 20-30%. This can increase the agricultural output of developing countries by 4% which ultimately can fulfil the hunger of 100-150 million people. In Indian agriculture, the roles of women is getting redefined due to the migration of men to the urban centres in search of better remuneration. This has resulted in increase of women workforce in India in recent decades. Women farmers should be acknowledged by empowering them through adequate training & removing biased perceptions of women's roles.

Malnutrition

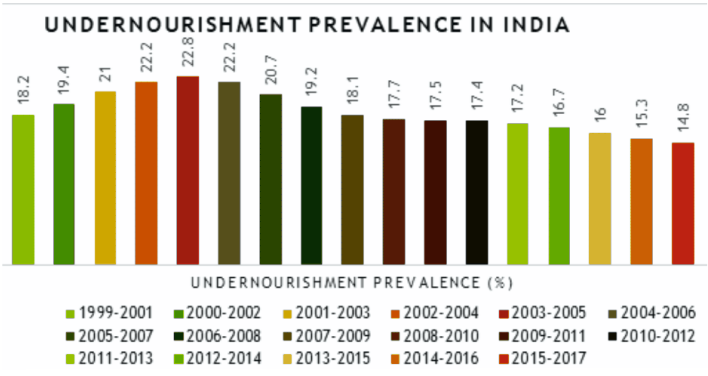
A Silent Epidemic:

Malnutrition is a silent emergency in India which needs to be addressed priorly. India remains as nutritional weakling with nearly 195 million undernourished people in spite of the economic developments. India is a home to 46.6 million stunted children, a third of world's total & 25.5 million wasted children according to the global nutrition report 2018. Also, India is a home to over 1 million overweight children. It ranks 103rd among 119qualifying countries with an alarming score of 31.1 on global hunger index 2018. The South-East Asian countries are at a serious threat of facing the issue of triple burden, comprising of malnutrition, undernutrition and micronutrient deficiencies. Hunger is not a social issue but a political issue indeed, which need to be addressed immediately.



(Source- Global Hunger Index)

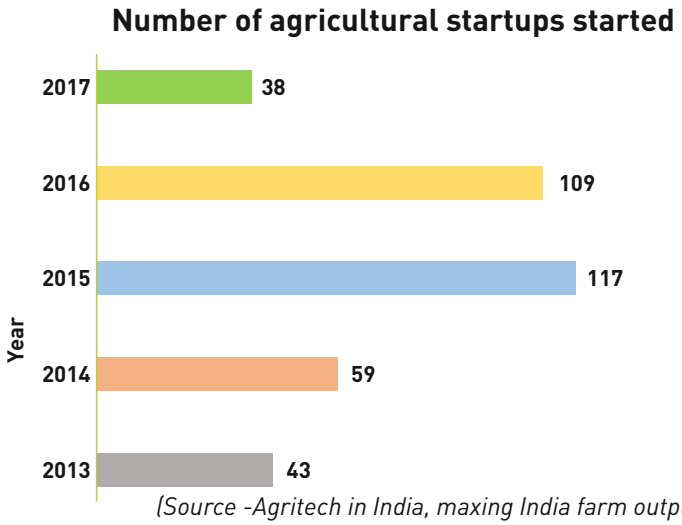
Malnutrition is not just due inaccessibility of the food but also because of undiversified diets. 'India's focus needs to shift from food security to nutrition security'- are the words of renowned geneticist M.S Swaminathan. Good public nutrition can be ensured through raising agricultural productivity. Farm production diversification is highly correlated with dietary diversification which can ultimately help in combating the malnutrition. Immense capacity building is required to address India's war on malnutrition. Government initiatives like National Food Security Mission, National Nutrition Mission, Integrated Child Development Scheme, Mid-day meal schemes are in progress to ensure food security in India. One of the strategic frameworks of FAO, the Monitoring and Analysing food and agricultural policy (MAFAP) which is implemented in India tends to support the government in modifying its efforts in the agricultural domain, emphasizing more on the productivity and small farm holdings. Through the National Institution for Transforming India (NITI Aayog), India is planning to join the MAFAP II for monitoring and Analysis of domestic, agricultural and food policies.



Agricultural Startups

The Indian agricultural sector is plagued by plethora of challenges which entails the need of innovations in the sector. India is self-sufficient in many commodities & has a significant international presence in production of many commodities but still productivity is comparatively low. As per ICAR estimates the demand for food grains by 2030 will be 345 million tonnes. Along with the challenging factors like increasing population growth, Smaller land holding, inadequate infrastructure etc. the performance pressure on the farms is increasing considerably. It underpins the need of innovations in agricultural sector. Agri- start-ups which has huge potential for innovation, investment & impact can provide a meaningful solution for this crisis.

India is one among top 5 countries in number of start-ups in the world. The World Bank 2019 report has ranked India among the top ten improvers for two consecutive years in the ease of doing business. Government of India is planning to reorient the agribusiness sector by introducing the 'Ease of Doing Agribusiness index'. From 2013 to 2017, a total 366 Agri start-ups have come up in India. 90% of funding is focused on seed stage & early stage start-ups is noteworthy. Number of start-ups in India is projected to raise to 11500 by 2020 with large number of job opportunities. Major focus areas of the Agri start-ups in India are Supply chain, Infrastructure development, Finance - related solutions, Farm data analytics & Information platforms. Rise in number of Agri – start-ups underpins the need for the human capital with knowledge & skills in the innovation.



(Source -Agritech in India, maxing India farm output, June 2018, NASSCOM and PwC analysis)

» Research & Development

Enhancing agricultural productivity in those areas of the world which by passed the Green Revolution will require new approaches that provide incentives and funding mechanisms that promote the translation of new innovations in plant science into concrete benefits for poor farmers. Through better dialogue, plant breeders and laboratory scientists from both the public and private-sectors need to find solutions for the key constraints to crop production, many of which centre around abiotic and biotic stresses.

Genetics and Breeding: The revolution in plant genomics has opened up new perspectives and opportunities for plant breeders who can now apply molecular markers to assess and enhance diversity in their germ-plasm collections, to introgress valuable traits from new sources, and to identify genes that control key traits.

Roadblocks Facing the Public-Sector Learning to think like the Private Sector Technically, GM: For all these issues, there could be no better mentor than the scientists of the private sector who deal with these issues on a routine basis. One way to foster such mentoring would be to engage the interest of the Private Sector Committee for CGIAR, the mission of which is to foster better interactions between private-sector science and that conducted in the CGIAR system.

Micro Factors

'Factors and emerging trends relating directly to agriculture within India and which have a direct bearing on the skills and workforce development needs of the industry'.

Digitisation

The need of the hour is of skill enhancements in digital and technological aspects as the employment opportunities in near future will be more skill intensive. The last decade witnessed rise of entrepreneurship in agritech from Artificial Intelligence to Autonomous tractors. Digital literacy in India is merely around 6.5%. Due to extreme climatic distress about 50% of farmer's queries in India are pertaining to weather related information. In addition, Agriculture is an intense databased occupation. Information and Communication Technologies (ICTs) will play a key role in knowledge exchange, targeted recommendations, market integration and access to finance to make agriculture a profitable enterprise and attractive for youth. The provision of precise information regarding soil moisture and nutrient content, climatic variability, timing of agricultural operations of sowing, planting, harvesting will prove beneficial through adequately driven and professionally managed system.

As, 94% of farmers in India depend upon 'fellow farmers' as the preferred source of information, followed by 10% on agro retailers, 4% of TV/Radio and only 3% on agro-extension officers. Audio-Visual aids like Radio & Television reach only 150 million households of India. The rise of internet connectivity and cell phone usage in rural areas has laid a well-equipped platform for dissemination of advance technologies and information to farmers. In February 2019, the Indian internet user base crossed 500 million with 200 million from rural areas. Information dissemination through cell-phones will equip them with real time information.

Digital India envisions empowering citizens with e-access to government and related livelihood services. This project has 3 core components - digital infrastructure, digital services and digital literacy. Mobile phone is the preferred delivery medium under Digital India with focus on m-Governance and m-Services. Public – Private partnerships involving proven ICT led agriculture initiatives will also benefit Indian farmer's at large scale. The most trending & sought-after concept 'block chain technology' has potential to resolve the issues persistent in the Indian agriculture.

Block chain will offer transparency due to its decentralized attribute in supply chain management. The Indian government has to probe and acknowledge the significance of it before its full implementation in the agriculture sector and has to de-complex the concept to make it comprehendible to farmers. 'Ika', the digital commodity management platform along with the Coffee Board of India for easing the trading of agricultural commodities and reduce wastage and ensuring good returns to farmers has implemented Block Chain technology for commodity trading while ensuring timely payments to farmers.

Use of Artificial Intelligence

The World has always experienced a wave of scientific evolution which transforms the outlook of the nation's towards development, this time it is Artificial Intelligence that is driving the technological advancements in different sectors. Agriculture being the Primary industry has also caught up in this wind of change. Due to the arising problems of unavailability of labour, population explosion, food security concerns the need of Artificial Intelligence (AI) is indispensable. Indian agriculture domain has recently witnessed the inclusion of drones with AI for crop growth monitoring, predictive agriculture, automation technology for which the agri-machinery segment has attracted FDI equity flow worth 2.45 billion in the past decade.

Farm Mechanisation

Agriculture & allied sector in India has immense significance in the sustainable growth of economy. The sector has welcomed many technological advancements in past decades. Stagnant productivity per hectare & shortage of agriculture labour are the upcoming prime bottle necks in agriculture sector. Agricultural mechanisation is the appropriate answer to these challenges. Effective utilisation of farm machinery can help in improving productivity & timely undertaking of farm operations. Proper equipment can increase the productivity by 30% & reduce the cost by 20%. Degree of mechanisation visualised a slow progress during the period from mid-1970's to 2013-14 but gained momentum to reach 2.02 kW/ha by 2016-17. But mechanisation level in India has reached only 40-45% which is lower than countries like USA, Brazil & China. The farm mechanisation market value which was INR 320 billion in 2015-16 is estimated to reach INR 400 billion by 2019-20. India is the largest tractor market in the world. The sale of tractors & power tillers has shown a growth with CAGR of 6% during the period from 2005-06 to 2016-17.

The Government has launched Sub-mission on Agricultural Mechanisation (SMAM) to increase the machinery use among small & marginal farmers. The trending concept of custom hiring which works on value driven approach has potential to increase the mechanisation level in India. Custom hiring model or farm machinery banks has pivotal role in introducing new technology to the farmers. It is an evolving concept which can change mechanisation landscape of country but the lack of knowledge of operation remains as an obstacle to this achievement.

