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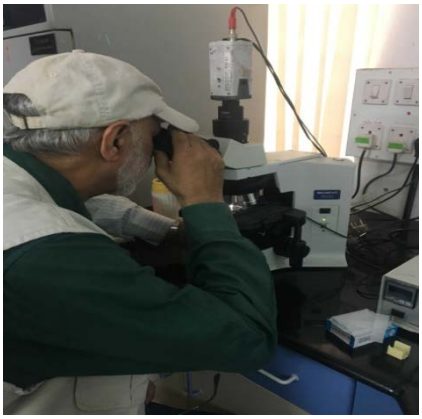

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Skill Development in Indian Agriculture and Food Processing Sectors

A Scoping Exercise

Kavery Ganguly, Ashok Gulati, and Joachim von Braun

Abstract

The agriculture and food sector in India employ a significant proportion (about 44 percent) of the workforce, the majority of whom are not very educated and lack formal or informal skill training. Hence, they are unable to make the most out of their occupation. About 67 percent of the population in India is aged 15-64 years while 27 percent is aged 0-14 years (UNFPA n.d.). This offers both a challenge and an opportunity to skill the youth as well as the existing workforce in India with the objective to improve their productivity and enhance their incomes. This paper is a scoping study of policies and institutions that are operational in this context of skill formation in India, with a focus on the agriculture and food sector. It takes stock of ongoing initiatives and programs, their design and scope in achieving skill development in general and related to the agriculture and food sector in particular. In terms of policy, skill development has been accorded high priority with an objective to make the programs aspirational for youth as well as for them to recognize the value of experience and knowledge. The focus is laid on quality of training, assessment, and certification thus ensuring standards and greater market acceptability. These are prerequisites for investments in skills to bring higher returns in terms of remunerative jobs. The government has been a catalyst of change in this area in terms of designing, implementing and financing of such programs. The role of private players including both potential employers as well as global partners (government, business and non-governmental organizations) has been widely recognized in upgrading the scope, target and outcomes as well as ensuring sustainability of the national skill development program. As technology plays a very important role in sustainable value chains, it creates demand for a better skilled workforce, and accordingly rewards them with better paid jobs and higher returns in farming. Hence designing appropriate qualification packs and training programs with a focus on innovations all along the value chains (that help promote technology adoption, facilitate effective value chain management, etc.) are critical. Also, innovative models of outreach (for example, classroom training for agricultural professionals, agricultural entrepreneurs, farmer field schools, and e-platforms) can add substantial value to skills at very low cost. Hence, scaling up fast is necessary to benefit the agriculture and food sector in India. While this paper gives an overview of the landscape of various programs and projects, and how they are being implemented by various actors (government, domestic private sector and international agencies), there is dire need to evaluate their outcomes in terms of increased incomes and more stable jobs of those trained through these programs.

Keywords: skill development, vocational training, agriculture and food

JEL classifications: J21, J24, J43, Q16

Table of Contents

List of Abbreviations

ACABC	Agri Clinic and Agri Business Centre
ARYA	Attracting and Retaining Youth in Agriculture
ASCI	Agriculture Skill Council of India
ASPIRE	A Scheme for Promotion of Innovation, Rural Industries and Entrepreneurship
ATARI	Agricultural Technology Application Research Institute
ATIC	Agricultural Technology Information Centers
B2B	Business to Business
CFC	Common Facility Centers
CHC	Custom Hiring Centre
CIE	Centre for Innovation and Entrepreneurship
COE	Centre of Excellence
CSR	Corporate Social Responsibility
DA&FW	Department of Agriculture and Farmers' Welfare
DAC	Department of Agriculture & Cooperation
DAHD&F	Department of Animal Husbandry, Dairying & Fisheries
DARE	Department of Agricultural Research and Education
DGT	Directorate General of Training
DOE	Department of Education
EDP	Entrepreneurship development program
FAO	Food and Agriculture Organization
FICCI	Federation of Indian Chambers of Commerce and Industry
FICSI	Food Industry Capacity and Skill Initiative
G2G	Government to Government
GIZ	Gesellschaft für Internationale Zusammenarbeit
GoI	Government of India
HRD	Human Resource Development
ICAR	Indian Council for Agricultural Research
IIFPT	Indian Institute of Food Processing Technology
IIM	Indian Institute of Management
IIT	Indian Institute of Technology
ILO	International Labor Organization
ISAP	Indian Society of Agribusiness Professionals
ITI	Industrial Training Institute
KVKs	Krishi Vigyan Kendra
LBI	Livelihood Business Incubator
MANAGE	National Institute of Extension Management
MEA	Ministry of External Affairs
MoA&FW	Ministry of Agriculture and Farmers' Welfare
MoF&AH	Ministry of Fisheries and Animal Husbandry
MOFPI	Ministry of Food Processing Industries
MoLE	Ministry of Labor and Employment
MoSDE	Ministry of Skill Development and Entrepreneurship
NIFTEM	National Institute of Food Technology Entrepreneurship and Management
NOS	National Occupational Standards
NPSD	National Policy on Skill Development
NPSDE	National Policy on Skill Development and Entrepreneurship
NRLM	National Rural Livelihood Mission
NSDC	National Skill Development Corporation
NSDM	National Skill Development Mission

NSFI	National Skills Foundation of India
NSSO	National Sample Survey Organization
NSQF	National Skills Qualification Framework
PMKK	Pradhan Mantri Kaushal Kendra
PMKVY	Pradhan Mantri Kaushal Vikas Yojana
QPs	Qualification Packs
RMSA	Rashtriya Madhyamik Siksha Abhiyan
SANKALP	Skill Acquisition and Knowledge Awareness for Livelihood Promotion Program
SFURTI	Scheme of Fund for Upgradation and Regeneration of Traditional Industries
SSC	Sector Skill Council
STRY	Skill Training of Rural Youth
TBI	Technology Business Incubator
TCS	Tata Consultancy Services
ToT	Training of Trainer
UBA	Unnat Bharat Abhiyan
UNFPA	United Nations Fund for Population Activities,
USAID	United States Agency for International Development
VAP	Village Adoption Program

1 Introduction

1.1 Significance of Skill Development in the Agriculture and Food Sector

In several developing countries of South Asia, South-East Asia and Sub-Saharan Africa, agriculture assumes a critical role in the overall development process as it engages the largest section of workforce and consumers spend a large part of their expenditures on food. In India, for example, agriculture still employs about 44 percent of the workforce (in 2019, ILO 2019) and an average consumer spends nearly 45 percent of her expenditure on food (in 2011, NSSO, GoI 2014). Most of the farmers have very small landholdings. The average size of landholding in India is just 1.08 hectares (in 2015, Agriculture Census, GoI 2018a). The only way to feed the rising population with increasing per capita incomes as well as augment incomes of farmers, from a very low base, would be to raise productivity by using modern inputs (such as high yielding seeds, fertilizers, pesticides, farm machinery, precision farming practices, etc.) in a sustainable manner. However, the use of these modern technologies requires skills that may be different from those necessary for subsistence traditional agriculture. This requires policy attention and institutional support to provide appropriate skills and vocational training to people engaged in not only production activities in agriculture, but all along the agricultural value chains and food-processing sector.

It is against this backdrop that this study maps the overarching skill development program in India - its scope, targets, and institutional mechanisms to address the existing skill gaps and bring about a major transformation in the quality of workforce. The study looks at not only the policy direction and support, but also the evolving designs of skill development programs, thus bringing in innovations and entrepreneurship. It provides an overview of the roles of various stakeholders, such as public and private sectors and their efforts in advancing skill development. Further, it also looks at important global partnerships in skill development programs focusing on the agriculture and food sector. Global partnerships help to facilitate an exchange of ideas and expertise through Government to Government (G2G) dialogues and commitments as well as through Business to Business (B2B) collaborations and other possible partnerships. As a way forward, this study provides insight on ways to ensure the sustainability of the program, enhance private sector participation, and expand the frontiers of skill development for a more modern, productive, and sustainable agriculture. We believe that such a scoping study can have important lessons for many smallholder agricultural economies in the developing world.

Globally, even though the agricultural employment has decreased from 45 percent of the total workforce in 1991 to 31 percent in 2013, about 1.1 billion people still derive their livelihood from agriculture. In South Asia and Sub Saharan Africa, about 45 to 60 percent of the total workforce is engaged in agriculture (ILO 2017). In India, the sector employs 44 percent of the workforce (ILO, 2019). The majority of the agricultural workforce is neither educated nor skilled which is a result of them being poorer than workers in other sectors. Also, being poor does not allow them to invest in training and skill development. Agricultural workers are more than four times as likely to be poor than those employed in other sectors (World Bank 2016). Of the 766.6 million poor people, about 80 percent are rural poor; 64 percent work in agriculture; 44 percent are 14 years old or younger; and 39 percent have no formal education at all (World Bank 2016). Agricultural livelihoods have a direct linkage with poverty and hunger given that these are more endemic among the rural population and agriculture employs predominantly the rural workforce. Hence, dovetailing access to innovations and technology with the right skill and education can play a major role in enabling countries to achieve a productivity breakthrough, to improve economic returns of farmers and, interestingly, to open up new avenues of engagement in the sector through jobs like technology developers, entrepreneurs, and agribusiness specialists.

