

Executive Summary

The Ministry of Skill Development and Entrepreneurship (MSDE) had undertaken the study titled '**National Skill Gap Study for High Growth Sectors**' under the Skills Acquisition and Knowledge Awareness for Livelihood Promotion (SANKALP) programme. This study was undertaken by the National Council of Applied Economic Research (NCAER).

The primary aim of the study is to create a dynamic framework for skill gap assessment that can be regularly updated to predict skill requirements in line with the evolving economic landscape. To ensure uniformity and standardisation a methodology for conducting demand assessments at both sectoral and State levels has been developed. This effort will significantly inform the design of skill initiatives at the national and State levels.

I. Objectives

The specific objectives of the study included:

1. To identify seven high growth potential sectors.
2. To analyse industry feedback on identifying industry-specific key skill (cognitive, socio-emotional, technical & vocational, and knowledge) requirements in the seven identified industries.
3. To map the key job roles/ professions and geographic clusters aligned with the seven selected sectors along with the qualification and skill requirements associated with these job roles and provide estimates of current employment.
4. To identify the existing and potential job roles for enhancing female workforce participation in the seven identified sectors.
5. To provide projections and forecasts of future skill needs for the seven selected sectors for a period of three years based on anticipated changes in the labour market, technological advancements, and industry trends at the national and international levels.
6. To provide a framework for regular updation of demand assessment results at predefined intervals to provide continuous insights for skill planning for the selected seven sectors.
7. To provide detailed methodology for undertaking skill demand assessment at the sectoral level, as also guidelines / methodology for undertaking similar assessments at the State level.
8. To seek recommendations for improving the design and effectiveness of the skill programmes.
9. To provide policy recommendations to address systemic issues contributing to skill gaps.
10. To provide recommendations to MSDE on enhancing skill training programmes, curriculum development, and skill initiatives to align them with the identified skill gaps; sector-wise upskilling or reskilling initiatives;

apprenticeship, vocational, or on-the-job trainings; areas of collaboration with industry including opportunities for establishing partnerships; industry-led training programmes, internships, or mentorship programmes to bridge the gap between industry needs and the skills possessed by the workforce.

II. Definitions

“Skills are personal qualities with three key features – (i) productive: using skills at work are productive of value; (ii) expandable: skills are enhanced by training and development and; (iii) social: skills are socially determined” (Green, 2013; pp. 10).¹ NCAER (2018) delineated three types of skills and they are:²

- **Cognitive skills** are *basic skills* of literacy and numeracy, applied knowledge and problem- solving aptitudes and *higher-order skills* such as experimentation, reasoning, and creativity.
- **Technical and Vocational Education and Training skills (TVET)** are the physical and mental ability to perform specific tasks using tools and methods in any occupation.
- **Social and behavioural skills** include working well with others, communicating and listening well, and being agreeable and outgoing.

The study develops methodology to assess skills shortage at sectoral level and skill gap at the worker level in a particular sector.

Skills shortage describes the situation where a job vacancy is hard to fill because of a lack of applications with the needed skills.³ For example, one is looking for accountants but is unable to find any with the appropriate degree, qualifications, experiences and skills.

A **skill gap** occurs where an employee’s competence to do the job is called into question (typically by his/her manager).⁴ For example, one is looking for accountants and finds several with the appropriate degree and qualifications but not the appropriate skill set.

III. Methodology and Results

A hybrid methodology using quantitative and qualitative techniques were used to assess skill shortages and skill gaps.

- A. **Selection of Sectors:** Using shares of Gross Value Added (GVA), workers, input & output multipliers, identification of key sunrise sectors and policy inputs, seven sectors were selected for analysis.

¹ Green, F. 2013. *Skills and Skilled Work: An Economic and Social Analysis*. Oxford University Press, United Kingdom.

² NCAER. 2018. *Skilling India: No time to lose*.
http://www.ncaer.org/publication_details.php?pID=300, New Delhi, India.

³ Green, F. 2013. *Skills and Skilled Work: An Economic and Social Analysis*. Oxford University Press, United Kingdom.

⁴ Ibid.