Rise in Agricultural Credit

Agriculture Credit is one of the major drivers fostering agricultural production and equitable growth in the country. A large number of institutional agencies like Co- operatives, Scheduled commercial banks, Regional rural banks, Non-banking financial institutions (NBFIs) etc. are involved in disbursement of credit to agriculture. Loans have been effective in creating productive assets in the agrarian society as well as their effective utilization. However, the persistence of money lenders is still matter of concern in the credit sector. Institutional credit has seen a tremendous increase in past decades. It has increased from Rs. 2659.74 billion in 2016-2017 to Rs. 2913.48 billion in 2017-2018. About 52% of the agricultural households in India are indebted. But the issue of inequity in disbursement remains a hurdle for the development of agriculture. Several measures are taken by government to increase the institutional flow to benefit the small & marginal farmers.

The Long-Term Rural Credit Fund by NABARD is the investment credit that catalyses capital formation going a long way in promoting agricultural production and productivity. NABARD is providing refinance facility to Cooperative Banks and RRBs out of this fund to enable them to provide agriculture term credit at concessional rate. Similarly, the Self-Help Group- Bank Linkage Model of NABARD supports the innovation leveraging on community structures and existing bank institutions. It gained momentum as a partnership model between SHGs, Banks and NGOs so as to achieve financial inclusion of undeserved section of the society. Also, there has been a surge in rural credit lending by microfinance institutions. Some of the microfinance institutions are specifically focused in lending credit for a particular segment. Government schemes are on rise focusing rural entrepreneurship, women empowerment and crop insurance. Through Pradhan Mantri Jan Dhan Yojna, the financial inclusion of Indian mass to access financial services is being ensured. The scheme is providing benefits like free cover insurance and easy transfer.

Towards Organic India

India is home to nearly 30% of organic growers in the world. As per world of organic agriculture 2018 report, organic cultivation area in India accounts merely 2.59% of the world with 9th position. The global organic market is growing at a CAGR of 16% much faster than the conventional product market of 10%. Poor policy measures & rising input costs make organic farmers struggle as per the study of ASSOCHAM & Ernest and young. Fear of decline in production & unavailability of organic inputs in market are discouraging farmers to switch to organic farming. Productivity on an average dips by 6.7% during first year as per ICAR reports. Government should support farmer at the period of transition. Tedious & cumbersome certification systems prevailed as an obstacle from availing better market opportunities by farmers. Central government has launched Paramparagat Krishi Vikas Yojana – free certification programme for organic farmers to address this issue.

The state of Sikkim has achieved a commendable status by converting its more than 76000 ha cultivable land under organic certification in the year 2016. The other emerging states in the Indian organic market being Madhya Pradesh, Maharashtra, Karnataka, Uttar Pradesh and Rajasthan. Sikkim is a promising state in the export scenario of organic produce and its exports are globally perceived to be of premium quality. The organic industry is anticipating to procure 55% of its produce in the near future. The country has exported 4.58 MT of organic produce in the year 2017-18. The major importers of Indian organic produce are USA, European Union, Canada, Switzerland, Australia, Israel, South Korea, Japan etc.

Agricultural Infrastructure

Food wastage issue remains as a hitch in India's effort to combat the hunger & poverty. As per FAO 2011 report, 45% of fruits & vegatables losses are due to inadequate infrastructure. Food supply chain losses is still very less addressed issue in India. Agriculture infrastructure like roads, markets, cold storage structures etc. has significant impact in raising farm productivity & reducing the farming costs. It helps in accelerating the agricultural development of the country. Agricultural infrastructure provides services which facilitates in production, procurement, processing, preservation & trade. Investments in agricultural infrastructure helps in lowering transportation costs & increases the farmer's access to markets. A major portion of agriculture produce is lost between farm gate & consumer because of the poor roads & inappropriate storage facilities as per World Bank study. Inadequate road connectivity limits the market access to the farmers & act as a hurdle in dissemination of technologies. On an average, farmers need to travel 12 kms to reach nearest mandi & more than 50 kms in North Eastern regions. Government has launched Golden quadrilateral project and Pradhan Mantri Gram Sadak Yojana (PMGSY) to improve the road connectivity in a view to reduce the agricultural wastage.

Agricultural supply chain in India is inefficient because of the heavy losses of commodities. 20% of the food grain produced annually are lost due to poor storage. According to Knight & Frank report, the total warehousing requirement is expected to grow at 9% CAGR during 2014 to 2019. Also, the lack of proper knowledge about maintenance of the premises act as a drawback for improvement of supply chain.

In India, 10-11% of fruits & vegetables produce only uses cold storage. Annual loss due to inadequate storage facility stood at $14 billion. Adequate cold chain infrastructure is immediate need of the decade. Cold chain industry is still at nascent stage in India. High share of single commodity storage, high initial investment, lack of awareness of handling perishable produce are acting as a snag to the development of cold chain. Cold chain infrastructure is the next big wave in the country which is going to play a pivotal role in meeting the demand of food.

Fragmentation

Fragmentation of agricultural land is a wide spread menace which has huge impact on farmers decision & farm performance. Number of farms in India has increased from 71 million in 1970-71 to 145 million in 2015-16. Average farm size has reduced considerably. More than 70% of the cultivated farm land is less than 1 ha. 86% of the farm land is owned by small & marginal farmers. National average land holding has reduced from 2.28 hectares to 1.08 hectares. Population outburst & Succession planning are the major factors which has led to the continuous subdivision of farmland.

Fragmentation has significant negative effect on the farm profit. It has led to the rise of more obstacles for farm performance like difficulty in machinery use, inability to adapt modern technologies, decline in soil fertility (due to continuous mono-cropping) & trouble in availing farm credit. Scattered agricultural production increases the transportation cost & reduces the producer's share in consumer rupee. It has also increased the involvement of family labour rather than the skilled workforce. Central government for supporting farmers with mere land size has launched PM Kissan Samman Nidhi which promises Rs 6000 per year per family with land size less than 2 ha. The complexity of identification of beneficiaries & non-beneficiaries without significant database is evolving as a hurdle for effective implementation of farm income support scheme. Fragmentation is a challenge for sustainable agricultural development.

Policy Drives

With advancements in technological measures and land reforms, the government looks forward to meet the need of population and development. The recent policies of Make in India and Skill India look forward to up-skill the Indian workforce through trainings and Recognition of Prior Learning programme.

Paramparagat Krishi Vikas Yojna
The government has launched Paramparagat Krishi Vikas Yojana in order to address the critical importance of soil and water for improving agricultural production. The government would support and improve the organic farming practices prevalent in India. Following cluster approach mode of farming, at least 50 farmers would form a group having 50 acres of land to implement organic farming. The government aims to cover 10,000 clusters and five lakh hectares of arable land under organic farming within three years.

e-NAM: National Agricultural Market is a pan-India electronic trading portal launched by Ministry of Agriculture & Farmers' Welfare, Govt of India, to facilitate farmers, traders, buyers, exporters and processors with a common platform for trading commodities.

Pradhan Mantri Fasal Beema Yojna: To ensure crop insurance at optimum premium. There will be a uniform premium of only 2% to be paid by farmers for all Kharif crops and 1.5% for all Rabi crops. In case of annual commercial and horticultural crops, the premium to be paid by farmers will be only 5%. The premium rates to be paid by farmers are very low and balance premium will be paid by the Government to provide full insured amount to the farmers against crop loss on account of natural calamities.

Soil Health Card Scheme: To promote the soil health status, the government issued soil cards to farmers which carry crop-wise recommendations of nutrients and fertilizers required for the individual farms to help farmers to improve productivity through judicious use of inputs.

Agriculture Export Policy 2018: Government of India targets to double the value of exports to $ 60 billion by 2022. A monitoring framework was established with commerce as the nodal department to monitor export-import market. This policy will be beneficial in diversifying the export basket & boost the agriculture exports. It is a step taken by government of India in vision of Doubling Farmer's Income.

E-Pashuhaat: It is a web portal launched by the Ministry of Agriculture and Farmers Welfare, Government of India, under the Department of Animal Husbandry, Dairying and Fisheries (DADF) to boost dairy productivity in India by organizing the livestock market. The portal allows farmers and entrepreneurs find information about bovine animals, buy or sell livestock, frozen semen and embryos.

Rashtriya Gokul Mission: With the aim to conserve and develop indigenous breeds in a scientific and holistic manner. This undertakes breed improvement programme for indigenous cattle breeds so as to improve the genetic makeup and increase the stock. It also aims to enhance milk production and productivity of indigenous bovines.

National Livestock Mission: It is designed to cover all the activities required to ensure quantitative and qualitative improvement in livestock production systems and capacity building of all stakeholders. The Mission will cover everything germane to improvement of livestock productivity and support projects and initiatives required for that purpose subject. This Mission is formulated with the objective of sustainable development of livestock sector, focusing on improving availability of quality feed and fodder.

Dairy Entrepreneurship Development Scheme: This aims to promote setting up of modern dairy farms for production of clean milk and to encourage heifer calf rearing, thereby conserving good breeding stock. It looks forward to bring structural changes in the unorganized sector so that initial processing of milk can be taken up at the village level itself. The objective of the scheme is to upgrade quality and generate self-employment.

National Dairy Plan: NDP is a scientifically planned multi-state initiative with the objectives of increasing productivity of milch animals and thereby increasing milk production to meet the rapidly growing demand for milk. NDP helps to provide rural milk producers with greater access to the organized milk-processing sector.

National Scheme on Welfare of Fishermen

Its objective is to provide financial assistance to fishers for construction of house, community hall for recreation and common working place and installation of tube-wells for drinking water and assistance during lean period through saving cum relief component.

100% FDI: In order to meet the food grain requirements of the country, the agricultural productivity and its growth needs to be sustained and further improved. The government too, is determined to rejuvenate the agriculture sector. India needs Foreign Capital that can boost Agricultural Sector in terms of productivity and capital formation. Moreover, foreign capital with latest technology and research would be an added advantage for agricultural sector. FDI up to 100% is permitted under the automatic route in activities such as development of seeds, animal husbandry, pisciculture, cultivation of vegetables and mushrooms etc. under controlled conditions and services related to agro and allied sectors. Recently, the government has been active in investing in agricultural infrastructure such as irrigational facilities, mechanized farming, and warehousing. The growing use of genetically modified crops will also improve the sector's contribution to GDP.

Rain fed areas development program:
Implemented under the flagship scheme of Rashtriya Krishi Vikas Yojana (RKVY), the program aims to improve the livelihood of small and marginal farmers by offering a complete package of practices. The program focuses on developing a sustainable approach to increase the productivity of farms by reducing risk of climatic disruption. Adoption of modern on-farm technologies and practices will generate employment opportunities.

Agricultural Contingency Plans: launched by Central Institute for Dryland Agriculture, the Agricultural Contingency Plans are specified technical plans designed for districts, to deal with various climatic anomalies. The program focuses on mitigating and averting the climatic deviations on different agricultural segments such as livestock, fisheries, dairy, horticulture, and poultry. These plans are uploaded on the farmer portal of Ministry of Agriculture and farmer's welfare for 614 districts.

