शिक्षा मंत्रालय
MINISTRY OF
EDUCATION

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STARS
Strengthening Teaching-Learning
And Results for States

JOBS AT YOUR DOORSTEP

A Jobs Diagnostics for Young People in Six States

THE WORLD BANK
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ଧର୍ମେନ୍ଦ୍ର ପ୍ରଧାନ
Dharmendra Pradhan

सत्यमेव जयते

आज़ादी का अमृत महोत्सव

शिक्षा मंत्री
भारत सरकार
Minister of Education
Government of India

FOREWORD

India is growing rapidly, and firmly on its path to becoming *Viksit Bharat*. Employment and skilling is a key priority area for India to become a developed country. With the steady economic growth, there has been a transformation in local industry and Micro, Small and Medium Enterprises (MSME) sector, and this, in turn, has transformed the country's employment landscape. Today, our youth can take advantage of the growing profile of India's economy, which has unleashed the growth impulses, thus, opening a plethora of opportunities to our youth to explore and excel. The Government has rightfully acknowledged its enabling role as facilitator, presenting myriad avenues for gainful employment.

The Prime Minister Shri Narendra Modi has always highlighted the country's limitless potential to become not only a knowledge centre, but the skill Capital of the world. India can become the engine of global growth, through skilling, upskilling and re-skilling of our youth. He has underscored the need for cultivating a future-ready workforce with industry relevant skills training to develop certain competencies in the youth.

The National Education Policy (NEP) 2020, as well as the consequent National Curriculum Framework 2023, emphasize integration of skill development into mainstream education. NEP 2020 incorporates pre-vocational education at the Upper Primary level, to ensure that at least 50% of students have access to vocational education by the year 2025. Furthermore, it calls upon all secondary schools to provide vocational education by 2030. In addition, the National Credit Framework (NCrF) is designed to synchronize education with the requirements of the job market. Its competency-based methodology recognizes all types of learning—academic, skills-based, and experiential—contributing to a more comprehensive educational system. NEP 2020 encourages technology enabled, competency-based assessments, and continuous evaluation. Integrating skill assessments with the Vidya Samiksha Kendra and PARAKH Rashtriya Sarvekshan will facilitate the identification of areas requiring improvement. The Ministry of Education is dedicated to achieving these targets through collaboration and support from various organizations, including the Ministry of Skill Development and Entrepreneurship, State Education Departments, National and State Boards, as well as the private sector and civil society institutions.

Jobs at Your Doorstep is an initiative to conduct an extensive jobs diagnostic, aiming to delineate the socio-economic, demographic, and employment landscape of six states: **Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Rajasthan, and Odisha**. This initial research, conducted by the World Bank in collaboration with a third party, provides a preliminary skill and job diagnosis based on local requirements and demands. The states may further refine this analysis to meet their dynamic needs. The report advocates for specific trades based on comprehensive primary and secondary research and emphasizes the importance of industry partnerships to enhance the connection between education and job opportunities. Ultimately, the initiative seeks to empower students to become self-sufficient adults who can positively impact their communities and the economy.

P.T.O.

सबको शिक्षा, अच्छी शिक्षा

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The Strengthening Teaching-Learning and Results for States (STARS) programme, developed in collaboration with the World Bank, stands as a crucial component of this endeavor. I hope that the six states will implement the recommendations laid out in this report and emerge as leaders in identifying jobs at the doorstep of the youth connecting them with their desired employment opportunities. This report may also serve as a template for other States/UTs to assess and consequently formulate skill and job requirement.

By 2030, India is projected to have 1 billion working-age adults, indicating that approximately one-fourth of the world's incremental workforce over the next decade will come from India. The successful transition of youth into suitable jobs is integral to India's progression toward a US $5 trillion economy. Making this enduring investment in human capital is essential to bolster competitiveness, promote job readiness, and bolster India's vision to become a beacon of skill infrastructure for the world. I trust that this Report will galvanize all stakeholders to take actionable steps in realizing this vision for India, and lead to a larger discourse on enhancing skill development in school ecosystem across the country.

(Dharmendra Pradhan)

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Preface

The Government of India has an ambitious plan to transform the economy towards a high-income country status by 2047. To achieve the goals of India becoming a productive economy, she needs to urgently address challenges facing its employment landscape and prepare its workforce. Multifaceted, dynamic, convergent approaches aligned to educational reform and market linked skill development (SD) will help India reach its jobs growth potential. Key reforms by Government of India, will help strengthen the vocational education sector to become a decentralized, local market-led, inclusive, and fiscally sustainable sector, to train the workforce for the skills required for a high-income India.

The Ministry of Education has made major strides on this front by launching the National Education Policy (NEP) 2020 and the National Curriculum Framework (NCF) 2023. Both policies emphasize the importance of skilling in schools, with the NEP setting ambitious targets of 50 percent students accessing skill education by 2025 and all secondary schools offering skill education by 2030. As India sets out to achieve these targets, the "Jobs at Your Doorstep" report serves as both diagnostic and roadmap to providing strategic linkages and convergence between education and the jobs agenda of India. It goes deep into the job landscape of six states: Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Odisha, and Rajasthan, and identifies key priority sectors and roles that offer the highest employment potential for young people graduating from secondary school.

The World Bank assists the Ministry of Education, Government of India, on its program called *Strengthening Teaching-Learning and Results for States (STARS)* covering six states namely **Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Odisha, and Rajasthan** (collectively the STARS states). STARS has a national component under which key reforms are shared and disseminated for implementation. This report underscores the significant benefits of embedding skill-based education from grades 9-12 to prepare students for diverse career paths relying on a bottom-up approach, going deep in districts of six states, Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Odisha and Rajasthan. These present varying socio-economic profiles and offer a nuanced view of how industry and government can both contribute towards the jobs agenda.

Jobs at Your Doorstep is a skills gap analysis that attempts to align trades offered in schools with industry-specific needs of the districts where the schools are present. The study was initiated to reimagine the skill education offering through in-depth primary as well as secondary research in the six STARS states. The report is organized into six broad chapters:

- Setting the context on the urgent social and economic imperative for the country.
- An in-depth articulation of the objectives, approach and methodology adopted for this study.
- Findings on "Where are the Jobs"– which sectors are willing to hire skilled school graduates; where is the greatest volume; hence what trades should be offered in schools?
- Skill Gap Assessment: What is the nature and extent of the skill gap in each of the six STARS states compared to where the jobs are in their respective state and district economies? What are some common gaps in the design and delivery of skill education in schools today?

- An articulation of nine key recommendations to address the emerging skill gaps.
- Finally, the last chapter lays out the path forward – both short-term and long-term actions required by stakeholders across Central Ministries and organizations, State education departments, State examination Boards, Industry, Private Sector, and Civil Society to achieve the vision.

I hope that the findings and recommendations presented will be useful to policy makers, practitioners and industry leaders in preparing smooth pathways for school to work transition in India.

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Further, the authors acknowledge the time and contribution of all the stakeholders who agreed to engage and shared valuable insights. These include various experts and individuals from the different Sector Skill Councils (SSC), private sector, industry associations, individual employees in farms, factories and shops, government staff within the education department, as well as students, parents, skill education trainers, principals, and teachers.

This report would not have been possible without the support of all these stakeholders. The authors are deeply grateful to each of them for offering their time, advise, and resources to draft this report.

List of Abbreviations

AY	Assessment Year	**MSME**	Micro, Small and Medium Enterprises
ANM	Auxiliary Nursing and Midwifery	**MSP**	Minimum Support Price
BFSI	Banking Financial Services and Insurance	**NAPS**	National Apprentice Promotion Scheme
BPO	Business Process Outsourcing	**NCERT**	National Council of Educational Research and Training
CAGR	Compound Average Growth Rate	**NCF**	National Curriculum Framework
CDAO	Chief District Agriculture Officer	**NEET**	Not in Education, Employment or Training
CPC	Central Placement Cell	**NEP**	National Education Policy
Cr	Crore	**NGO**	Non-Governmental Organization
CSO	Civil Society Organization	**NSDC**	National Skill Development Corporation
DIC	District Industrial Commissioner	**NSQF**	National Skill Qualification Framework
DTE	Directorate of Technical Education	**OEM**	Original Equipment Manufacturer
EV	Electric Vehicle	**OJT**	On-the-job Training
GDA	General Duty Assistant	**PLFS**	Periodic Labor Force Survey
GDDP	Gross District Domestic Product	**PMKVY**	Pradhan Mantri Kaushal Vikas Yojana
GER	Gross Enrollment Ratio	**PSSCIVE**	Pandit Sunderlal Sharma Central Institute of Vocational Education
Gr.	Grade	**PT**	Polytechnic

GNM	General Nursing and Midwifery	**RCP**	Rubber, Chemical and Petrochemical
GSDP	Gross State Domestic Product	**STW**	School-to-Work
GSVA	Gross State Value Added	**SAMS**	Student Academic Management System
GVA	Gross Value Added	**SCERT**	State Council of Educational Research and Training
HM	Headmaster	**SEZ**	Special Economic Zone
HS	High School	**SHG**	Self Help Group
IFFCO	Indian Farmers Fertilizer Cooperative Limited	**SS**	Samagra Shiksha
IT	Information Technology	**SSC**	Sector Skill Council
ITI	Industrial Training Institute	**STARS**	Strengthening Teaching Learning and Results for States
MBBS	Bachelor of Medicine and Bachelor of Surgery	**TCS**	Tata Consultancy Services
MNC	Multinational Companies	**UNDP**	United Nations Development Programme
SE	Skill Education	**VTP/VT**	Vocational Training Provider/ Vocational Trainer

Stakeholder Glossary for Skill Education

National Government Bodies		
Categories	Department/Bodies	Role Description
Central government bodies	Ministry of Education (MoE)	• Formulates policies and programs for the development of education, including skill education, at the national level
	Ministry of Skill Development and Entrepreneurship (MSDE)	• Responsible for the development of skill education training programs in India
Quality assurance bodies and assessment bodies	National Council for Vocational Education and Training (NCVET)	• Regulatory body that approves and monitors awarding bodies (ABs) and assessment agencies for quality assurance in the skill education and training ecosystem in India
	Quality Council of India (QCI)	• Autonomous body focused on promoting and maintaining quality and standards across various sectors, including education
Research and support institutions	Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE)	• Responsible for curriculum development, teacher training, and research in skill education
	National Council of Educational Research and Training (NCERT)	• Creates books and materials to help students learn better
Academic bodies	National Institute of Open Schooling (NIOS)	• Provides relevant continuing education at school stage, up to pre-degree level through open learning system. Also Offers skill education courses and certifications
	Central Board of Secondary Education (CBSE)	• National-level education board under the Government of India that regulates public and private schools. Also offers skill education across several schools in the country

Non-Government Bodies at National and State Level		
Categories	Department/Bodies	Role Description
Public-private partnership organization	National Skill Development Corporation (NSDC)	• Facilitates skill development by providing funding and support to training partners • Ex- regulating body for Qualification packs (QPs)
Industry led sector bodies	Sector Skill Council (SSC)	• 38 SSCs each for a different sector, focusing on setting industry standards and qualifications for respective sectors including certifications • Develop and maintain National Occupational Standards (NOS) and Qualification Packs (QPs) • Function as Awarding Bodies, awarding certifications to trainees for approved qualifications
Industry teaching organizations/ persons	Vocational Training Provider (VTP)	• Contractual partners for delivering skill education trades, hire and monitor vocational teachers (VTs)
	Vocational Trainer (VT)	• Teach skill education trades to students from the PSSCIVE/ NCERT curriculum which is then tested by Boards & independent assessors certified by awarding bodies • Responsible for organizing industry visits, guest lectures and OJTs

State Governance		
Categories	Department/Bodies	Role Description
State government bodies	State Council of Educational Research and Training (SCERT)	• Develop state-specific skill education frameworks, curricula, and teacher training programs
	State Education Boards/ other Boards	• Regulate the functioning of schools within a state. Also manage and regulate government skill education programs within the state

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Executive Summary

India is home to a fifth of the world's youth[1]; this population advantage could play a critical role in achieving the nation's ambitious target to become a five trillion dollars economy. However, with the changing nature of work, it is important to review how India prepares her youth to be ready for the available jobs. Work is constantly reshaped by technological progress. Firms adopt new ways of production, markets expand, and societies evolve. Technology is changing the skills that employers seek. Workers need to be better at complex problem-solving, teamwork and adaptability. Digital technology is also changing how people work and the terms on which they work.[2] Studying and identifying where the jobs are is an equally important imperative as is education - *Jobs at your doorstep - How do we train and educate our youth so as to access jobs with ease and with preparation to be optimally productive? Is it possible to provide access and exposure to jobs even as students are in school or out of it?* These are critical questions that need to be answered to ensure that the "youth bulge" of India is prepared, productive and aligned with the needs of the market.

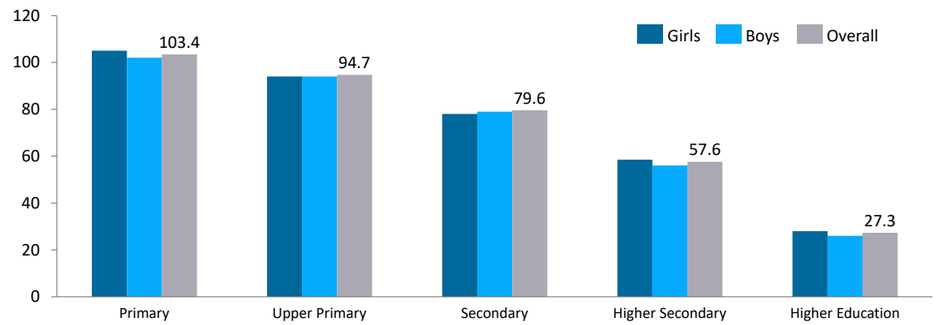
The **National Education Policy (NEP) 2020** is an enabling policy instrument of India, which has some critical observations on skill education. It mentions that there is a need to accommodate greater vertical mobility for students from the skill education stream; enhance the aspirational value of skill education, and remove the perception that young people who join the labor force without completing what was traditionally called "education" are in a stream that is largely for students who are unable to cope with academic subjects. The NEP calls for a *complete re-imagination of how skill education is offered to students in the future*. Subsequently, the release of the **National Curriculum Framework (NCF) for Education, 2023**, rearticulates this vision: *that skill education should be locally relevant as far as possible and, at the same time, respond to the aspirations of students.*

With these empowering policy pronouncements, it was imperative for India to dig deeper and unravel - *where are the jobs*? How can we ensure that youth that is either in school, out of school, or already in the labor market without sufficient education is ready for the labor market and competitive?

Where Are the Jobs? A Diagnostic Analysis:

A review of the Unified District Information System for Education (UDISE) reveals that school enrollments decrease as education levels progress from elementary to secondary and then to senior secondary enrollment.

Gross Enrolment Ratio (GER)



Source: UDISE+ 2021-22 and All India Survey on Higher Education (AISHE) 2020-21

Illustration 1 | Gross Enrollment Ratio (GER) by levels of school education in India

[1] Youth in India: 2022 (Ministry of Statistics and Program Implementation. Government of India.)
[2] The Changing Nature of Work: The World Development Report, 2019 (World Bank)

There is a corresponding reduction in the retention rates. The challenge was compounded by the onslaught of COVID-19, with long school closures, leading to migration of students, especially from vulnerable sections, into the labor market.

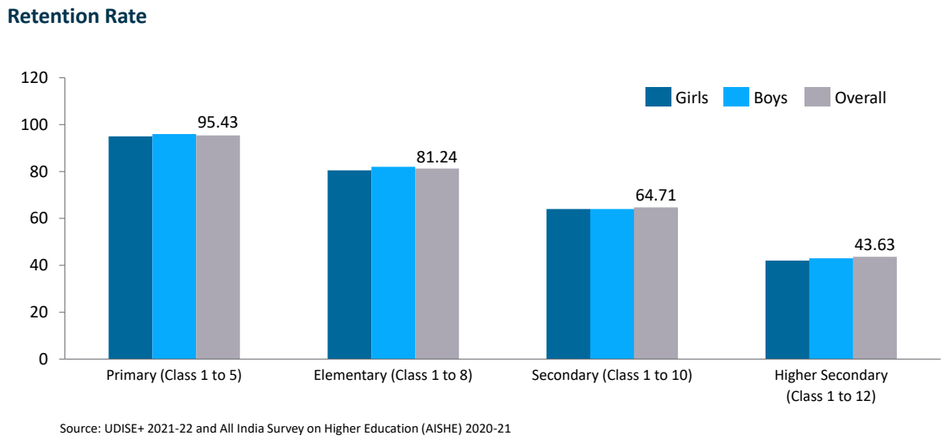


Illustration 2| Retention rate by level of schooling

Unprepared and without the necessary certified skills for the labor market, these students face an inherent challenge that massively reduces their productivity. A key goal of this study was to understand the nature of jobs that such students could have easy access to, and further, to determine the appropriate preparation strategies for these jobs. It leads to some significant reflections on the proposed reform that the government of India could undertake.

Objectives of the Study:

The World Bank supports the Ministry of Education, Government of India on its program called **Strengthening Teaching-Learning and Results for States (STARS)** benefitting the public schools of six states namely *Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Odisha and Rajasthan (collectively the STARS states).* It has five key results areas:

- Strengthening early years education
- Improving learning assessment systems
- Improving teacher performance and classroom practice
- Strengthening school-to-work transition and skill education
- Governance and decentralized management for improved service delivery

Strategizing for enhancing school-to-work (STW) transition programs and identifying jobs that would be relevant to the schooling sector has been a key exercise undertaken by STARS. Skill education can give young people, especially young women, the skills to compete for better paying jobs. Engaging local employers to ensure that the curriculum and delivery of these programs respond to labor market needs is increasingly becoming imperative and the NEP 2020 encourages this facilitation from schooling to skilling for better jobs.

The Micro, Small, and Medium Enterprises Sector:

Over the past five decades, the Micro, Small, and Medium Enterprises (MSME) sector in India has evolved into a vibrant and dynamic component of the economy. *It contributes in a significant way to the growth of the Indian economy with a vast network of about 63.38 million enterprises. The sector contributes about 45 percent to manufacturing output, more than 40 percent of exports, and over 28 percent of the GDP while creating employment for about 111 million people, which in terms of volume stands next to the agricultural sector*[3]. With capital requirements second only to agriculture, it plays a substantial role in advancing both the economic and social development of the country, promoting entrepreneurship, and creating employment opportunities.[4] Of the 63 million estimated enterprises, micro enterprises make up more than 99 percent of the total; small sector consists of around 0.3 million or 0.52 percent enterprises, while the medium sector comprises around 50,000 or merely 0.01 percent enterprises. Of the total estimated 63.33 million MSMEs, 51.25 percent are located in rural areas, 48.75 percent are situated in urban areas[5].