For several developing countries, employing youth is a major challenge because of their emerging numbers combined with a lack of gainful employment opportunities in other non-farm sectors. Hence,

ways to create various job roles within the agriculture and food sector can create a win-win situation for both the people seeking employment as well as the sectors in terms of higher productivity and growth. This will also contain jobless migration from rural to urban areas, a trend that has serious implications on people's socioeconomic well-being. Collaborative efforts leveraging the advantages of public and private sectors in investments, infrastructure, expertise and human resources will be critical to strengthen skill development in the agriculture and food sector. Public sector resources such as infrastructure and extensions networks can be leveraged in addition to public spending to make these programs more affordable to begin with. Programs need to be demand-driven catering to the needs of the farming sector, agribusiness, and industry. Hence, these stakeholders need to be engaged in designing such programs as well as in contributing by providing expertise in the form of trainers, faculty members, and integrating some of these programs with their corporate social responsibility (CSR). Setting forth a target of skilling youth in a supply-led model runs the risks of generating a pool of skilled jobless youth in the absence of linkages with sectoral demand. Also, the curriculum, questions of classroom versus hands-on training, and the exposure to technology and know-how are critical elements of related programs which determine the quality of skills imparted to the beneficiaries and how best these fit into the applied field.

1.2 Assessing Sectoral Need for Skill Development

About 67 percent of the population in India is aged 15-64 years and 27 percent of its population is aged 0-14 years (UNFPA n.d.). The National Policy for Skill Development and Entrepreneurship (NPSDE) 2015 reports that by 2020 the average age of the Indian population will be 29 years compared to 40 years in the US, 46 years in Europe and 47 years in Japan. In contrast, the African population is going to be the youngest, with a median age of about 21 years by 2030. Over the next two decades, the workforce in the industrialized world is likely to shrink by 4 percent, while in India it is projected to increase by 32 percent (GoI 2016). A giant share of employment in India is concentrated in the informal sector, which turns any skill development approach into a massive challenge. As in 2009-10, nearly 93 percent of the total workforce was occupied in the informal sector having increased from 91 percent in 1999–2000. The share of informal workers in the non-agricultural sectors (excluding agriculture) declined to 85.6 percent from 93 percent during the above period. This is still very high compared to Thailand (49 percent), Mexico (50 percent), Brazil (51 percent), the Philippines (72 percent), and Indonesia (78 percent) (GoI 2013). One of the main reasons for this trend are very restrictive labor laws in the organized sector, which encourage even the organized sector to hire labor through informal routes of third-party contracts. Since the announcement of the National Policy on Skill Development Policy (NPSD) in 2009, successive governments have announced different skilling targets based on the existing workforce and the increasing need for skilled manpower across different economic sectors (table 1.1).

Table 1.1: Skill development targets

Year	Skill Development Targets (million)	Target period
2009	500	2012-2022
2015	400	2015-2022
2019	10*	2020

Source: NPSD 2009, GoI 2009; PIB 2015; PIB 2019
Note: * target under PMKVY only

MoSDE estimated the human resource requirement and the incremental training needs for the period 2017-2022 as summarized in table 1.2. The human resource requirement in the agriculture and food processing sectors is estimated to be about 37 percent of the total requirement in 2022 as compared

to 47 percent in 2017. The incremental human resource and training needs are estimated to be 6 percent of the total requirement.

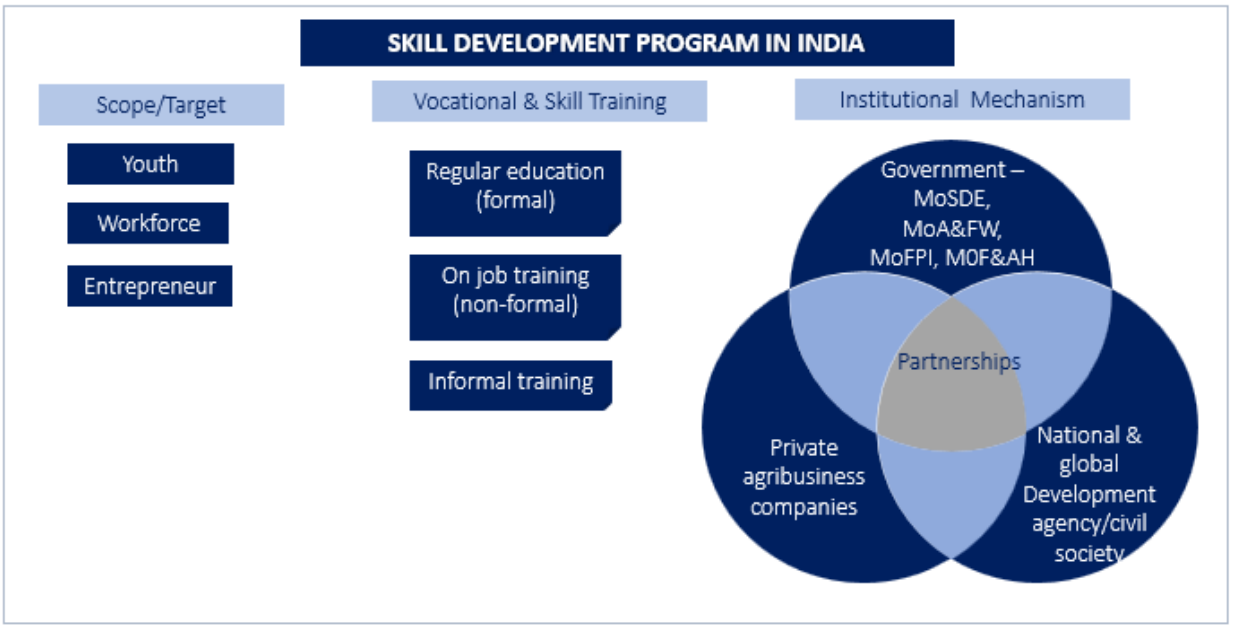
Table 1.2: Human resource requirement and incremental training needs

	Human Resource Requirement Estimate (million)		Incremental Human Resource & Training needs (million)
	2017	2022	
Agriculture	229	215.5	4.3
Food Processing	8.8	11.6	3.4
Total	510.8	614.2	128.2

Source: MoSDE Annual Report 2017-18, GoI 2018b

Figure 1.1 presents a framework of the skill development program in India. The scope and target are to skill youth, the current workforce and entrepreneurs as well as to address the existing skill gaps across sectors. Vocational and skill training involves formal, non-formal and informal models. The institutional mechanism driving the program comprises the government as the major player, and includes the private sector such as the related industry players, development agencies and civil society.

Figure 1.1: Structure of skill development program in India



Source: Authors' Illustration

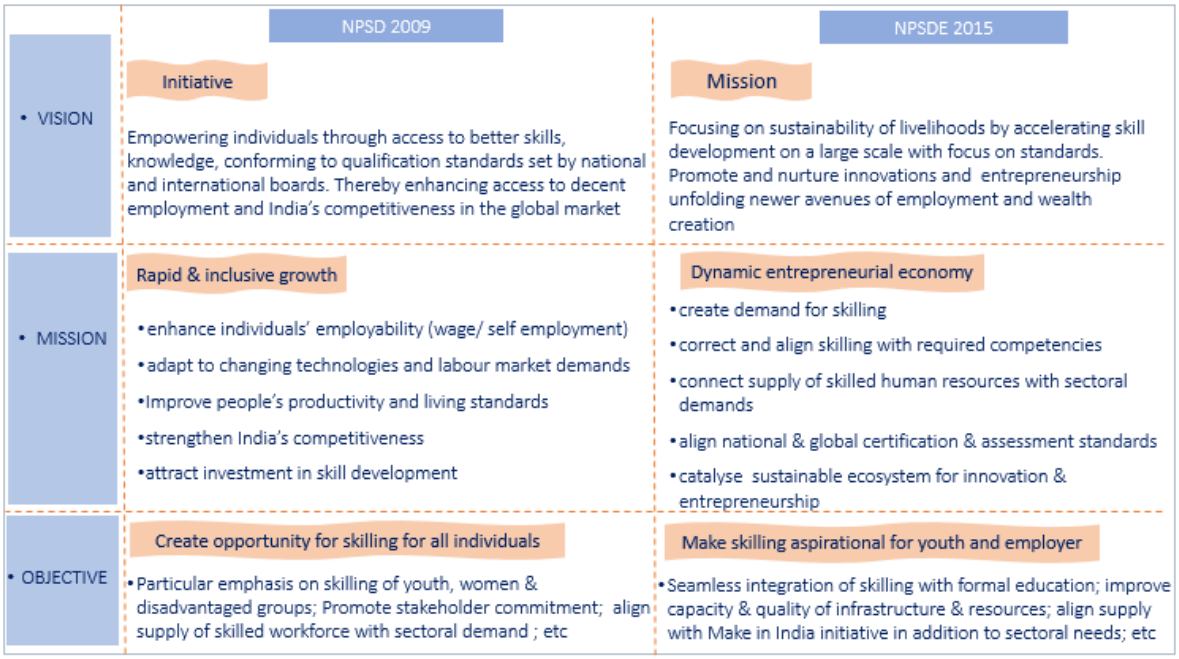
Note: MoSDE-Ministry of Skill Development & Entrepreneurship; MoA&FW – Ministry of Agriculture & Family Welfare; MoF&AH – Ministry of Fisheries & Animal Husbandry; MoFPI – Ministry of Food Processing Industries