Market Factors

» Attraction of New Generation Workers

According to 2011 census report, everyday 2000 farmers are giving up farming. The younger generation is hardly interested in agriculture. Many factors like low remuneration, physical hardship, outdated image of industry etc. make agriculture unattractive to the young & educated workforce. Migration to urban centres where agriculture is meagre also makes the youth unfamiliar to farming. Almost 40% of the population engaged in agriculture is illiterate and demands skilling. By 2020, the demand of workforce in agriculture will be 205 Million and most of the jobs will be skill based to keep in line with technological improvements. With supportive infrastructure and high levels of education, skill development of the agro-employed workforce can be achieved.
Governments should formulate necessary strategies to address the challenges faced by youth in agriculture. Attracting & Retaining Youth in Agriculture (ARYA) aims to attract the youth towards agriculture such that the workforce employed in agriculture is equally skilled and updated with the technological advancements. Blending rural youth with technology & inspiring them to be Agripreneurs can increase their contribution to agriculture sector.

- Promoting the contemporary business, science and innovation centered profession openings.
- Building reasonable, grass roots, locally based abilities eco-frameworks.
- Growing and advancing the assortment of pathways into the business.
- Identifying and advancing industry achievers, specialists and middle people.

» Diffusion of New Research Findings, Innovative Practice & Technologies

Indian agriculture sector will turn into more knowledge & skill intensive in the upcoming decade. Agriculture sector's research expenditure is significant as majority of the population depends on it as their livelihood. The total research & development expenditure in agriculture is stagnant since 2 decades & low compared to countries like US, China, Israel etc. Institutional research in India started way back in 1880s with the establishment of department of agriculture in each of the provinces.

All the research centres came under ICAR after India gained independence. Correspondingly the State agricultural universities (SAUs) took the responsibility of research & education at state level. Today, 27500 eminent scientists & 1 lakh supporting staffs are part of nation's agriculture research system.
The contribution of new technology or research to the economic growth can only be tracked when it is efficiently diffused. Dissemination, adoption & adaptation of a new knowledge or research finding at grass root level & equipping people with the skills to extract ideas from research is a challenge in India. Extension services/Training helps in bridging the gap between research centres & farmers/trainees and makes farmers familiar to the new innovative technologies.

» Adoption of Higher-level Skills Within Existing Workforce

Agriculture sector is witnessing new & evolving changes day by day. As the industry is getting transformed with new & advanced technologies, it is the prime need of employers & employees to evolve the skills to keep pace with change. If the evolution of skills is not in momentum with the change, then a massive gap develops between the demand & supply of the skills in the market. Upskilling of the existing workers is the need of the era. Employees are the ones who are supposed drive this initiative. Adoption of higher skills provides immense opportunity to the employees to retain their existing workforce. The cost of replacing an employee is also much higher. The ultimate challenge here is the identification of future needs of the sector. Effective & need identified training can only build effective skills in this modern century. Appropriation of higher aptitude levels over the workforce remains the absolute most basic methodology in addressing the difficulties which lie ahead and will include:

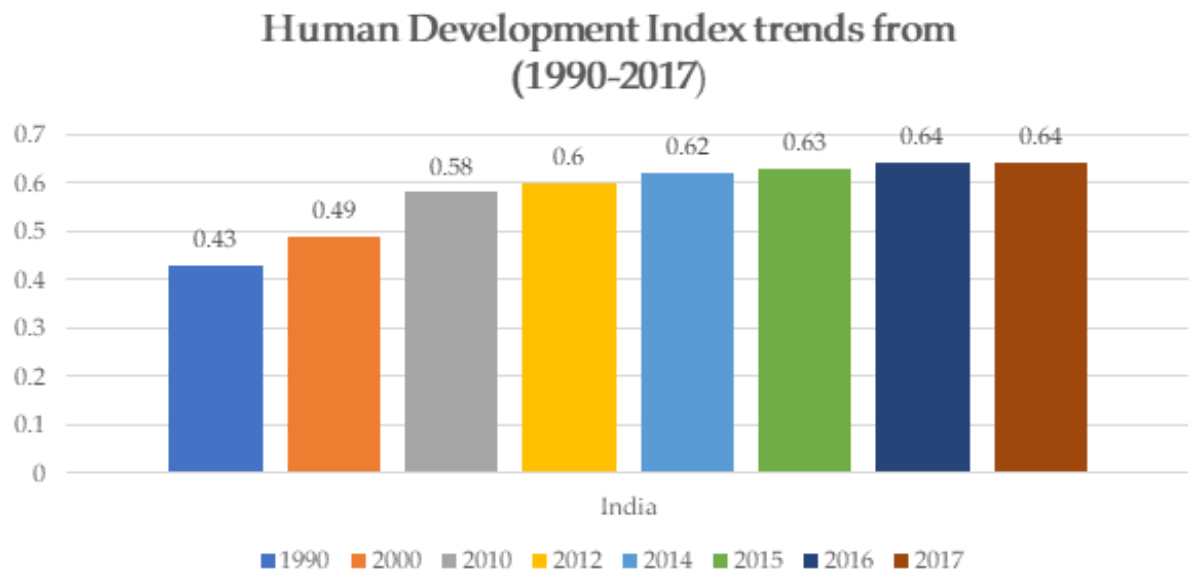
- Diffusing new and emerging abilities to the workforce through focused, constructing squares way to deal with conveyance.
- Increasing language, literacy, and numerical proficiency and core abilities of the workforce to enable them for the highly skilled jobs.

Retention & Skills Utilisation of Existing Workers

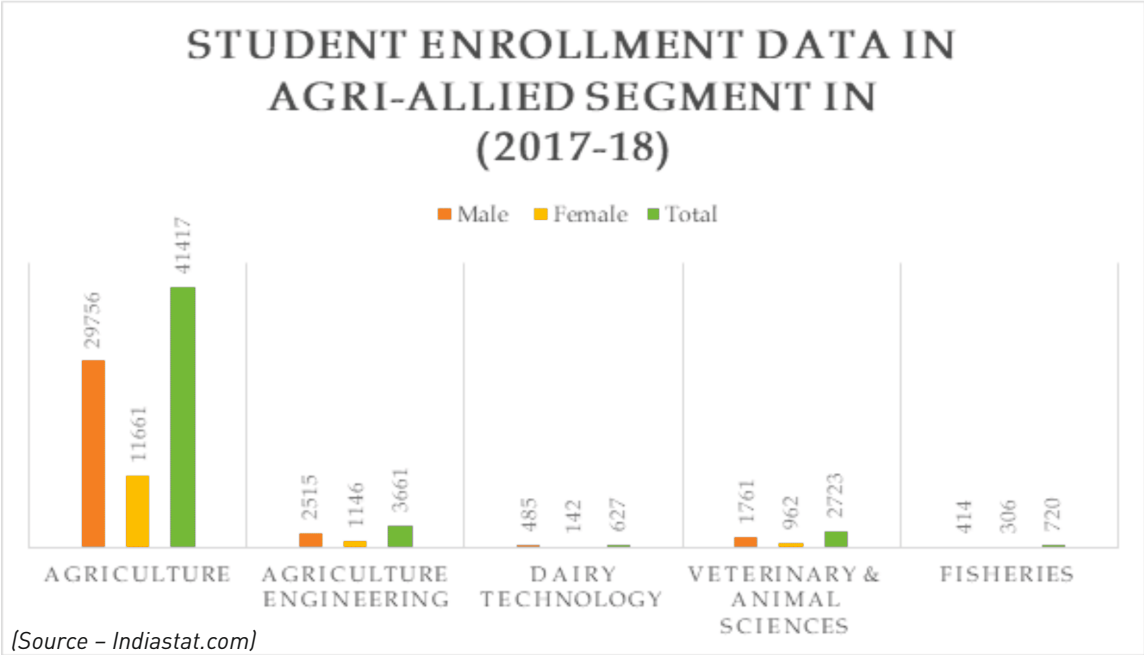
As an effective tool to underpin workforce retention, better utilisation of existing skills and re-engagement of workers in learning process, 'Recognition of prior learning' must be elevated. Recognition to prior learning is an initiative to acknowledge the skills learned through informal learning or through experience as formal levels of education. This scheme recognises the learning irrespective of its medium of achievement.

As per World Bank report, only 2.3% workforce in India received formal training. When compared to other countries like South Korea (96%), Japan (80%), Germany (75%), UK (68%) & China (40%), this percent of formally trained workforce in India is meagre. (Source- Indiastat.com).

By 2022, there will be demand of 109 million skilled workers as per the skill gap analysis done by government of India. Improving access to formal skills by recognition can be a transformative lever to the agriculture sector. It encourages the existing workers by validating their learning through informal setting. Also it can bring many indigenous technical knowledges & skills to the forefront. To transit India to a high skills equilibrium, it is crucial to exponentially increase the demand for skilling. A concerted focus on the recognition of informal learning can be first step in achieving this objective.



Distribution of Human Resource by Education Level



(Source – Indiastat.com)

SECTION-2
IDENTIFIED WORKFORCE DEVELOPMENT NEEDS

Agriculture Crop Production

Agriculture & allied sectors being the largest source of livelihood in India, supports 70% of its rural households with 82% of farmers being small and marginal. India's food grain production is showcasing an increasing trend. Food grain production in India is recorded as 281.37 million tonnes, as per second advance estimates in the year 2018-2019. India is the largest producer, consumer & importer of pulses in the world. Although, India is self-sufficient in grain production, the production is resource intensive, cereal centric and regionally biased. Rice production in India is going to record the highest in the 2018-19, as the production is estimated as 115.6 million tonnes according to second advance estimates. This segment consists of Job roles related to cultivation of field crops, Organic farming & its pest and nutrient management.

CHALLENGES

- Raising Agriculture as first destination for Job seekers
- Skilling of Casual, Contract & Seasonal workers and Multi-skilling to sustain full time employment
- Making cultivators adaptive to the new technologies
- Accurate understanding of current labour & skill trends in Agriculture
- Bringing change in the mind-set of people to adapt new, profitable cultivation practices

EMERGING SKILL NEEDS

- Skills required by organic farmers to cope up the conversion period losses
- Drought/Flood preparedness & mitigation
- Supply Chain Management & Logistics
- Integrated Farming Systems
- Integrated Pest & Nutrient Management
- Zero budget national farming & Organic farming
- Permaculture
- Good communication skills in interacting with multiple stakeholders

Production Horticulture

Production horticulture is a diverse industry involving growing & harvesting fruits and vegetables. It includes root and green vegetable production, spices production, herb growing, berry fruit growing, citrus growing, sun-drying fruit & grapes and vineyard operation. Production horticulture business produces fresh & dried fruits & vegetables for local markets, processing and exporting. The vast production base offers India tremendous opportunities for export. Horticulture accounts for 30% of India's agriculture GDP from 8.5% of cropped area. India witnessed a record production of horticulture crops during 2017-18. Horticulture production in 2017-18 was 275 million tonnes which is 1.5% higher than the previous year & about 7% higher than the average of previous 5 years. Production of fruits & plantation crops recorded an increase of 10% & 15% respectively in 2017-18 than the previous year. Horticulture production exceeded the grain production in India.