The sector generated the highest jobs in the trade sector at 38.7 million in rural and urban areas, followed by 36.2 million in '"other services"' and 36 million jobs in the manufacturing sector[6]. Based on the 2019 report by the Reserve Bank of India (RBI) regarding the "Expert Committee on Micro, Small, and Medium Enterprises," the non-agricultural sector primarily consists of three significant activity groups: Retail trade, Manufacturing, and '"Other" service activities not specifically categorized elsewhere (including services like membership organizations, computer repairs, and personal household goods services). These three activity groups collectively constitute 67 percent of all establishments, with "retail trade" alone contributing to more than 35 percent of this total.[7]

The Current Study:

It was necessary to assess the kinds of industries/local small and medium enterprises that have potential to provide jobs in the vicinity of schools to ensure employment for school graduates and those dropping out of schools. Special economic zones, labor market trends, industry presence, and overall primary, secondary, and tertiary labor market trends were analyzed. Status of skill education in schools and the need for reform to cater to the identified jobs for youth was also looked into. Overall goals of the study were to:

- Outline the economic and industrial profile of the six states (covered under STARS) including key sectors, current and projected growth, MSME penetration, key economic zones etc.
- Understand current and future employment landscape including growth, trends, and priority sectors.
- Identify key priority sectors and roles that offer the highest employment potential from a school-to-work transition lens.
- Understand current skill education delivery across schools and Industrial Training Institutes (ITIs - offering longer term programs).
- Recommend a set of trades that could be offered in schools, and how those should change for each district of a state linked to the local economy.
- Outline the way forward for all stakeholders to deliver on a strengthened skill education model for schools.

Our comprehensive approach involved extensive primary research, engaging with a wide array of experts, and conducting deep dives in districts across six states to ensure a nuanced understanding of various sectors' economic activities, employment potential, and skill requirements. This was complemented by rigorous data collection on employment estimates, job roles, and the impact of external factors, alongside mapping skilling capacity and quality through both primary and secondary research, including visits to educational and skill provisioning centers to understand skill education's current landscape and challenges.

[3] Reserve Bank of India. Expert Committee on Micro, Small and Medium Enterprises.; 2019
[4] Ministry of Micro and Small Enterprises, government of India. Annual Report: 2022-2023.
[5] Confederation of Indian Industry. Micro, Medium and Small-Scale Industry.
[6] Reserve Bank of India. Expert committee on Micro, Small and Medium Enterprises. 2019.
[7] Reserve Bank of India. Expert committee on Micro, Small and Medium Enterprises. 2019.

During the course of the study, 300+ hours of in-depth interviews were conducted. Majority of the Sector Skill Councils (SSCs) were engaged. 25 sub-sectors listed below were examined.

Various sub-sectors defined under primary, secondary and tertiary sector for the purpose of this study

The classifications were arrived at to align with market needs, as well as make them mutually exclusive

Primary	
• Crop Cultivation	• Dairy and Livestock
• Mining	• Aquaculture and Fisheries

Secondary	
• Textile and Apparel	• Auto and Auto Components
• Traditional (Handicraft etc)	• Rubber, Petrochemical and Chemical
• Food Processing	• Pharmaceutical
• Heavy Engineering/ Iron Steel	• Building and Construction

Tertiary	
• Tourism and Hospitality	• Logistics and Transport
• Retail	• Repair (Electronics/Auto)
• BFSI	• Domestic Work/at home services
• Healthcare	• KPO/BPO/IT Software development and Support
• Renewable Energy (Green Jobs)	• Programming/Digital Design
• Beauty and Wellness	• WASH (Green Jobs)
• Facilities Management	

Illustration 3 | 25 sub-sectors defined for the purpose of the study

Out of the above, nine sectors emerged as high potential sectors for school graduates, and another nine as medium. High potential sectors were defined as those that would benefit from a younger, more skilled workforce, and that today either do not find the workforce or suffer from high costs and higher attrition on account of recruiting overqualified workers. In these sectors, there is immense scope for more profitability, greater productivity, and competitiveness.

A view of the sub-sectors classified by their potential for school graduates is illustrated below.

High STW Potential (highest in services)

- **Crop Production** — High scope of self-employment and income enhancement
- **Dairy and Livestock** — High scope of self-employment and income enhancement
- **BFSI/NBFC** — Back-office roles, urban and rural sales roles
- **Retail** — Good pay in organized retail, aspirational
- **Information Technology** — High growth and pay, highly aspirational
- **Tourism and Hospitality** — Large skilled labor demand in hospitality and high scope of self-employment
- **Beauty and Wellness** — Aspirational, offers good pay, scope of self employment, large market
- **Repair (Auto and Electronics)** — high scope of self employment, large market

Medium STW Potential

- **Food Processing** — MSME and self employment driven
- **Iron Steel/ Heavy Engineering/ Automotive** — MSME and self employment driven
- **Textile and Apparel** — MSME and self employment driven (e.g. tailors)
- **Traditional Artisan** — Scope for upskilling for income enhancement in backward areas
- **Building and Construction** — Scope in fabricator roles (plumber, carpenter etc.)
- **Healthcare** — Scope in non-clinical roles; pre-requisites vary by States. E.g., MH needs add. certification for GDA
- **Renewable Energy (Green Jobs)** — High scope of self-employment and income enhancement
- **Aquaculture and Fisheries** — High scope of self-employment and income enhancement

Low STW Potential

- **Mining and Quarrying** — Mechanized, un-aspirational, low skilled requirement
- High skill requirement with minimum graduation criteria
- **Domestic Work** — No market for skilled workers, un-aspirational
- **Facilities Management** — Small market in Tier 1 cities, no long-term skilling required
- **Water, Sanitation and Health(Green Jobs)** — Hazardous work environment (e.g., e-waste management), un-aspirational, no skilling required
- **Transportation, Logistics and Warehousing** — No long-term skilling required, largely unskilled roles

All sub-sectors are skill driven, with no minimum qualification required for majority of job roles

Illustration 4 | High, medium, and low potential sectors for school-to-work graduates

In each of the high/medium priority sectors, an extensive study was further undertaken to understand the target job roles that students could pursue post appropriate skilling inside schools. It was found that all of the target job roles could be well served by a set of 14 broad, multi-skill-oriented trades as illustrated below.

14 Trades can cater to target job roles in priority sectors for school-to-work

Agriculture	1 Agriculture, with curriculum customizations basis local area need i.e., more focus towards: 1. Farm Productivity and Agronomy 2. Horticulture and Gardening 3. Dairy Farming and Livestock Health 4. Aquaculture and Fisheries	Largely targeting income enhancement opportunities + select sales/ procurement/ QA roles dominantly in input companies
Manufacturing	2 Workshop Technology and Machine Operation	Welders, fitters, machine operators etc. on shopfloor
	3 Automotive Tech and Servicing	Auto repair and servicing roles primarily
	4 Fabrication Technologies (Building/ Construction)	Plumber, electrician etc.
	5 Electronics and Hardware	Repair roles primarily for electronics, machines etc.
Services	6 BFSI	Sales roles (e.g., insurance), microfinance roles etc.
	7 Beauty and Wellness	Large self employment opportunity
	8 Front office and Hospitality/ Tourism	Front desk and office management roles across sectors
	9 Sales and Marketing (Retail and other sectors)	Large demand for sales/ customer service roles
	10 Healthcare	GDA, ANM/GNM (nursing) and diagnostic roles
	11 Fashion and apparel	Large self employment opportunity and design/ tailoring jobs
	12 Armed Forces and Physical Education	Defence roles, gym trainers, nutritionists etc.
Information technology	13 IT Software Development and Support	Programming as well as IT Software development and Support/ help desk jobs
	14 Digital Media and Design technologies	Graphic designing, digital marketing etc.

Illustration 5 | 14 Trades to cater to target job roles in priority sectors

With an understanding of the demand from industry and target job roles, the diagnostic study of six STARS states (*Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Odisha and Rajasthan)* focused on identifying where adequate skilling capacity existed in states and where there was a need to enhance capacity to address the skill gaps. The study conducted secondary data analysis across all six states, and primary data analysis was performed for six districts.,

Districts studied represent varied economies e.g., multi-faceted urban economy, industrial economy, deep rural economy with tribal population, etc.

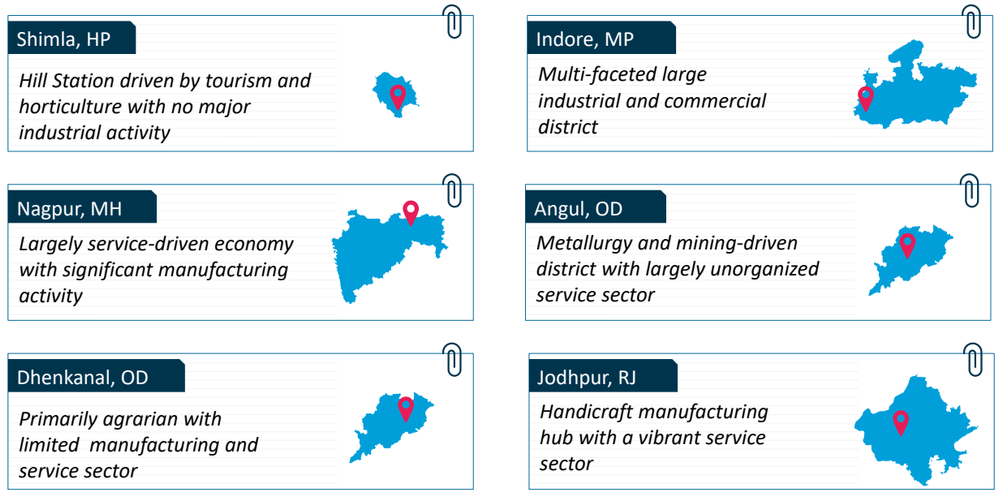


Illustration 6 | Districts selected for in-depth primary research

Secondary and primary research techniques were used during the diagnostic study. Secondary research included review of 50+ reports published by the government (e.g., Census 2011, Periodic Labor Force Survey (PLFS) 2020, Education Department databases), private sector (state of market reports on sectors, employment by various reputed organizations) as well as industry associations (including sector skill councils). Separately, the understanding of the current situation, problems, opportunity landscape, and solutioning has been designed bottom-up through depth interviews, and field visits across six districts including 100+ organizations/ industry associations and individual experts to understand employment, investments, economic zones, and plans. Schools (including urban, rural, and state open SIOS), and skilling institutes including government and private ITIs covering students, teachers, headmasters and school in-charge were interviewed. Non-school/ ITI stakeholder interviews including dropout young people's interviews (boys, girls, employed and unemployed) and parents (including of existing students and dropouts) were done. Academic experts were approached to validate methodology of employment projections. In estimating employment across states, districts, and sectors, three key datasets were used: the Census 2011, PLFS` 2020 and projections form Oxford Economics (as of July 2022). These estimates were further validated through conversations with sector skill councils and anecdotal feedback from industry experts.

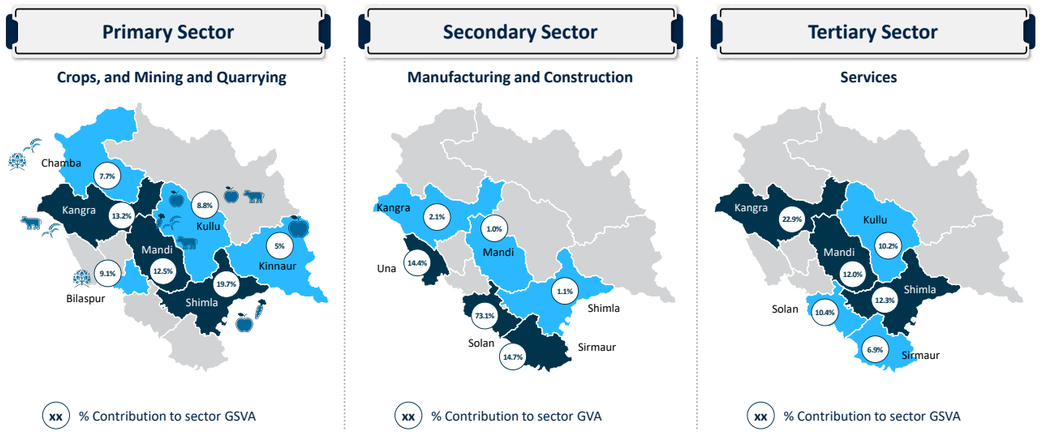
State parcels for all six states (*Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Odisha, and Rajasthan*) were created. Three key representations for each state are included below:

- State economic zone
- Sectors and trades present state-wide.
- Trades present in one district of the state

Himachal Pradesh

Economic Zones:

State economic snapshot| Manufacturing skewed to Solan; Kangra, Mandi and Shimla emerge as key districts within agriculture & services



Note: Top districts calculated basis district's contribution to GVA of a sector at the state level
Source: Directorate of Economics and Statistics, of HP, 2016

Illustration 7 | State Economic Snapshot

Sectors and Trades Present:

State skilling snapshot | Clear opportunity to expand skilling capacity in line with demand

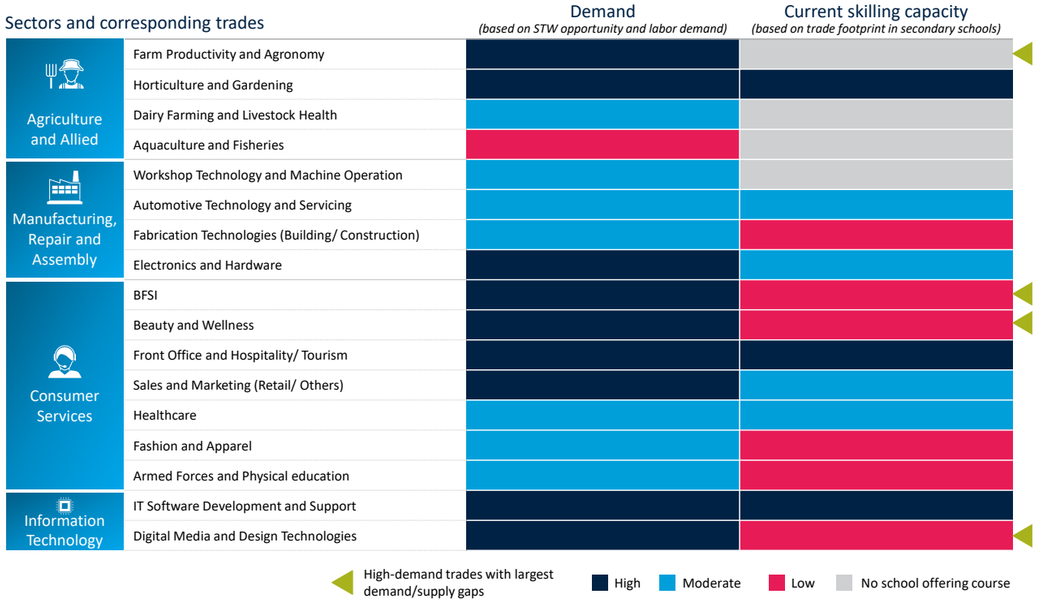
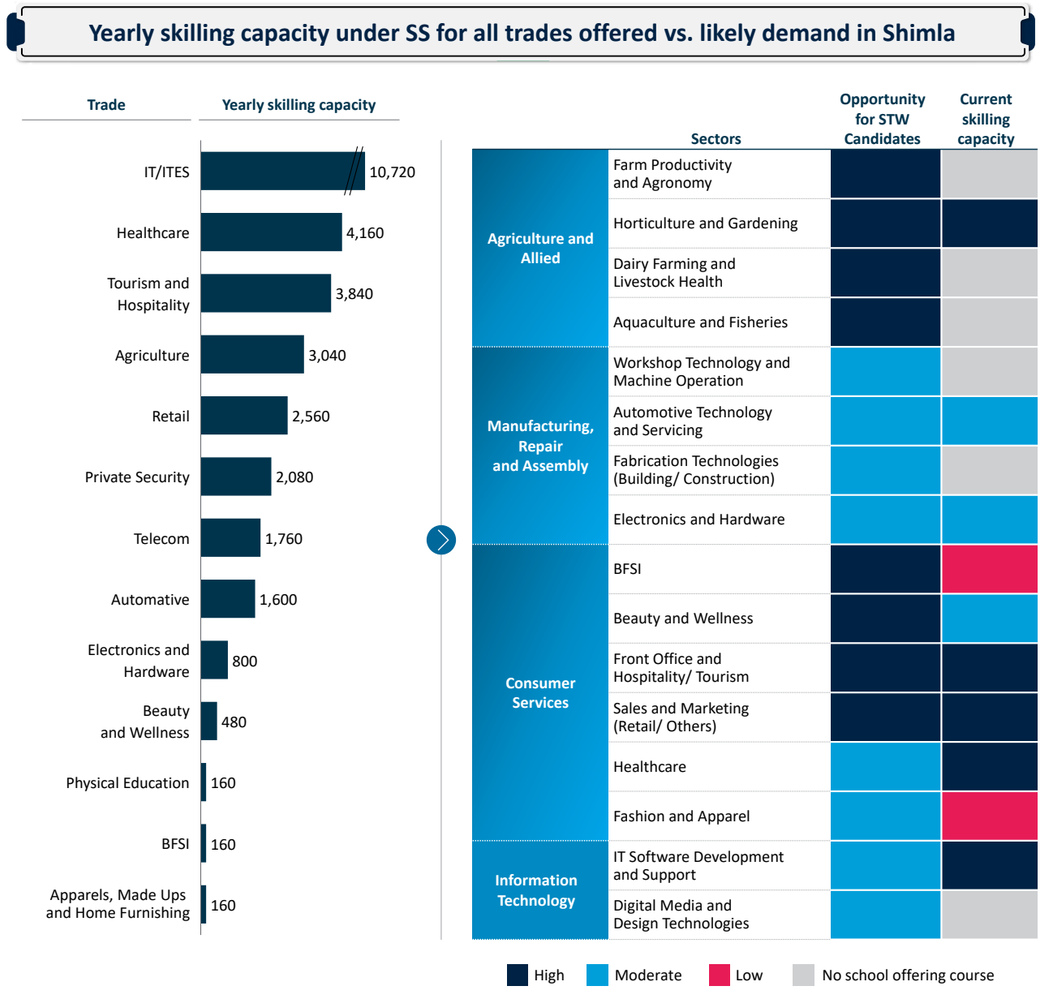