1. Growing of cereals (including rice), leguminous crops and oil seeds
2. Raising of cattle and buffaloes
3. Weaving of textiles
4. Manufacturing of motor vehicles (MVs) and parts and components of motor vehicles
5. Electric power generation of solar energy and other non-conventional sources
6. Retail sale of food, clothing, footwear, leather articles in specialised stores and maintenance and repair of motor vehicles (this was clubbed with the auto sector).
7. Computer programming activities

B. Forecasting Jobs and Occupations Using Input-Output (I-O) Analysis

The input-output analysis was used to forecast jobs for 2026–27.

- In the baseline scenario, the sectoral Gross Value of Output (GVO) was assumed to be based on the average growth rate of the past five years excluding the pandemic years of 2020–21 and 2021–22. Using the International Monetary Fund (IMF) projections for India, alternative growth scenarios were also derived.
- The assumptions were used to project GVO in 2026–27 at 2022–23 prices.
- The number of (direct and indirect) jobs were estimated by multiplying employment multiplier with the projected GVO at the 64 I-O sectors for the seven sectors.
- Using projected sectoral GVO, direct and indirect sectoral jobs for 2026–27 was projected. Technology was assumed to be constant.
- Jobs for the sub-sectors (that were selected in the NCAER-MSDE analysis) by taking the job shares of the sub-sectors in the main sectors for the years 2022–23 (Table ES.1).
- Distribution across occupations of ONLY direct jobs based on share of occupations for the year 2022–23 were computed from Periodic Labour Force Survey (PLFS).
- Using the same shares, projections for the top five occupations were projected for 2026–27.
- For comparison purposes, top five occupations in the seven sectors are estimated from the PLFS 2022–23 (see Tables 3.5 to 3.11 in the report).

The key challenge with using I-O analysis is that technology is assumed to be constant. Technological cycles have become short and all industries are experiencing rapid technological changes. Table ES.2 shows the key technological changes that are affecting the selected sub-sectors. Therefore, relying on I-O analysis is not enough and one has to substantiate that with stakeholder interactions/survey.

Table ES.1: Projected jobs in 2026–27 for selected sub-sectors

<i>lakh jobs</i>	<i>Growing of cereals, leguminous crops and oilseeds</i>	<i>Raising of cattle and buffaloes</i>	<i>Weaving of textiles</i>	<i>Manufacturing of motor vehicles, parts & accessories of motor vehicles</i>	<i>Electric power generation using solar energy and other non-conventional sources</i>	<i>Retail sale of food, clothing, footwear and leather articles in specialised stores and maintenance & repair of MVs</i>	<i>Computer programming activities</i>
2022–23 from PLFS*							
	1,789.6	206.1	22.6	13.9	1.1	261.3	25.9
2022–23 using I-O Analysis							
Direct jobs	1,849.9	207.6	29.9	17.6	1.1	281.0	26.4
Direct + Indirect jobs	2,034.8	394.5	101.7	145.7	7.5	393.3	76.6
Scenario 1 using Past Growth Rates: Projections for 2026–27							
Direct jobs	2,066.3	259.4	26.4	24.9	1.3	399.7	43.7
Direct+ Indirect jobs	2,272.9	492.8	89.8	206.5	9.2	559.5	126.6
% Change in direct jobs over 2022–23 using I-O Analysis*	11.7	24.9	-11.6	41.7	22.4	42.3	65.3
Scenario 2 using International Monetary Fund (IMF) Growth Projections; Projections for 2026–27							
Direct jobs	2,157.5	241.9	23.2	35.8	1.4	414.4	42.1
Direct+ Indirect jobs	2,373.3	459.7	78.9	297.4	9.8	580.1	122.2
% Change in direct jobs over 2022–23 using I-O Analysis*	16.6	16.5	-22.4	104.1	30.1	47.5	59.6

Source: NCAER Computations.