India stands first in production of Banana, Mango, Citrus fruits, Okra, Ginger & Cardamom. Also, India is the leading producer of plantation crops & second leading producer of fruits & vegetables. Although India's share in global market is nearly 1%, the demand for horticulture produce from India is showcasing an increasing trend. During 2017-18, India exported fruits and vegetables worth Rs. 9,410.81 crores which comprised of fruits worth Rs. 4,229.03 crores and vegetables worth Rs. 5181.78 crores. India's total export of floriculture was Rs. 507.31 crores in 2017-18. The use & awareness about medicinal plants in herbal medicine products & supplements has increased in India. This is underpinned by the emergence of large sized companies like Patanjali in the trade of herbal medicine.

CHALLENGES

- Dispelling horticulture sector's outdated image among the workforce.
- Developing clear career pathways within the industry
- Precise understanding of the demand.
- Highly fragmented Marketing/Supply chain
- Skilling & up skilling about value chain in farm gate & at wholesale level
- Building an understanding of consumer preferences in export countries
- Evolving Job roles with high technical skills
- Lack of knowledge about temperature sensitive products & improper handling.

EMERGING SKILL NEEDS

- Diversification to high value crops.
- Advanced crop management & Precision horticulture
- Protected production with technologies like hydroponics, Aquaponics, Aerogardens etc.
- Skills & Market knowledge for exporting products to emerging markets & global logistics
- Efficient handling of post-harvest infrastructure & curbing of post-harvest losses.
- Pollination management for horticultural crops
- Conventional & modern breeding approaches for quality improvement.

Amenity Horticulture

Amenity horticulture, the sector which has gained traction in the recent years is also described as 'gardening & landscaping'/'ornamental horticulture' or 'recreational horticulture'. Amenity horticulture in this era of globalization has found its way to cross industrial pathways. It encapsules segments like arboriculture, landscaping, parks & gardens, turf management, nursery management, interior landscaping & floriculture. Amenity horticulture has a crucial role to enact in the future management of environment. Landscaping is a field where architecture, art & horticulture is combined to fulfil the aesthetic needs of human. Urbanization is increasing at a fast pace to accommodate the growing population. This change in economy has evoked the need of open space, parks, garden for relaxation, recreation, peace of mind & unpolluted air which ultimately led to bio-aesthetic planning. Amenity horticulture which was earlier considered as an art & science, now emerged as a huge industry. This multi-faceted industry is generating huge employment opportunities and simultaneously promoting activities that would improve the environment.

CHALLENGES

- Promoting the image of industry as high valued industry
- Promoting Amenity horticulture as career choice
- Identifying the aspect of industry where skills are required
- Developing career pathways
- Gaining deep understanding of consumer preferences.
- Adoption of new technologies across workforce
- Building high performing workplaces & emerging as employers of choice

EMERGING SKILL NEEDS

- Flower & Foliage plant arrangement
- Turfing & Lawn management
- Horticultural Therapy
- Creation of Terrariums, Bottle gardens, Vertical gardens & Green buildings
- Bonsai cultivations & Aquascaping
- Skills to identify the suitable foliage, flowering plants, creepers etc. to deliver the best landscape architecture.
- Natural resource management – Bush regeneration, Sustainable management of land, water and vegetation.
- Post-harvest handling of flowers & foliage for decorations/arrangements
- Meeting organic requirements
- Development of wildlife garden & grounds

Post Harvest Supply Chain Management

Large losses in agriculture sector are incurred between farm to fork, i.e. during post-harvest supply chain management. When the pressure is building on the resources, the losses during supply chain has heavy impact in the economy. Hence it is a necessity to increase the handling efficiency and minimize post-harvest losses. India is the second leading producer of fruits & vegetables but still there exists a gap between the per capita demand & supply due to enormous post-harvest losses at the time of storage and handling due to inappropriate bagging, lack of temperature-controlled vehicles, unavailability of cold chain facilities etc. Approximately 18% of fruits & vegetables get wasted in the country. Supply chain management plays crucial role in keeping business costs minimum & profitability as high as possible. India can conquer the global food trade if only it has agile, adaptive, responsive & efficient supply chain. Demand estimation & technology applications such as cold chain logistic supply chains, Product tracking, tracing etc. are lacking in supply chains of India. Now, cold chain industry is emerging & fast-growing business sector in India. It can be next big wave provided continued government support & improvement in present physical infrastructure & technology is achieved.

CHALLENGES

- Lack of number of vocational & training institutes focused on cold chain logistics
- Upskilling the existing workforce to adapt to the modern technologies
- Meeting quarantine measures specified for the export products
- Building environmentally sustainable production systems
- Better management of crop residue, primary processing by-products and wastes in eco-friendly and economically rewarding model

EMERGING SKILL NEEDS

- Modernisation of existing stores
- Better & more sophiscated machinery & equipments
- Multipurpose cold storages rather than conventional single commodity storage
- Modern pack houses & packaging technology
- Ripening facilities
- Farm gate or source point cold storage
- Integrated cargo complexes at airports
- Logistics to supplement cold chain
- By-product management skills

Forestry / Agroforestry

India is ecologically blessed with an abundance of wild flora & fauna. The total green foot print of India is 802088 sq.km which is almost 24.39% geographical area of the country. India is showing an increasing trend in forest cover whereas global trend is decreasing. Indian state of forest report recorded 1% raise in the overall forest & tree cover in India between 2015 & 2017 despite of the resource pressures. Green foot print in north east region shrunked by 630 sq.km. India ranks 10th in the world with forest cover accounting 2.4% of world surface area & sustaining the needs of 17% of human and 18% of livestock population. Lakshadweep, Mizoram and Andaman & Nicobar Islands are estimated to have highest percentage of forest cover with respect to geographical area in India. Increasing trend of forest cover is contributed by various government policies like Green India Mission, National Agro-forestry policy, Joint forest management etc. More than 275 million Indians, i.e. majority of the nation's tribal, women & marginal farmers depend on non-timber forest produce for income.

CHALLENGES

- Equipping employees & employers with management skills & change management expertise.
- Attracting the skilled workforce to the sector
- Inadequate and diminishing forest cover
- Evolving job roles with newly adopted technologies
- Skilling of tribals and local people
- Highly unorganised sector

EMERGING SKILL NEEDS

- Forest parks
- Commercial, Social & Urban forestry
- Silviculture
- Good forestry practices
- Forest health management & conservation
- Forest fires mitigation and management training

Soil Health Management

The green revolution marked the transition from traditional agriculture to current system with heavy penetration of agricultural inputs. After the milestone production, over these years increasing pressure on limited agricultural land has resulted in overuse of chemical fertilisers, excessive tillage, jettisoning of age-old organic soil revival practices and lack of appropriate crop rotation. India ranks 3rd in world in fertiliser production but has a 2nd position in consumption. This has led to the degradation of soil fertility causing a deterioration in its productive capacity. Apart from this, natural factors like floods, volcanoes, earthquakes & human induced factors like deforestation, ill-management of industrial waste, overgrazing of cattle and urban expansion has lead reduction of fertile soil in India. Farmers appear convinced that there is a perfect correlation between high fertiliser usage and more output. In long term, more fertilisers is a panacea for productivity of land. Hence, soil health must be positioned as crucial for achieving long term higher productivity. Meeting growing food grain needs & nurturing soil health should be of equal concern. Judicious use of agro-chemicals & attaining balance between organic & chemical products are critical to India's food sustainability goals.

CHALLENGES

- Yield optimisation during soil conservation
- Skilling & Upskilling employees regarding new technologies
- Changing the priority of population to sustainable practice
- Upgradation of soil database
- Land degradation
- Low productivity due to excessive use of fertilizers

EMERGING SKILL NEEDS

- Soil solarisation & fumigation
- Zero tillage practices
- Integrated & Site specific nutrient management
- Carbon sequestration
- Mulching & crop residue utilisation
- Soil health consultancy
- Bio fertilizer and VAM-mycorrhiza technician
- In-situ management of farm waste

Seed Industry Segment

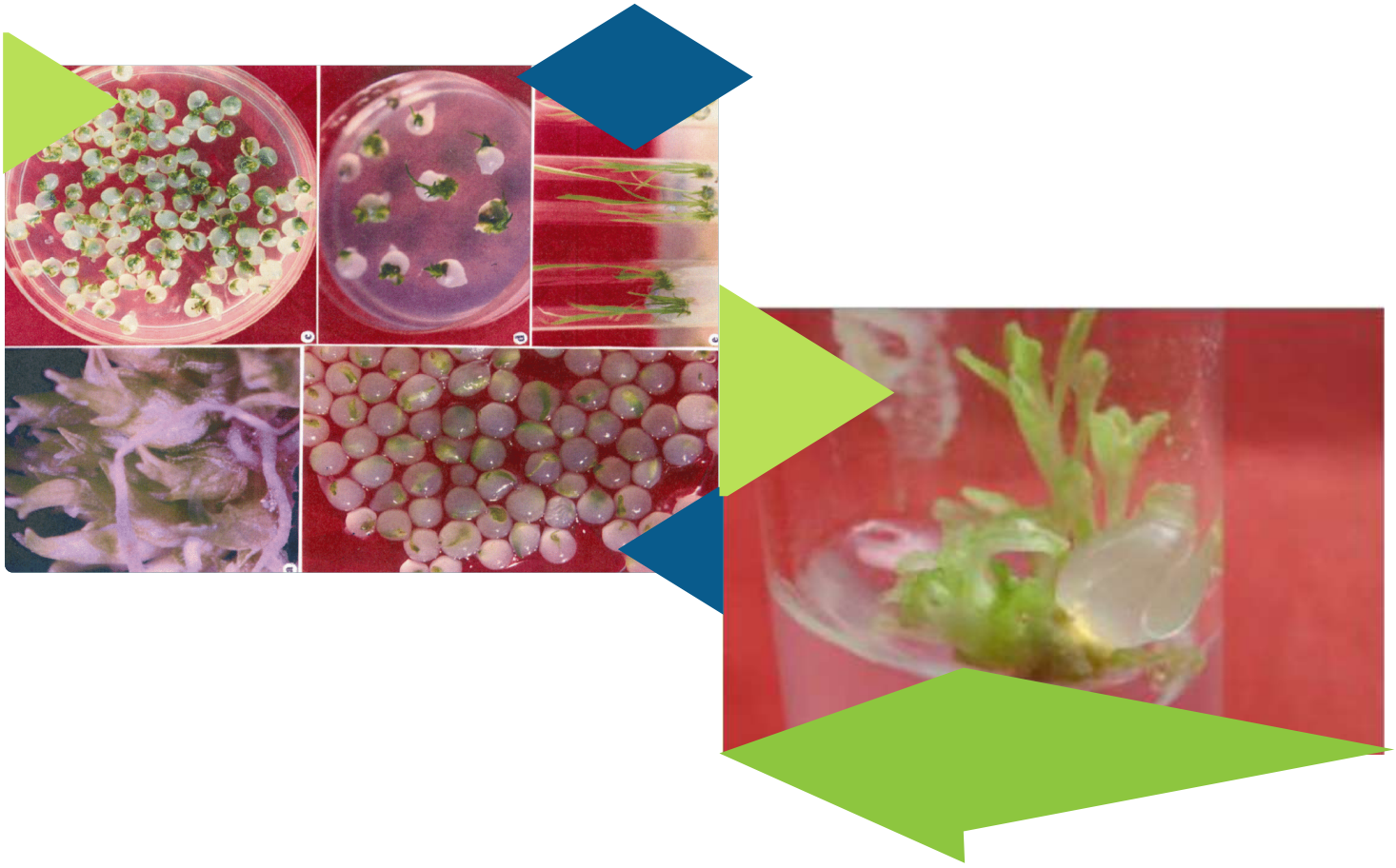
The most basic & critical input for sustainable agriculture is seed. In India, a country where agriculture is dominant occupation has abundant opportunities for the seed market. Availability & quality of seed is a big concern in agriculture sector to obtain a productive harvest. The Indian seed market reached a value of US $ 2.21 billion in 2018 & is estimated to have a CAGR of around 6.4% during 2019-2024. India is the fifth largest seed market across the world accounting 4.4 % of global seed market. India is almost self-sufficient in flower, fruits, vegetables & field crops seeds.