Illustration 8 | State Skilling Snapshot

Analysis of One District in HP: Shimla

Shimla: Trade analysis indicates a mismatch between capacity and demand



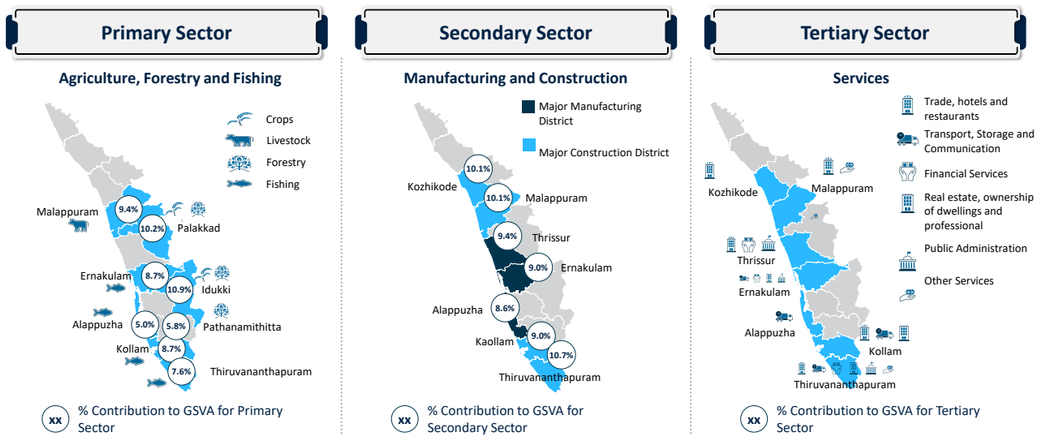
Note: 1. Capacity estimates only include NSQF-linked trade offerings in schools under the SS 2. Current capacity represents total number of seats available for each trade offered in SS schools in the district 3. STW to be read as School-to-Work
Source: School Education Department, HP

Illustration 9| Dis trict trades analysis indicating mismatch between skills demand and supply

Kerala

Economic Zones:

State economic snapshot | Plantation crops drive the primary sector; cottage industries drive the secondary sector while tourism is a prominent component of tertiary sector



Source: Directorate of Economics and Statistics, Government of Kerala; Internal Analysis

Illustration 10 | State Economic Snapshot

Sectors and Trades Present:

State skilling snapshot | Clear opportunity to expand skilling capacity in line with demand

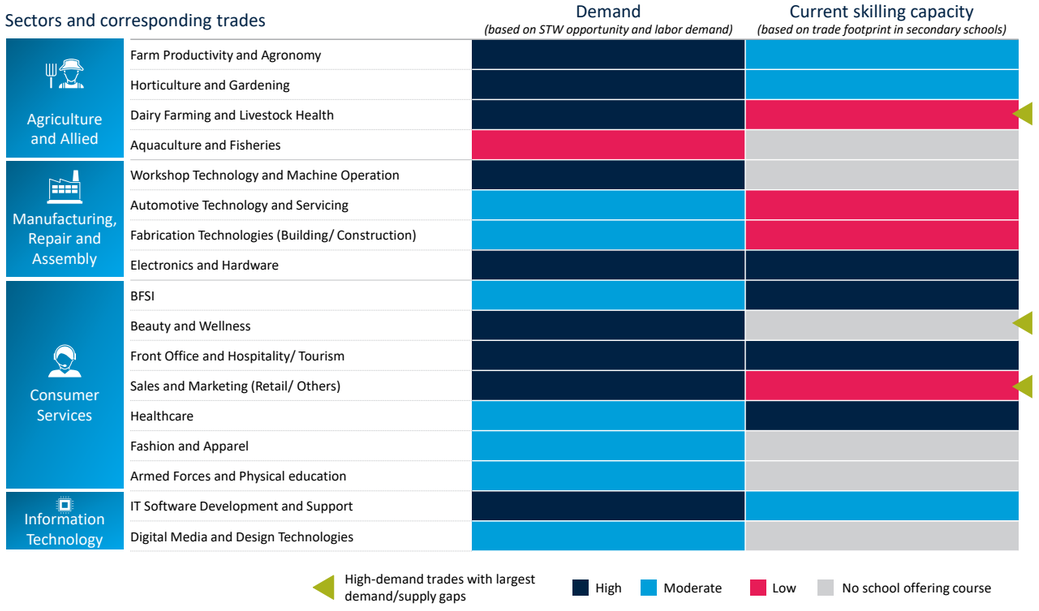
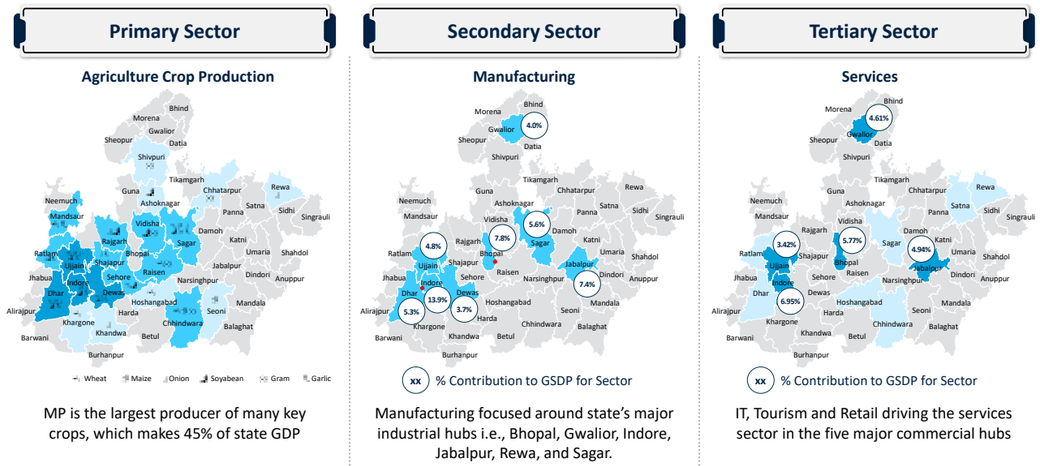


Illustration 11 | State Skilling Snapshot

Madhya Pradesh

Economic Zones:

State economic snapshot | Agriculture is dominant across districts, especially in the western part; manufacturing and services are focused around five main industrial and commercial hubs



Source: India Agriculture Survey 2019-20, DA and FW; Department of Planning, Statistics and Economics, MP

Illustration 12 | State Economic Snapshot

Sectors and Trades Present:

State skilling snapshot | Clear opportunity to expand skilling capacity in line with demand

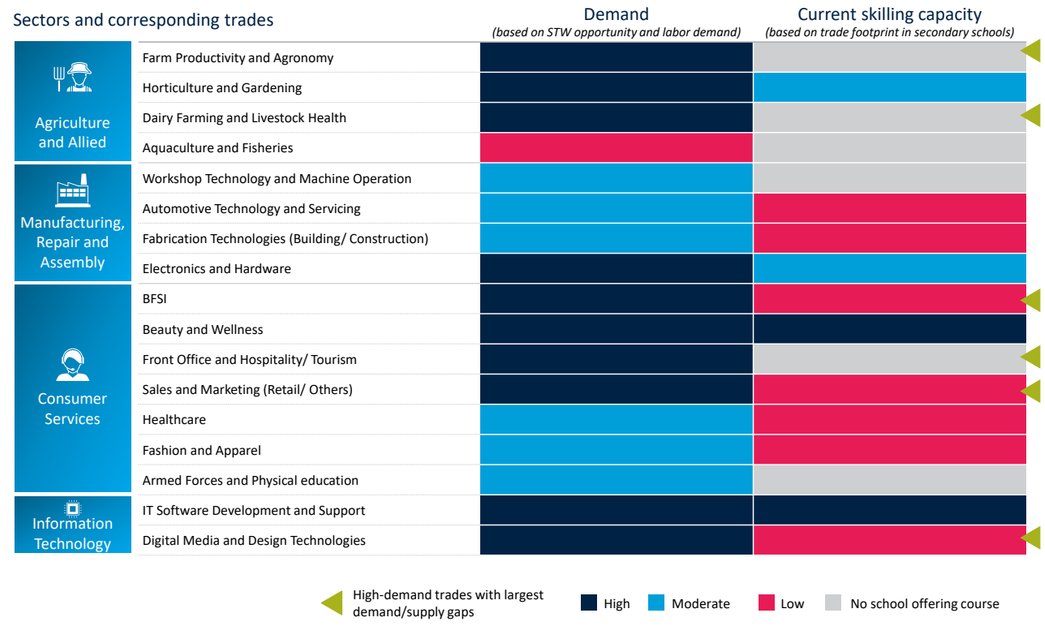
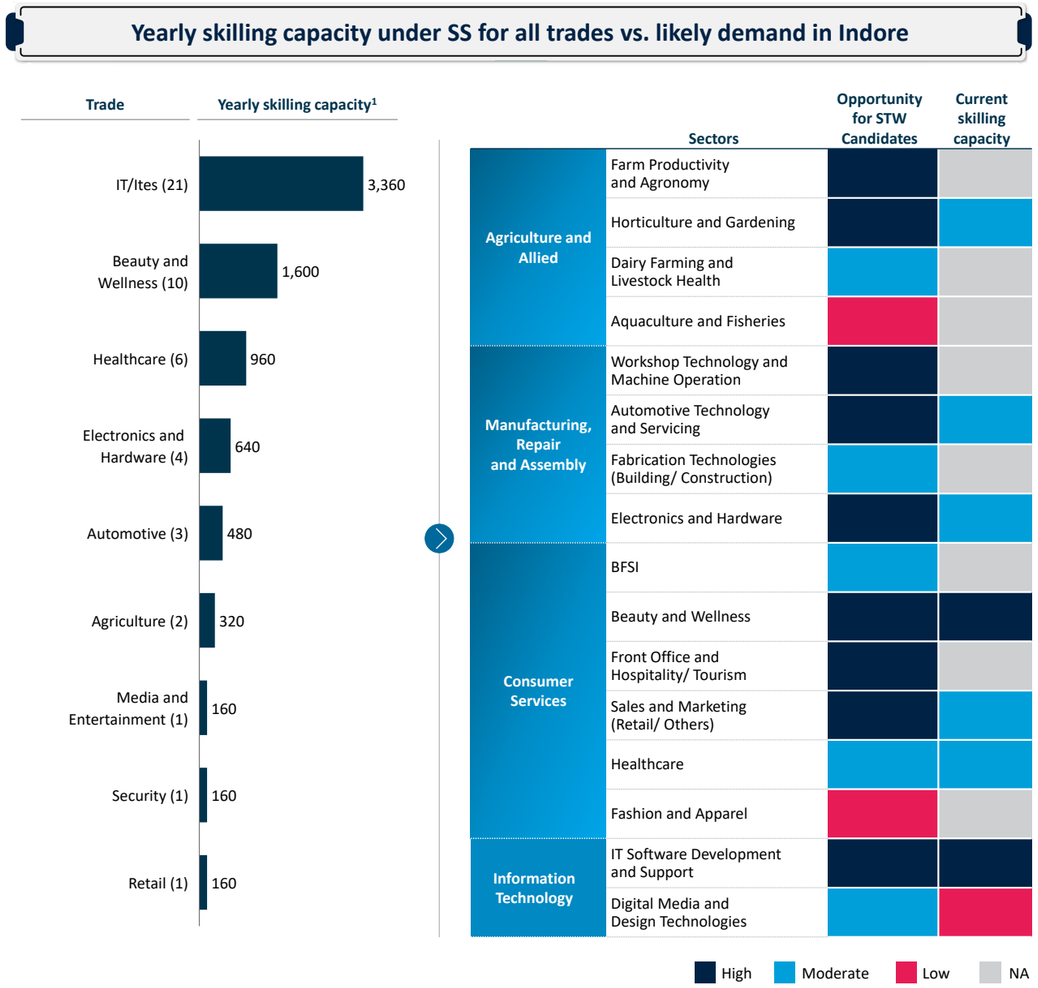


Illustration 13| State Skilling Snapshot

Analysis of One District in MP: Indore

Indore: Trade analysis indicates mismatch between capacity and demand



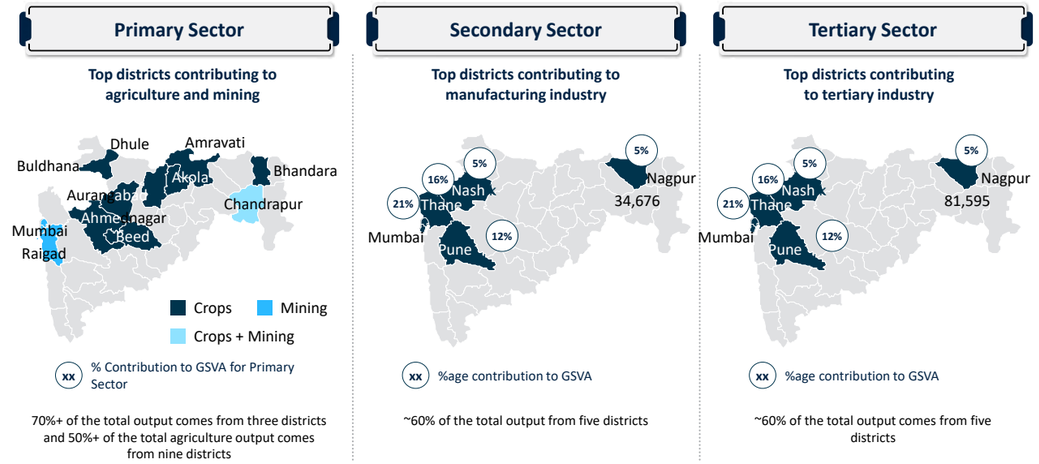
1. Calculation: no of schools offering a trade * no of grades in which the trade is offered * 40 seats per trade per grade
Source: Dept of School Education, MP; Internal Analysis

Illustration 14| District trades analysis indicating mismatch between skills demand and supply

Maharashtra

Economic Zones:

State economic snapshot | Agriculture spread across central and northern regions; limited mining; urban hubs dominate secondary & tertiary sectors



Source: Directorate of Economics and Statistics, 2019-20, Internal analysis

Illustration 15| State Economic Snapshot

Sectors and Trades Present:

State skilling snapshot | Clear opportunity to expand skilling capacity in line with demand

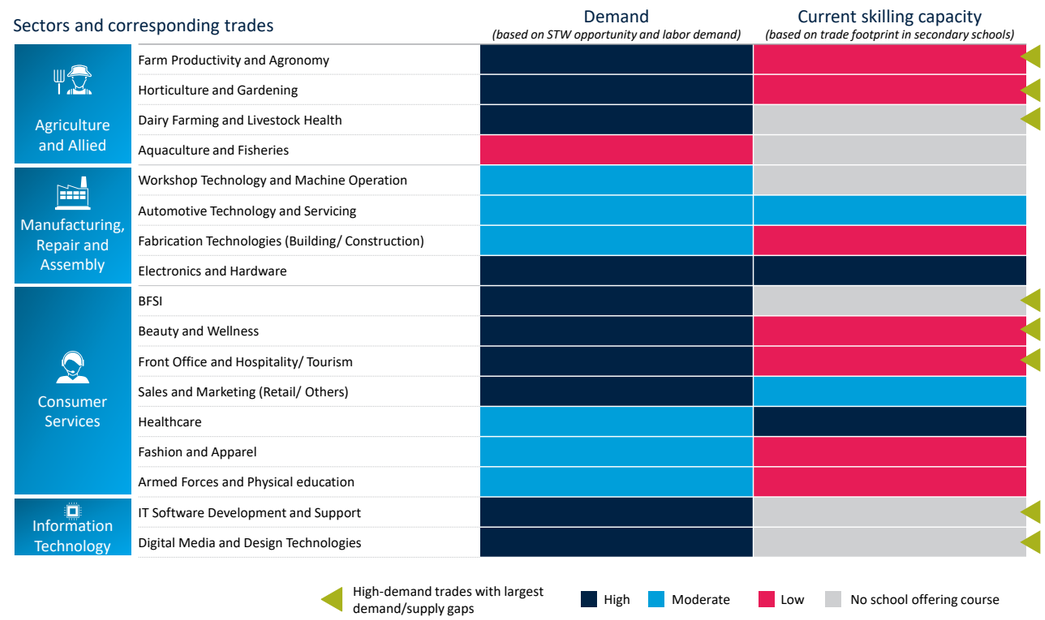
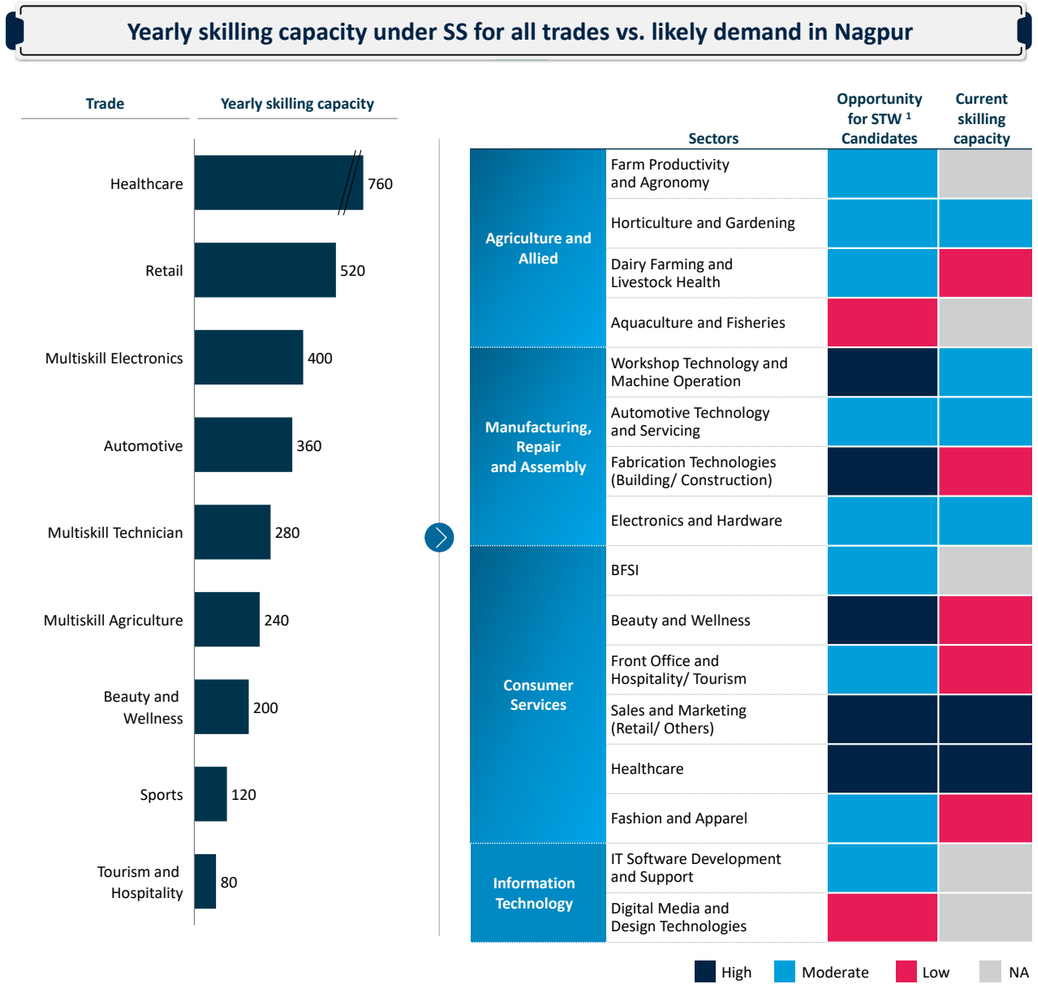