2 Public Policies and Institutions Driving Skill Development Programs

2.1 National Policy on Skill Development and Entrepreneurship

The 11th five-year plan (2007-2012) marked the beginning of a structured approach to a skill development program. This resulted in the creation of the Coordinated Action on Skill Development in 2008 followed by the formulation of the National Policy on Skill Development Policy (NPSD) in 2009. A three-tier governance structure primarily led by the government and other public-sector bodies was rolled out. The shift in policy vision from undertaking skill development primarily through vocational training to encouraging innovations and entrepreneurship in an outcome-oriented framework is clearly observed comparing the National Policy on Skill Development (NPSD) 2009 and the NPSD(E-Entrepreneurship) 2015 (figure 2.1). However, the blueprint of the organization of the skill development program has been carried forward as conceived first in 2009 under the NPSD. Much of the program elements that were crafted by the policymakers in the UPA government and those which could not be realized during their term have been adopted by the NDA government.

Figure 2.1: Comparing key features of NPSD 2009 and NPSDE 2015



Source: Authors' Illustration based on GoI 2009 & GoI 2015

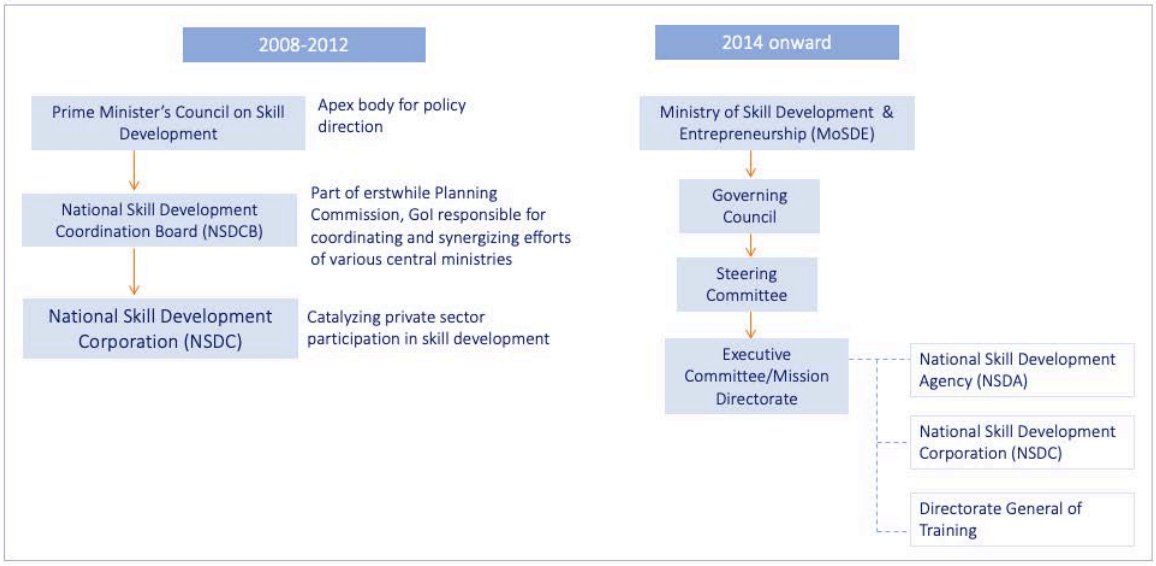
While much of the proposed stakeholder engagement, governance structure, and execution plan are common in both policies, the NPSDE 2015 aims at a more integrated and holistic approach for attaining skill development with greater emphasis on demand-driven outcomes. It also seeks to streamline the role of different ministries and public agencies at the central and state levels to avoid duplication of efforts and to achieve diversification of human and financial resources. The skill development program is linked with other flagship programs such as Digital India and Make in India since skilled manpower is the key driver for these programs. The NPSDE 2015 also lays down diversified financing sources for skill development programs in addition to the public spending undertaken by the central government. There is a renewed focus on equitable skilling opportunities for people from disadvantaged classes, those living in difficult terrains, and women who form an integral part of the workforce. The need for a national skill qualification framework (NSQF) applicable to all courses and sessions conducted has been formalized through the creation of the NSQF in 2013, which also states timelines for the final

adoption of this framework. The NPSDE 2015 strives towards a convergence of various skill development efforts through a structural framework that focuses on quality, infrastructure, and partnerships in order to achieve the target of skilling India for India and the world.

2.2 Role of Ministry of Skill Development and Entrepreneurship

Recognizing the need to better coordinate the diverse efforts of various ministries and government departments in promoting skill development, the government notified the formation of a Department of Skill Development and Entrepreneurship on 31th July 2014 under the Ministry of Youth Affairs and Sports, which was later upgraded to Ministry of Skill Development and Entrepreneurship (MoSDE) on 9th November 2014. With the announcement of the NPSDE on 15th July 2015, the National Skill Development Mission (NSDM) was approved and the different committees under the Ministry were notified. MoSDE is an umbrella Ministry coordinating all activities around skill development for not just achieving the ambitious targets set out for skilling people but for creating a national ecosystem of skilled workforce and fostering innovations and entrepreneurship powered by state-of-the-art infrastructure, high quality standards and mechanisms for compliance. The organization of the skill development program for the period 2008-2012 and from 2014 onward is as follows (figure 2.2).

Figure 2.2: Organization of the skill development program from 2008-2012 and from 2014 onwards



Source: 11th FYP and GoI 2018b

The National Skill Development Corporation (NSDC) was set up by the Ministry of Finance on 31 July 2008 under Section 25 of the Companies Act 1956 (corresponding to Section 8 of the Companies Act 2013). The NSDC has been primarily responsible for taking forward the skilling agenda in a public private partnership mode. To meet the funding requirements, the government announced the creation of a National Skill Development Fund in 2009 as a public trust. The NSDC was able to avail funds through this trust for its skill and training programs. The Directorate General of Training (DGT) was shifted from the Ministry of Labor and Employment to the MoSDE in 2015. The National Skill Development Agency (NSDA) was set up as an autonomous agency under the Societies Registration Act 1860 and is responsible for the implementation of the National Skill Qualifications Framework (NSQF) and for ensuring the coordination of different skill development initiatives. There is considerable diversity in the skill gaps across sectors and geographies and hence it is important for the skill development program to address the same through a uniform standardized approach. Providing a common framework and guidelines is important in ensuring that there is uniformity in the quality of skill training imparted to the candidates. This is of particular benefit to potential industry employers

whereby they are certain about the kind of training the person has undergone against which she/he has been certified (GoI. n.d.3).

Among the various skill development programs spread across 20 other departments and Ministries, **Pradhan Mantri Kaushal Vikas Yojana (PMKVY)** is a flagship program of the MoSDE, GoI. It was launched on 15th July 2015 post the approval by the union cabinet on 20th March 2015. After its successful implementation in 2015, the timeframe of the program was extended up to 2022 with the ambitious target of skilling 10 million youth. Being a governmentally funded program, the PMKVY is being implemented by the NSDC under the guidance of the MoSDE. The key components of the program comprise short-term training, recognition of prior learning, Kaushal and rozgar yojana, special projects, placements and monitoring activities. Under PMKVY 1.0, more than 1.9 million students were trained compared to the target of reaching 2.4 million (PIB 2019a). Under PMKVY 2.0, around 4.9 million candidates have been trained as of June 2019. The total number of Industrial Training Institutes (ITIs) have increased from 11,964 in 2014 to 14,494 in 2019 and the numbers of trainee enrolment increased from 1.7 million in 2014-15 to 2.3 million in 2018-19 (PIB 2019b). About 30 percent of the surveyed short-term training participants in the PMKVY reported, however, not to be looking for employment, which indicates the need for adequate pre-screening of eligible candidates (GoI 2019a).