CHALLENGES

- Necessity of technical knowledge in seed industry
- Stringent laws & policies prevailing in sector
- High cost of production of advanced seeds
- Problems linked with contract farming and less skilled farm workers
- Difficult to understand IPR laws
- Linking skill development with industry licensing and compliance requirement.

EMERGING SKILL NEEDS

- Production practices of high-quality seeds
- Germplasm conservation
- Genetic engineering
- Hybridization
- Quarantine measures & IPDM
- Transgenic crops
- Traceability with block chain technology



Dairy Segment

India is world's largest milk producer & consumer accounting for 20% of world's total milk production in 2017. India milk production stood at 174 million metric tonnes in 2017. In FY2021-22 the milk production is expected to reach 254.5 million tonnes. 20% of milk produced in India is accessed by co-operatives & private diaries, 34% is sold in unorganized market & rest quantity 46% is consumed locally. India has transformed from a country of acute milk shortage to world's leading producer because of the government initiative 'Operation Flood'. Major source of nutritious food & only acceptable source of animal protein to a large portion of Indians are dairy products. Dairying has a crucial role in alleviating the poverty & unemployment in the rural areas. According to Mr. R.S Sodhi, Managing Director of GCMMF, dairy industry is expected to emerge as the largest employment generator in a decade overtaking the IT sector. India exported dairy products of 48039.4 MT worth of Rs. 1196.19 Crores during the year 2017-18.

CHALLENGES

- Distribution through unorganized sectors
- Scattered nature of production
- Maintaining hygiene standards & preventing adulteration
- Full traceability across the supply chain
- Indian dairy products are not competitive in global markets
- Strengthen village milk collection, including milk weighing, testing, collection, and cooling.
- Rising consumer expectations of food quality and safety

EMERGING SKILL NEEDS

- Cold chain management
- Quality assurance
- Genetics & Breeding
- Automated milking parlours
- Organic dairying
- Trending A2 milk & Camel milk
- Expanding dairy based FMCG companies
- Modernised cattle farm management

Poultry Segment

Over the last decade, India has emerged as one of the fast-growing poultry producer globally & currently stands 4th in ranking for chicken production & 3rd for egg production. The domestic per capita consumption is still lowest in the world. The backyard poultry industry consists of broiler meat & egg. In 2017, the total broiler market size stood at Rs.730 billion indicating a growth of 7% in volume & total egg production market size stood at Rs.420 billion indicating a growth of 5%. As per ICAR's estimates the per capita meat consumption is 3.6 kg p.a & per capita egg consumption is 63 eggs p.a. As India's consumer preference is for freshly cut broilers, 90% of the broiler sales is done at traditional retail outlets making India as a live bird market. By 2050, the population of the world will raise to 9 billion, where achieving nutritional security will be under crisis. Poultry sector can play a vital role in combating with the crisis. Poultry production & consumption in India is expected to grow in upcoming years due to various factors like shift in food habits, Urbanization, Increasing awareness of balanced nutrition etc.

CHALLENGES

- Fluctuation in market price due to disease epidemics
- Accurate understanding of consumer preferences
- High cost of poultry equipments, Vaccines etc.
- Maintaining quality standards
- Poorly managed Waste disposals
- Attracting & skilling of workforce
- Inappropriate cold chain infrastructure

EMERGING SKILL NEEDS

- Storage, Advanced packaging, Cold chain & Transport
- Knowledge about feed & dietary supplements
- Quarantine measures & Quality testing
- Disease diagnosis & Epidemiology
- Waste management
- Rearing of poultry fowls like Quail, Turkey, Emu etc.
- Poultry farm management
- Genetics & breeding
- Export potential

Fisheries Segment

Indian fisheries & aquaculture rather than providing livelihood support, is an important sector of food production which supports in achieving nutritional security. India occupies 3rd position in fisheries & 2nd in aquaculture in world market. Fisheries supports 14 million people in India by giving employment opportunities & supporting agricultural exports. In 2017-18, the total fish production is estimated to be 12.60 million metric tonnes accounting 6.3% of global fish production. 65% of the total production is from inland fisheries & rest is from culture fisheries. 75 countries across the world are beneficiaries of export of fish & fish products from India. Fisheries export covers a major portion in agriculture export with 13.77 lakh tonnes in quantity & Rs.45106.89 crore in value. This accounts for 10% of total exports & 20% of agricultural exports from India. The contribution of fisheries sector to the country's GDP is 0.91%. Also fisheries contributes 5.23% to agricultural GDP. Besides large scale freshwater food fish culture, ornamental fish culture & high value marine fish farming are gaining importance recently.

CHALLENGES

- Lack of training partners in fisheries
- Attracting opportunities in other sectors
- Evolving job roles with technical skills
- Seasonal nature of employment
- Indiscriminate fishing & habitat loss
- Depletion & pollution of water sources
- Natural disasters like flood, cyclones etc.
- Upgradation of skills of fishermen

EMERGING SKILL NEEDS

- Risk management & climate change adaptation
- Weather forecast & Early warning system
- Mariculture of filter feeders
- Hatchery management
- Skills for handling Fish aggregating devices & other equipments
- Diversification of fisheries (Polyculture)
- Seaweed farming & Spirulina production
- Supply chain management
- Quality testing & quarantine measures
- Artificial reef/ Artificial fish habitat technology

Animal Husbandry

Animal husbandry along with agriculture, dairying, fisheries is an integral part of human life since the starting of civilization. Animal husbandry deals with agricultural practice of breeding & raising livestock. It not only contributes to the food basket & animal draught power but also to maintain ecological balance. Livestock forms important livelihood activity for farmers & also supports by providing critical inputs to the agriculture. India has a rich resource of livestock which aids in improving the socio-economic conditions of rural masses. About 20.5 million people in India depend on livestock for their livelihood which is about 8.8% of total population. The value of livestock sector was 811847 crores during 2015-2016 as per Central Statistics Office (CSO). Total livestock population in India is 512.05 million which accounts 10.71% of world's livestock population. Livestock sector contributes 4.11% to GDP & 25.6% to total agricultural GDP of India.

CHALLENGES

- Disease epidemics
- Shortage of feed & fodder
- Hygiene maintenance in the farm
- Maintenance of reliable database
- Changing the perception of farmers about this sector as a supplementary farming activity to a main business activity
- Highly unorganized sector

EMERGING SKILL NEEDS

- Scientific feeding practices
- Breed improvement
- Animal health care
- Germplasm conservation & genetic upgradation
- Evaluating semen stations
- Biosecurity, automation & modernisation of equipments
- Animal quarantine & certification service
- Quality control testing of veterinary biologicals & Vaccination (Master Vaccinator)

Farm Mechanisation

Farm mechanisation is a crucial tool for modernisation & commercialisation of agriculture as it improves productivity & timeliness of agriculture operations, aids in value addition, brings down the cost of cultivation & enables climate change adaptation. In last few years, there has been an inclination towards the use of mechanical & electrical sources of power to mitigate the labour shortage & to facilitate judicious use of resources. The level of farm mechanisation in India stands at 40-45%. It is estimated that the use of proper equipment can increase productivity by 30% & reduce cost by 20%. India is the largest tractor market in the world. The upcoming phase of agriculture in the country will be driven by innovation in farm machinery sector. Various policy interventions like Sub Mission on Agricultural Mechanisation (SMAM) has been introduced by government to boost mechanisation in India. Farm power availability in India was 2.02 kW/ha (2016-17) & has set target to increase it to 4 kW/ha by 2030 to cope up with rising needs. Farm equipment market is expected to reach Rs 9 lakh crore by 2022. Custom hiring models & agriculture machinery banks are paving a way for raise in mechanisation in India. The precision agriculture technology for farms have spawned a new incarnation of the sector, resulting in greater yields with lesser inputs. Evolving technologies like Drones, Artificial intelligence, Robotics etc. are crucial inventions to the agriculture sector & offers a long-term solution but demands support from government, technology giants etc

CHALLENGES

- Hill topography
- Upskilling of existing workers
- Evolving job roles with high technical skills
- Adequate infrastructure & training partners
- Fragmentation of land holdings
- Large presence of small & marginal farmers

EMERGING SKILL NEEDS

- Custom hiring models
- Agriculture machinery banks
- Commodity & location specific technologies
- Repair & Maintenance of new technologies
- Irrigation & Plant protection technologies
- Crop health monitoring
- Artificial intelligence
- Quality testing of newly developed technologies
- Digital farming – GPS &GIS

Watershed Management

India is heading towards a looming water crisis. Accessibility to safe drinking water & dwindling ground water are grave problems. Farmers are facing bad time in managing crop cycles with unavailability of water India secured 120th rank among 122 countries in water quality index. The Asian Development Bank has forecasted that by 2030, 50% of India will face water deficit. Ironically India is 9th wettest country in the world & receives rainfall of 1170 mm. Lack of sensitisation to conservation of water & pollution of water resources has resulted in the worst situation. Infrastructure for storage/ conservation of water resources is the solution for addressing the water crisis in India. Watershed management is a viable option to harness production requirement in agriculture sector especially in rain fed unirrigated areas. The essence of watershed management is balancing the soil & water resources between upstream & downstream areas within watershed intended to the conservation of natural resources and raising agricultural productivity & standard of living of inhabitants.

CHALLENGES

- Effective people's participation
- Increasing awareness about importance of watershed
- Co-operation of Ministries like forest, agriculture etc.

