Fifth National Conference of Chief Secretaries

"Human Capital for Viksit Bharat"

Concept Note for Sub-Theme 3

Skilling: Future Ready Workforce

Nodal Ministry/Department: Ministry of Skill Development and Entrepreneurship (MSDE), Government of India in collaboration with the Department of Agricultural Research and Education (DARE)

सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

Theme 5th CS Conference: Human Capital for Viksit Bharat

Concept Note: Skilling Future Ready Workforce

1. Introduction

1.1. India today stands at the threshold of a transformative era, an *Amrit Kaal*, marked by unprecedented opportunities to shape a *Viksit Bharat*, a developed and inclusive India by 2047. This vision of our Hon'ble Prime Minister is rooted in building a resilient economy, world-class infrastructure, a skilled and empowered workforce, and a just and inclusive society. By 2047, India is poised to become a $30 trillion economy, with a projected population of about 1.6 billion and a working-age population of 1.12 billion, making India the largest workforce globally[1].

1.2. India's economy meets four transformative disruptions: accelerated digitalisation, shifting global supply chains to reliable and cost-efficient destinations, the green transition along with circular production, and ageing workforces in advanced economies. Harnessing this window demands a skilling esosystem that is not only **future-oriented** and industry-aligned but also upgrades agriculture with precision, climate-smart and agri-logistics skills, ensuring rural communities' benefit. An inclusive, demand-responsive ecosystem focusing on **new age skills** will position India as a preferred destination for technology-led investment and a leading exporter of skilled talent.

1.3. The National Education Policy (NEP) 2020 has been pathbreaking as it envisions creation of a holistic, flexible, multidisciplinary education system that nurtures critical thinking, creativity, and practical skills. By integrating vocational training at every stage of education, it aims to create a future-ready workforce that can adapt to the changing demands of the economy, both domestic and global. The policy advocates early integration of vocational education in schools, offering modular and flexible learning opportunities, integration of vocational education in higher education by formulating National Higher Education Qualifications Framework (NHEQF) and providing both technical and soft skills for holistic development of youth.

1.4. Yet, despite demonstrable progress, formidable gaps persist. Employment outcomes vary widely across districts; women and marginalised groups are under-represented in advanced manufacturing and technology job roles; agriculture and Micro, Small and Medium Enterprises (MSMEs) remain on the periphery of formal skilling; and digital inequity constrains uptake in underserved, remote and aspirational districts.

1.5. In this context, the sub-theme "Skilling: Future Ready Workforce" underscores the importance of a unified national approach to equipping youth with employable skills blending both skilling in the context of emerging technologies and ensuring such technologies permeate to grassroot level recognising the integral role of agriculture in India's economy and workforce, facilitating lifelong learning, and creating employment-ready ecosystems.

2. Current Situation:

2.1. Pre-2014, India's skill development landscape was fragmented and scattered, with institutions spread across ministries, lacking standardization, regulation, industry connect, and aspirational pathways. However, post-2014, significant reforms have been implemented, that have led to a more organized, regulated, and industry-aligned skill development ecosystem, fostering greater employability and international competitiveness.

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[1] Decoding India Vision 2047: Niti Aayog's Strategy for a Developed Bharat

2.2. A comprehensive set of interventions are being implemented across the skilling ecosystem. These efforts can be broadly grouped under the following thematic area:

A. *Policy and Regulatory Architecture*

a. India's early skilling system was fragmented, prompting the launch of the National Skills Qualification Framework (NSQF) in 2013 for standardized, competency-based training. The National Credit Framework (NCrF) followed, enabling credit-based recognition of academic, vocational, and experiential learning through Multiple Entry and Multiple Exit (MEME). Integrated with NSQF and the Academic Bank of Credits (ABC), NCrF promotes mobility and lifelong learning. Micro-credentials on SIDH further support flexible upskilling, especially for gig workers, women returnees, and those entering sectors like AI, EVs, and Green energy.

b. **Convergence under NEP:** Aligned with NEP 2020, MSDE and UGC are integrating vocational education into higher education to bridge academics with industry-relevant skills and boost employability. This includes embedding skill modules in undergraduate curricula, credit-bearing courses with Awarding Bodies, promoting B.Voc programs, and enabling credit transfers via ABC. Similar initiatives of integration of vocational education in the school education are envisaged in partnership with Department of School Education & Literacy, Ministry of Education (MoE). The goal is to mainstream skill-based education across 1,100+ universities and 40,000+ colleges in line with economic needs.

c. **Awarding Body (AB) Reforms:** To simplify and decentralise skilling certifications while aligning with industry standards, NCVET is reforming the AB ecosystem. It accredits industry-led bodies and now also recognises State Boards, Institutes of National Importance (INIs) and other institutions for curriculum, assessment, and certification. With 130+ recognised ABs, the focus is on streamlining approvals, strengthening governance, ensuring quality, diversity and customizability to enhance employability and workforce mobility.