2.3 Role of Sector Skill Councils

With an aim to strengthen the demand supply linkage in skill development and step up the level of private industry (potential employers) engagement in skill development programs, the NSDM included the concept of sector skill council (SSC) in 2015. Industry participation has the benefit of tuning the curriculum and training modules to the requirements of the potential job market; bringing the right expertise and knowledge; fostering investments in training programs; an improving capacity to observed skilled manpower. SSCs are responsible for identifying skill development needs per sector; listing out the details for candidates to choose from; and maintaining a repository of skills. SSCs are involved in creating skill development plans, in determining skill/competency standards and qualifications, and in notifying the same as per the NSQF. They can also conduct skill-based assessment and certification of Qualification Packs (QPs) and National Occupational Standards (NOS). SSCs are also tasked with promoting centres of excellence (CoE) and conducting train-the-trainer programs together with the states and the NSDC. SSCs are also part of the process of setting up affiliation, accreditation, examination and certification norms for each sector. A critical role assigned to the SSCs is that they ensure that candidates who have undergone training in accordance with the established norms and standards are able to find decently paying jobs. Among the 21 sector skill councils established by the NSDC, the Agricultural Sector Skill Council of India (ASCI) and the Food Industry Capacity and Skill Initiative (FICSI) cater to the skill development requirements of the agriculture and food sectors.

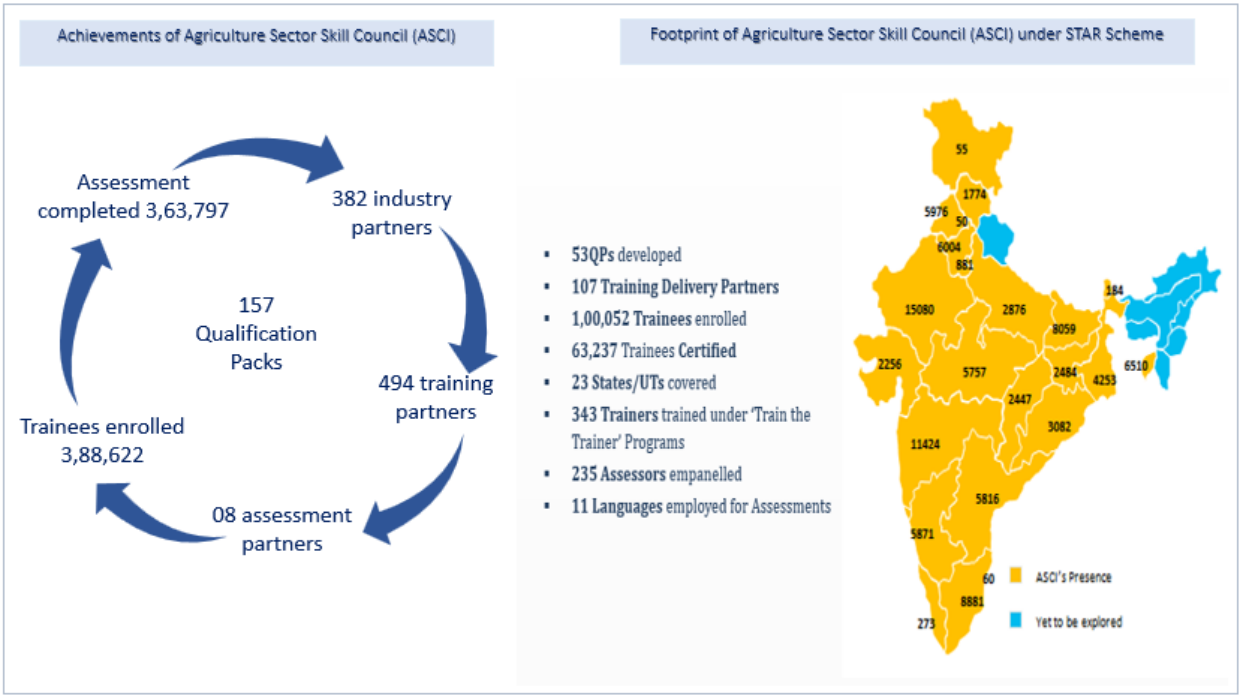
The **Agriculture Skill Council of India (ASCI)** was established in January 2013 as a Section 8 Company under the Companies Act of the Ministry of Corporate Affairs.[1] ASCI undertakes capacity building and upgrading skills of farmers and farm related workers, and extension service providers in the organized and unorganized sectors. Through these efforts, it aims at strengthening agricultural value chains like horticulture, livestock, fisheries and other segments of agriculture and allied sectors (ASCI n.d.).

The ASCI has been working closely with the Department of Agriculture & Cooperation (DAC), the Department of Animal Husbandry, Dairying & Fisheries (DADF), the Indian Council for Agricultural Research (ICAR), and the Ministry of Agriculture and Farmers' Welfare to strengthen capacities of Krishi Vigyan Kendra (KVKs) and other departments in conducting training sessions as per NOS and QPs. The ASCI targets greater employability of students by promoting vocational training institutes and programs in agricultural colleges (figure 2.5). The ASCI is also working with the Ministry of Human Resource Development through *Rashtriya Madhyamik Siksha Abhiyan* (RMSA), an agriculture skill

[1] https://nsai.co.in/ulinks/623-agriculture-skill-council-india

development program aimed at students from grades 9 (equivalent to level 01 of the NSQF) and 12 (level 04). In addition to the support extended to the state education board, the ASCI provides QPs for training, and undertakes assessments and trainings. For effective training programs and meeting the mandatory requirements of certified trainers to conduct training programs, it is critical to generate a pool of highly trained trainers. Hence, Training of Trainers (ToT) is one of the key focus areas of ASCI for training and capacity building in agricultural and allied sectors, and related training sessions are conducted pan India. The ASCI has developed 157 qualification packs (QPs) across the spectrum of agriculture value chain related activities and commodity groups. It aims at creating new generational jobs in agriculture that have the potential to enhance the productivity and profitability of the sector. The achievements of the ASCI are summarized in figure 2.3.

Figure 2.3: Achievements of ASCI (as accessed on July 2018)



Source: http://www.asci-india.com/star-scheme.php. Accessed on 20 July 2018

The **Food Industry Capacity & Skill Initiative (FICSI)** is the Food Processing Sector Skill Council established as a non-profit organization, registered under the Societies Registration Act, 1860. The FICSI is being promoted by the Federation of Indian Chambers of Commerce and Industry (FICCI) and financially supported by the National Skill Development Corporation (NSDC) (FICSI 2018). Like other SSCs, its mandate is to generate a pool of skilled manpower to meet the skill requirements of the food processing industry. The FICSI had been assigned a target of 30,810 workers to be trained under PMKVY by March 2016. At this point, 28,199 have enrolled for trainings and 22,461, i.e. 80 percent, have been certified under PMKVY 1.0, and 3,308 candidates have been enrolled and 1,815, i.e. 55 percent, have been certified under PMKVY 2.0 (GoI n.d.1). The FICSI has developed 45 QPs cutting across various operations related to the food processing industry.

2.4 Skill Development Initiatives of MoA&FW and M0FPI

In addition to the skill development agenda undertaken by the MoSDE, individual Ministries have been undertaking sector specific skilling and training initiatives. There is considerable scope for aligning these different initiatives as well as for synergizing the implementation efforts.

The **Ministry of Agriculture & Farmers' Welfare (MoA&FW)**: Unlike many other sectors, agriculture is not an aspirational job option for farmers and/or people engaged in the sector in various capacities.

Yet, it accounts for 44 percent of the workforce in India including farmers and cultivators and many more in terms of those indirectly working for the sector such as extension workers, input dealers, market functionaries, etc. Amongst these stakeholders, the majority have no formal training and depend on learning by doing, knowhow passed on from earlier generations, and on on-the-job training. Hence, there is an immense potential for skilling people engaged in agriculture through a differentiated approach catering to the specific needs of the people involved at different levels of the agriculture value chains.

The MoA&FW – through the department of agriculture and farmers' welfare (DAC&FW) and the department of agricultural research and education (DARE) – have undertaken important initiatives towards ensuring a greater outreach of extension and education services to individuals aspiring for a career in agriculture and allied sectors. The Indian Council for Agricultural Research (ICAR), an autonomous institute under DARE, MoA&FW, and GoI leads agricultural research and education. Through its agricultural education division having a network of 98 institutes and 71 universities across India (as in 2016-17), ICAR delivers agri extension and education, which are an integral part of the overall skill development agenda of the government of India. It primarily caters to building professional capacities capable of undertaking advanced technical research and ensuring its effective outreach and adoption amongst farmers. Through its extension division, which includes Agricultural Technology Application Research Institutes (ATARIs) and Krishi Vigyan Kendras (KVKs) or Farm Science Centres, ICAR undertakes technology assessment, demonstration and capacity building of farmers. ICAR launched the ARYA (Attracting and Retaining Youth in Agriculture) project in 25 districts of 25 states to train youth in entrepreneurial activities. In each of these districts, 200-300 youth are being empowered to establish their income generating units and work as model for other youth in the villages. Agrinnovate India Ltd. was set up in October 2011 incorporated under the Companies Act, 1956 and is a for-profit company owned by DARE. Its objective is to promote agricultural innovations and entrepreneurship by leveraging the strengths of ICAR and DARE at creating public private partnerships in the area of capacity building (GoI 2017a).

Through the department of extension (DoE), DAC&FW has undertaken key initiatives towards capacity and skill development of farmers, and other agri business players. The National Institute of Agricultural Extension Management (MANAGE) is the nodal agency for the implementation of these programs in addition to its mandate of offering management and technical skill development to agri business professionals.