Table ES.2: Technological Changes

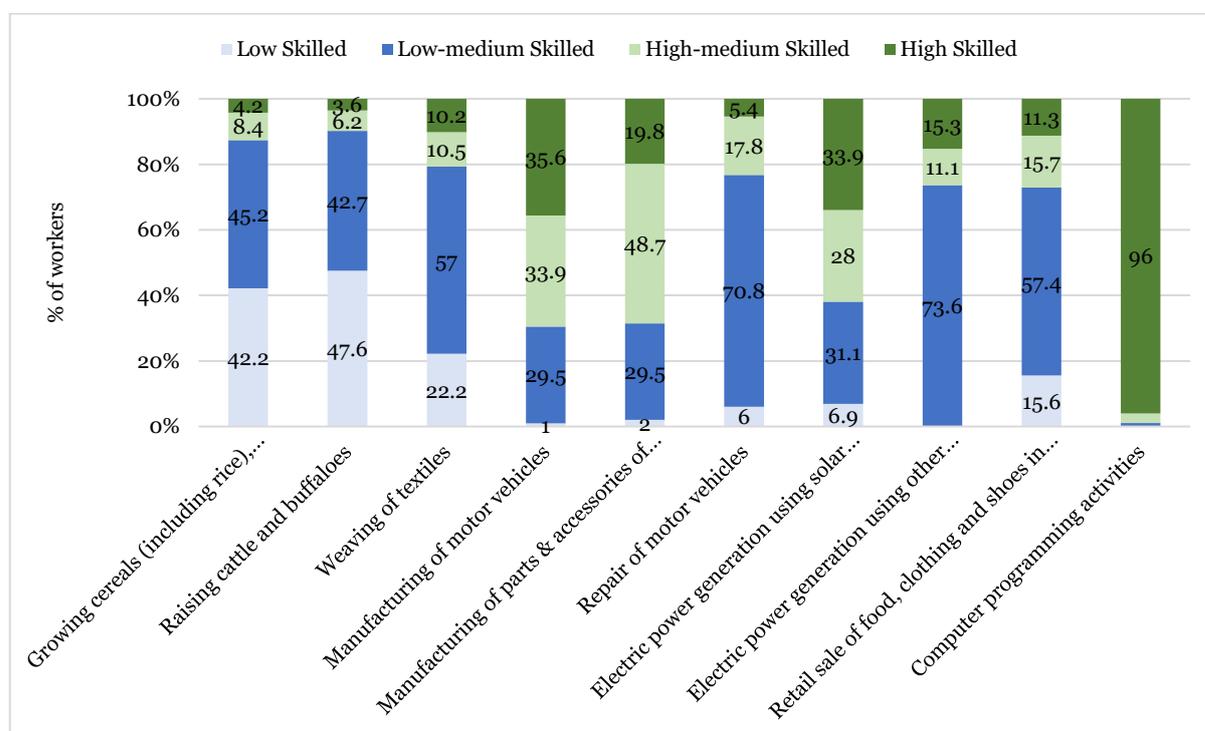
Sector	Digital technologies	Sector-Specific technology	Others
Growing of cereals, leguminous crops and oilseeds (farms)	Artificial Intelligence (AI), Machine Learning (ML), Internet of Things (IoT), Big Data and Blockchain	Farm machinery, Point of Sale (PoS) and Soil data	Drones, satellite data, and statistical model
Raising cattle and buffaloes	AI	Artificial Insemination	Improved refrigeration technologies for better milk preservation
Weaving of textiles	AI, ML, automation & digital technologies, supply chain invocations (traceability, block chain, etc.)	<ul style="list-style-type: none"> • Sustainable technologies (Eco-friendly chemicals/dyes) • Circular/ green/ recycled/ sustainable textiles • Advanced materials (technical textiles, smart textiles, etc.) 	
Electric power generation using solar and other non-conventional energy	Software to read and forecast solar and wind data	RE is a new technology in electricity sector; automation in Operations and Maintenance (O&M); Higher efficiency solar and wind modules, taller windmills	Offshore wind; green hydrogen
Manufacturing of MVs and its auto parts and repair	AI/ML; software and cybersecurity	BS4 to BS6 (transition to BS7); electric, hybrid, and flex fuel vehicles; electronics in motor vehicles; automation and robotics in manufacturing and repair and maintenance	New materials and light-weighting components
Retail sale of food, clothing and shoes	AI, Digitized supply chain—IoS, GPS and RFID technology, Cloud/hybrid storage, AI/ML, Blockchain, Automated data loggers Barcode pricing	Electronic retail- Modern retail and e-Commerce; remote monitoring of stores	Data analytics
Information Technology (IT) sector	<ul style="list-style-type: none"> • Python – AI/ML • Full stack developer • Image and signal processing • Natural Language Processing • Large language model building 	<ul style="list-style-type: none"> • For Agri-tech, commerce and Electric Vehicle (EV) <ul style="list-style-type: none"> ○ Remote sensing ○ Drip technology with cloud computing • For Manufacturing <ul style="list-style-type: none"> ○ Robotics ○ Embedded computing 	