EMERGING SKILL NEEDS

- Resource management & problem identification
- Watershed monitoring & assessment
- Use of GIS & map to analyse watershed
- Rural capacity building and information sharing
- Erosion control & rehabilitation techniques
- Water quality monitoring
- Development of watershed atlas
- Cartography

Agri-information Management

While the Indian agro information system also known as the extension system, is now guided by a variety of models, schemes, and institutions, public sector extension continues to dominate. Though ICAR's extension initiatives have been important to transformations in Indian agriculture, their capacity and reach has always been limited compared to those of first-line extension systems run by State-level departments of agriculture. Further, since agriculture is a State subject, the mode of organization and operation of public extension systems vary widely across States.

The proportion of farmers with access to information has been found to increase with an increase in the size of holding. Small land holders have been found to rely mainly on local sources of information, such as progressive farmers (16 per cent) and input dealers (12.6 per cent), along with the radio (12.4 per cent). Only 4.8 per cent of small holders view the extension worker as a primary source of information, as compared to 9.8 per cent of medium farmers and 12.4 per cent of large farmers. These observations have serious implications for organizing the extension system in India, where 83 percent of farmers meet their livelihoods from small and marginal land holdings.

CHALLENGES

- Identification of farmer's training needs
- Attracting skilled workforce
- Accurate understanding of training needs
- Monitoring & Evaluation of extension system

EMERGING SKILL NEEDS

- Digital literacy
- Leadership skills with multi-lingual proficiency
- Dissemination of new technologies
- Good communication & teaching skills

Commodity Management

Commodity exchanges has become a crucial part of the financial markets of the economy as an effective price risk management tool. It is widely recognised as commodity future markets. Price discovery, Price risk management, Easiness of selling & adoption of new technologies are the attractive features of the commodity markets. The first technology driven agricultural commodity exchange in India is NCDEX. 25 agricultural & non-agricultural commodities were offered by NCDEX for future trading in 2017. As per the reports of SEBI, 98% of the turnover of NCDEX during 2016-17 was due to agricultural products. Lack of participants with adequate capital, lack of standardisation & warehousing facility etc. are the challenges prevailing in agri-commodity market in India.

CHALLENGES

- Accurate understanding of trends in supply chain
- Evolving changes in supply chain of commodities

EMERGING SKILL NEEDS

- Negotiation and conflict-resolution skills
- Multi-tasking & managerial skills
- Proficiency with soft wares & technology
- Technical knowledge about trends in sector

Other Allied

» Apiculture

The study & practice of beekeeping to produce natural honey is known as Apiculture. Beeswax, propolis, royal jelly, honeycomb etc. – the by-products of apiculture are also in high demand in the market. In India, apiculture is practised as both full time occupation & as an agro-based subsidiary enterprise providing supplementary income. The Indian apiculture market was worth INR 16818 million in 2018. As per FAO 2016 report, India ranks first among south Asian countries in honey production. But India has a lower per capita consumption of honey than developed countries because of the lack of awareness about nutritional benefits of honey. Apiculture not only provides supplementary income but as a crucial element in pollination increases the productivity of crops too. Apiculture industry can be a major foreign exchange earner if the standards for the exports are met.

CHALLENGES

- Inadequate knowledge among youth
- Attracting skilled labours
- Climate change & Natural calamities
- Reducing green cover
- Radiation from mobiles
- Lack of proper marketing

EMERGING SKILL NEEDS

- Modern hives
- Commercial bee keeping
- Organic honey production
- Increasing market of by-products
- Value addition
- Advanced packaging
- Skills to handle modern equipments

» Mushroom Growing

Mushroom farming in India is showing an increasing trend & has developed as an export-oriented business. As per 2018-19 first advance estimates, mushroom production in India is reported as 503000 MT. India ranks 6th in mushroom production among Asian countries (2016). Mushroom industry in India has registered an average growth rate of 4.3% per annum from 2010 to 2017. Per capita consumption of mushrooms is very meagre in India. Indian mushroom industry is majorly focused on white button mushrooms accounting 73% of mushroom production. During 2016-17, India exported mushroom spawn of 26.31 MT worth Rs.15.85 lakhs. Mushrooms pave an efficient way of conversion of agricultural wastes into valuable protein & has a huge potential of generating additional income & employment. Mushrooms for pharmaceutical purposes also presents immense opportunities.

CHALLENGES

- Attracting trained manpower
- Contamination
- Climate changes

EMERGING SKILL NEEDS

- Mother & Bed Spawn production
- Compost technology
- Production of new varieties
- Emerging export potential
- Production at controlled conditions
- Advanced packaging (Ready to grow packs) & shelf life enhancement
- Development of pure culture

» Sericulture

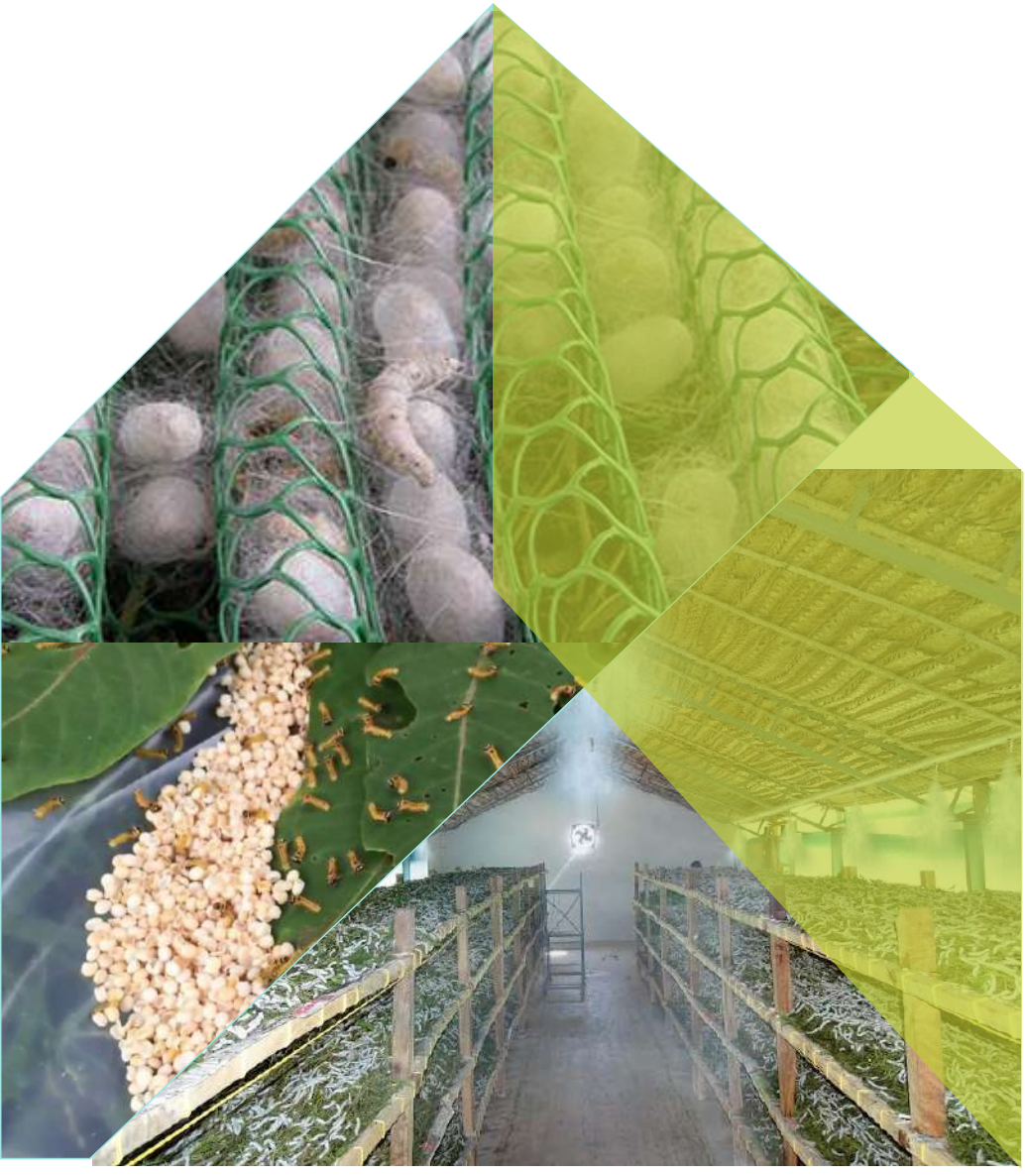
Silk industry in India is one of the large generators of employment & foreign exchange. India is the second large producer of silk & largest consumer of raw silk & silk fabrics with sericulture activities spread over 52,360 villages. During 2017-18, it provided employment opportunities to over 8.6 million people in the country. Export of silk & silk products from India was worth US $ 255.93 million in 2017-18. In India both export & domestic demand drives the silk market.