Under ARYA (Attracting and Retaining Youth in Agriculture), 5,000 youth are being empowered through Krishi Vigyan Kendras (KVKs). Through a total of 662 KVKs spread across the country, 48,983 training programs were organized with an outreach of 1.3 million farmers and extension personnel. Skill-oriented vocational training courses were organized for 170,000 rural youth. Capacity development programs were conducted for 104,200 extension personnel, 22,889 (22 percent) of whom were women. KVKs organized 469,000 extension programs with 19.8 million participants to create awareness among farmers about improved technologies and to provide advisory services. Technology weeks organized by KVKs were targeted towards 2.06 million farmers, including women farmers, extension personnel, rural youth and members of self-help groups. Agricultural advisory services through SMS (56,107) targeted 15.5 million farmers. ICAR-Agricultural Technology Application Research Institutes (ATARIs) upgraded the knowledge and skills of 5,009 staff of KVKs by arranging capacity development programs. Agricultural Technology Information Centers (ATICs) served as single-window delivery systems and provided technology information, technology services and technology inputs to 467,000 farmers (GoI 2017a). With the vision to promote innovation and entrepreneurship, ICAR created an Incubation Fund supporting 25 agribusiness incubation (ABI) centres located in various institutes for fostering commercialization of ICAR technologies. These ABIs undertook various activities including business plan development (75); conferences and seminars (21); short-term and long-term consultancy (104); enrolling entrepreneurs in incubation (163); graduating entrepreneurs from the incubator (61); and value chain development (40) (GoI 2017a). Under the ACABC program steered by MANAGE, nearly 23,501 clinics were set up and 54,496 candidates were trained between April 2002

and September 2017 (MANAGE 2017). There are several other skill development programs initiated by the department of extension (DoE) of MoA&FW in 2015 and modelled along similar lines in order to not only target the youth but farmers in general as well as others who are already engaged in agriculture. To leverage the existing network and programs, the NSDM should bring these programs under one banner rather than creating new programs and responsibilities within the government. Pandit Deen Dayal Upadhyay Unnat Krishi Shiksha Yojana under Unnat Bharat Abhiyan (UBA) is another promising program that aims at creating an inclusive academic system wherein higher academic institutions play a strategic role in the rural development mission.[2]

The **Ministry of Food Processing Industries (MoFPI):** The Availability of skilled manpower is one of the major challenges for the Indian Food Processing Industry, addressing which can enable the sector to grow rapidly. By increasingly focusing on the quality of food, stringent processes need to be adhered to in the processing sector, which requires skilled and trained manpower. The Ministry of Food Processing Industries (MoFPI) is working with the Food Industry Capacity and Skill Initiative (FICSI), the sector skill council (SSC) in food processing, to complete the validations of QPs for each job role. It is also involved in the development of course curricula through the National Institute of Food Technology Entrepreneurship and Management (NIFTEM).[3] Under Pradhan Mantri Kisan SAMPADA Yojana, MoFPI supports skilling infrastructure and development of course curricula with a budget outlay of Rs 275 million from 2017-18 to 2019-20. The scheme comprises two components: i) development of course curricula for training modules and their translation to English, Hindi and regional languages; and ii) assistance for the creation of infrastructure facilities for skill training centers. The scheme guidelines are still under process. The Indian Institute of Food Processing Technology (IIFPT)[4] and the NIFTEM conduct regular programs on skill development and entrepreneurship for youth, farmers, self-help groups and industry. MoFPI, through NIFTEM and IIFPT, focuses on entrepreneurship development by ways of skill and capacity building, outreach programs and village adoption programs. It has included a module on entrepreneurship in the course curriculum pertaining to all job roles (GoI n.d.2).

MoFPI established NIFTEM in 2012 and has been declared a Deemed University under the de novo category. NIFTEM offers Bachelor of Technology (BTech), Master of Technology (MTech) and PhD courses and furthermore undertakes research and development projects in the area of food technology. The institute receives financial support from MoFPI to promote research activities, expand the Village Adoption Program (VAP) and skill development in the food-processing sector for which an allocation of Rs 1 billion has been made. The IIFPT in Thanjavur, Tamil Nadu, has been upgraded to a national level institute in 2008. It also offers BTech, MTech and PhD courses and undertakes research and development projects in the area of food processing. An allocation of Rs 750 million has been made to expand its activities and programs to meet the increasing demands of the food-processing sector. The IIFPT has created a hi-tech, state-of-the-art food processing incubation-cum-training centre with sales outlet as a food processing incubation model on campus. Through this facility, it offers short- and long-term hands-on training to rural youth, women self-help groups, producers, students, new and experienced entrepreneurs and other stakeholders. It also offers technical consultancy services for setting up food industry units (GoI n.d.3).

In 2016-17, the IIFPT and NIFTEM trained/skilled 1,300 and 4,736 persons respectively. In 2017-18 (until June 2017) NIFTEM and IIFPT trained another 330 and 369 persons respectively. The Food Industry Capacity and Skill Initiative (FICSI), the sector skill council (SSC) in food processing, has the mandate to develop a total of 70 QPs, 55 of which have already been developed. Of those 55 QPs, 44 QPs have been approved by the QRC, and the remaining 11 QPs are complete and are to be presented to the QRC for approval. The content of 5 QPs has been approved by the NSDC. The 28 remaining contents have been developed and sent to the NSDC for approval. The feedback for 7 of those QPs has

[2] http://unnat.iitd.ac.in/index.php/Pages/display/introduction

[3] The Cabinet Committee on Economic Affairs, in its meeting held on 31.08.2006, approved the setting up of the NIFTEM at Kundli, Distt. Sonepat, Haryana (Annual Report 2017-18, NIFTEM).

[4] ICPT set up in 2008 has been upgraded as an IIFPT in 2017. The origin of this institute goes back to 1960s. For more details, please refer to http://www.iifpt.edu.in/pages/about-us.html

been received from the NSDC. Under PMKVY 1.0, 46 Training Partners (TPs) and 218 Training Centres (TCs) were affiliated with the FICSI. Under PMKVY 2.0, 21 Training Centers have been affiliated with the NSDC through the SMART Portal. The first cycle of training under the PMKVY was inaugurated by the Hon'ble Minister of Food Processing Industries on 4th September, 2015, in 30 centers across 11 states (GoI n.d.6).

In addition to the skill development initiatives undertaken by MoSDE, MoA&FW and MoFPI, prime autonomous public educational institutions like the Indian Institute of Management (IIM) and the Indian Institute of Technology (IIT) have been playing an important role in advancing innovations and entrepreneurship through their respective incubators that support innovations and nurture entrepreneurship. Through the Bharat Innovation Fund, the Centre for Innovation and Entrepreneurship (CIE), which is affiliated with the IIM-Bangalore, provides pre-series A and series A funding to game-changing entrepreneurs.

2.5 Budgetary Allocations and Financing Mechanisms of Skill Development Programs

The budgetary allocation to the Ministry of Skill Development and Entrepreneurship (MoSDE) increased from Rs 10.1 billion in 2015-16 to Rs 23.2 in 2018-19 (in current prices). The budget allocation for 2019-20 is Rs 29.9 billion. The major share of the allocations has gone towards the development of skills under the Pradhan Mantri Kaushal Vikas Yojana (PMKVY). In addition to the MoSDE, the MoA&FW and the MoFPI have budgets allocated towards various programs and institutions focusing on skill development (table 2.1).

The Union Budget 2017-18 announced the following initiatives to further boost skill development programs in India:

- Pradhan Mantri Kaushal Kendras (PMKK) to be extended to more than 600 districts across the country. 100 India International Skills Centres will be established across the country.
- Skill Acquisition and Knowledge Awareness for Livelihood Promotion programme (SANKALP) to be launched at a cost of Rs 40 billion. SANKALP will provide market relevant training to 35 million youth.

In addition to the budget of the MSDE, the MoA&FW and the MoFPI, through their respective programs, have increased allocations to promote skill development and training of agriculture and food professionals, farmers and entrepreneurs.