Illustration 16| State Skilling Snapshot

Analysis of One District in Maharashtra: Nagpur

Nagpur: Trade analysis indicates a mismatch between capacity and demand



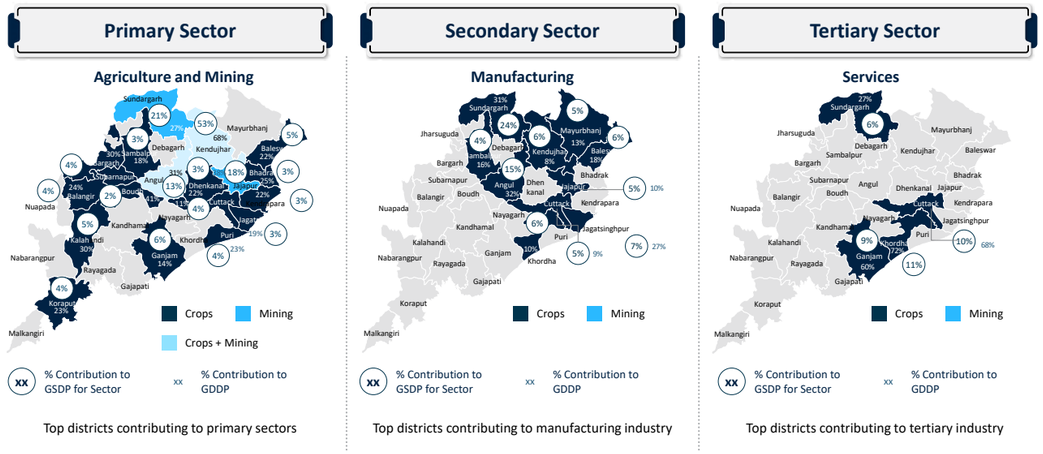
Note: 1. STW- School-to-work 2. Capacity estimates based on duration of each course offered
Source: School education department, Maharashtra

Illustration 17| District trades analysis indicating mismatch between skills demand and supply

Odisha

Economic Zones:

State economic snapshot | Agriculture is fragmented; mining is limited to four districts; manufacturing driven by districts in and around mining belt; urban hubs dominate tertiary sector



Note: District-wise contribution to GSDP and GDDP for districts contributing to both mining and agriculture represented as the cumulative contribution across both sectors
Source: 2011-12 GSDP-Directorate of Economics and Statistics, Government of Odisha; Odisha Economic Survey 2021-22; Primary Analysis

Illustration 18 | State Economic Snapshot

Sectors and Trades Present:

State skilling snapshot | Clear opportunity to expand skilling capacity in line with demand

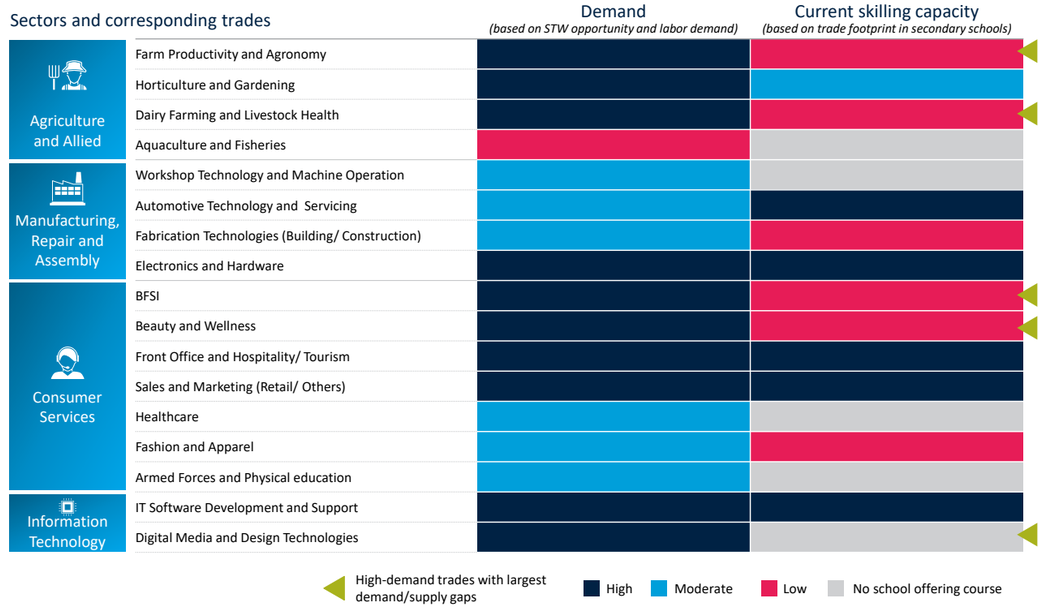
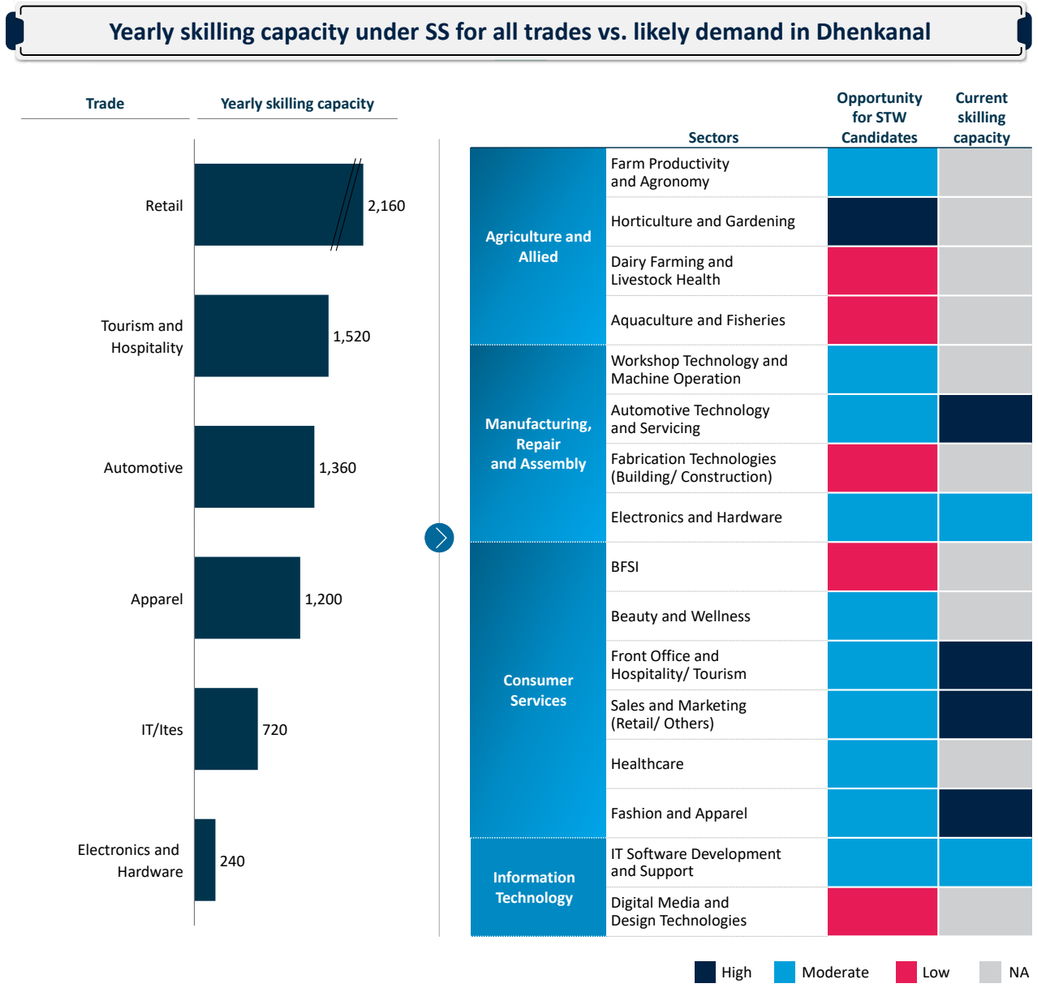


Illustration 19 | State Skilling Snapshot

Analysis of One District in Odisha: Dhenkenal

Dhenkenal: Trade analysis indicates mismatch between capacity and demand



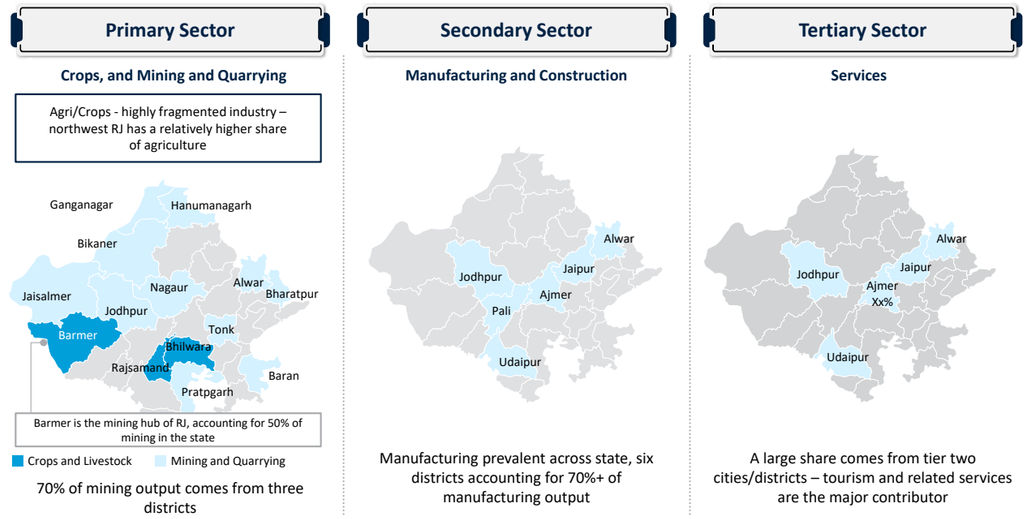
Note: 1. Capacity estimates only include NSQF-linked trade offerings in schools under the SS 2. Current capacity represents total number of seats available per year for each trade offered in SS schools in the district 3. STW to be read as School-to-Work
Source: District Education office, Dhenkanal; OSEPA; Primary Analysis; Internal Analysis

Illustration 20 | District trades analysis indicating mismatch between skills demand and supply

Rajasthan

Economic Zones:

State economic snapshot | Agriculture fragmented; mining limited to three districts; eastern economic belt of top districts has highest share of secondary and tertiary sector



Note: Top districts calculated basis district's contribution to GVA of a sector at the state level
Source: Directorate of Economics and Statistics, Government of Rajasthan (2021)

Illustration 21 | State Economic Snapshot

Sectors and Trades Present:

State Skilling Snapshot | Clear opportunity to expand skilling capacity in line with demand

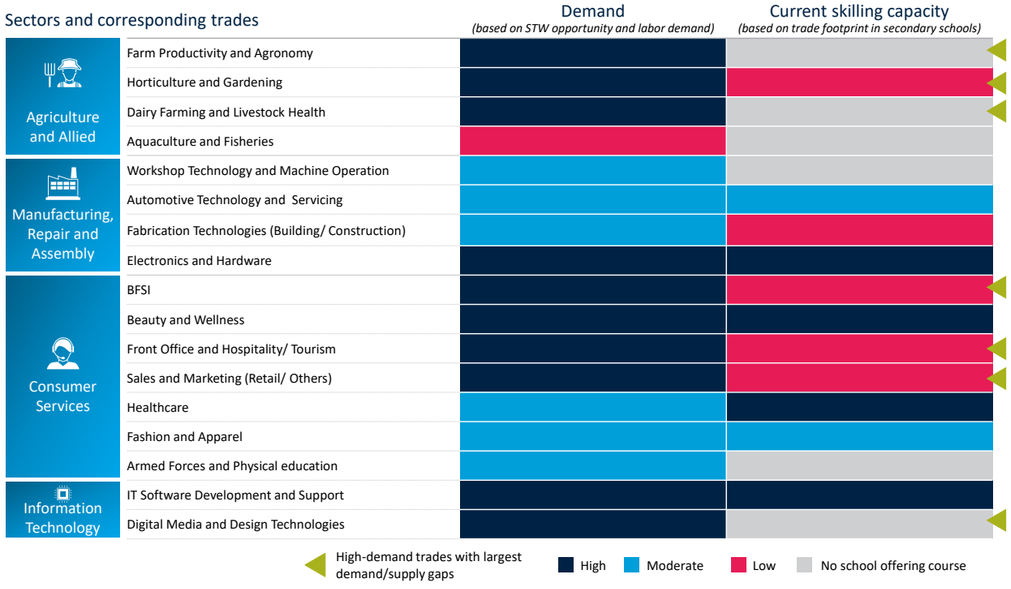
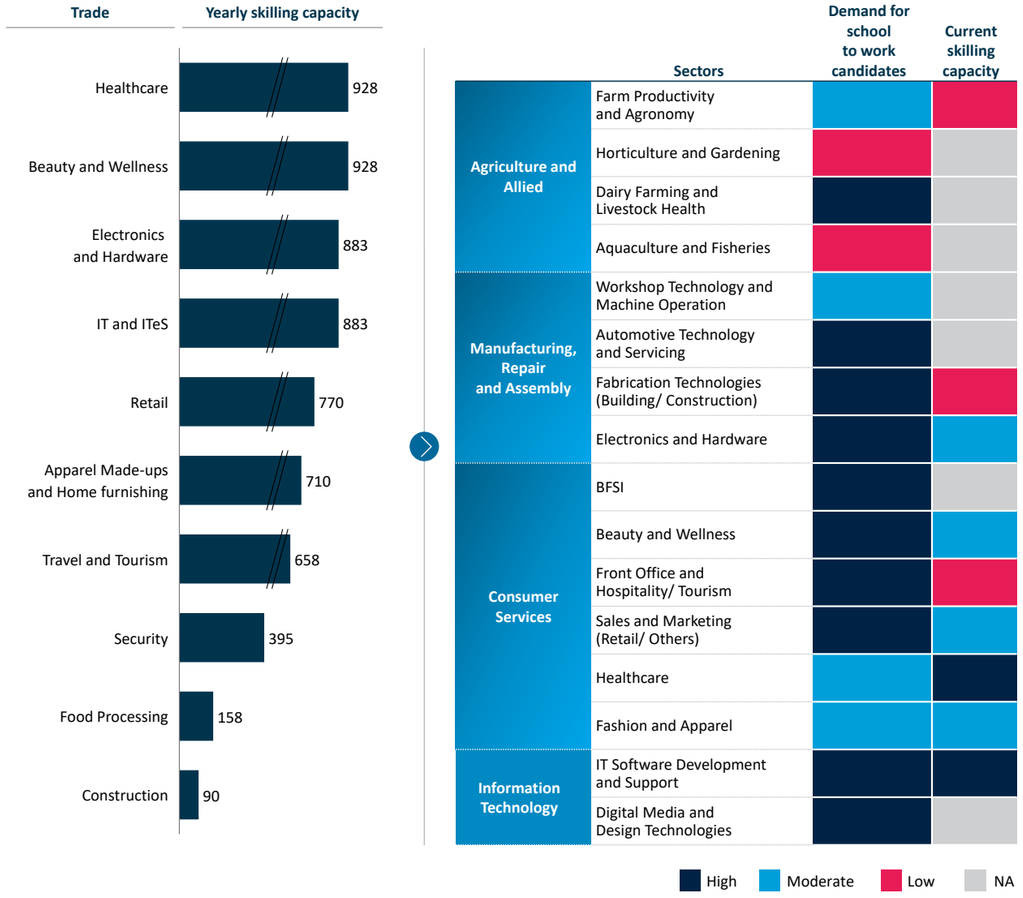


Illustration 22 | State Skilling Snapshot

Analysis of One District in Rajasthan: Jodhpur

Jodhpur: Trade analysis indicates mismatch between capacity and demand

Yearly skilling capacity under SS for all trades vs. likely demand in Jodhpur



Note: Capacity estimates based on duration of each course offered
Source: Directorate of Technical Education

Illustration 23 | District trades analysis indicating mismatch between skills demand and supply

Section II

A Need for Introspection - the Way Forward

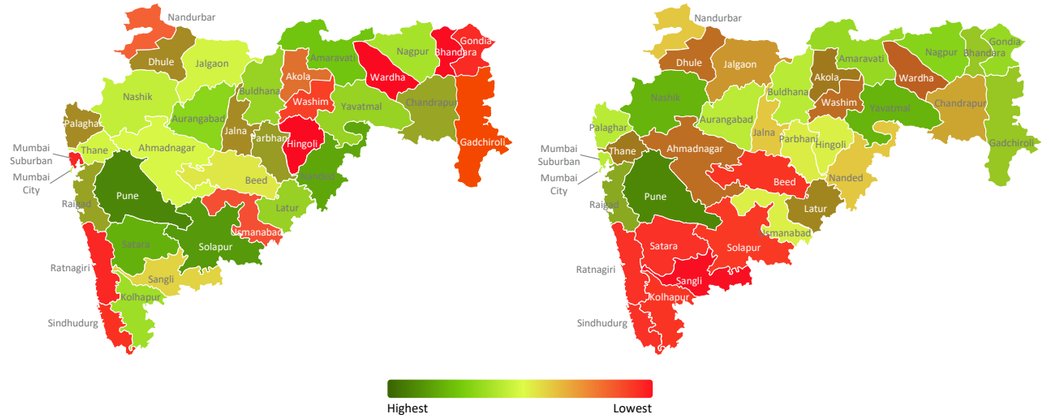
Data analysis, field research, primary conversations, and stakeholder discussions point to nine key challenges to address and corresponding opportunity areas to capitalize on:

1. Need to Expand Footprint of Skill Education

Skill education in schools has already gained significant momentum, with tremendous potential for further progress toward achieving the NEP goal. Although the goal is to provide skill education in 100 percent of schools by 2030, today approximately eight[8] percent of schools, including both government and government-aided institutions, are already offering skill-vocational programs under the Samagra Shiksha initiative. As we move forward, aligning the distribution of skill schools with the enrollment patterns of secondary students presents a valuable opportunity for even greater impact.