Sector	Digital technologies	Sector-Specific technology	Others
	<ul style="list-style-type: none"> • Small language model building • Deep neural networks • Cyber cloud security • Cybersecurity: • Cloud computing • Data protection • Econometric modelling • Block chain and 5G technology 	<ul style="list-style-type: none"> ○ Digital Twin • Pharmaceutical and medical <ul style="list-style-type: none"> ○ 3D modeling ○ 3D Printing ○ Robotics: Virtual and Augmented Reality (VR/AR) ○ Nanotechnology ○ Digital twin ○ CRISPR ○ Bio printing 	

Source: NCAER Conceptualisation from literature review and stakeholder interviews.

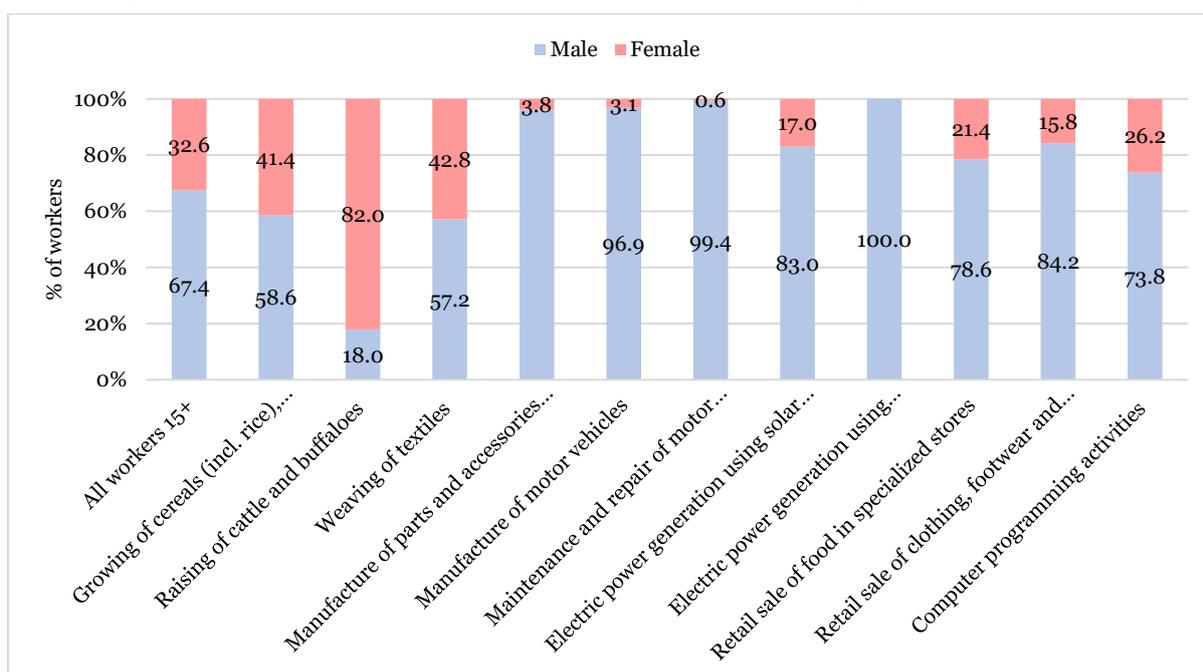
C. **Workforce Characteristics:** Workers’ characteristics were identified across States, general education, technical and vocational education, skills (see Figure ES.1), type of worker, occupation, gender (Figure ES.2) and engagement. Female workers across job roles were also analysed for each sectors. The presence of women in leadership roles is quite limited.

Figure ES.1: Sectoral share of workers across skills, 2022–23



Source: NCAER Analysis from PLFS 2022–23.
Note: See Annexure 4.2 for definition of skills.

Figure ES.2: Sectoral share of workers across gender, 2022–23



Source: NCAER Analysis from PLFS 2022–23.