Table 2.1: Budgetary allocations for skill development programs (in Rs billion)

	2015-16 AE	2016-17 AE	2017-18 AE	2018-19 RE	2019-20 BE
National Mission on Food Processing (SAMPADA)		7.0	6.1		
Pradhan Mantri Kisan Sampada Yojana				8.7	11.0
Autonomous Bodies (IICPT & NIFTEM)			0.6	1.0	0.7
Total Budget Allocation in Food Processing	5.0	7.1	6.8	10.0	12.0
% share of selected programs		***98%***	***97%***	***97%***	***98%***
Dairy Entrepreneurship Development	1.2	2.4	2.0	3.2	3.3
Total Budget Allocation in Dairying & AH	14.1	18.6	20.2	32.7	29.3
% share of selected programs	***8%***	***13%***	***10%***	***10%***	***11%***
Sub-Mission on Agriculture Extension	6.0	5.9	8.2	8.8	9.5
Sub-Mission on Agriculture Mechanisation	1.5	3.7	7.6	9.0	10.0
Total Budget Allocation in Agriculture	153.0	369.1	374.0	678.0	1304.9
% share of selected programs	**5%**	**3%**	**4%**	**3%**	**1%**
Agriculture Research and Education	53.9	57.3	69.4	79.5	80.8
Ministry of Skill Development & Entrepreneurship - Pradhan Mantri Kaushal Vikas Yojana	10.1	15.5	22.0	23.2	29.9

Source: Union Budget Expenditure statements 2017-18, GoI 2017b; Union Budget Expenditure statements 2019-20, GoI 2019c

Note: AE – actual estimate; RE – revised estimate; BE – budget estimate

The Union Budget 2019-20 announced the Scheme of Fund for Upgradation and Regeneration of Traditional Industries (SFURTI) with the objective to facilitate cluster-based development of traditional industries focusing on bamboo, honey and khadi clusters. Common Facility Centers (CFCs) would help realize a target of setting up 100 new clusters by 2019-20 to provide employment opportunities to 50,000 artisans. This will ensure that these industries become more productive, profitable and employment generating in a sustainable manner. The earlier program – A Scheme for Promotion of Innovation, Rural Industries and Entrepreneurship (ASPIRE) – has been consolidated into two new initiatives: Livelihood Business Incubators (LBIs) and Technology Business Incubators (TBIs) with the objective to launch 80 and 20 centres, respectively, and generate 75,000 skilled entrepreneurs in agro-rural industry sectors (GoI 2019b).

Public spending provides a good start to this huge program but to make this outcome-oriented and sustainable over time, private investments will play a critical role. Also, the program should mature from a subsidy and/or sponsored model to one for which candidates are willing to pay (for example through education loans). This will begin to happen when these programs enhance the employability of the candidates who underwent a training and now are certified for particular job roles. There are different models of attracting private sector funding into the skill development programs:

- private agribusiness companies can spend funds out of CSR towards targeted skill development either through educational institutions or non-governmental organizations working with rural workforce including farmers. Their focus can be laid on training young girls and women in rural areas.
- agri input and food processing companies as part of the professional development funds of employees can dedicate funds towards these skill development programs.

- private agribusiness companies can seek certain applicable tax exemptions based on their spending on skill development. The spending cut-offs can be kept high enough for this model to work in the interest of the program, and not just a means for companies to seek exemptions.
- private banks can extend educational loans for such vocational trainings. Agribusiness companies which are potential employers can extend some kind of guarantee linked to the placement of candidates undergoing the training process.
- donor funding for large agriculture, food or other rural development projects can bring in a key element of skill development into the programs making it mandatory for the implementing agency to spend part of the funds towards certified skill development of the beneficiaries involved.
- global partnerships can be effective in facilitating a free-of-cost mutual exchange of ideas, expertise and training tours for selected candidates.

3 Private and Global Players Engaged in Skill Development and Entrepreneurship

3.1 Private Sector Engagement in Skill Development and Entrepreneurship

Skill development in India has been primarily led by the government with the private sector playing its roles in limited capacity. Public programs on skill development have the scope for private sector participation in partnership and such models have been in progress. With the shift in focus of the skill development programs from mere vocational training to innovation and entrepreneurship, there is a greater role that the private sector can play. Also, most importantly, the policy emphasis on aligning skill development with demand requires the participation of private players. This is particularly relevant as the industry is a potential employer and is also better versed with the changing technology and operations which need to be considered in the development of training modules.

Figure 3.1: Private sector engagement in skill development

Source: Authors' illustration

Private players present in the skill development space can be categorized into private companies who undertake skill development as part of their core business as well as CSR and/or through foundations and trusts, which work on larger social and human developmental issues (figure 3.1). There are developmental agencies who are active in capacity building and skill development of targeted beneficiaries in terms of funding such programs run by the government or other private players. In addition, there are private training institutes which conduct trainings for the publically run programs on skill development. Skill development at the village level is also undertaken by self-help groups and/or farmer clubs, etc. Most of these players work in partnership with each other and in partnership with the government. However, the training curricula and methods do not always conform the NSQF and hence acceptability of such certification in quite varied. With the implementation of the NSQF, it is targeted that all trainings will have to be NSQF-compliant and training centres and partners need to be accredited and affiliated as per guidelines. This will give a major boost to quality skill training.

With the increasing adoption of technology in the agriculture and food sectors, demand for skilled labor resources is likely to increase manifold. As private agri-business players try to secure and expand

existing markets through value added services, their required labor resources increase and the skill sets needed are also quite diverse. For example, in agriculture, precision farming which involves hi-tech mechanization will require people with advanced skills for developing these technologies, customizing them to meet local needs, operating the same on the farmers' fields as well as educating and training the farmers for the future. There is a growing shift in business strategy from merely marketing tractors, seeds, micro irrigation equipment, agro chemicals, etc. to offering packages of practices and related services such that the farmers are able to adopt the same as a package and benefit rather than using bits and parts which on their own are not effective. This also works well as a business model considering that these services are not free and as the benefits are demonstrated, demand for such package of inputs and services will increase. With increasing awareness amongst consumers about food quality, improving farming practices and farm management are gaining importance. This requires specialized skills in ensuring that the right practices are followed and issues related to traceability can be handled adequately, which is a pre-requisite for export markets. Private companies such as Jubilant Bhartia Foundation, ICICI Foundation, Mahindra Tech Foundation, Unilever India, and Hindustan Coca Cola Beverages Pvt. Ltd. are also contributing towards skill development through their CSR models.

The penetration of technology in remote rural areas is continuously throwing up new challenges which need to be addressed in a timely manner. Hence, skilled people are required to work closer to the farmers' fields and/or connected over a virtual platform. While people no longer want to continue in agriculture and particularly in farming, technology driven agriculture is opening up new employment opportunities for youth in both on- and off-farm jobs. Development agencies play a critical role in integrating skill development with social and human development, and for incorporating lessons learnt and best practices from across the world for an improved design, implementation and monitoring of these programs. There efforts are not guided by for-profit motives but indirectly impact economic outcomes for the people undergoing training as well as for the sector in which they are finally employed in terms of higher productivity and revenues. The smaller private institutions work like nodes that offer training to people and particularly youth who are not into mainstream education. These institutions can contribute most effectively when linked to government programs such that their accreditation and affiliation are ensured and quality trainings are provided at affordable costs. There are also bigger private institutions and colleges which offer technical and managerial programs which are expensive compared to those provided by state universities, colleges and other institutions. Some of the major agribusiness companies engaged in skill development are Mahindra and Mahindra through their Samriddhi and Tringo (rental model for tractors) initiatives, Tata Kisan Centres (TKS), TAFE, John Deere, and Syngenta.

Innovation and entrepreneurship are two emerging elements of the skill development agenda. Several private sector players including corporate giants like Google, Microsoft, GE Capital, and Tata Consultancy Services (TCS) have set up accelerators and incubators to nurture innovations and boost entrepreneurship. Financiers like venture capitalists and angel investors have come forward in a big way in financing start-ups critical for sustaining the venture. There has been a flurry of agriculture and food related start-ups and early stage companies in India thereby giving rise to a new generation of entrepreneurs.

Other private institutions involved in skill development activities include the **Indian Society of Agribusiness Professionals (ISAP)** which runs a skill development program targeting unemployed agriculture and allied sector graduates across 12 states in India including Jammu & Kashmir, Punjab, Himachal Pradesh, Haryana, Uttarakhand, Rajasthan, Gujarat, Madhya Pradesh, Jharkhand, West Bengal, and Chhattisgarh. The Entrepreneurship development program (EDP) is part of the Agri Clinic and Agri Business Centres (ACABC) scheme steered by the National Institute of Agricultural Extension Management (MANAGE). After two months of training, agri-preneurs are provided active support for up to one year for setting up their own business ventures by ISAP. The training modules cover soft skills, business skills, and the preparation of detailed project reports (DPR) for access to credit. Support

activities include mentoring and guidance. ISAP also offers certified vocational skills training spanning a period of nine days for rural youth in below poverty line (BPL) districts. [5]

The **National Skills Foundation of India (NSFI)**, a non-profit organization, focuses on skill development and entrepreneurship for enhanced and sustainable outcomes. The NSFI provides training need analysis, training and evaluation, facilitates certification, and provides incubation services. It covers sectors such as agriculture and allied services; water and nutrition; handicrafts; and renewable energy and environment. Some of the key project implementation efforts of NSFI have been as follows:[6]

- Trainings for farmers on emerging agriculture technologies and practices
- Market linkage programs for north east agriculture commodities and products
- Women farmers' organic festivals
- Training on clean milk production technologies
- Horticulture and handloom market linkage programs
- Financial inclusion of women farmers
- Capacity building of entrepreneurs in food processing, ornamental fish production
- Skill development on bee keeping, dairy entrepreneurship
- Women farmers' spice and tea festivals
- Incubation of green colleges
- Agriculture risk management

NSFI leverages the strengthening of partnerships with government, industry, academia, think-tanks and experts to design, execute and monitor the outcomes of training programs. In the context of agriculture and food, the focus has been laid on technology adoption and market linkages.