Total students enrolled in secondary schools[1]

Total skill education schools



Note: 1. Includes Government. and aided schools
Source: UDISE 2020-21, School Education Department, Maharashtra, Press research, Internal analysis

Illustration 24 | Maharashtra - number of skill education schools vs. secondary enrollments in each district

To meet the immediate-term goal of expanding access, governments can transform large secondary schools into "Skill hubs" – centers of skill education excellence that are co-created by the school education system, skill education ecosystem, and industry and where students from schools in the vicinity as well as out-of-school children can come and learn skill education programs in labs and from expert faculty. Given the costs associated with setting up skill hubs with requisite infrastructure and teaching resources, it is practical to plan their expansion to about 20-30 percent of secondary schools over the next three to five years. At the same time, to ensure that all students gain valuable skills, all schools across the state should consider

[8] According to UDISE 2021-22 data, there are 1,61,130 secondary and higher secondary schools in India, comprising 1,17,439 government schools and 43,691 government-aided schools. Of these, 13,206 schools (13,090 government and 116 government-aided) offer skill education programs. This accounts for 8% (13,206/1,61,130) of the total schools

introducing courses focused on employability skills. This approach not only meets the guidelines and goals laid out in the NEP but also addresses a critical industry need.

What is Skill Hub?

Skill Hubs are nodal skill centers identified to provide skill development and vocational training opportunities to target population segments from class sixth to eighth (introduction to world-of-work through orientation, industry visits, bag-less days), nineth to twelfth (aimed at exposing students to skill development avenues), school dropouts and out-of-education (aimed at academic credit, mainstreaming back to education and/or apprenticeship and employment linkages).

Over a period of time these Skill Hubs will associate with adjoining education and skilling institutions (spokes) over a district, or a cluster of adjacent districts, to provide access to skill development training at hub location or at spoke location. (Pradhan Mantri Kaushal Vikas Yojana, Ministry of Skills Development and Entrepreneurship, government of India)

Such adjoining institutions in the vicinity of the Skill Hub may leverage the infrastructure and resources available at the associated hub for their in-school, drop-outs, and out-of-education candidates in the 15-29 age cohort.

In the initial phase, 5,000 such skill hubs will be identified in the country from across the education and skill ecosystems.

2. Trade Definition Can Be Broader And Multi-skilled:

The job roles taught today in schools focus on covering one job role over two years (some examples are listed in the following illustration). However, both NEP 2020 and NCF 2023 have recommended a shift towards a multi-skill approach. This is in line with industry requirements of multiskilled individuals who can perform a variety of tasks. For example, in agriculture, the job roles currently offered such as “Citrus Fruit Grower”, “Mango Grower”, “Small Poultry Farmer” among others are too narrow and decrease students’ chances of finding employment post school. Students need to study a combination of agriculture, horticulture, and animal husbandry/poultry, incorporating modern practices within each area, to be valuable either on their own farm or when employed by larger farms. Similar challenges exist in other trades necessitating an overall revamp of the trades offered in schools.

Agriculture

Agriculture Machinery Operator	XI - XII
Citrus Fruit Grower	IX - X
Floriculturist (Open Cultivation)	XI - XII
Floriculturist – Protected Cultivation	XI - XII
Gardener	XI - XII
Mango Grower	IX - X
Small Poultry Farmer	XI - XII
Solanaceous Crop Cultivator	IX - X

Apparel

Assistant Fashion Designer	XI - XII
Hand Embroiderer	IX - X
Hand Embroiderer (Addawala)	IX - X
Self Employed Tailor	XI - XII
Sewing Machine Operator	IX - X
Specialized Sewing Machine Operator	XI - XII

Illustration 25 | Example of narrowly defined NSQF trades (Agriculture and Apparel)

As part of this study, a view has been developed on the relevant sectors and trades for school-to-work graduates basis field visits and industry conversations. The largest opportunities available are in the service sector. Agriculture follows next with income enhancement opportunity in addition to a few modern farming job roles such as farm advisory/ agri-equipment operator. Lastly, manufacturing opportunities are available

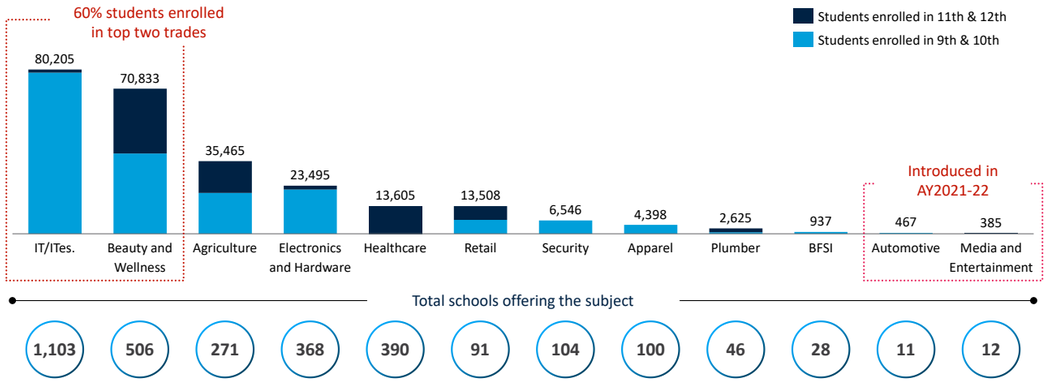
for school-to-work graduates primarily in MSMEs for semi-skilled roles. MSMEs were particularly positive to hire school graduates and willing to provide career growth opportunities in light of the concern of attrition faced when hiring college graduates.

14 such trades that allow a “multi-job roles, deep skilling” approach to be deployed in schools have been identified and previously shared in this report. In addition to meeting industry need, such a multi-skilling approach also increases employability choices and career flexibility from a students’ perspective.

3. Trade Mapping Needs to Account for the Local Economy, Leverage Skill Hubs

In the current model, the trade offering across most states is skewed towards a few trades and often does not align with the local economy. For instance, in Madhya Pradesh, 55 percent of the capacity is for IT, and Beauty and Wellness (as shown in Illustration below), regardless of the district-level demand. Therefore, there is scope to revisit the trade selection criteria at district and block levels to offer diversified and industry relevant trades. Further, Skill Hubs can be effectively leveraged to ensure sufficient choice is offered to students where satellite schools do not have the necessary enrollment scale to offer more than one trade.

Skill education enrollment in government schools, AY 2022-23



Source: Data shared by Dept of Secondary Education, MP; Internal Analysis

Illustration 26 | Madhya Pradesh – trades offered and enrollment in each trade

4. Focus on Employability Skills Required Along with Technical Skills

In addition to core technical skills, employers require individuals to be trained in basic employability skills such as “soft skills”, “digital literacy”, and “financial literacy”, among others. The current employability skills courses if any, are not sufficient and there is a need to broaden the learning outcomes of the course based on evolving industry demands. There are several different avenues via which employability skills can be strengthened including (i) embedding it in core academic teaching e.g. integration with teaching of English, Computer Science, Mathematics etc., (ii) incorporating within the pedagogy and assessments of trades, (iii) embedding into activities outside classroom e.g. extended on-the-job training (OJT) hours, reflections pre- and post-internships etc.), (iv) considering additional courses for employability skills for learning outcomes not addressed by other pathways (e.g. legal and financial literacy).

5. Hands-On Learning Infrastructure Has to Be Enhanced

Several school visits highlighted the need to establish full-fledged, up-to-date labs with appropriate equipment – both quantity and quality. For example, typewriters were found where computers would have been more appropriate for learning or old cars from 1990s models were found in automotive labs. Labs across many states either lacked the required number or quality of equipment. Well-equipped labs,

consisting of modern and high-quality equipment, will truly enable students to gain valuable practical experience and also allow for effective practice-based pedagogy and assessments.

Illustration 27 | Skill Education labs as observed during school visits

6. Need to Engage Qualified Teachers/Trainers with Industry Experience

Vocational Training Providers (VTPs) currently supply trainers under the NSQF. While this model swiftly adapts to industry needs, it leads to uneven teaching quality across regions. To improve the quality of teaching, the report suggests re-examining VT compensations to attract talent with both industry and teaching expertise, enhancing VT accountability through clear roles and performance monitoring, and appointing dedicated teachers for employability skills due to their importance to employers Furthermore, states could gradually explore establishing dedicated contractual cadres for skill education instructors. These teachers could be hired on a contractual basis for two to three years, with appointments based on their previous qualifications or industry experience. Renewal of contracts would then depend on the necessity and performance evaluations at the end of each contract period. Ideally, there should be flexibility to offer variable compensation to teachers of different trades, reflecting the current market conditions. For example, a teacher qualified in a digital-related trade might command higher compensation than one teaching a beauty-related trade.

7. Assessments Have Scope to Be More Rigorous And Truly Test Hands-On Learning

While the assessments are typically conducted via external assessors provided by SSCs, the rigor with which they assess the students varies significantly. Field visits and observations indicated that often concessions towards students are made on account of limited infrastructure or limited instructional time. However, easier assessments also create a vicious loop leading back to non-rigorous delivery and lower student engagement. To make the assessments more effective, there is a need for far greater rigor in testing “student’s skills” as well as a shift towards more in-depth practical assessments as opposed to superficial ones.

8. Strong Local Industry Linkages Need to Be Established

The current skill education model in states encompasses a few guest lectures and field visits as a part of the skill education trade offering in schools. OJT is included in the curricular requirements but is sporadic in execution, with inadequate funding and duration (e.g., seven-day OJT prescribed currently). Further, while all students are expected to complete some kind of OJT, the longer “apprenticeships” are often allotted to just two students per school per trade.

Overall, the lack of industry integration is due to lack of focus on skill education historically and hence lack of any systemic efforts and funding towards establishing and strengthening formal industry partnerships at state and district levels. Current efforts are reliant on individual teachers, resulting in inconsistent outcomes across schools. Further, industry stakeholders highlight the lack of benefits to them from engaging students in short stints (such as the seven day on-the-job-training model).

To address these issues, a systematic approach to industry partnerships (e.g., as evidenced in South Korea’s Meister Schools which strike industry MoUs) is essential. Such strategic industry tie-ups can play a crucial role in four key domains: (i) curricula design, (ii) delivery, such as guest lectures, (iii) infrastructural support, (iv) OJTs and placements. Whether it is Germany or Korea, industry linkages form a crucial part of skill education in schools. Placement results via industry partnerships can also help in building the image of skill education by providing a clear pathway to employment for school-to-work graduates. One way to implement this in the Indian context would be to pursue industry partnerships through interdepartmental convergence at various levels. The Department of School Education and Literacy can reach out to industry stakeholders while also involving other government actors such as the Department of Industries and Commerce and even local district administration.

Perception Around Skill Education Needs to Be Changed

While globally true, in India, there is an overpowering narrative around skill education being for students who are weak and would have dropped out. The result is that many students who want to or can benefit more from skill education than mainstream education run to conventional streams like arts, commerce, or STEM. Concerted efforts are needed towards re-branding skill education. For instance, Meister schools in Korea meaning “master of trades.” Other names used across countries are technical education and 21st century skills education, among others.

In summary nine key shifts are required to revitalize the school-to-work skilling ecosystem.

1. **Need to expand footprint of skill Education:** Transform select secondary schools into "Skill hubs" for skill excellence.
2. **Trade definition can be broader and multi-skilled:** Introduce versatile, multi-skill trades to prepare students for diverse industries.
3. **Trade mapping needs to account for the local economy; leverage Skill Hubs**: Tailor skill offerings to the specific economic needs of local regions.
4. **Focus on employability skills required along with technical skills**: Infuse the curriculum with essential soft skills, digital literacy, and financial acumen.
5. **Hands-on learning infrastructure has to be enhanced**: Prioritize experiential learning through improved infrastructure and practical pedagogy.
6. **Engage qualified teachers/trainers with industry experience**: Engage trainers with real-world experience for authentic skill instruction.
7. **Assessments have scope to be more rigorous and truly test hands-on learning**: Implement assessments that emphasize practical skills over theoretical knowledge.
8. **Strong local industry linkages need to be established**: Forge strong ties with industries for curriculum relevance, internships, and job placements.
9. **Perception around skill education needs to be changed**: Shift skill education's image through effective counselling and strategic branding.

Illustration 28 | Summary of recommendations

The Way Forward:

Coordinated Action Required At All Levels to Realize the Vision

Transformation of skill education in India will require both time and coordinated action across diverse types of stakeholders. To get started, the table below lists some immediate recommendations to get started.

Union Ministries (MoE, MSDE)	• Expand NSQF construct to allow students choice of in-depth skilling via multi-job role, multi-skill trades • Guide curricula bodies to revamp curricula to meet multi-skill needs • Guide SSCs to revamp assessments as trades are redeveloped • Drive large-scale awareness campaigns on skill education
Academic Institutions (NCERT, PSSCIVE, SCERT)	• Redevelop trades curricula with a multi-job role, multi-skill approach • Embed employability skills in trade pedagogy
State Governments	• Offer skill education in more schools and create Skill Hubs • Refresh the trade mix and map locally relevant trades to schools • Rollout redeveloped trade curricula with PSSCIVE's support • Redesign components of trade assessments under state board • Revamp approach for employability skills delivery • Sign industry partnerships for internships, curriculum and more
Current Skilling Ecosystem (NSDC and SSCs)	• Support trade redevelopment (deep, multi-skill approach) • Augment design of assessments to deepen practical component • Strengthen institutional mechanisms for monitoring assessments
Private Sector and Industry	• Co-create flagship Skill Hubs in schools as anchor partners • Offer industrial trainings, internships, and placements at-scale • Support curricula design and lab infrastructure setup in schools • Participate in in-school teaching and assessments
Civil Society, and NGOs	• Assist in select initiatives (communication, mobilization, counseling) • Support impact assessments of key interventions
Multilaterals and Philanthropist	• Support government in funding skill education pilot projects • Provide technical assistance (for example in curricula design) • Drive impact assessments of key interventions

01

Introduction: Why Focus on Skill Education

1 Introduction: Why Focus on Skill Education in Schools?

India hosts a fifth of the global youth population, and this demographic advantage could significantly contribute to the nation's ambitious target of achieving a five trillion US dollar economy. However, in light of the shifting work landscape, it is imperative to reassess how India prepares its youth for the available jobs. Emerging global trends such as automation, climate change, and digitalization emphasize the need for proactive adjustments in skills and workforce development systems to keep pace with the dynamic transformations in the labor market. Moreover, these systems should guide educational frameworks to ensure that relevant skill development pathways are accessible to young individuals choosing this trajectory.

Skill education has significantly boosted income levels and employment prospects, as evidenced by the NSDC survey where 47 percent of participants reported higher monthly earnings. Furthermore, the Pradhan Mantri Kaushal Vikas Yojana II (PMKVY II) evaluation revealed that trained individuals earned 15 percent more than their peers. Additionally, the Recognition of Prior Learning (RPL) program enhanced employment readiness and resulted in a 25 percent surge in average monthly incomes. Such programs play a pivotal role in enhancing employability and financial growth of individuals.[9]

In this context, skill education is a crucial component of how India reimagines its skills ecosystem. The National Education Policy (NEP) 2020 has already set ambitious targets for skill education. Expanding skill education could also help India achieve its goal of retaining students in schools. Lastly, learnings from other countries also indicate that strong skill education is a core component of a successful school system. This chapter examines each of these aspects in more detail thus making the case for focusing on skill education in schools.

1.1 NEP 2020 and NCF 2023 Have Set an Ambitious Vision for SE in Schools

India already has a starting point for skill education in schools. A centrally - sponsored scheme – "Vocationalisation of School Education" under the Samagra Shiksha Initiative, helps states run skill education in public schools[10]. Beyond this central plan, many states also have their own plans started several years prior – however, these are now largely being phased out. Today 8[10] percent of government and government aided secondary schools (13,206 schools) offer skill education under NSQF, with approximately 4[11] percent secondary grade students enrolled in vocational courses[11].

NEP 2020 has laid out a much larger vision for skill education in the country. It sets out the goals that:

- By 2025, at least 50 percent of learners through the school and higher education ecosystem should have exposure to skill education
- By 2030, 100 percent secondary schools to provide skill education

[9] Economic Survey of India, 2021-22
[10] Samagra Education
[11] According to UDISE 2021-22 data, there are 1,61,130 secondary and higher secondary schools in India, comprising 1,17,439 government schools and 43,691 government-aided schools. Of these, 13,206 schools (13,090 government and 116 government-aided) offer skill education programs. This accounts for 8% (13,206/1,61,130) of the total schools
[11] The UDISE 2021-22 data indicates that out of a total of 4,32,31,968 students in government and government-aided secondary and higher secondary schools (2,94,41,052 from government schools and 1,37,90,916 from government-aided schools), 17,84,696 students (17,72,259 from government schools and 12,437 from government-aided schools) are enrolled in skill education programs. This represents 4% of the overall student enrolment (17,84,696/4,32,31,968)

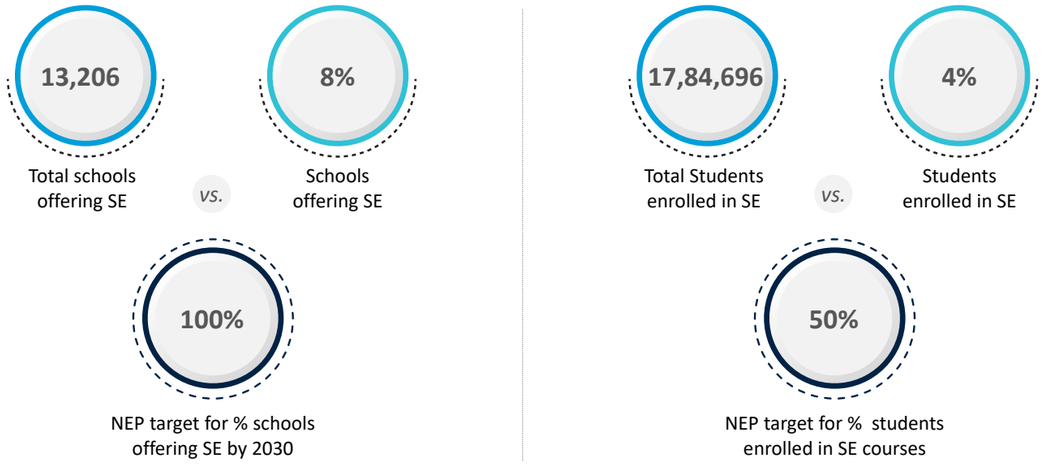


Illustration 29 | Overview of skill education in India[12]

NEP also emphasizes the importance of providing more opportunities for vertical mobility to students in skill education. It calls for increasing the value and appeal of skill education and challenging the belief that those who choose skill education pathways and enter the workforce without completing traditional "Education" are those who struggle with academic subjects. This requires a thorough reconsideration of how skill education is approached in the future.