D. Geographical Clusters: Porter (1990) defined an industry cluster as a geographically proximate group of firms and associated institutions in related industries, linked by economic and social interdependencies. Delgado et al. (2014) defined clusters as “geographic concentrations of industries related by knowledge, skills, inputs, demand, and/or other linkages.” In the primary sector and Information Technology (IT) sector, the Delgado et al. definition is used to define clusters and in the secondary sector & retail trade, the Porter (1990) definition is used. A step-wise ranking method is used to compile the indicators. The top five geographical clusters are shown in Table ES.3. Detailed results are available in the report.

The concentration of workers by States and by agglomeration are compared to indicate spatial mismatch, if any.

Table ES.3: Top five geographical clusters in each sector

S. No.	Growing cereals (including rice), leguminous crops and oilseeds	Raising of cattle and buffaloes	Weaving of textiles	Manufacture of Motor Vehicles (MVs)	Manufacture of parts & accessories of MVs	Repair and maintenance of MVs	Generation of solar energy	Generation of wind energy	Retail sale of food, clothing, footwear & leather articles in specialised stores	Computer programming activities
1.	Uttar Pradesh	Karnataka	Tamil Nadu	Maharashtra	Maharashtra	Maharashtra	Gujarat	Gujarat	Maharashtra	Maharashtra
2.	Maharashtra	Maharashtra	Uttar Pradesh	Haryana	Tamil Nadu	Tamil Nadu	Karnataka	Tamil Nadu	Karnataka	Tamil Nadu
3.	Rajasthan	Rajasthan	West Bengal	Karnataka	Uttar Pradesh	Uttar Pradesh	Rajasthan	Karnataka	Uttar Pradesh	Karnataka
4.	Madhya Pradesh	Gujarat	Andhra Pradesh	Tamil Nadu	Haryana	Kerala	Tamil Nadu	Maharashtra	West Bengal	Uttar Pradesh
5.	Gujarat	Bihar	Gujarat	West Bengal	Gujarat	Gujarat	Andhra Pradesh	Rajasthan	Tamil Nadu	Gujarat

Source: NCAER analysis from various sources.

E. **Occupational Mapping:** The PLFS gives 3-digit National Classification of Occupations (NCO) 2015 code. Using the NCO 2015, we derived the 8-digit NCO codes under those specific NCO 3-digit codes to understand job roles that are 'used' in the industry. Further, the Sector Skill Council (SSC) job roles available on website were mapped to the identified NCO 8-digit codes, wherever applicable. Through this process, derived a universal list of possible job roles for each sector.

F. **Stakeholder Surveys:** Total 191 interviews were conducted across seven sectors (Table ES.4).

Table ES.4: Distribution of stakeholder surveys

<i>Sector</i>	<i>Growing of cereals, leguminous crops and oilseeds</i>	<i>Raising cattle and buffaloes</i>	<i>Weaving of textiles</i>	<i>Manufacturing of MVs & its auto parts and repair</i>	<i>Electric power generation using solar and other non-conventional energy</i>	<i>Computer programming activities</i>	<i>Retail sale of food, clothing and shoes</i>	<i>Total</i>
Ministry	1	1	No response	No response	No response	1	1	4
Sector Skill Council(SSCs)	1	1	1	1	1	1	1	7
National-level Industry Association ¹	1	1	1	3	2	1		9
No of Farms/ Firms								
Micro/Small	7	6	11	3	3		7	
Medium	5	3	6	4	4		4	
Large	3	6	3	6	7		4	
Total	15	15	20	13	14	17	19	115
No. of placement cells/TVET Institutions	5	3	5	2	2	3	2	17
Recruitment agencies				1	1	1	1	4
Other stakeholders	9	5		7	6	3	2	32
Firms plus other stakeholders	24	20	20	20	20	20	21	148
Total	32	26	27	27	26	27	26	191

Supply-side Challenges

The supply-side challenges are:

- **Limitations of Current Statistics:** From the perspective of assessing skills, the Periodic Labour Force Survey (PLFS) suffers from some key limitations. It only captures job roles at the 3-digit NCO code. Some job roles like the solar panel

technician are not consistently captured. The Annual Survey of Industries (ASI) and Annual Survey of Unincorporated Sector Enterprises (ASUSE) does not capture NCO codes at all. Further, databases do not always match in terms of numbers. Chapter 6 especially discusses the issues of the differences between PLFS, Enterprise Survey, and Handloom Census data. The National Classification of Occupations (NCO) also has major challenges that has repeatedly come up in the sectoral chapters.