B. *District Skill Committees (DSCs):* Chaired by district administrations, DSCs are critical for bottom-up, demand-driven skilling. Comprising local industry, training providers, academia, and civil society, they align training with district economic priorities and youth aspirations through local feedback and labour market insights.

a. District Skill Development Plans (DSDPs): Prepared by DSCs, DSDPs map skilling needs and employment trends. By 2024, over 700 districts had developed DSDPs to aid scheme targeting, course rationalisation, and demand forecasting.

b. State Skill Development Plans (SSDPs): SSDPs consolidate district inputs into a strategic State-level blueprint, promoting convergence and partnerships. As of 2024, 18 States had formalised SSDPs, enabling coordinated planning and governance.

C. *Industry Alignment and Future-Readiness*

a. **Industry Consultations:** Given the advancement in technology, job market requirements are dynamic and are changing at a fast pace. In order to keep the training curriculum aligned with industry demand, regular industry consultations are organised by MSDE. These consultations are being organised across prominent sectors such as IT/ITeS, Automotive, Semiconductor, Banking and Financial Services (BFSI), Pharmaceuticals, Hospitality, etc. More than 120 industries have participated in 13 industry consultations to align curriculum and pedagogy with market needs.

b. **Industry-led Training Models:** To make skilling demand-driven and employment-oriented, MSDE is actively promoting deeper industry participation across the skilling value chain. Industries are increasingly being engaged as curriculum co-creators, practical assessors, and

ABs, ensuring that the training imparted reflects current workplace requirements and emerging industry trends.

c. **Industry Co-creation:** Industries are being onboarded as ABs with 45 Original Equipment Manufacturer (OEM) qualifications being recognized from Google, IBM, Hero Moto Corp Limited, Samsung, Tata Motors, etc.

d. **On-the-Job Training (OJT):** OJT has been made a mandatory component of the job roles, as per recommendation of the industry for exposing the candidates to real life situation and make them job ready. Accordingly, Pradhan Mantri Kaushal Vikas Yojana (PMKVY) 4.0 mandates OJT as part of the training duration as defined by NCVET. The provision applies to all the applicable job roles taken up under Short-Term Training (STT) and Special Projects (SP).

e. **India's Apprenticeship Ecosystem:** Apprenticeship bridges education and industry through hands-on learning. MSDE is making it more inclusive and future-ready by expanding into sectors like AI, Fintech, Semiconductors, and Green Energy. New formats—hybrid, remote, and OJT—enable participation from MSMEs, startups, and gig workers. Stipends are disbursed via DBT to ensure transparency, with incentives for women, youth, and marginalised groups. Since 2016, over 43.7 lakh apprentices have been engaged by 51,000+ establishments (as of 31 May 2025). From July 2025, UGC-mandated Apprenticeship Embedded Degree Programmes (AEDP) will embed up to 50% apprenticeship within degrees, with credit recognition under NCrF and tripartite agreements linking students, institutions, and industry—advancing NEP 2020's vision for employability through experiential learning.

f. **Inclusion of New-Age Sectors:** To meet future workforce needs, over 500 job roles in sectors such as Industry 4.0, Artificial Intelligence, Machine Learning, Precision Engineering, Cybersecurity, Electric Mobility, and Renewable energy have been introduced, equipping youth with skills for India's innovation-driven and globally competitive economy.

D. *ITI Modernization:*

Industrial Training Institutes (ITIs) are key to long-term skilling, with industry involvement through the Dual System of Training (DST) and Flexi- Memorandums of Understanding (MoUs) for classroom and On-the-Job learning. The ₹60,000 crore National ITI Upgradation Scheme embeds industry in governance via a blended model: ₹30,000 crore from the Centre (including World Bank and ADB), ₹20,000 crore from States, and ₹10,000 crore from Industry. It will upgrade 1,000 ITIs through a hub-and-spoke model led by industry Special Purpose Vehicles (SPVs), focusing on high-growth sectors like EVs, Green energy, Precision manufacturing, etc. Anchor industry partners will manage curriculum, infrastructure, trainers, and placements, with each hub linked to 3–5 spoke ITIs. National Skill Training Institutes (NSTIs) are also being developed as global-standard Centres of Excellence for trainer development and innovation through international and industry partnerships.