The recently introduced NCF in 2023 further supports this vision by highlighting that skill education should be relevant to local contexts and, at the same time, should align with the goals and dreams of students. It mentions skill education as one of the eight key curricula areas. For grades ninth and tenth, the NCF recommends an interdisciplinary subject that gives students exposure to skill education across multiple disciplines. In grades 11 and 12, the NCF suggests that students be allowed to choose up to three subjects from skill education. Beyond these changes from grades ninth to twelfth, the policy also emphasizes the need to bring exposure to skill education earlier – starting from grade sixth.

Overall, both NEP 2020 and NCF 2023 provide strong enabling conditions for the expansion of skill education in schools.

1.2 Focus on SE Can Help Achieve India's Retention Goals

An NCERT impact study in 2017 underscored that skill education significantly boosts students' confidence, academic interest, and performance, with an employability rate as high as 90 percent among those surveyed. [13]This enhanced academic engagement and improved performance, as observed by parents, could be a pivotal factor in addressing the issue of declining school enrollments from elementary to secondary and senior secondary grades in India. While the country has made notable strides in elementary education enrollment and retention, secondary education lags, facing retention challenges that were exacerbated during the COVID-19 pandemic. The long school closures during the pandemic led to increased migration from schools to the labor market, particularly affecting vulnerable social segments. This premature shift to the workforce not only disrupts educational trajectories but also presents challenges for the students, who may encounter reduced productivity in their new job roles. Integrating skill education at the secondary level might offer a strategic intervention, providing students with the skills and confidence needed to improve

[12] UDISE 2021-22, accounted for both government and government-aided secondary and higher secondary schools
[13] State of the Education Report for India 2020 by UNESCO

their immediate employability while also potentially mitigating the dropout rates by aligning education more closely with labor market opportunities.

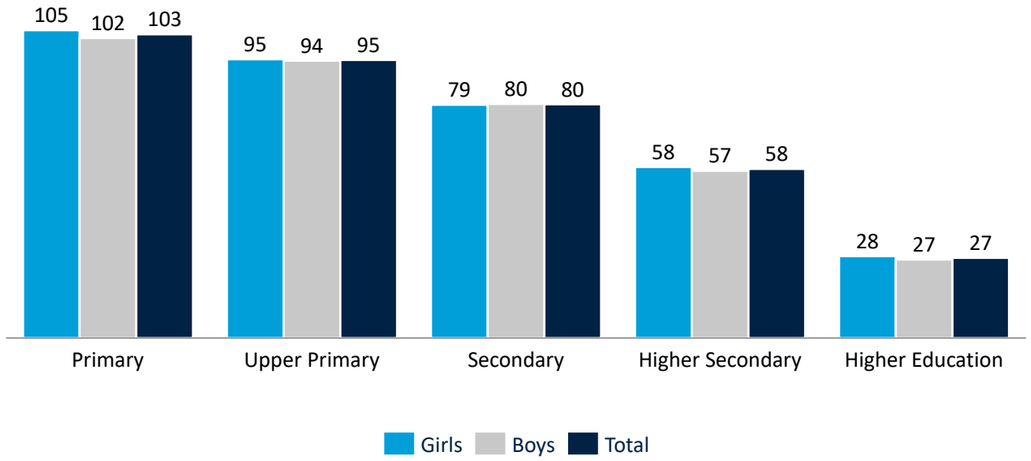


Illustration 30 | Gross Enrollment Ratio (2020-21)

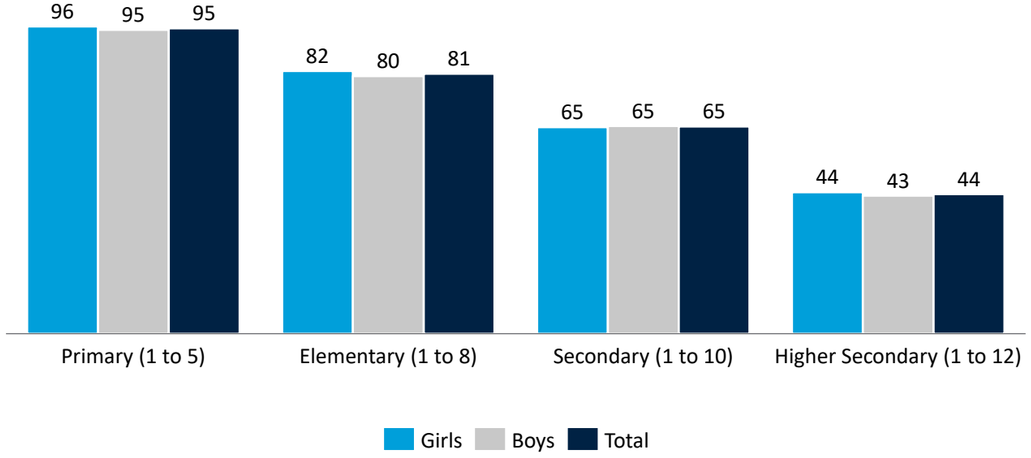


Illustration 31 | Retention Rate

Primary conversations undertaken as part of this study indicated that the students left school for several reasons, including:

1. **Several students do not perceive regular academic subjects as valuable to their career, with no pathway to employment.** Most students who remain in school tend to continue only with the hope of pursuing higher education to land well-paying "office" jobs eventually. However, in hindsight, all students prefer skills that would have given them access and opportunities to decent work (for example, filling out online applications, basic English communication, digital and financial literacy, among others).

2. **Many students find the curriculum hard and are unable to cope with conventional academics.** Most students and their parents begin recognizing their learning gaps as they get assessed for the first time in grade 9 and receive a "pass" or "fail" for each subject.
3. **Several students also face financial issues at home; therefore, supporting family members is a competing priority.** Many students in rural areas enter jobs in farms, factories, and shops near their homes and may end up working in hazardous environments (for example, a metal fabrication unit, a mine, a mechanic shop, or a cashew processing unit). Children in urban cities have similar outcomes, albeit with a broader range of opportunities, particularly in the services sector (for example, loader or stacker in warehouses, delivery person (on cycles), assistant in shops (for example, a saree shop).
4. **Families are hesitant to permit children to travel to a secondary school far from home.** Many students in schools that end with upper primary or secondary grades decide to discontinue education because their school does not offer secondary or higher secondary grades. The nearest school that does offer those grades may be too far.

Further, at a national level, the Gross Enrollment Ratio for higher secondary (11th and 12th) is 57.6 percent[14]. In contrast, the same for higher education (including undergrad and diploma at colleges/universities) is only 27 percent[15] - roughly 70 percent of students who make it to grade 12 do not go to college for education and either end up in employment or NEET (Not in education, employment, or training).

Effective skilling within schools is crucial to support the large number of students who enter the workforce immediately after dropping out or graduating. It can also be a critical lever to improve retention in secondary and higher secondary grades. While it is true that skilling opportunities are available to students outside of the school system via Industrial Training Institutes (ITIs) and Polytechnics (PTs) those opportunities are not fully adequate for three reasons:

1. **ITIs and PTs do not have sufficient geographical coverage:** The footprint of ITIs and PTs is extremely limited. There is one ITI for every 20 secondary schools and one government ITI for every 50 government secondary schools.[16] PTs have an even lower footprint with one PT for every 100 secondary schools.[17] ITIs are typically limited to two-thirds blocks of a state, and only one per block on average[18] and hence the access is very limited.
2. **Even where ITIs or PTs exist, their scale does not match the demand for skilling:** India is expected to see over 12 million youth between the age of 15 to 29 entering the workforce annually for the next two decades.[19] The current capacity of ITIs is 2.5 million[20] and enrollment in PTs is about 1.5 million.[21] Further, even with the inclusion of additional government initiatives such as PMKVY (about 0.8 million trained)[22], there remains a shortfall of over five million youth between the age of 15 to 29 who require skilling[23].
3. **Trades offered in ITIs focus on manufacturing job roles:** A quick look at the top trades offered in ITIs (listed in illustration below) shows that ITIs primarily focus on manufacturing. While PTs offer some engineering courses beyond manufacturing (for example, computer science engineering), their share in the overall skilling landscape is low because PTs are already low in number and within that the non-manufacturing courses are further low in count.

[14] UDISE+2021-2022
[15] AISHE 2020-2021
[16] NITI AAYOG: Transforming Industrial Training Institutes, 2023; UDISE+2021-2022, accounted for SS and HSS
[17] AISHE 2020-2021; UDISE+2021-2022 – Ratio (SS + HSS)
[18] MSDE dashboard; average calculated based on total ITIs and number of blocks in a district
[19] The World Bank: Skilling India
[20] NITI AAYOG: Transforming Industrial Training Institutes, 2023
[21] AISHE 2021-2022 students enrolled count
[22] PMKVY official dashboard
[23] MSDE 2022 Year End Review; UDISE+2021-2022 - Sum total of skilling seats across different skilling institutes and schemes

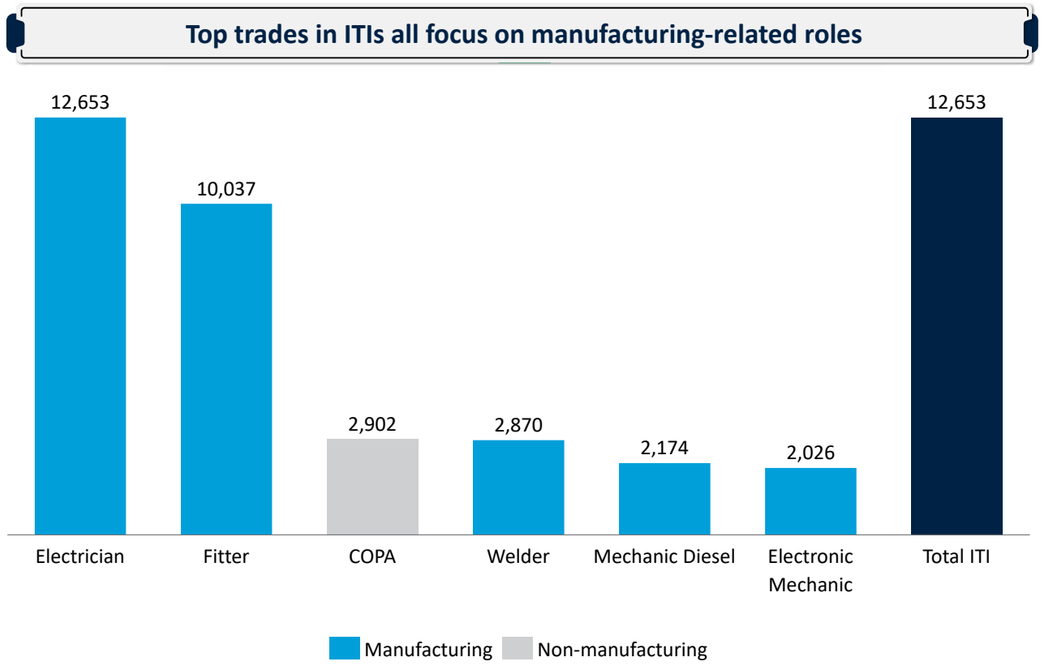


Illustration 32 | Overview of top trades offered in ITIs[24]

Overall, deeper integration of skills inside schools is critical, while being commentary to and establishing inter-linkages with the existing offerings in the ITI and PT ecosystem.

1.3 International Benchmarks Offer Learnings for This Journey

Global benchmarks indicate several countries have deeply integrated skill education into their school systems. In these nations, skill education is offered as an integrated offering in a majority, if not all schools and a substantial proportion of students pursue skill education in their secondary grades.[25] These countries also demonstrate higher retention rates while offering wage - premium for skilled school candidates.[26]

[24] NITI AAYOG: Transforming Industrial Training Institutes, 2023
[25] National Center for Education Statistics: Table Secondary/High school; CEDEFOP; KRIVET; UDISE+2021-2022; OECD indicators
[26] OECD indicators; Survey data and market portals for entry level salaries

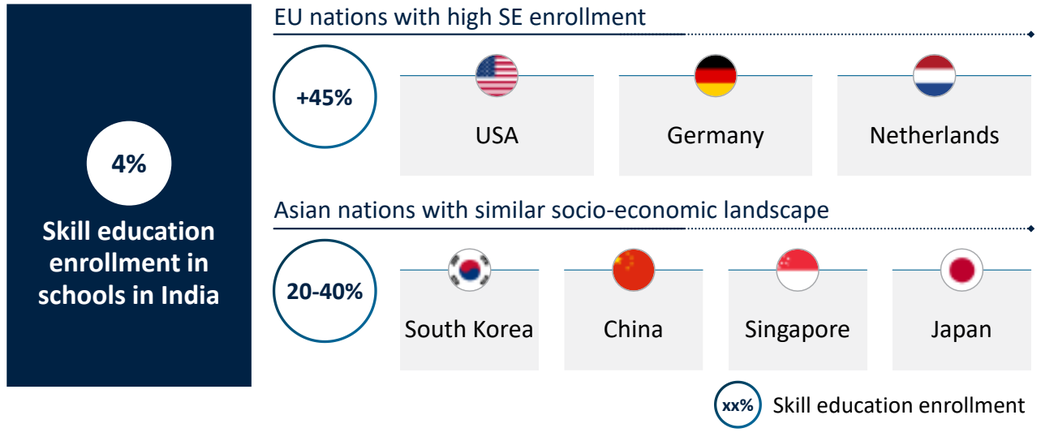
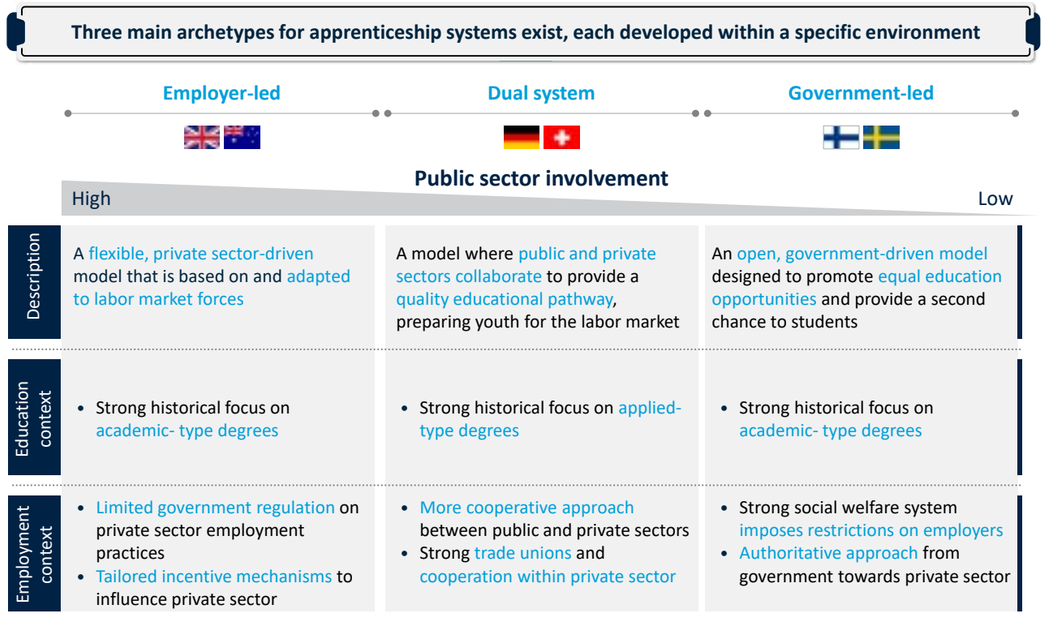


Illustration 33| International benchmarking on skill education enrollment[27]



Source: World Economic Forum, 2021 European Educational Research Association, 2019; BCG desktop research and analysis

Illustration 34| Archetypes of school-based skill education models

Learnings from five countries – China, United States, South Korea, Australia, Germany – are shared below.

1. **China:** China stands out as a key nation to offer skill education after primary school, with a landscape offering 10.3 thousand secondary skill education schools across 770 disciplines, enrolling roughly 40 percent of secondary students—totaling 15.5 million. These institutions range from Skill Worker Schools focusing on machinery to Secondary Specialized and Skill Education High Schools, emphasizing advanced production, management, and technology. Key success factors include robust industry participation and government support, with scholarships and awareness initiatives bolstering the system. This

[27] OECD indicators; CEDEFOP; UDISE+2021-2022

multifaceted approach achieves a 95 percent employment rate among school graduates, demonstrating skill education's effectiveness in the manufacturing and production sectors[28].

2. **United States (US):** Skill education in US is primarily integrated within regular schools and is called Career and Technical Education (CTE). There are limited dedicated skill education schools and only about 50 percent of students pursue higher education. CTE programs in US are accessible[29]:
   - 98 percent of public-school districts offer CTE programs to students at the high school level
   - 75 percent of public high schools provide work experience opportunities
   - 60 percent of public high schools provide training in job seeking or interviewing skills

Further, the enrollment is also high and approximately 53 percent (8.3 million) of Class ninth to twelfth students undergo skill education through CTE[30]. Examples of the top "career clusters" students explore are listed in illustration below.