Digital Green, a non-profit organization pioneered the concept of video-based learning in rural India. In 2012, Digital Green partnered with the National Rural Livelihood Mission (NRLM) to enhance the public extension system through its digital approach. The model is based on training frontline workers who screen the videos on best practices related to farming, non-farm practices, financial inclusion and institution building with the larger community. The mandate is to reach out to 10,000 villages covering 1 million farmers through around 3000 participatory videos. Andhra Pradesh and Bihar are the focus states. Digital Green in partnership with the NRLM and its state level counterparts is empowering 10,000 frontline workers across 13,600 villages for promoting improved agricultural and nutrition practices. It is noteworthy that nearly 90 percent of the beneficiaries are women; this is a critical number as a large share of the farm and off-farm work is done by women.[7] Hence empowering them is the right approach to attain a productivity breakthrough in many cases. Digital Green is also present in Africa where it uses video learning for community development. The USP of Digital Green has been its approach to use technology at a very basic level (i.e. videography) yet retain human interaction to fast track extension services. The solutions offered emanate from local practices which rules out the need to tailor solutions to suit local needs and conditions and hence acceptability and adaptability of improved practices become much smoother.

While the skill development in India is primarily driven by the public sector, in its original design, the private sector was envisioned to play an important role in terms of developing market demand-driven course curricula and job roles, partnering with the government to conduct training programs, lending technical and knowledge expertise, and also absorbing the emerging skilled workforce through internships, etc. However, the engagement of the private sector has been somewhat limited which

[5] http://www.isapindia.org/pages.php?url_key=rural-entrepreneurship-and-vocational-training
[6] http://nsfindia.org/our-journey/
[7] http://www.digitalgreen.org/india/

needs to be addressed. The sustainability of the skill development program will depend on its financial viability moving away from subsidies and public spending towards paid training services. In order to make skill development aspirational for the youth, particularly in the agricultural sector, which is not as lucrative as other sectors, curricula should be demand-driven such that at the end of the training and certification, people are employed gainfully.

3.2 International Partnerships in Skill Development and Entrepreneurship

Be it international partnerships at government-to-government (G2G), business-to-business (B2B), G2B, or B2G level – India's skill development agenda is aimed at further strengthening the design of the program by setting the right quality parameters for training, assessment, and certification. Moreover, the agenda relies on identifying job roles that are transnational in nature to create global mobility of the skilled work force. Partnerships such as those named above are critical for India for bringing the right expertise to and adapting best practices in skill development. The Ministry of Skill Development and Entrepreneurship (MSDE) of the Government of India has sought active collaboration with several countries like the UK, Australia, Germany, France, the US, and Singapore in the area of technology transfer, training of trainers, and designing model centres of excellence. The India-Israel collaboration is focused on improving water use efficiency and agricultural productivity leveraging the innovation and technology strength of Israel. Some of the global partnerships steered by the Government of India are summarized in annexure 1.

To enable skill development at the grassroots level through the right partnerships and leveraging existing knowledge with farmers, the German Federal Ministry for Economic Cooperation and Development (BMZ) under its Global Initiative on Promoting Green Innovation Centres under the One World No Hunger Initiative (SEWOH) and the Gesellschaft für Internationale Zusammenarbeit (GIZ) are supporting green colleges in India. This initiative is focused on skilling rural tribal youth to empower them within their own communities by means of gainful employment (annexure 2). India has been working extensively in several countries in Africa to strengthen the skill quotient of their agricultural workforce and professionals through bilateral collaboration as well as through cooperation with third countries. The India-US partnership in Feed the Future: India Triangular Training Program is such a flagship partnership (annexure 3).

These partnerships are critical for the broader goal of putting together an international standards framework for skill development and benchmarking of practices. International partnerships are aimed at not just strengthening skill development programs in India but also at taking some of the demonstrated best practices in skill development outcomes beyond India to countries which have similar requirements. Thereby creating a virtual platform for knowledge transfer and exchange of ideas, concepts and best practices is crucial for empowering a larger pool of people, particularly youth and women, through skill development.

4 Addressing Gaps and Harnessing Opportunities – Future Roadmap

Skill development has gained significant relevance over time in India owing to a large pool of young people; bulging workforce; and the general scope of improving sectoral productivity and growth manifold. Programmatic efforts to impart skill training in the form of vocational education and training has been in place for quite some time. People who are unable to enrol or continue in formal education systems usually went for vocational training to improve their chances of employability. To a large extent, vocational training in its erstwhile format was not attractive enough for the youth and also lacked a far-reaching impact in terms of making skill development aspirational; encouraging innovative and entrepreneurial spirit; and making skill development a life-long learning process. Hence, the commonly observed challenges related to skill development programs need to be addressed with an alternative approach based on better partnerships, institutions, and program designs to achieve the desired outcomes.

While the National Skill Development Mission (NSDM) has set the right platform for developing a holistic skill development program that addresses the challenges the existing programs face in their attempt to build a skilled nation, there are specific areas in the agriculture and food sectors that need focused attention. A World Bank (2015) study on selected skill development programs in certain states showed that while candidates who underwent trainings had been able to find jobs, not many continued in these jobs for a long time, which raises questions about the sustainability of placements after the completion of a training. Hence, to make these programs more impactful, post-placement tracking mechanisms can be useful to understand the issues and difficulties faced by the trained candidates and to devise appropriate interventions to address the same. The impact of vocational education and training on employment, wage levels, etc. have been studied in the past. Often the findings indicate poor quality and outreach of many of the programs as well as a lack of a clear monitoring and evaluation design, which is critical to track and assess such programs. Some of the common challenges observed are gaps in the screening of candidates who are seriously motivated to find a job post training; quality of trainers and training partners; reporting anomalies which impact assessment; adequacy of training durations for certain qualification packs; incentives for paying for such trainings; funding of programs; etc. Some of the specific recommendations emerging from the study more in the context of the agriculture and food sector are summarized as follows:

Make innovation and entrepreneurship integral to skill development

- **All skill development programs, whether they are part of the vocational education and training or formal education, should emphasize innovation and entrepreneurship.** These are the two important pillars for sustainable development and economic progress and they have begun to define the future of jobs across sectors. With India's population being youthful and growing and diverse opportunities across sectors, it is important to catch the talents young and nurture them going forward through the right incubation and mentoring, thus preparing readying them for the market and finally for take-off.
- The agriculture and food sectors have witnessed a rapid flurry of innovations that are aimed at solving some of the pressing challenges confronting the sectors. With these has emerged a new generation of entrepreneurs who are able to leverage technology towards improved agricultural and food processing practices. They have the potential to benefit the sector at large and farmers and primary processors in particular in terms of optimal utilization of resources and of achieving higher returns.
- However, not all innovations have survived the odds and turned successful due to a lack of institutional, intellectual, and investment support. Hence incubation ranging from advanced research and development opportunities, trials and experiments on farmers' fields, mentoring

and advisory services to develop robust business models, and financial support, among others, are critical for commercializing several innovations.

- Entrepreneurship in agriculture has opened a new employment opportunity for youth and is already gaining momentum against a large number of people who are not willing to continue in agriculture. Practitioners with access to knowledge and technology can make a huge difference to the way agriculture has been functioning thus far. Business acumen can enable to progress beyond traditional practices and view agriculture as a business endeavour.
- A virtual platform connecting all public and private run incubation and accelerator programs can be useful in sharing best practices, implementable solutions that can be replicated, and can create a unified community supporting innovation and entrepreneurship with certain standard objectives, approaches, and targets thereby amplifying the impact.
- The concept of farmer field schools can be extended to build a partnership between lead farmers, village level entrepreneur and public extension system to offer skilling and demonstrate adoptable practices at grassroots levels.

Expand the frontiers of skill development in the agriculture and food sector

- Targeted beneficiaries with respect to skill development in the agricultural sector comprise two distinct categories. First, youth who are trained on different job roles in agriculture and can venture into the sectors as practitioners and/or extension and technical advisory workers. Second, existing farmers who can benefit from upgrading their skill sets towards efficient farming practices. Hence, the type of skill training to be provided will be different for these two groups. Skill development in agriculture has to go beyond classroom models and include community participatory learning, farmer field schools, and other innovative models. Identifying dynamic farmer representatives can be instrumental in expanding the outreach and accelerating dissemination of knowhow and best practices.
- Specific to agriculture, there are innovative practices which are home-grown and passed on over generations. These can be leveraged to develop further improved practices and are particularly relevant for small-scale farming practices where the scope of technology is limited. These innovative practices can be documented, curated, and shared over a virtual network to benefit the larger farming community, as is being done by Digital Green in India. The same can be extended to global practices to facilitate effective exchange and adoption of practices.
- To further consolidate such efforts, these practices could form part of the curriculum that is being developed and designed by ASCI in consultation with other stakeholders. They could also form the basis for developing national occupational standards and qualification packs for the sector.
- Curriculum design, examination, assessment and certification processes should be structured in consultation with the industry and sectoral experts to bring in the market requirements. Successful entrepreneurs should form part of this consultative process and training programs as experts and mentors.