- ❖ Existing job roles are also not intuitive because the data are published at the 3-digit NCO code whereas occupations are identified at the 8-digit NCO code.
- ❖ Difficult to match new and emerging job roles to NCO codes
- ❖ Job roles do not capture different skill sets
- ❖ The Skill India Digital Hub and National Career Services need to ramp up their integration and communication with each other to improve the effectiveness of both.
- There are several mismatches in the workers market due to both supply and demand issues:
 - ❖ Mismatch between employers and employees due to poor foundational skills that cannot be improved by skill training programmes (Industrial Training Institutes (ITIs) or other short-term training programmes)
 - ❖ Poor quality of education and TVET systems due to poor quality of teachers, curriculum and low emphasis on practical worker
 - ❖ Local skilling mismatch between industries and training providers
 - ❖ Mismatch of traditional sectors' needs and youth aspirations: For example, weaving jobs, milker, manufacturing jobs at the entry level are perceived as tedious and not remunerative enough. Youth are aspiring towards jobs which do not require much arduous training or skilling but pay equally well such as delivery jobs.
 - ❖ Retention problem in jobs as workers leave after a few months
 - ❖ Wage mismatch – What youth are aspiring or expecting do not match what firms are offering.
 - ❖ Poorly skilled workers are not able to adapt to rapid technological changes.
- Low female Labour Force Participation Rate (LFPR) due to supply-side issues.

In-demand Job Roles across Sectors

Firms were asked about the job roles where they face a shortage, i.e., they are not able to fill in vacancies or find it difficult to fill it (skills shortage). Even if they fill the vacancies, the employees are missing certain skills (skills gap). The list of in-demand job roles across sectors are:

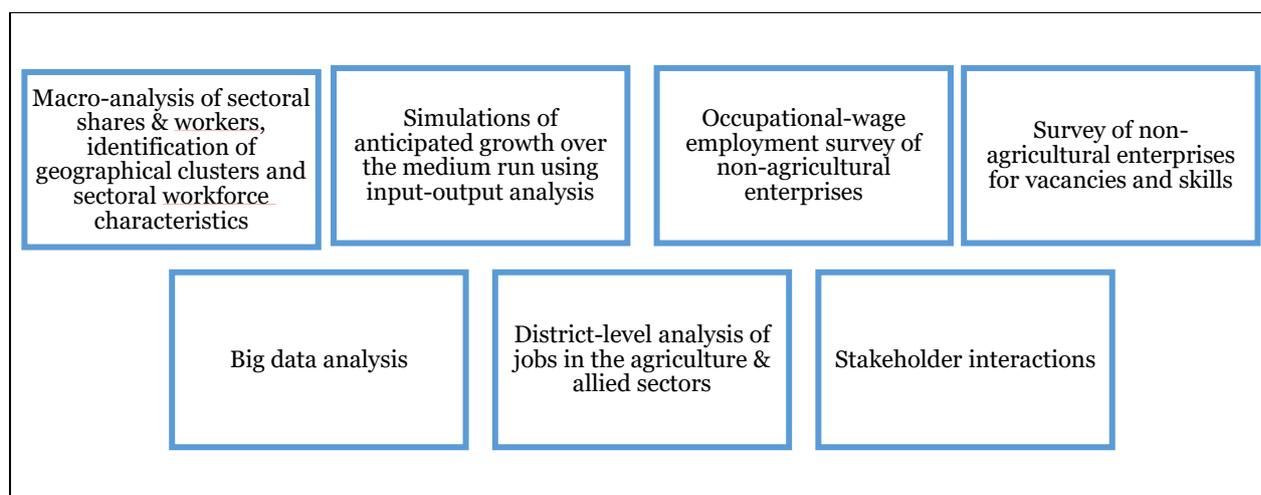
1. Growing of cereals (including rice), leguminous crops and oil seeds: Drone Operators, Agriculture Advisor/Crop Advisor (Agri-tech), IT-GIS (Geographic information system) Specialist, MIG Welding Operator and Farm Machinery Service Technician.