E. *Access and Inclusion*

a. **Aspirational District Coverage**: To address challenges in the 112 Aspirational Districts, MSDE is implementing targeted skilling to improve human development. Efforts include expanding short- and long-term training, setting up Model Skill Centres, and using local ITIs and Jan Shikshan Sansthans (JSS). Youth are trained in local livelihoods like agri-processing and handicrafts, and in emerging sectors (e.g., logistics, hospitality, and electronics repair).

b. **Inclusive skilling ecosystem**: MSDE has launched targeted measures for Persons with Disabilities (PwDs) and women. For PwDs, initiatives include customised Qualification Packs (QPs), assistive tech, accessible digital content, inclusive infrastructure, sensitised trainers, and partnerships with disability organisations. For women, who now make up over 45% of the total

candidates trained under PMKVY, support includes DBT stipends, transport, crèches, counselling, and special drives in non-traditional sectors like Drone piloting. Skilling is also linked to Self-Help Group (SHG) and State Rural Livelihood Mission (SRLM) led entrepreneurship. Outreach to the third gender is underway to ensure inclusion, among the most marginalised, to ensure no one is left behind.

c. **NER Special Pilot:** The North Eastern Region (NER) faces geographic and infrastructural challenges but holds potential in agri-based value chains, tourism, textiles, and handloom. MSDE has launched a special pilot using context-specific delivery models like mobile training units, vernacular content, and partnerships with State Skill Development Missions (SSDMs) and community colleges. Focus areas include increasing women's participation and aligning training with market linkages like organic food processing and eco-tourism, while integrating with other Government of India (GoI) and state programs and schemes.

d. **Multilingual content:** To ensure that learners can access skilling opportunities irrespective of linguistic background, learning content has been made available in around 12 languages under PMKVY and PM Vishwakarma schemes. Over 600 trainee and trainer handbooks have been translated into eight regional languages to enhance learning outcomes. with most of the courses being at least bi-lingual.

F. Technology Enablement

Skill India Digital Hub (SIDH): SIDH is MSDE's unified digital public infrastructure that manages the entire skilling lifecycle, from Aadhaar-based e-KYC and attendance to certification, DBT, and post-placement tracking, on a secure, cloud-native platform. It integrates legacy portals and offers onboarding APIs for Central and State schemes, providing each learner with a personalized dashboard for applications and upskilling. Features like Public Finance Management System (PFMS) linked DBT, DigiLocker based certificate exchange, real-time employer validation, and Digital Personal Data Protection (DPDP) Act 2023 aligned data security ensure privacy and accuracy.

Key Achievements: Over 90 lakh users have registered on the platform, with 55 lakh completing e-KYC, and over 40 lakh candidates enrolled under PMKVY, PM Vishwakarma, and other schemes. The platform hosts 550+ digital courses and integrates 133 Central and State schemes, ensuring convergence, transparency, and broad access across the skilling ecosystem.

G. Innovative Financing Mechanisms

a. **Skill Loans:** To help youth access fee-based skilling in high-demand and new-age sectors, MSDE has revamped the Skill Loan Scheme launched in 2015 by the Hon'ble Prime Minister. It offers collateral-free loans up to ₹7.5 lakh, with no processing fee and flexible repayment, for NSQF or non-NSQF courses by verified training entities on the SIDH, aligned to course duration and employability outcomes.

b. **Skill Voucher Pilots:** To improve efficiency and equity in skill financing, MSDE is piloting Skill Voucher models, shifting from training provider-driven to candidate-centric, demand-side mechanisms. This empowers candidates to choose training providers and courses aligned with their aspirations, local jobs, and career goals.

c. **Skill Impact Bond:** Performance-linked financing for outcomes-based skilling piloted with an investment of US $14.4 million to train 50,000 youth—60 % of them women—over four years; National Skill Development Corporation (NSDC) and the Michael and Susan Dell Foundation (MSDF) provided US $4 million in upfront risk capital among others, with the British Asian

Trust acting as transaction manager. Repayment was tied to verified outcomes—certification, placement, and retention—ensuring a strong focus on quality and jobs.