Foster skill development through firm-farm linkages

- Fostering skill development through firm-farm linkages can help encourage private sector participation in skill development in the agriculture and food sector. It is commonly observed that firm-farm linkages strive at educating the farmers about the right farming practices as well as management in order to ensure that the end product is of desired quality and specification (most important for ventures catering to export markets).

- The same can be done in a more structured manner wherein the private player can offer a compulsory training package to the farmers which conforms to the skill development standards developed by ASCI including training, assessment and certifications. This model can help expand outreach and add to the number of certified skilled farmers and agri entrepreneurs as part of the recognition of prior learning (RPL) model of the NSDM.
- With respect to the agri inputs, advisory segments and the food-processing sector, a combination of vocational education and on-the-job training (similar to that of the dual education system pioneered in Germany) can be promoted. This will allow making skill development programs in agri and food sectors better aligned to the market demand and further prepare the candidates for the opportunities that exist.

Strive towards sustainability of skill development programs

- to begin with, the Indian Government has sanctioned massive outlays to jumpstart the revamped skill development program and make it more attractive and affordable to the masses. However, going forward it is important to ensure that the program is financially viable. To make this happen, the program should be demand driven and linked to job opportunities across sectors, whereby people having undergone the skill development programs are able to find suitable jobs.
- encouraging private sector engagement through partnerships in designing market-oriented training programs, faculty for conducting trainings, as well as on-the-job trainings will add significantly to the sustainability of the skill development mission.
- private sector spending through corporate social responsibility (CSR) initiatives need to be encouraged by creating the right platform integrated in the overall skill development program.
- global (G2G or B2G or B2B) partnerships will add value in terms of upgrading the quality of the program through sharing of their best practices, technical expertise, and facilitating exchange programs for participants, internships and job mobility.
- leveraging existing infrastructure, expertise and learning tools can be useful in avoiding massive spending on the same. Upgrading existing resources rather than creating new ones will allow greater efficiency in resource use for developing better skills.

The skill gaps are quite substantial and hence a mission mode approach is required to bridge the same. However, one should not lose sight of the importance of aligning availability of skilled manpower with existing and potential job opportunities across sector. For the agricultural sector, it is important to skill and train people engaged in the sector to leap forward from subsistence farming mechanisms and make the same job more remunerative and profitable. With the rapid uptake of technology in the agriculture and food sectors in India, skilled workforce can add greater momentum to the emerging trend as well as create a new generation of people employed in agriculture.

Going forward, success of the skill development program will not be limited to the number of people skilled and their gainful employment. The focus will be on whether the skill development program has been instrumental in generating a pool of people equipped with the desired skills to take on future jobs, which are more technology-driven, require precision, focus on higher product standard and quality, and are professionally managed.

5 Annexures

Annexure 5.1: Global partnerships to promote overall skill development in India

Partner country/organization	India MoU Partner	Scope of the MoU
UK India Education & Research Initiative	MSDE in 2015	• Identify sectoral skill gaps and creating the right job roles, curriculum, accreditation & assessment models, leveraging technical expertise • capacity building of personnel in charge of the program • join initiative on validating NOS & processes related to setting up of sector skill councils through NSDC & UK Commission for Employment and Skills (UKCES) • undertake joint research on priority sector skill issues • joint trainings on entrepreneurship development • support development of employment services in India on the lines of National Careers Service, UK • UK India Education Research Initiative (UKIERI) to bid for projects related to skill development initiatives. Specifically to support NSDC to establish network of sector skill councils (SSCs) and facilitate their promotion and incubation of SSCs on agriculture & media
Association of Colleges, UK	NSDC in 2014	
Department for Business, Innovation and Skills on behalf of the Government and the Devolved Administrations of the United Kingdom of Great Britain and Northern Ireland	Directorate General of Training (DGT) then under Ministry of Labor & Employment (MoLE) in 2013	
UKCES (UK Commission on Employment and Skills)	NSDC in 2011	
US-India Business Council (USIBC)	NSDC in 2014	• Collaborate with US companies for supporting 10 training centres in India & over a span of 3 years reach a scale of 10,000 people trained per annum & over a horizon of 10 years, attain a target of 100,000 people per annum. Agriculture is one of the sectors identified under this program
Associate of Canadian Community Colleges		• Collaborate with community colleges to set up academies of excellence for training programs with a target of at least 50,000 skilled trainers & assessors over 10 years. Canadian SSC to work with Indian SSCs in strengthening curriculum, assessment & certification standards & boost labor mobility

Source: http://www.skilldevelopment.gov.in/global.html

Annexure 5.2: Green colleges initiative in India

Green Colleges Initiative – Developing Green Entrepreneurship in Tribal areas of India	
Objective:	focuses on training rural youth from the most backward districts in the states of Jharkhand, Odisha and West Bengal in order to provide them dignified livelihood within their own community.
Partnerships	Supported by German Federal Ministry for Economic Cooperation and Development (BMZ) under its Global Initiative on Promoting Green Innovation Centres under One World No Hunger Initiative (SEWOH) and the Gesellschaft für Internationale Zusammenarbeit (GIZ). Program implemented by Welthungerlife. Other partners include civil society organizations at the state level and CSR foundations; ASCI for affiliation of green colleges; Incubator hosted by the National Skills Foundation of India provides pedagogical and business support to the colleges.
Program scope	• Course comprises of both short term (15-30 days) as well as long term certificate courses (six months). Training methods included a mix of theoretical, practical and experiential learning. • Lessons included soft skills such as business plan development, marketing, entrepreneurship, motivation, conflict resolution, leadership and communication skills. • Courses organized by 13 Green Colleges, include skill development in areas such as sustainable farming, animal husbandry, integrated fishery, sustainable harvesting and processing of forest produce, agro food processing and solar lightning. • Farmer Field Schools (FFS), set up by the Green Colleges offer training on integrated farming systems for promoting family farming with focus on nutrition sensitive agriculture
Program Outcome	• Between 2010-2014, 4600 trainees were trained in short duration courses, and 3400 trainees successfully established their farms/enterprises. They are further linked to farmer producer organizations to benefit from economies of scale. • Additional 30,000 youth were to be trained between 2015 and 2017. At least 21,000 smallholder are expected to increase their annual net income by EUR 240

Source: http://welthungerhilfeindia.org/wp-content/uploads/2016/07/Green-Colleges-India.pdf

Annexure 5.3: Feed the Future: India Triangular Training Program

FEED THE FUTURE: INDIA TRIANGULAR TRAINING PROGRAM

In November 2010, India and US partnered for a Triangular Cooperation adapting technological advances and innovative solutions to address Food Security Challenges in Africa. The pilot intervention included three African countries - Kenya, Liberia and Malawi. Following the positive impact of 7 training programs conducted by National Institute of Agricultural Extension Management (MANAGE), Hyderabad and National Institute of Agricultural Marketing (NIAM), Jaipur covering 219 executives, the program was extended to 17 more countries. USAID and MEA led this Feed the Future; India Triangular Training Program which was launched on 25th July, 2016.

The objective of the training programs is to address human and institutional capacity gaps in food and nutritional security in select African and Asian countries. The aim is to train around 1400 agricultural professionals in Africa and Asia in phased manner until 2020. About 11 out of 13 identified programs on farm mechanization, poultry management, marketing, among others have been already conducted by various agricultural institutions across India attracting a large number of executives from selected countries in Africa and Asia.

Participating countries include Afghanistan, Cambodia, Lao PDR, Myanmar, Mongolia, Vietnam, Kenya, Malawi, Liberia, Ghana, Uganda, Rwanda, Democratic Republic of Congo, Mozambique, Tanzania, Sudan and Botswana.

MANAGE, USAID and the Government of India (GoI) are required to formally inform officials of new participating country governments before the program implementation begins. All nominations and applications are to be made directly to MANAGE through the respective Ministry of Agriculture or any other appropriate government agency. MANAGE will lead all review of applications and selecting final participants based on diverse working areas such as planning, administration, teaching, research and extension in agriculture and allied fields namely livestock, fisheries, natural resources management, nutrition, agribusiness, post-harvest and value addition, marketing, etc.

There will be 32 training programs for 25 participants in each program comprising of 15 days training courses at select Indian institutions. Each course module will focus on themes or subsectors in which India has demonstrated comparative advantage to offer such trainings. The selected institutions will have the right bandwidth in terms of expertise to effectively respond to the capacity gaps and challenges faced by the target countries. Also, 12 training programs for 50 participants each comprising of 10 days course will be conducted in selected African and Asian countries, which have considerable human resource development needs

Course curriculum will be developed based on the capacity gaps and HR development needs which will be mobilized through stakeholder consultations including private agro-businesses, public service providers and policy makers, for profit and not for profit non-governmental organizations, professional associations, and farmers groups. MANAGE is required to follow a participatory approach in program design and implementation.

Source: http://www.manage.gov.in/ftf-itt/prgbrochures/prgbrochures.asp

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