United States: High-school students choose skill electives across 16 career clusters under the "Career and Technical Education" program

#	Career Cluster	% of public high school students enrolled
1	Health Science	12%
2	Agriculture, Food, and Natural Resources	11%
3	Business, Management, and Administration	10%
4	Arts, Audio Visual, and Communications	9%
5	Science, Technology, Engineering, and Math	7%
6	Human Services	7%
7	Architecture and Construction	7%
8	Hospitality and Tourism	6%
9	Information Technology	6%
10	Marketing, Sales, and Service	5%
11	Manufacturing	5%
12	Finance	5%
13	Transportation, Distribution, and Logistics	4%
14	Law, Public Safety, Corrections and Security	4%
15	Education and Training	3%
16	Government and Public Administration	1%

Source: Perkins Collaborative Research Network (2020-21)

Illustration 35 | Trade options (clusters) for students pursuing skill education under CTE

3. **South Korea:** Skill education is delivered in secondary schools through specialized skill education high schools and Meister high schools. In middle school, students are given exposure through career related activities and electives on careers and occupations. In Upper secondary schools, there are three pathways to skill education:
   - *Vocational high schools:* These are high schools that are dedicated to skill education. Admission through grade, interview, and performance.
   - *Meister high schools:* Select schools (about 10 percent of all skill education high schools in Korea) are directly attached to industries and offer even higher quality skill education training. Curriculum at Meister schools is conducted in cooperation with local companies, and over time these schools have achieved 90 percent+ job placement records.

[28] Chinese Ministry of Education; OECD; Press search; BCG analysis
[29] National Center for Education Statistics: Table Secondary/High school
[30] Perkins Collaborative Resource Network: CTE Participation rate (2020-21) (at least one credit)

- *General high school with* skill education *track:* General education high schools also offer a few skill education courses.

Korea: Specialized skill schools and meister schools are a key feature of schooling for grade 10 and beyond

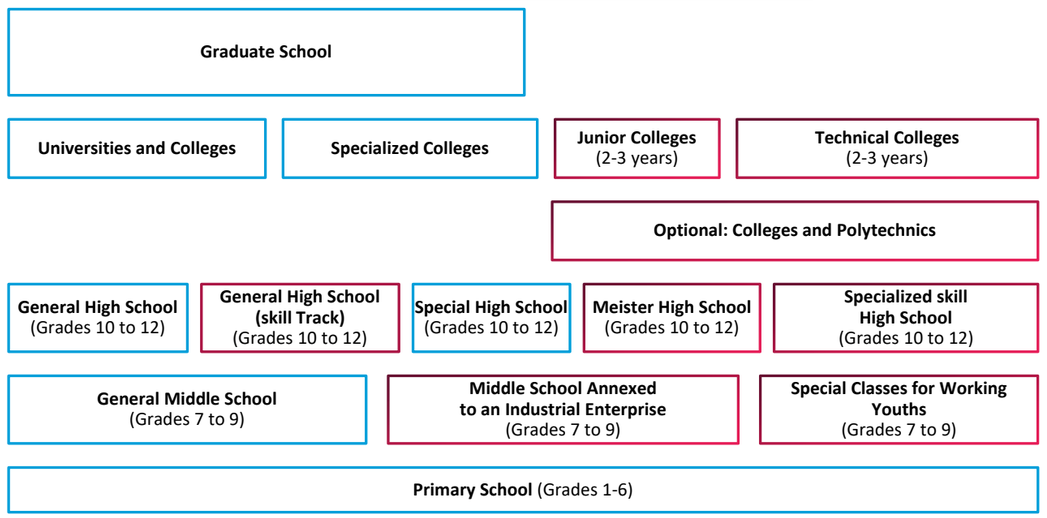


Illustration 36 | South Korea education ecosystem block diagram

4. **Australia:** Skill education is delivered in parallel with regular school education through certifications. At the lower secondary level, students are usually provided with basic exposure to skill education. At the upper secondary level, students can choose from a wide range of courses which include both general and skill education options. Depending on their choice of electives, they can opt for skill education certifications in specific trades. Credits required to test for a certification vary by both trade and certification level. However, all these choices fit within the credit framework needed to complete schooling. For example, out of 500 credits required across grades 11 and 12, Automotive Sales requires 40 credits while Automotive Electrical Technician requires 160 credits.

5. **Germany:** In the lower secondary (two years), students go through an orientation/testing phase where students are segregated as per academic abilities. Skill education is primarily provided in upper secondary grades in three ways:
   - Fach-Gymnasium: General education with skill education orientation
   - Beruffschule (dual track): Most popular track providing training at the workplace and school
   - Berufsfachachule: School-based full-time skill education programs (single track)

Around 66 to 85 percent of time is dedicated to skill education in dual track and full-time schools. In terms of assessment, chamber exam is conducted at the end and the certificate provided holds high value. Lastly, industry integration is at the core and about 68 percent of dual track students enter the workforce.

In summary, skill education training models vary across countries, including dedicated multi-trade or single-trade schools, hybrids focusing on one major trade, and integrated schools offering several locally relevant trades, streamlining the skill education landscape. However, in nations where skill education training is prominent, educational tracks are often determined by academic achievement and students are nudged to pursue skill education. Significant curricular time is spent on skill education subjects by those students who choose to pursue it indicating that depth of skill education study is important. Industry's role is pivotal, enhancing skill education's effectiveness through various models including practical dual curricula and input

on design and delivery of programs. Finally, programs integrating life and employability skills, starting from upper primary education, tend to enable more informed career choices among students. In doing this, robust governance systems should be in place to ensure student rights are met during industry apprenticeships or on the job training.

1.4 Summary: SE in Schools is an Urgent Social and Economic Imperative

The case for vocationalisation of secondary schools starts emerging in the preceding sections. The expansion of skill education schooling can address gaps in both the current skilling ecosystem and existing secondary schooling. A look at the education systems in other countries provides further proof-of-concept.

In addition, there is an even broader social case for a well-structured school-based skill education system. Despite the progress made in raising literacy rates and primary-level education, many countries globally have been unable to provide their youth with quality education and the skills required to transition from school to the world of work[31]. Youth with unsatisfactory transitions are more likely to show signs of depression and a lower sense of well-being, having a deep impact on the economic and social welfare of the country[32].

A well-integrated skill education in the mainstream school curriculum will not only make the current school education more robust but will also offer various socioeconomic benefits:

Social Benefits

- Increased awareness of career pathways
- Improved retention rate
- Increased relevance and meaningfulness of secondary education for students
- Greater inclusion of women and people from different backgrounds in the workforce

Economic Benefits

- Mass availability of skilled labor for the growing economy
- Increased average household earnings due to the higher income potential of skilled labor
- Formalization of the workforce with more and more people moving from unorganized to organized sector

Illustration 37 | Social and Economic benefits of Skill Education

The NEP's ambitious targets and direction laid out by the NCF provide a solid foundation to take forward this critical agenda for the country.

[31] Institute for Human Development & UNDP, 2021
[32] Int J Environ Res Public Health; World Health Organization

02

Approach and Methodology

2 Approach and Methodology

From Concept to Completion: The Study's Comprehensive Efforts

As described in the preceding chapter, effective delivery of SE is a critical priority for the country and the World Bank. The World Bank supports the Ministry of Education, Government of India on its program called Strengthening Teaching-Learning and Results for States (STARS) benefitting the public schools of six States namely Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Odisha, and Rajasthan (collectively the STARS states). It has five key results areas:

- Strengthening early years education
- Improving learning assessment systems
- Improving teacher performance and classroom practice
- Strengthening school-to-work transition and skill education
- Governance and decentralized management for improved service delivery

One of the five result areas aims to support innovative and scalable initiatives to strengthen school-to-work transition. The current report delves deep into the strategies to achieve success within this component. It examines prevalent skill gaps and suggests solutions and scalable delivery models for states, considering global and Indian best practices. The report also provides guidance on effective implementation and how various stakeholders, including the central ministry and state education departments (across school education, technical education, higher education, and school boards, amongst others), can collaborate to enhance students' access to skilling, offer industry relevant courses and establish strong industry linkages.

Approach and Methodology

A four-step approach was followed to understand the current scenario in the six STARS states and develop the forward-looking strategies.

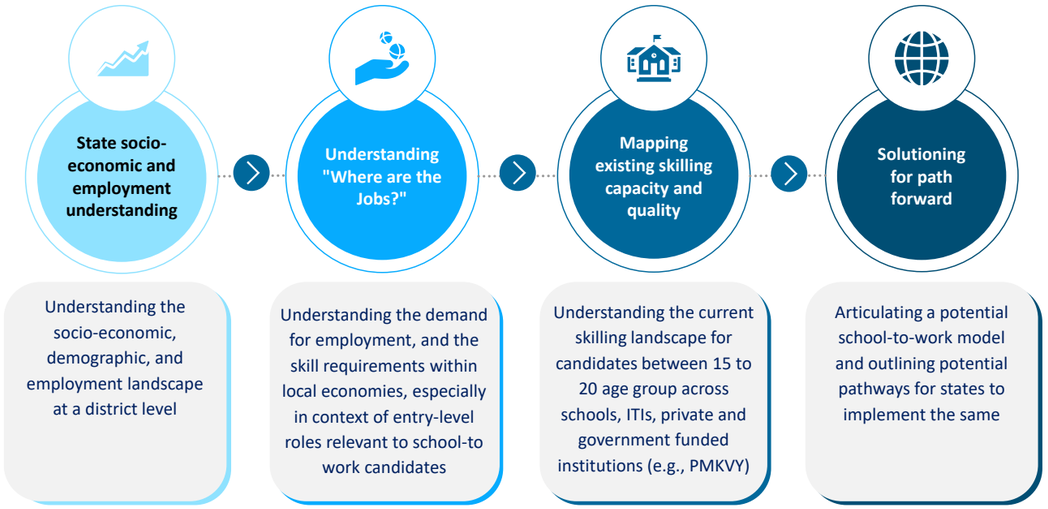


Illustration 38 | Four-step approach for district deep-dives

1. State Socio-Economic and Employment Understanding

A combination of secondary resources (based on availability for each of the six states) including state department publication, Census 2011, reports published by PLFS etc. were used to understand each state's economic and demographic landscape. Based on these documents, gross state and district domestic product was documented along with the split amongst the primary, secondary and tertiary sectors. Key economic districts and specific economic clusters (e.g., key industrial parks, SEZ) for each of the states were also identified to plan primary research.

The employment outlook was also reviewed and analyzed for further research. We examined industrial classifications in the Census, PLFS, and Sector Skill Councils (SSC).

Census 2011 and PLFS categorize sectors broadly. For example, employment estimates for manufacturing are grouped as one sector and estimates for key sub-sectors such as textiles, automotive etc. are unavailable. Similarly, the scope of employment within wholesale and retail; repair of motor vehicles and motorcycles (considered as one sector under Census and PLFS) is extensive. Studying various critical sectors combined into a single category could hinder a nuanced understanding of the jobs landscape such as within retail and electronics repair. To gain insight into the employment potential of these key sectors, a more detailed breakdown of existing definitions was considered essential.

On the other hand, while SSC Classifications are more granular, employment estimations available are not exclusive to a given SSC (e.g., green jobs cuts across sectors; last mile delivery exists in both tourism and logistics). The following illustration demonstrates the mapping between the Census and PLFS Sector name and its relevant SSC.

Census and PLFS Sector Name	Relevant Skill Sector Council
Publishes employment data by 'Nature of activity' defined under NIC	*Classifies and publishes data at an Industry level; 38 such SSCs defined by NSDC*
• Agriculture, Forestry and Fishing	• Agriculture, Food Processing
• Mining and Quarrying	• Mining
• Manufacturing	• Cut across 10+ SSCs (Textile, Furniture, Auto, Iron and Steel, Handicraft, Electronics, etc.)
• Electricity, Gas, and Water supply	• Water Management, Plumbing, Electronics, Green Jobs
• Building and Construction	• Construction, Capital goods, Infrastructure
• Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	• Retail
• Transportation and Storage	• Logistics, Aviation
• Accommodation and Food Services Activities	• Food Industry, Tourism and Hospitality
• Information and Communication	• IT-ITeS, Media and Entertainment, Telecom
• Financial, Real estate and Professional Services	• BFSI, Management and Entrepreneurship
• Public Administration	• NA
• Education and Health	• Healthcare
• Other Services	• Sports and Fitness, Domestic Work, Beauty and Wellness

Illustration 39 | Classification of sectors per Census 2011, PLFS and Sector Skill Councils

Consequently, for the purposes of this research, we refined the sector classification into primary (encompassing agriculture and mining), secondary (covering manufacturing-related sub-sectors and building

and construction), and tertiary sector (encompassing services and related sectors) with 25 specific sub-sectors to be studied within them in total. Subsequently, we estimated employment potential using these refined categories, incorporating assumptions derived from expert consultations including insights from labor market experts, and validations from industry experts to ensure that the estimates accurately reflect the current scenario. The revised sector classifications are detailed in the following illustration.

Various sub-sectors defined under primary, secondary and tertiary sector for the purpose of this study

The classifications were arrived at to align with market needs, as well as make them mutually exclusive

Primary	
• Crop Cultivation	• Dairy and Livestock
• Mining	• Aquaculture and Fisheries

Secondary	
• Textile and Apparel	• Auto and Auto Components
• Traditional (Handicraft etc)	• Rubber, Petrochemical and Chemical
• Food Processing	• Pharmaceutical
• Heavy Engineering/ Iron Steel	• Building and Construction

Tertiary	
• Tourism and Hospitality	• Logistics and Transport
• Retail	• Repair (Electronics/Auto)
• BFSI	• Domestic Work/at home services
• Healthcare	• KPO/BPO/IT Software development and Support
• Renewable Energy (Green Jobs)	• Programming/Digital Design
• Beauty and Wellness	• WASH (Green Jobs)
• Facilities Management	

Illustration 40 | Classification of sectors for the purpose of this study

2. Understanding "Where Are the Jobs?"

To be able to assess the relevance and importance of the above sectors, detailed primary research was carried out across a range of experts (including from industry, industry associations, skilling experts, and labor market experts among others) coupled with district deep dives across the six states. Districts were chosen in a manner that they represented various socio-economic profiles that are prevalent across the country as well as provided perspectives beyond the metro cities. It was important to do this to have a representative understanding of the types of economic activities, their employment potential as well as the nuanced skills required of them. Teams devoted two to three weeks per district, extensively exploring local economies, and interviewing stakeholders in farms, factories, schools, and government departments:

1. **Tourism and horticulture driven economy in Shimla, Himachal Pradesh:** Shimla's economy thrives on tourism, offering a blend of hospitality and adventure. Government employment, horticulture, and handicrafts also contribute to Shimla's economic fabric.
2. **Multi-faceted industrial economy in Indore, Madhya Pradesh:** Indore, a flourishing economic hub, boasts a robust economy anchored by a burgeoning automotive sector. Indore is a prominent center for textiles, thrives in agriculture, and hosts a burgeoning IT and services sector.
3. **Vibrant, multi-faceted, economy in Nagpur, Maharashtra:** Nagpur's economy is diverse, featuring agriculture, manufacturing, and a growing services sector. Known for its orange production, the city also houses industrial zones, educational institutions, and transportation hubs.
4. **Agrarian and low-income economy in Dhenkanal, Odisha:** Dhenkanal's economy centers around agriculture, focusing on crop cultivation and animal husbandry. Additionally, the district has a large unorganized services sector and hosts various food processing industries.
5. **Industrial town with large unorganized services sector in Angul, Odisha:** Angul's economy thrives on industry, notably with major industrial establishments like NALCO and Talcher Thermal Power Station. The district also focuses on agriculture including paddy cultivation, vegetables etc.
6. **Traditional artisan and services economy in Jodhpur, Rajasthan:** Jodhpur's economy is diverse, with a historical significance in handicrafts, textiles, and tourism. It thrives on traditional industries, trade, and emerging sectors, contributing to the city's economic richness.

Districts visited include multi-faced economy, industrial economy, vibrant rural and deep rural with tribal working population

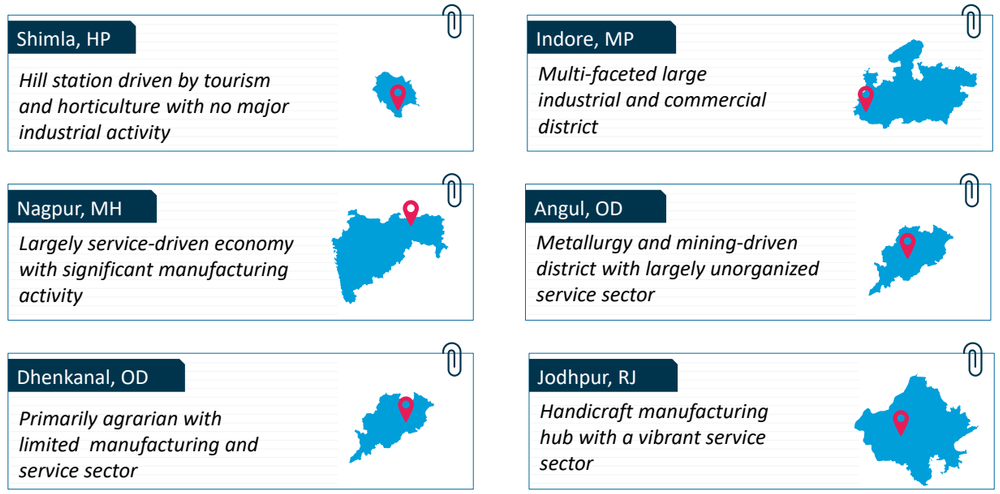


Illustration 41 | Districts visited for primary research

Data collected included validating employment estimates (covered in earlier section), understanding key job roles across the value chain of a sector including employment, getting feedback on impact of any externalities (e.g., technology), potential pay, willingness to recruit school graduates, current hiring practices, among others.

3. Mapping Existing Skilling Capacity and Quality

A combination of primary and secondary research was used. Education department data from each State was used to understand the current penetration of skill education, the types of courses being provided in schools, enrollments, as well as key districts offering skill education. School visits were undertaken across all States in the prioritized districts. In each visit, teams conducted in-depth interviews with students, teachers, principals, trainers, and others to comprehend current provision, challenges, course selection rationale, stakeholder motivations, and prospects. Additionally, teams explored adjacent skill provisioning centers, including ITIs, government, and private training providers, as they cater to the same age cohorts, offering insights into the highlighted agenda areas. In recent years, several initiatives have been undertaken under the STARS program (e.g - Maharashtra established English language labs in 1000 schools across 36 districts, Rajasthan and Himachal Pradesh established robotic labs in 300 Mahatma Gandhi Schools and 100 government schools, respectively, etc.).. Where possible and applicable (e.g., ITI), data of trades, certifications, enrollment capacity, utilization etc. was reviewed and analyzed.