H. Quality Assurance and Ecosystem Reforms

a. **Trainer Ecosystem Strengthening:** Standardised Training of Trainers (ToT) frameworks have been developed for continuous professional development. More than 1 lakh trainers and assessors have undergone training and been onboarded. Craft Instructor Training Scheme (CITS) certified candidates along with Defence Instructors have been recognised as deemed trainers.

b. **Curriculum Upgradation:** In order to meet the dynamic demand of the job market and catering to the needs of **new age** sectors, MSDE continuously upgrades the curriculum for various training programs. For example, to strengthen agriculture sector, around 14 NSQF-aligned qualifications focused on applications of drone technology such as Kisan Drone Operator, Drone Technician, and other emerging job functions in the drone ecosystem have been approved. Further 300+ Micro-credential (MC) and National Occupation Standards (NOS) based courses have been introduced across various sectors including agriculture. The curriculum for each job role, including those in the agriculture domain, is designed and developed in alignment with market demand and industry requirements, in close collaboration with sectoral experts and industry stakeholders.

c. **Cross utilisation of infrastructure:** The Ministry is leveraging quality infrastructure from other departments to improve training delivery. Under PMKVY 4.0, Skill Hubs are set up in educational institutions, including Institutes of National Importance (INIs) such as Indian Institutes of Technology (IITs), Indian Institutes of Management (IIMs), National Institutes of Technology (NITs), etc. Schools such as Jawahar Navodaya Vidyalayas (JNVs), Kendriya Vidyalayas (KVs), Sainik Schools, Eklavya Model Residential Schools (EMRS), etc. are also used. Industry training infrastructure supports apprenticeship training under NAPS. For example, IIT, Jammu and IIT, Nagpur imparted skilling in Drone Manufacturing and Assembly Technician. Sainik School, East Siang, Kalikiri, Ghorakhal and Bhubaneswar provided training in Software Programmer under PMKVY 4.0.

I. Global Mobility and Internationalization

In line with Hon'ble Prime Minister's vision of making India the Skill Capital of the World, a large unmet demand for various jobs has been identified across 16 countries through a global skill gap study. Further, MSDE is enhancing global employability through international partnerships, with MoUs currently active with seven countries, focussing on curriculum development, trainer exchange, and mutual qualification recognition. It also supports Migration and Mobility Agreements and Labour Mobility Agreements led by Ministry of External Affairs, embedding skill components like language training, PDOT, and certification in agreements with eight countries. To facilitate international mobility and enhance global competitiveness, 30 Skill India International Centres (SIICs) are being established as one-stop hubs for creating a trusted, transparent skilled workforce supply chain. In parallel, five National Centres of Excellence (NCoEs) with world-class infrastructure are being set up, with international partnerships to enable knowledge exchange, joint research, faculty training, and cross-border mobility.

J. Sector-Specific Focus

a. **Agriculture and Allied Sectors:** Agriculture, employing over 40% of India's workforce, is transforming through climate action, technology, and value chain shifts. However, an acute shortage of skilled labour, given that less than 10% of the 25+ crore population engaged in agriculture has received formal skill training, poses significant challenges across production,

processing, distribution, and marketing. To modernise the sector and boost rural livelihoods, targeted skilling in drone operations, mechanisation, agro-processing, and sustainability is underway. Institutions such as Krishi Vigyan Kendras (KVKs), Agricultural Technology Management Agency (ATMA), and Farmer Producer Organisations (FPOs) deliver short-term, NSQF-aligned courses on precision farming and climate-resilient practices, integrated with SIDH for certification. Focus areas include solar pump maintenance, dairy, fisheries, and beekeeping, with convergence across Ministry of Rural Development (MoRD), Ministry of Agriculture and Farmers' Welfare (MoA&FW), and Ministry of Panchayati Raj (MoPR), building a tech-enabled, climate-ready agri-workforce for Viksit Bharat.

b. **Traditional Sectors:** India's traditional sectors, comprising handicrafts, handlooms, artisanal trades, and rural livelihoods remain a vital source of employment, especially in semi-urban and rural areas. To preserve, modernise, and scale these vocations, the GoI has launched focused skilling interventions under schemes such as PM Vishwakarma and JSS.

c. **PM Vishwakarma**, launched in Sept 2023, supports 18 traditional trades, including blacksmithing, carpentry, pottery, tailoring, etc., through skill upgradation, toolkit assistance, digital and financial literacy, and market linkages. As on 15 June 2025, 23 lakh+ candidates have been trained across 678 districts in the country, with special emphasis on certification through Recognition of Prior Learning (RPL) and formal credit facilitation for self-employment. The scheme underlines the importance of providing wage loss support to encourage upskilling. Around ₹940 crore have been transferred to trainees through DBT.

K. *Cluster Focus*

MSDE promotes clusterization by targeting sector-specific skills in industrial corridors, aligning skilling needs with local value chains. It customizes training infrastructure and courses to regional workforce catchments in sectors like Automobiles, EVs, Textiles, and Pharmaceuticals.