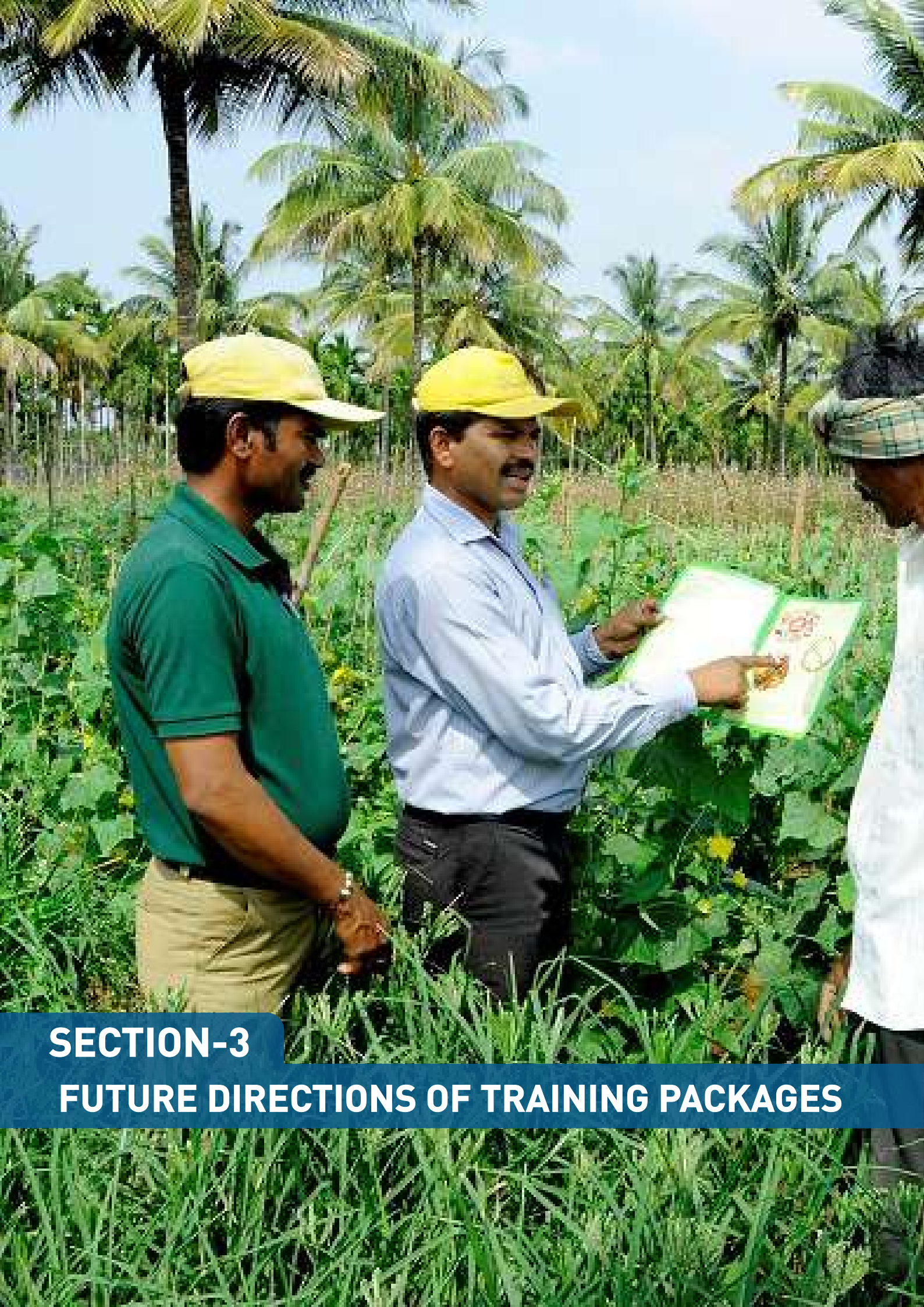
CHALLENGES

- Price fluctuation
- Lack of awareness about market trend
- Competition from synthetic fibres
- Skill up-gradation
- Climate changes
- Low awareness about non-mulberry silks

EMERGING SKILL NEEDS

- Mechanisation in silk industry (Automatic reeling machines etc.)
- Climate resilient sericulture
- Biovoltine sericulture
- Fibroin extraction
- Silkworm powder preparation
- Cocoon crafts





SECTION-3

FUTURE DIRECTIONS OF TRAINING PACKAGES

Section- 3 Future Directions Of Training Packages

The future direction of training packages is driven majorly by two factors:
Changes taking place in the industry due to technological advancements and emerging opportunities in the sector.
New policies by government which initiate changes in the training packages.

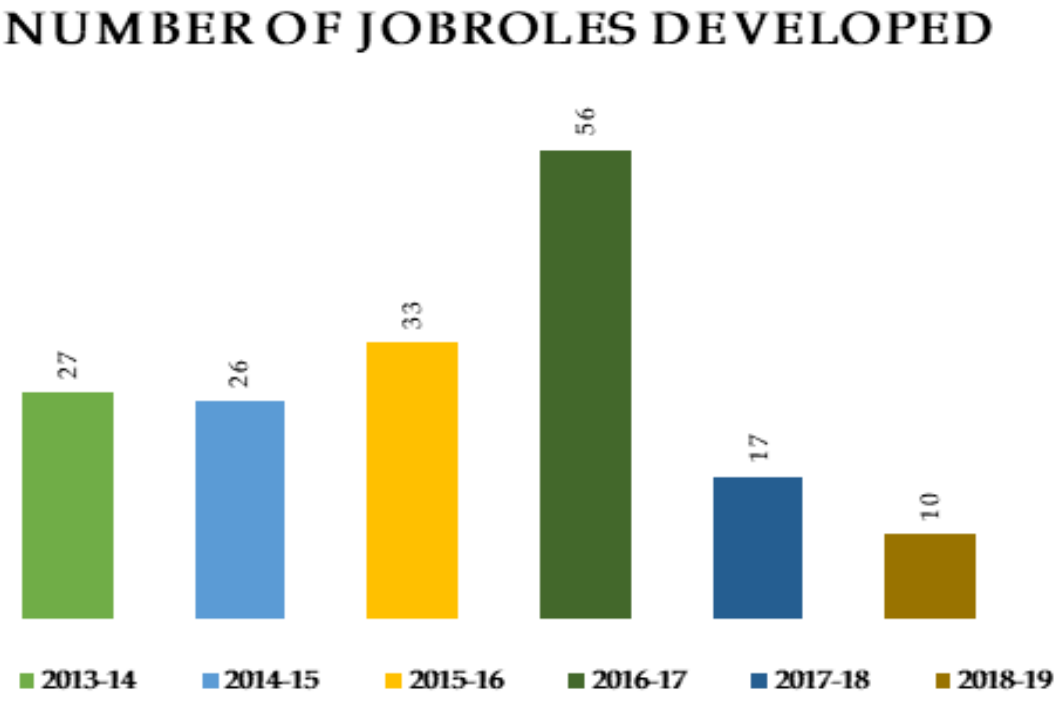
Changing Industry Requirements:
An industry needs to change, adapt & grow, so do the training requirements. Therefore, to derive more profit from agriculture sector, the skills & knowledge involved in the sector is rapidly evolving to be more sustainable & competitive. These changes are continuously reflected in the training packages. Training packages needs to be updated to keep in pace with emerging job opportunities. Changes in the training packages is inevitable in improving the consistency of quality of the training and assessments. NSDC & Sector skill councils are responsible for the developing, maintaining and endorsing training packages according to the standards. Environmental scan, as the name suggests scans the environment for the emerging issues impacting the skills and knowledge required by the workforce in the sector. It aids to alert the sector skill councils, training providers etc in directing towards the emerging training package as per industry requirements.

New Policy Requirements
With the prime aim of job creation, Government of India is launching many initiatives which has immense potential to innovate the training packages. The Government initiatives to reform education and training sectors in each year necessitates adequate changes in the training packages. Various government initiatives like Skill India, National Skill Development Mission, PMKVY etc are intended to skill a greater number of citizens to help them to take up entrepreneurship. These initiatives are demanding a rise in standards of training packages. Sector skill councils are working with policy makers to clarify and finalize policy for the development of streamlined training packages.

Continues Improvement of Training Packages
Keeping in view of the diverse nature of industry and its geographic spread, registered training partners with the scope of ASCI qualification packs range from the large scale public providers to small scale, niche market operators across urban, regional and remote India. As of Financial year, 2018-19, ASCI has developed 173 qualification packs under 16 different segments.

Number Of Job Roles Developed

SEGMENTS	No. of Job Roles
Agriculture Crop Production	13
Production Horticulture	26
Amenity Horticulture & Landscaping	11
Post-harvest Supply Chain Management	9
Farm Mechanization & Precision Farming	17
Seed Industry Segment	5
Soil Health Management	3
Commodity Management	8
Agri-information Management	4
Other Allied (AGRI)	9
Forestry/ Agroforestry	5
Watershed Management	7
Dairy Farm Management	8
Animal Husbandry & Other Veterinary Related.	7
Poultry Farm Management	10
Fisheries	27



APPENDIX

APPENDIX A
Qualification Packs In Demand

SEGMENTS	JOB ROLES/QPs
Agriculture Crop Production	• Organic Grower • Vermicompost Producer • Paddy Farmer • Wheat Cultivator
Production Horticulture	• Medicinal Plants Grower • Nursery worker • Mango grower • Coconut Grower • Friends of Coconut Tree
Amenity Horticulture & Landscaping	• Gardener • Floriculturist - Open cultivation • Gardener cum Nursery Raiser
Watershed Management	• Watershed Supervisor • Watershed Assistant
Post Harvest Supply Chain Management	• Supply Chain Field Assistant • Cold Storage Supervisor • Cold Store Keeper
Farm Mechanization & Precision Farming	• Micro irrigation technician • Tractor Mechanic • Tractor operator • Greenhouse Operator
Forestry / Agroforestry	• Non Timber Forest Produce Collector • Forest Nursery Raiser
Seed Industry Segment	• Quality Seed Grower • Seed Processing Worker
Soil Health Management	• Soil & Water Testing Lab Analyst • Soil & Water Testing Lab Assistant • Soil Sampler/collector
Agri - Information Management	• Agriculture extension service provider • Agriculture Extension Executive • Community Service Provider
Other Allied (agri)	• Mushroom Grower • BareFoot Technician • Sericulturist • Beekeeper
Dairy Farm Management	• Dairy Farmer/Entrepreneur
Poultry Farm Management	• Small poultry farmer • Broiler Farm Worker
Animal Husbandry & Others (veterinary Related)	• Animal Health Worker • Artificial Insemination Technician • Piggery Farmer • Veterinary Clinical Assistant
Fisheries	• Aquaculture worker • Marine capture fisherman cum Primary Processor • Inland capture fisherman cum primary processor
Commodity Management	• Agri Commodity Procurement Manager • Agri Commodity Quality Assayer • Commodity Account Manager

APPENDIX B
Emerging Job Roles

SEGMENTS	JOB ROLES
Agriculture Crop Production	• Farm Worker • Farm Supervisor • Farm Manager • Agri-Clinic & Agri-Business Centre Manager
Production Horticulture	• Makhana Grower cum Processor • Spice Crop Cultivator • Temperate Fruit Grower • Orchard/Plantation Worker • Horticulture Supervisor
Fisheries	• Deep Sea Fisher

APPENDIX C
The Relevance Of Vet Courses

The technological advancements have increased the demand for higher education in the industries. But due to government intervention the industry has started focusing on relevance of skill specifications in addition to the qualifications in the labor force.

The labour participation rate in India has reduced to 49.8% in 2017-18 from 55.9 in 2011-12. LFPR is the section of working population in the age group of 16-64 in the economy currently employed or seeking employment. 65% of Indian population is in the age group of working population. The report says that there is a proportionate decline in the active female workforce which fell by 8% 23.3 in 2017-18. Whereas the LFPR for males dipped by 4% to 75.8%. The fall in LFPR turned out to be much in rural areas, i.e. 67.7% to 58.7%.

Then in urban areas from 49.3% to 47.6%. The gap in LFPR has narrowed between urban and rural areas due to a decline in the active labour force in villages. During the period 2011-15 the workforce shift from agriculture to non-farm sectors has increased with the drop-in jobs to 26 million in agriculture and 33 million rises in jobs in non-farm sectors.

The global rise of independent work and micro-entrepreneurship, aided by new digital ecosystems, is mirrored in India, where they are providing new work opportunities with better pay and links to organised value chains, including in parts of the country less covered by formal labour markets. Our initial estimates are that the rapidly growing sectors of cab-hailing platforms, e-commerce, digital financial services through networks of banking correspondents, and lending for micro entrepreneurship and self-help groups have improved income opportunities for 18 to 22 million workers in about the past three years.

India needs to collect more frequent, timely, and relevant labour market data to understand trends in gainful employment. Government could help stimulate the creation of gainful employment through targeted programmes and by further removing hurdles that block private investment and innovation. Business and policy makers can work together in areas such as boosting growth in the labour-intensive tourism sector, unlocking the digital economy's potential to create work opportunities, and reskilling of the workforce.