2. Raising of cattle and buffaloes: Veterinary Technician Assistant, Mechanic—Refrigeration and Air Conditioning, Dairy Technologist and Manager—Dairy Farm.
3. Weaving of textiles: Weaver-Handloom (Jacquard/ Loin loom), Weaver Power loom and Weaver Assistant (Handloom)
4. Manufacturing of motor vehicles and parts and components of motor vehicles: Machine/CNC Operator; Turner; Grinder; Tool and Die Maker and Technician /Mechanic; Motor Mechanic, Power / Micro electronics Engineers; AI/ML Expert, Embedded Software Engineers; Vehicle Software Developer and AI Data Science Engineers; Automotive Cybersecurity Specialist
5. Electric power generation of solar energy and other non-conventional sources: Solar Project Manager; Solar Installer; Solar PV Installer and O&M Technician (Surya Mitra), O&M Technicians— Mechanical and Electrical, Engineers: Electrical Engineers—Power Systems Design; Civil and Electrical Engineers; Project Engineers and Resource Assessment; Site Surveyor; Resource Analysis, Site Managers / In-charge /Supervisor; Construction / Project Managers and Asset Management; Quality and Vendor Management Engineers.
6. Retail sale of food, clothing, footwear, leather articles in specialised stores and maintenance and repair of motor vehicles (maintenance and repair of motor vehicles was clubbed with the auto sector): Customer Service Representative/Sales Associate/Sales Person/e-Commerce Marketing Assistant/Manager, Merchandising Manager/ Associate, Logistics Manager/ Associate and Information and Communication Technology(ICT) Personnel/ Computer Operator.
7. Computer programming activities: Data Engineering, Business Analyst-Technical, Data Security and Functional/Domain Analyst.

G. Recommended Methodology

The uniform and standardised methodology proposed consists of seven components (Figure ES.3).

Figure ES.3: Components of methodology



Source: NCAER conceptualisation

The suggested research frameworks/ methodology is as follows:

1. Identification of sectors (industries) and occupations
 - a. Identification of Sectors (Industries): This involves the following steps:
 - i. Identify sectors at the desired level of aggregation that will be used for analysis
 - ii. Map National Industry Classification (NIC) sectors to sectoral sub-sectors
 - iii. Data Source: NIC Classifications by Ministry of Statistics and Programme Implementation (MoSPI) and Centre and Sector Skill Councils (SSCs)
 - b. Identification of Occupations: This involves the following steps:
 - i. Update mapping of NCO 2015 job roles with job roles identified by the Sector Skill Councils (SSCs)
 - ii. Out of the 3,600+ occupations identified in the NCO-2015, select occupations that will be used for analysis for all the components of assessing skills shortages and gaps
 - iii. Data Source: NCO-2015 by Ministry of Labour and Employment (MoLE), Centre and Sector Skill Councils (SSCs)
2. Macro-analysis of sectoral shares and workers, identification of geographical clusters and sectoral workforce characteristics
 - a. Selection of sectors and sub sectors: This involves the following steps:
 - i. Use of Input-Output analysis for estimating income and employment Multipliers, sectoral share in GVA and workers; ranking of sectors based on the four parameters mentioned, taking into account the sunrise sectors over and above the ranking of sectors.
 - ii. Analysis of value chains for the selected sectors to know the associated job roles at various levels of the value chains.
 - iii. Data sources: Periodic Labour Force Survey (PLFS), National Accounts Statistics (NAS)
 - b. Sectoral Workforce Characteristics: This involves analysis of workers in the selected sectors on parameters like educational qualifications (general, technical and vocational education), engagement type (self-employed versus workers), occupation (NCO 3-digit), gender wise distribution, etc.
3. Identification of Geographical Clusters: The approach may vary from sector to sector based on availability of relevant parameters. Parameters like agglomerations of units, institutions, etc. may be considered. Further, workforce distribution across regions also may be done to analyse spatial mismatch, if any. The Centre can do a State-wise analysis, States can do district-wise analysis.
4. Simulations for forecasting jobs and occupations:
 - a. The first step is making growth assumptions for the selected sectors. Past growth trends, projections by organisations like International Monetary Fund (IMF), Reserve Bank of India (RBI) or by States (if any) may be considered. Then using the growth assumptions, GVO numbers may be projected for future