L. *Convergence with Ministries*

MSDE leads national skill development efforts by bridging manpower gaps and enhancing vocational and technical training through skill upgradation, new-age skilling, and innovation. Central to this is convergence with Ministries/Departments under a Whole-of-Government approach. MSDE partners in flagship schemes like PM Vishwakarma (MSME), PM JANMAN (MoTA), National Green Hydrogen Mission (MNRE), PM SVANidhi (MoHUA), etc., while providing common norms for costing, accreditation via NCVET, and a national assessor pool. Sectoral schemes like Samarth (Textiles) and RKVY (Agriculture) leverage these services to certify candidates without duplicating systems. To maximize the impact of skilling, structured mechanisms should also be developed to connect trained individuals with schemes like PMFME, NRLM, and AC&ABC for financial and infrastructural support. Convergence with Ministry of Education schemes—across both school and higher education—will also be critical to integrate skilling with formal education and ensure seamless learner mobility.

M. *Training of Defence personnel under Agnipath scheme*

To enable employment for Agniveers post their 4-year service, their defence-acquired skills are being mapped to industry-relevant skills. They will be awarded 'Kaushal Praman Patra' based on qualifications and experience gained. Over 60% of defence trades are mapped with Craftsmen Training Scheme (CTS) trades: Army (40), Navy (28), and IAF (2), benefiting over 1 lakh enrolled Agniveers.

3. Challenges

3.1. Limited coverage of formal skilling: Only 4.4[2] percent of India's population aged 15–29 years possesses a recognized vocational certificate, a stark contrast to South Korea (96%)[3], Japan (80%)[4], and Germany (75%)[5]. This gap restricts productivity, limits integration into the formal labour market, and constrains the availability of job-ready talent in emerging sectors. Enhanced focus on Recognition of Prior Learning (RPL) and integration of vocational education within mainstream curricula is essential, though current coverage remains inadequate for the scale of need.

3.2. Lack of Dynamic Demand Planning and Labour Market Intelligence: India's skilling ecosystem remains unresponsive to fast-evolving labour market trends driven by automation, AI, and new technologies. Skill gap studies are infrequent and lack a mechanism for real-time updates. Only 41% of ITI and 29% of polytechnic graduates are deemed employable[6]. The absence of a unified Labour Market Information System (LMIS) that integrates high-frequency datasets, such as GST, e-Shram, and Invest India, prevents evidence-driven planning. Sectors such as aerospace underscore this challenge, where academic outputs remain misaligned with high-end industrial demand. Gujarat's District Skill Coordinators model illustrates how localised labour market insights can improve planning and responsiveness.

3.3. Industry Co-ownership in Skilling: Despite multiple MoUs between industry and government, industry involvement in curriculum design, training delivery, and hiring remains limited. Apprenticeship programs have yet to reach critical mass.

3.4. Limited Integration between Skilling and Education: India has a unique opportunity to unlock the full potential of its youth by strengthening the integration between education and skilling. Building flexible, well-defined pathways between general education and vocational training can enhance career mobility, increase the appeal of vocational education, and promote lifelong learning. The National Education Policy (NEP) 2020 envisions such integration, and with focused efforts, institutions can adopt credit-based systems that enable smooth progression from certificate to diploma and degree levels. Advancing this alignment will empower learners with greater choice and mobility, and foster a more holistic, outcome-driven learning ecosystem.

3.5. Low Aspirational Value of Vocational Education: Vocational training is often viewed as a secondary option due to unclear progression pathways from certificates to diplomas/degrees and weak links to wages or career growth. Limited visibility of success stories, inadequate career counselling, and scarce recognition for skilled trainers reduce its appeal. The absence of short, stackable courses in areas like project management, product development, and small-business finance further hinders upward mobility and enterprise creation, dampening youth interest.

3.6. Trainer Shortage and Capacity Gaps: The quality and availability of skilled trainers are major bottlenecks. Many trainers lack formal industry experience or exposure to modern pedagogies and technology. The absence of a standardised skills practitioner framework and limited performance-linked incentives hinder the development of a dynamic and diverse training

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[2] PLFS Data, 2022-23

[3] Government of India, Ministry of Education, 2021. *Reimagining Vocational Education and Skill Building* Concept Note prepared for Shikshak Parv on 17 September 2021.

[4] Mehrotra, S. & Sharma, H., 2024. The reality of Skill India Mission: Short courses, no employable skills and a lack of jobs. The Wire

[5] Government of India, Ministry of Education, 2021. *Reimagining Vocational Education and Skill Building* Concept Note prepared for Shikshak Parv on 17 September 2021.