The working age population in India grows by 16 million every year.

Loopholes in skill development initiatives for the new entrant workforce and the existing workforce can be resolved if India takes certain measures such as:

- Focusing on the demand-supply mismatches and lack of information on geographic specific job opportunities.
- High dropout rates during training,
- Inadequate employer linkages, and a passive approach to seeking employment—all of which result in high attrition rates in the first few months of employment.
- Demand-driven models for skills training, with the curriculum designed to resolve common points of failure for employers, can help establish a higher return on investment for skills training programs and could result in more sustainable benefits to both workers and employers.

APPENDIX D
Methodology

As an annual document, the environmental scan is an evolving story. Market factors and other externalities may result in subtle or gradual changes with little or no discernible short to medium term impact on the enterprise or its work force.

Each year, Agriculture Skill council of India undertakes an intensive consultation process with the enterprises, industry bodies, and other stakeholders to gather real-time view on those factors shaping their operations, impacting on their workforce and its skills base, how well-or not- the tertiary sector is responding. These views are tested across the nation on various workshops and panel discussions.

In addition, we draw on advice and feedback gathered throughout the year during the continuous improvement of Training Packages and workforce development activities.

APPENDIX E
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APPENDIX F
Glossary and Definitions:

Ministry of Skill Development and Entrepreneurship (MSDE)

The Ministry of Skill Development and Entrepreneurship is a Ministry of Government of India set up on 9th Nov, 2014 to coordinate all skill development efforts across the country. Industrial Training and Apprenticeship and other skill development responsibilities were transferred from the Ministry Of labour and Employment to this newly made Ministry on 16 April 2015. It aims to remove the disconnect between demand and supply of skilled manpower, build new skills and innovative thinking not only for existing jobs but also for new job roles that are to be created.

Directorate General of Training

The two verticals of Training and Apprenticeship under DGET, Ministry of Labour & Employment (MoLE) have been shifted to Ministry of Skill Development and Entrepreneurship from 16th April 2015. These two verticals will function through Directorate of Training and Directorate of Apprenticeship Training respectively under the Directorate General of Training under the Ministry of Skill Development and Entrepreneurship. It will be responsible for maintaining existing skill training structures in the country through National Council for Vocational Training (NCVT). Its large institutional framework consisting of ITIs, ATIs, RVTIs and other national institutes will act as tools of execution for Mission activities.

National Skill Development Corporation

The National Skill Development Corporation India (NSDC) was setup as a one of its kind, Public Private Partnership Company with the primary mandate of catalysing the skills landscape in India.

National Skill Development Agency

NSDC provides skill development funding either as loans or equity, and supports financial incentives to select private sector initiatives to improve financial viability through tax breaks etc. NSDC's financing initiatives provide funding through: Loan Equity and Grants.

National Skill Development Fund

The National Skill Development Fund was set up in 2009 by the Government of India for raising funds both from Government and Non-Government sectors for skill development in the country.

The Fund is contributed by various Government sources, and other donors/ contributors to enhance, stimulate and develop the skills of Indian youth by various sector specific programs.

National Skills Research Division (NSRD)

National Skills Research Division, under NSDA will serve as the apex body for providing technical and research support to the Mission. This institution will act as a think-tank for Ministry of Skill Development and Entrepreneurship and be the core skill development hub, which will connect implementation of the Mission with academic research and data.

National Skill Development Mission or Skill India Mission

The Mission has been developed to create convergence across sectors and States in terms of skill training activities. It will be implemented through a streamlined institutional mechanism driven by Ministry of Skill Development and Entrepreneurship (MSDE). Mission Directorate will be supported by three other institutions: National Skill Development Agency (NSDA), National Skill Development Corporation (NSDC), and Directorate General of Training (DGT).

National Skills Qualifications Framework (NSQF)

The National Skills Qualifications Framework is a competency-based framework that organizes all qualifications according to a series of levels of knowledge, skills and aptitude. These levels, graded from one to ten, are defined in terms of learning outcomes which the learner must possess regardless of whether they are obtained through formal, non-formal or informal learning.

Definitions Applicable To NSQF

- **Skill means** the proven ability to use acquired knowledge, skills and personal and social abilities, in discharge of responsibility roles. It is the ability to do a job well.
- **Credit** is recognition that a learner has successfully learning, corresponding to a qualification at a given level.
- **Knowledge** means the outcome information through learning. Knowledge is the body of facts, principles, theories and practices that is related to a field of work or study. Knowledge is described as theoretical and/or factual.
- **Learner** refers to an individual undergoing skill development training, whether in a formal or informal setting.
- **Learning** Outcomes represent what a learner knows, understands and is able to do on completion of a learning process, and which would be expressed in terms of knowledge, skills and competence.
- **Qualification** means a formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards.
- **Skills** means the ability to apply knowledge and use know-how to complete tasks and solve problems. Skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments).
- **Trainer** means someone who trains, instructs, teaches or otherwise enables the learner(s) to acquire the appropriate knowledge and skills.
- **Training Provider, Institute and Institution** refer to any organization providing knowledge and skills to learners.
- **Recognition of Prior Learning (RPL)** is a platform to provide recognition to the informal learning or learning through work to get equal acceptance as the formal levels of education. It aims to appreciate prior learning irrespective of the medium of achieving it. RPL can help them get assessed and certified on their current competencies as per NSQF levels.

Sector Skill Councils (SSC)

Sector Skill Councils are set up as autonomous industry-led bodies by MSDE. They create Occupational Standards and Qualification bodies, develop competency framework, conduct Train the Trainer Programs, conduct skill gap studies and Assess and Certify trainees on the curriculum aligned to National Occupational Standards developed by them.

Definitions Applicable to SSC

Sector: Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.

Sub-sector: Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.

Occupation: Occupation is a set of job roles, which perform similar/ related set of functions in an industry.

Function: Function is an activity necessary for achieving the key purpose of the sector, occupation, or an area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of OS.

Sub-function: Sub-functions are sub-activities essential to fulfil the achieving the objectives of the function.

Job role: Job role defines a unique set of functions that together form a unique employment opportunity in an organization.

Occupational Standards (OS): OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the knowledge and understanding they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts. Performance Criteria Performance criteria are statements that together specify the standard of performance required when carrying out a task.

National Occupational Standards (NOS): NOS are occupational standards which apply uniquely in the Indian context.

Qualifications Pack (QP): QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.

Unit Code: Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N' Unit Title Unit title gives a clear overall statement about what the incumbent should be able to do.

Description: Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.

Scope: Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.

Knowledge and Understanding: Knowledge and understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to perform to the required standard.

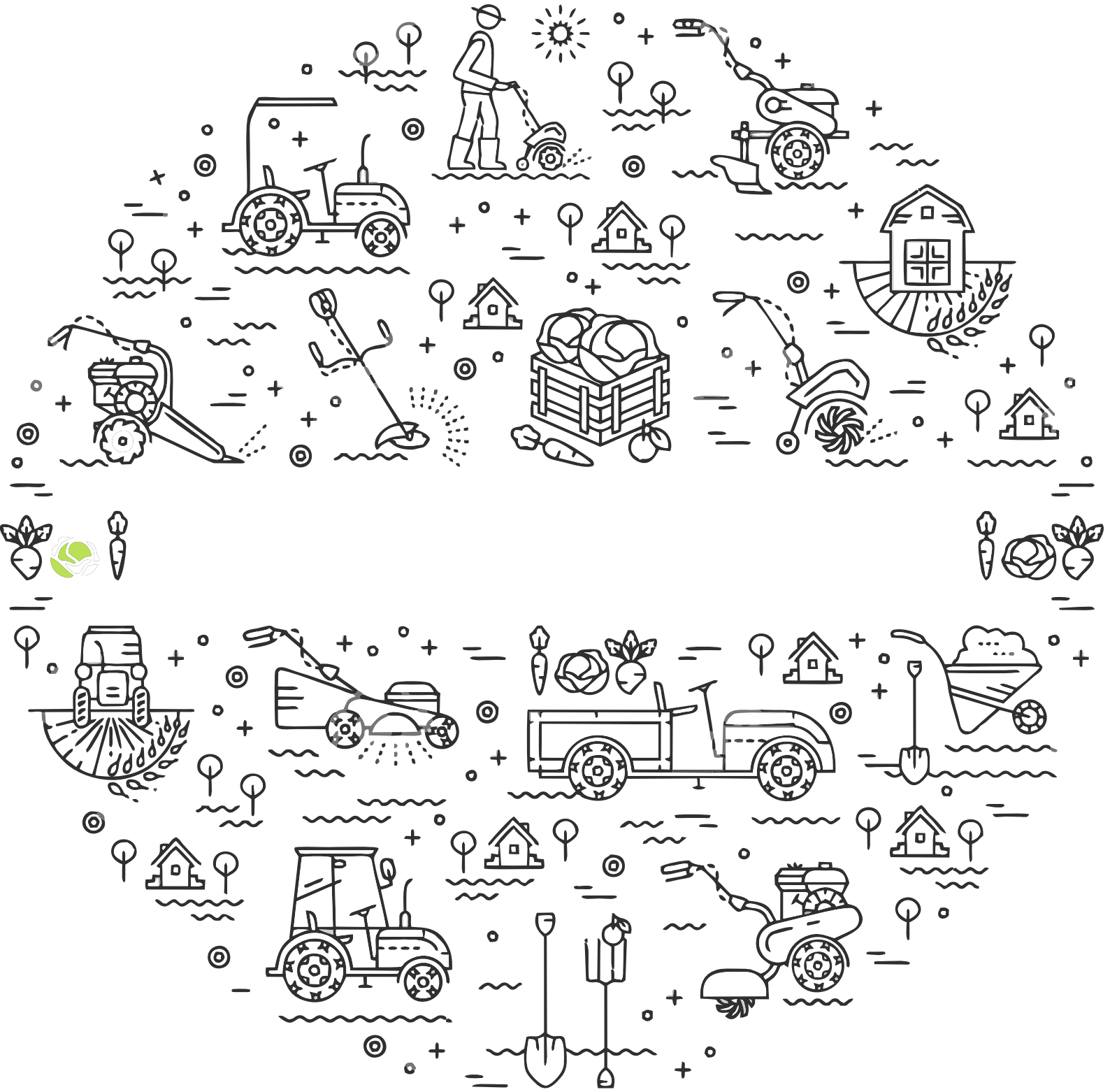
Organizational Context: Organizational context includes the way the organization is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.

Technical Knowledge: Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.

Core skills: Core skills or generic skills are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.

Labour Market Information System (LMIS)

LMIS is an integrated set of institutional arrangements, procedures, mechanisms and data systems designed to produce labour market information as per global standards and best practices. The system brings together statistical (quantitative) and non-statistical (qualitative) information concerning labour market actors and their environment and generate key analysis and reports which can be used for various policy interventions by different government stakeholders, as well as by the industry at large.



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