- years over a base year. Base year could be the latest normal year for which data are available.
- b. The next step is the estimation of employment multiplier based on the Leontief inverse matrix (measure of interlinkages among the sectors) and Labour/ Output ratios for the selected sectors.
 - c. Jobs projection by multiplying employment multiplier with the projected GVO numbers.
5. Demand projections using Occupation-Wage-Employment Survey for non-agricultural enterprises: The limitation of I-O analysis is that it assumes the technology to remain constant and so it cannot capture the sectoral dynamics in the economy. This can be captured through the Occupation-Wage-Employment Survey. This involves re-designing the existing Occupation-Wage Survey to capture wages in all geographies, employment (number) across qualifications and skills, and select specified number of occupations across firms. Ministry of Corporate Affairs (MCA) database can be taken as the universe. The Centre can design the questionnaire and methodology and Centre-State collaboration is required for conducting survey.
 6. Assess skill shortages and gaps in non-agriculture sectors using vacancy data for non-agricultural enterprises: This involves the following steps.
 - a. Firms should be sampled across size, ownership, regions, and sub-sectors that have been identified previously.
 - b. Vacancy data may be analysed in the short-run.
 - c. The Ministry of Corporate Affairs (MCA)/ Goods and Services Tax Network/Economic Census maybe used as the universe.
 - d. The occupations list should be the same as identified in the beginning.
 - e. The Centre should define a skill shortage. If vacancies last for more than three months, then it should be defined as a skill shortage.
 - f. Using this definition, Sector Skill Councils (SSCs) can use a common assessment framework to feed into MSDE policymaking
 - g. Centre should be designing the survey and State Sector Councils should be implementing it.
 7. Big Data Analysis of Non-agricultural Enterprises: The Sector Skill Councils (SSCs) should undertake big data analysis within their sub-sectors of advertised job positions on an annual basis. They should design the work and collect data across various job sites. The sub-sectors should be in sync with other definitions in the large schema of work. The data should be collected across sectors and across various geographies/clusters especially cities —Tier 1 and Tier 2 cities—to understand the dynamics of the skill markets, spatial needs, sub-sector specialisation in particular clusters etc.
 8. District-level analysis of jobs in agriculture and allied sectors: Secondary sources like Agriculture Census, Situation Assessment Survey of Farmers, States specific databases may be analysed and it could be complemented by primary survey of stakeholders.
 9. Stakeholders interactions: Interactions with stakeholders at various levels of the value chains are crucial to ascertain skill shortage and gaps in the selected sectors.

Interactions could be through Focus Group Discussions (FGDs) and survey through structured questionnaires.

The following table summarises the various methodologies for India to assess skill gaps and shortages.

Table ES.5: Objectives and methodology

<i>S.No.</i>	<i>Type of analysis</i>	<i>Study lead in design</i>	<i>Objectives and methods</i>	<i>Implementing agency</i>		<i>Frequency of analysis</i>
1.	Macro analysis of sectoral shares and labour force	MSDE	<ul style="list-style-type: none"> • Descriptive data analysis from secondary data • Identification of geographical clusters • Input-output analysis 	MSDE	All-India and State-level analysis	Annual Basis
				State	District-level analysis	
2.	Macro analysis (optional)	MSDE	(3 to 5 year) forecasts of occupations accounting for stated policy goals, technological changes (and simulations for scenario building)	MSDE	All-India	3 to 5 years
				State	State-level analysis	
3.	Demand projections of jobs of non-agricultural sectors	MSDE & MoLE (design of questionnaires, sampling strategy based on universal company data sourced from MCA)	Occupational-wage employment survey of non-agricultural enterprises (panel data)	MoSPI with district-level participation		3 to 5 years
4.	Assess skill shortages and gaps of non-agricultural sectors	MSDE (design of questionnaires, sampling strategy based on universal company data sourced from MCA/GSTN/Economic Census)	Survey of non-agricultural firms for data on vacancies and skills	Sector Skill Councils (SSCs)		Annual
5.	Analysis of jobs in sub-sectors of non-agricultural sectors	SSCs	Big data analysis	SSCs		Annual
6.	Analysis of agriculture & allied sectors	State Government	District-level secondary data analysis	State Skill Missions		Annual
		MSDE (design of questionnaires, identification of stakeholders, etc.)	Survey, FGDs of farms, cooperatives, other stakeholders in the value chain, etc.	State and District Skill Missions		Annual

Source: NCAER.