[6] India Skills Report 2025 published by CII

workforce. Retired professionals and industry experts are also not adequately integrated into the ecosystem.

3.7. **Access to quality skilling especially for marginalised communities:** Marginalised groups, including SC/STs, women, PwDs, and people from remote areas, have limited access to skilling programs due to poor connectivity, physical isolation, and lack of supportive infrastructure. Centres in these regions often lack modern tools such as simulation labs, AR/VR devices, or even reliable internet, while persons with disabilities are further excluded due to inaccessible buildings and absence of assistive technologies. These factors create significant entry barriers, deepen the urban-rural skill divide, and reduce the overall effectiveness and inclusivity of the skilling system.

3.8. **Gender Barriers and Low Female Participation:** Women's participation in skill training is restricted due to digital exclusion, socio-cultural norms, disproportionate burden of unpaid care responsibilities**,** mobility constraints, lack of safe and inclusive infrastructure, and limited childcare support. Socio-cultural norms also limit career options for women. Gender-targeted initiatives have been proposed but are yet to achieve scale and impact.

3.9. **Harmonization with Global Mobility Framework:** India has a demographic edge and is positioned to fill global skill shortages. However, lack of mutual recognition of qualifications and limited language training results in low global placements. Though Skill India International Centres (SIICs) are being developed, greater institutional and G2G effort and support from Ministry of External Affairs is required to unlock international skilling opportunities at scale.

3.10. **Fragmented Governance and Institutional Convergence:** With over 20 Central Ministries involved in delivering skilling schemes, the system is highly fragmented. Coordination across central and state levels is limited, and data flow is often not smooth. A unified "Whole of Government" governance model is still in early stages of implementation.

3.11. **Skilling needs in Agriculture and allied sector:** Agriculture and allied sectors employ 43% of India's workforce but contribute only 18 percent to GDP[7], indicating under-employment and low productivity. With less than 10% of its 25 crore-strong workforce formally trained, there is acute need to 'formalize the informal'. Current training curriculum has limited exposure to emerging practices like precision farming, digital agriculture, agri-logistics, value chain management, soil-water management, drones, AI, IoT, climate-smart methods, etc. and industry linkages remain weak. Infrastructure in rural skilling centres remains inadequate and career pathways are unclear, especially for women, smallholders, and marginalised groups. Skilling must cover the entire agri-value chain, from cultivation and post-harvest management to food processing, livestock integration, and export compliance. Effective models will require convergence among MSDE, state agencies, and the 731 Krishi Vigyan Kendras (KVKs), complemented by blended learning and rigorous outcome tracking to create a future-ready agricultural workforce.

4. **Way forward: Possible Solutions/ Issues for deliberations**

4.1. **Integrating vocational and mainstream education system to create a unified learning ecosystem:** Although a policy framework exists to enable seamless mobility between mainstream and vocational education, its adoption and implementation remain limited. Promoting awareness among youth and engaging academic institutions is essential to ensure effective use of these pathways. Simultaneously, scaling up micro-credentials and expanding the use of the Academic

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[7] Department of Agricultural Research & Education

Bank of Credits (ABC) are critical to building a flexible, learner-centric system that supports Multiple Entry and Multiple Exit options and lifelong learning.

4.2. **Upgrade physical infrastructure and upskilling the trainer pool:** To address rapid technological shifts and evolving shop floor needs, training infrastructure and trainer capabilities must be upgraded. The ITI enhancement programme with an investment of ₹60,000 Crore is being designed with an objective of initially upgrading 1,000 ITIs. A structured system for ongoing capacity building, certification, industry exposure, and performance-linked incentives is essential. Recognition and reward mechanisms will boost trainer motivation, retention, and instructional quality, strengthening overall skilling value chain. Periodic refresher courses and Training of Trainers (ToT) programs may be institutionalized to ensure continuous upskilling and reskilling of trainers across all sectors. Developing Master Trainers to expand grassroots-level skilling is equally important for all sectors, including agriculture, where KVKs can play a pivotal role in creating a pool of skilled trainers to scale agri-skilling efforts.

4.3. **Enable State-Led Skilling Ecosystems and Innovations:** States play a pivotal role in driving decentralised skilling innovations by aligning interventions with local economic strengths. Some states have built robust ecosystems with migration support, language training, and international employer linkages, while others hold untapped potential. A cluster-based approach—focusing on high-employment sectors within geographic or industrial clusters—can strengthen both skilling and apprenticeship delivery by directly linking training with demand. Embedding apprenticeships and job matching into local MSME ecosystems enhances workforce absorption. Special focus must be given to women, the Northeast, and aspirational districts through targeted initiatives, flexible delivery models, and mobility support. Empowered SSDMs and District Skill Committees, backed by sector-specific partnerships and a performance-linked incentive framework, are critical to enabling innovation, convergence, and replication across states.

4.4. **Establishing CoEs to skill in futuristic sectors:** Centres of Excellence (CoEs) should be established in emerging sectors such as AI, robotics, cybersecurity, renewable energy, biotech, advanced manufacturing, drones, semiconductors, aerospace, and green mobility. These innovation hubs will integrate advanced infrastructure, expert faculty, and industry-aligned curricula, while also supporting content and faculty development. Decentralised CoEs will reduce regional disparities, foster local innovation, and serve as hubs for high-end skilling, research, incubation, and policy experimentation.

4.5. **Revising the Common Cost Norms:** Skilling programmes currently operate under Common Cost Norms that were developed several years ago. As the sectoral landscape and job roles have evolved, existing norms are now misaligned with the requirements of new-age and emerging sectors, many of which demand substantial investments in advanced infrastructure and highly specialised trainers. As a result, these outdated cost structures act as a barrier to private sector participation and innovation in training delivery. There is, therefore, an urgent need to revisit and rationalise the cost norms to reflect current market realities and attract meaningful investment into high-growth, future-oriented skilling domains.

4.6. **Introducing and scaling-up outcome-based financing models like Skill Impact Bond:** Scaling quality skilling initiatives requires a significant boost in both public and private investments. To ensure sustainable financing and greater accountability, it is crucial to expand outcome-based funding models such as skill vouchers, skill bonds, and co-financing mechanisms. These instruments not only align incentives with measurable results but also encourage greater participation from industry and philanthropic partners, driving innovation, efficiency, and impact across the skilling ecosystem. Leveraging the learnings from first Skill Impact Bond (SIB), more such bonds can be launched covering short term training and entrepreneurship.

4.7. Promote Market-Aligned and Modular Curriculum Development: Curriculum development must be industry-academia led to align with emerging job roles and market demands. A dynamic system to assess workforce needs and skill gaps is essential. MSDE has engaged NCAER to standardise this process, which should be institutionalised for real-time demand-supply insights. Emphasis should be on customized courses, micro-credentials, and hybrid learning formats to support flexible, stackable, and lifelong learning pathways. This will keep skilling relevant, adaptive, and inclusive across sectors and employment stages.

4.8. Promoting international mobility and strengthening Skill India International Centres (SIICs): To promote international mobility and overseas employment, it will be critical to enhance the availability of international-standard training facilities, accredited trainers aligned with global qualification frameworks, and robust testing, assessment, and certification systems. Skilling programs must also incorporate international standards, including language and soft skills. Collaborations with international employers, diaspora networks, and accreditation bodies should be strengthened to tap into global labour demand. States have a pivotal role in this effort— while Kerala, Andhra Pradesh, Karnataka, and Tamil Nadu already have advanced ecosystems supporting global mobility, others like Uttar Pradesh, Bihar, Chhattisgarh, and the North Eastern States hold immense untapped potential for preparing youth for overseas employment. SIICs must be scaled up and strengthened to deliver internationally benchmarked training, with globally aligned curricula, recognized certification pathways, and active engagement with international recruiters and foreign governments.

4.9. Partnership with international Assessment and Certification agencies: Partnership with international Assessment and Certification agencies needs to be established to integrate global standards and benchmarks in skilling programs. This will provide globally recognized certificates to the youth and will enhance their employability for both domestic as well as international job market.

4.10. Upgrade Traditional Sector and Agricultural Skilling through Local Body Engagement: Empower ULBs, PRIs, and SHGs to implement skilling in traditional crafts, agriculture, and allied sectors through NSQF-aligned, vernacular training and market linkages. Launch agriculture-focused skilling covering precision farming, soil-water management, drones, organic farming, cold storage, and agri-supply chains. Successful models like FICCI's SSC-certified training for women in Northeast clusters (food processing, textiles, beauty) should be scaled. The Indian Council of Agricultural Research (ICAR), via KVKs, is already skilling rural youth and farmers; these efforts must be expanded through structured convergence. This will enhance the employability of rural youth, promote agri-entrepreneurship, and make KVKs central to India's rural skilling ecosystem. KVKs should also function as Incubation-cum-Skill Development Centres to promote rural entrepreneurship by fostering networks among FPOs and SHGs at the Gram Panchayat level, enabling unified branding and marketing of their agricultural and value-added products. Additionally, KVKs need to implement NSQF-compliant courses with flexibility in duration and content to suit different target groups. Further KVKs may develop modules aligned with the interests and aptitude of school students to build early awareness and engagement in agri-based livelihoods. Their domain-specific strengths should be identified and leveraged to promote select KVKs as Centres of Excellence, enabling them to serve as model hubs for specialised agri-skilling and innovation.

4.11. Promote Whole-of-Government Support for Local Entrepreneurship: There is a need to adopt a unified approach across central ministries, state departments, financial institutions, and incubation networks to support the entrepreneurial aspirations of skilled youth. This includes streamlined access to credit, mentorship programs, incubation support, market access, and compliance facilitation through common service platforms. Additionally, dedicated handholding support through mentorship, access to credit, business advisory services, and market linkages is

essential to ensure successful enterprise establishment and sustained growth. In this regard, dedicated units may be created within KVKs to provide mentorship, business advisory, and credit linkage support to assist trainees in setting up or scaling their enterprises.

4.12. Institutionalise Employer Co-ownership of Skilling and Promote Industry partnership in Course Design: Industry participation must span all stages: curriculum design, training, and assessments. Sector-specific industry councils at district/state levels should be incentivised via procurement preferences and tax benefits. Industry can contribute digital content to SIDH, deliver expert lectures, and support hybrid skilling through bootcamps and school sessions. Joint domain-based assessments by corporate and government, recognition of voluntary industry faculty, and digital campaigns can align skilling with market needs. A "Skill Inspector" model with certified auditors can enhance quality, compliance, and certification.

4.13. Recognise and Certify Informal and Prior Learning: Expand the scope of RPL to include informal work, gig economy skills and community-based training. Streamline onboarding of non-standard training providers into the NSQF system with simplified certification pathways.

4.14. Strengthen SIDH as a Foundational Public Infrastructure: SIDH should function as the unified digital backbone for skilling, supporting registration, certification, job matching, and monitoring. Like National Payments Corporation of India (NPCI) in payments, it can anchor a common skill taxonomy and integrate systems such as ABC, RPL, and open architecture, enabling public and private innovation. Inspired by Gujarat's federated F-SIDA model, SIDH should unify verified, real-time, and interoperable data across departments. It must also serve as a one-stop platform for demand-based skilling, facilitating industry consultations, leveraging AI to analyse job trends and feedback, validating course content, and enabling co-branded certifications recognised by both government and industry.

4.15. District-Led Skill Demand Planning: Institutionalise development of District Skill Development Plans through more than 750 District Skill Committees (DSCs) based on PM Gati Shakti data, industry inputs, investment plans, and migration trends. These plans shall flow into State and national level skill development plans aligning resource allocation under PMKVY and other schemes.

4.16. Drive Gender, Disability, and Social Inclusion: Create Inclusion Challenge Funds and support infrastructure (hostels, transport, accessible centres) to boost the participation of women, PwDs, and other marginalised groups. "Inclusion Facilitators" should be appointed at the block level to support enrolment and retention.

4.17. Promote Lifelong Skilling and Enabling Women Entrepreneurs through National Missions: Launch a "Learn for Life" mission targeting women returnees, gig workers, artisans, and ex-servicemen, embedding digital literacy, career guidance, and mobility services into skilling. Promote employability through short courses on project management, product development, supply chain, and entrepreneurship. Empower women entrepreneurs by integrating business planning, financial management, and digital literacy modules into skilling programs. Partner with NRLM, SRLMs, and mentor networks to provide financial and market linkages.

4.18. Enhance Job Linkages and Placement Support: Institutionalise district-level placement drives, integrated with National Career Services (NCS), e-Shram, and SIDH. Placement providers must be evaluated based on verifiable employment outcomes. Job fairs should be aligned to real-time labour market demand.

4.19. Technology and AI enabled assessment: Introduction of digital and AI based assessment tools shall enable scalability, consistency and accuracy in the assessment process. Further, such tools shall also enable simulations of work environment scenarios and will make assessments

more engaging. Courses which are more feasible to assess through digital tools shall be prioritized while other courses may continue with manual / hybrid mode of assessments.

4.20. Development of advanced skilling institutions in PPP mode: there is a need to encourage private sector to develop advanced skilling institutions in PPP mode. These institutions could be either green field institutions or upgradation of existing facilities. This would require various incentives for private sector like allowing CSR funds for this purpose, tax incentives, recognition in various forums etc.

4.21. Promote "CEO in a Box": Approach to enable entrepreneurship at scale is required to empower entrepreneurs operating at a small scale with readymade business solutions to sustain their business and scale it up. This will leverage local opportunities, enable local economy and will help in generating employment opportunities.

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