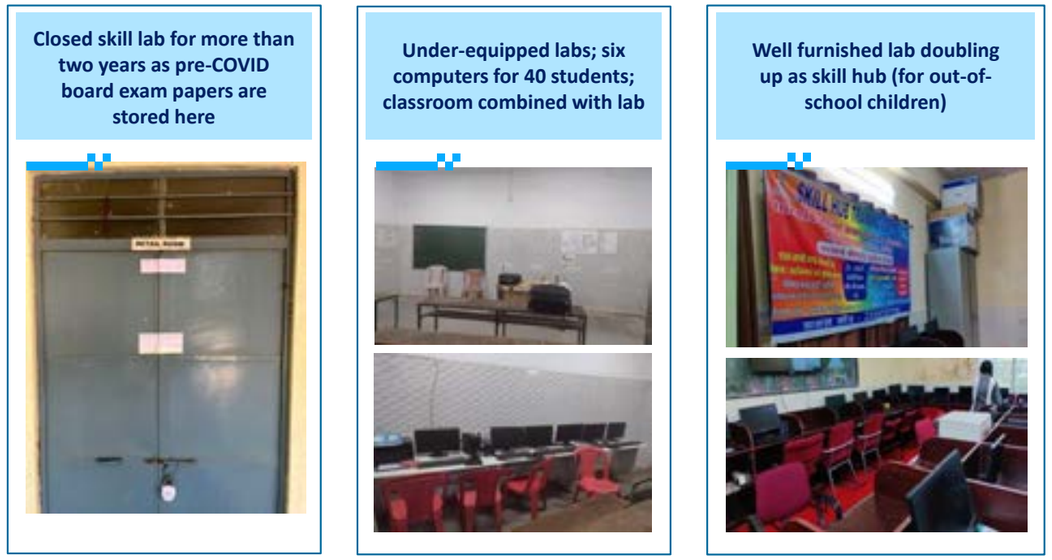


Illustration 42 | Example of school visits and study of skill education lab facilities

4. Solutioning and Path Forward

This stage included thorough stakeholder discussions with the Ministry of Education (MoE), the Ministry of Skill Development and Entrepreneurship (MSDE), and multiple rounds of talks with individual states. Additionally, two National Workshops aimed at fostering convergence and engaging leaders from education and skill departments were organized. The key findings and potential solutions were presented during these sessions, inviting feedback on the way forward. Building on the feedback and deliberations, a comprehensive solution framework for states, along with identified roles for various stakeholders, was delineated.

Overall, through field visits and beyond (as specified in illustrations 52 & 53), the research effort covered 300+ hours of in-depth interviews covering 375+ stakeholders across the country. The following illustration provides more details.

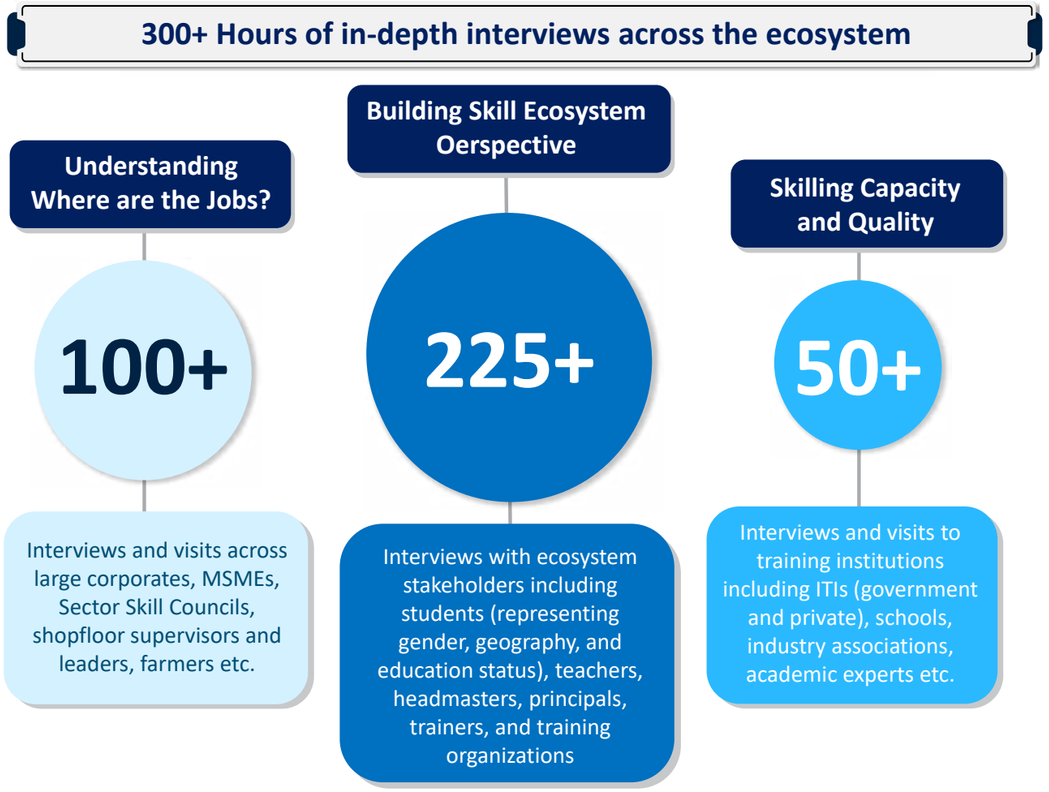


Illustration 43 | Snapshot of primary research

Additionally, secondary research included review of 50+ reports published by the government (e.g., Census 2011, PLFS 2020, Education department databases), private sector (state of market reports on sectors, employment by various reputed organizations) as well as industry associations (including CII, FICCI, Sector Skill Councils). The details are as follows:

- State level macro analysis of economy, employment, industrial trends, etc. through extensive review of secondary literature & databases such as Census 2011, PLFS, State Economic Review, UDISE, Oxford Economics, database shared by state departments (e.g., planning, education, etc.) for GSDP, GDDP, enrollments, etc.
- In-depth analysis of global skill education models such as Meister schools in South Korea to understand they key success factors and learnings for the India context
- Analysis of enrollment, outcomes, schools' data provided by the State Education Department; several staff interviewed in each state department
- Review of several reports published by reputed organizations, as well as industry associations (including CII, FICCI, Niti Aayog, Sector Skill Councils)

Detailed timeline of the research is illustrated below.

Timeline of the research

Sep –Dec 22

In-depth primary research: about three months of extensive field visits in STARS states and leadership discussions

1. The study started with visits to each STARS state to speak with state leadership and district vocational officers to understand the current status and plans for skill education. This was followed by 10-12 days of extensive field visits to schools, ITI and other skilling institutes and in-depth interviews with school principals, teachers, students, parents among others, in selected districts - Shimla in Himachal Pradesh, Indore in Madhya Pradesh, Nagpur in Maharashtra, Angul and Dhenkanal in Odisha and Jodhpur in Rajasthan. The districts were chosen in a manner to ensure economic diversity (for example, an agrarian district, a manufacturing cluster, a vibrant multi-industry economy and so on.). See illustration 53, for the selected districts.

Dec 22-Jan 23

Crafting insights: Development of the state-wise skill gap report leveraging field insights along with extensive secondary research across all districts of all six states

1. Based on extensive primary research, involving 50+ days of district field visits and more than 300 hours of interviews, coupled with secondary research that encompassed the review of over 50 reports from government sources, industries, and SSCs– a comprehensive skill gap report was developed for each state. These reports provide a holistic view of each state's socio-economic and educational landscape, insights into the employment potential across various sectors for school-to-work and a dedicated section highlighting key findings from the district deep-dive (such as demand, supply, trades that should be offered in light of district economy). The report ends with a thorough gap analysis comparing the current skilling capacity with employment demand across all districts of the state (ascertained based on secondary research) and suggestions for how the skilling capacity may be reshaped in line with district economy.

Jan – Mar 23

Collaborative planning with MoE, MSDE and states: Discussing skill gap study insights and way forward

1. Discussed Skill Gap findings with MoE and MSDE, and aligned on the next steps to initiate the design of roadmap for way forward.
2. Another round of state visits and conversations to share state-level insights with respective education department leadership.

Jan – May 23

Convening stakeholders: Two pivotal national workshops involving leaders from education and skill departments to enable convergence

1. National workshop in January, which brought together all the stakeholders from all six states to discuss the findings of the Skill Gap study and provide inputs towards shaping the forward-looking agenda.
2. National workshop in May in Mumbai featuring participation from Secretary MoE, Secretary MSDE, and all six STARS states' Education Secretaries, State Program Directors (SPD), as well as external industry experts. During this session, a preliminary roadmap was presented, and inputs were gathered from each state on state-wise goals, actions they wish to pursue, and others.

Aug - Ongoing

Disseminating insights: Statewide ToT workshops

Extensive Training-of-trainer (ToT) workshops are ongoing in each state. These workshops aim to disseminate the skill gap study findings with states' district level officers and equip them to conduct similar studies at their local levels. These studies will ensure that vocational offerings are in sync with local economy on an ongoing basis.

03

Where Are the Jobs?

3 Where Are the Jobs?

A key objective of this study was to identify which sectors, sub-sectors and hence trades are high-potential for skill education, and further, to provide comprehensive information on job roles, average pay, and potential employers for each. States can directly use these insights to identify high-potential trades that should be offered at the district level in line with their local economies, facilitating the provision of relevant opportunities for students.

As outlined in the preceding section, twenty-five sub-sectors within the broad primary, secondary and tertiary sectors were identified for demand assessment post harmonization across various secondary sources such as the Census, PLFS etc. The upcoming sections present overall sector-level insights to begin with followed by a sub-sector level view of high, medium, or low potential.

3.1 Sector-Level Insights

In the primary sector, the agriculture industry emerges as a key opportunity. The sector cuts across crop cultivation, horticulture, dairy etc. providing diverse opportunities, spanning not only jobs (e.g., in agri-input companies) but, more importantly, a large income enhancement opportunity through productivity gains in personal farms, and entrepreneurship as advisors or other areas. Conversely, the mining sector does not emerge as a significant employer for school-to-work transitions due to its hazardous environment, high demand for unskilled labor, and prerequisites which may not be suitable for individuals in the target age group.

> *We currently get all our nutrient related advisory via sales executive of input companies. For my polyhouse farm, I had to hire someone from Pune to manage the nutrients.*
>
> *- F and V farmer (Protected and open cultivation)*

> *We can't recruit candidates from schools as we need them to have heavy machinery license and ability to operate them. We also foresee a significant reduction in employment going forward.*
>
> *- CEO, Mining company*

In the secondary sector, manufacturing MSMEs from various sub-sectors including food processing, automotive, furniture and furnishings among others expressed keen interest in hiring and offering growth to school candidates as they often face high attrition amongst graduate hires due to aspiration and reality mismatch. MSMEs also particularly highlighted the need for multi-skill exposure given small set-ups that require fungible skills and the ability to fill in for other colleagues on days of absenteeism. Large manufacturing industries, on the other hand, often cited the need or strong preference for ITI certification or an equivalent in-depth skilling certificate for hires from compliance and policy perspective. They also did not face the challenge related to attrition, which was a significant pain point for MSMEs, and felt the need for additional talent supply beyond ITIs only in heavy manufacturing cluster geographies.

> *"We hire 12th pass people as assistants to be trained machine operators and workshop workers (fitter, welder, electrician etc.) They must have some basic mechanical knowledge and can learn the rest on the job."*
>
> - Owner, Small and Medium enterprise

> *"We want to retain people for longer since an experienced person is more efficient. An experienced welder/ fitter can earn upto 25-30K, and also train other apprentices under them."*
>
> - HR Manager, Medium enterprise

The tertiary or services sector presented the most significant opportunity from a school-to-work transition perspective especially in retail, IT, and banking, among other services sectors.

Across all sectors and roles, there was a consistent demand for strong employability skills.

> *We always have 20-30 applicants from ITI graduates for 5-6 openings. We are open to hiring repair technicians from schools as well - so long as the certificate is recognized like ITI.*
>
> *- Repair Executive manager*

> *We are open to hiring school graduates. But they need to be good in communication and have basic grooming in place. WE can teach them the theory on the job, but soft skills need to be in place.*
>
> *- Retail store manager*

The exhibit below summarizes these key findings across sectors.

Primary Sector	Agriculture	Presents opportunities across jobs (e.g., input companies), income enhancement in own farms, and entrepreneurship (as advisors)
	Mining	Does not emerge as significant employer from school-to-work perspective due to hazardous environment and high demand of unskilled labor
Secondary Sector	Manufacturing MSMEs	Show interest in hiring and offering growth/ pay; require multi-skill exposure
	Large Manufacturing Industries	Will hire only if a proper certification (ideally equivalence to ITI) and equal amount of focus and skill building happens in school. Further, they are open to collaborate on curricula design, guest lectures etc.
Tertiary Sector	Service Sectors	Large opportunities in service across retail, IT, banking, among others requiring exposure to multi-skills/ knowledge-consistent across the country
All Sectors	All Sectors	Employability skills is sought after a common requirement across sectors

High Medium Low

Illustration 44 | Sector-level insights on relevance for school-to-work

3.2 Sub-Sector Level Assessment of Job Potential

Labor demand within a sector does not automatically translate to high-potential for school-to-work transitions. This potential is assessed through a two-pronged framework. First, we evaluated the **labor intensity or the availability of substantial number of jobs and income enhancement opportunities** (where applicable) in each sub-sector. Second, we evaluated each sub-sectors' **relevance to school-to-work pathways** – this includes assessing the availability of a large number of skilled or semi-skilled opportunities, industry's readiness to hire school graduates at a meaningful scale, ensuring salaries are competitive (above minimum wage), with key job roles within the sub-sector being sufficiently aspirational for candidates.

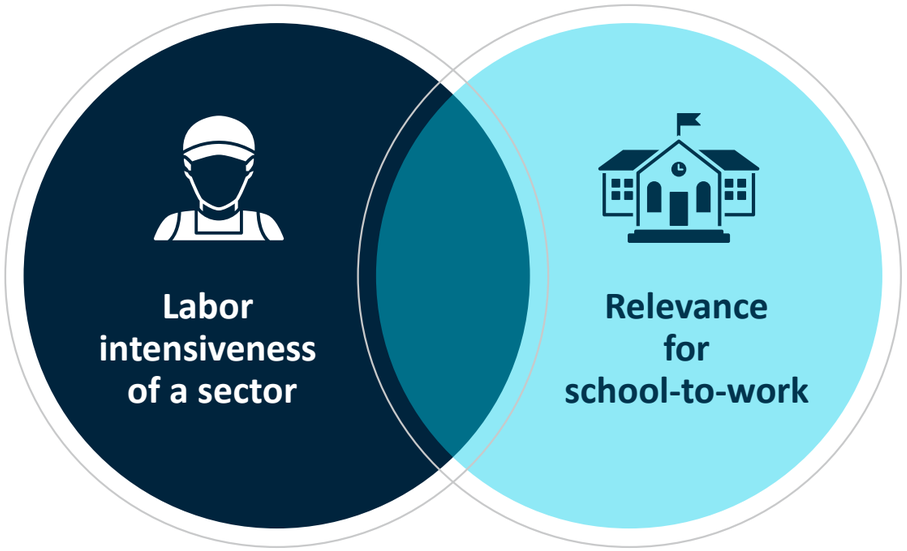


Illustration 45 | Framework for determining each sub-sector's potential for school-to-work graduates

1. **Labor Intensiveness**: We estimated the employment potential in various sectors and key roles over the next eight to ten years, alongside income enhancement opportunities. For example, teaching farmers advanced, tech-driven agricultural techniques have shown to increase both their productivity and potential earnings. Additionally, we analyzed government efforts such as the Make in India initiative and the Production Linked Incentive (PLI) initiative. These programs are expected to transform India's employment landscape by improving manufacturing and export capabilities. Specifically, the PLI initiative, which covers fourteen sectors, encourages investment with the goal of enhancing production and generating approximately 60 lakh new jobs in areas including manufacturing and electronics[33].
2. **Relevance for School-to-Work**: To evaluate relevance of each sub-sector, we evaluated four key areas. First, we looked at the availability of sufficient number of skilled/ semi-skilled opportunities. Sectors employing unskilled labor (i.e., lacking skilled/ semi-skilled roles), such as textiles and logistics receive a low rating due to minimal skilling needs. Second, we evaluated whether industries were receptive to hiring skilled school graduates - in certain sectors, industries explicitly conveyed their reluctance to employ school graduates, citing reasons such as the necessity for a heavy-vehicle license in mining. Conversely, sectors where industries demonstrated a keen interest in recruiting were considered higher potential especially from the point of view of launching or strengthening skill education offerings which can then over time enable a broader acceptance and demand for such skilled school students. Similarly, sectors hiring individuals with a 12th-grade education are rated high, whereas those requiring advanced degrees or specific diplomas (e.g., B. Tech, BSc, ITI) are rated low. Thirdly, we conducted interviews with industry experts, including business and HR leaders, staffing agencies, and sector skill councils, to understand salary levels and identify roles with reasonable starting salaries (e.g., at least above minimum wages). Finally, we interviewed a large number of students to capture their career aspirations or the lack thereof, aiming to understand what makes a sector appealing to them. For instance, the prospect of mechanization in manufacturing sparked interest among students who were previously disenchanted with the traditional, labor-intensive roles often found in factories. On the contrary, students were not overly excited by mining or working in agriculture using traditional practices.

[33] Economic Survey of India, 2021-22

Based on the above criteria, among the twenty-five sub-sectors analyzed, nine demonstrated a high potential for school-to-work transition, another nine exhibited medium potential, and the remaining seven had low potential.

Sectors	Sub sectors	Labor Intensiveness	Relevance	Overall Potential
Primary sector	Crop Production	High	High	High
	Dairy and Livestock	Moderate	High	High
	Aquaculture and Fisheries	Low	Moderate	Moderate
	Mining and Quarrying	Low	Low	Low
Secondary Sector	Textile and Apparel	High	Moderate	Moderate
	Traditional Artisan	Moderate	High	Moderate
	Food Processing	Moderate	High	Moderate
	Iron Steel / Heavy Engineering	Moderate	Moderate	Moderate
	Automotive and Auto components	Moderate	Moderate	Moderate
	Rubber, Chemicals, & Petrochemical	Low	Low	Low
	Pharmaceuticals	Moderate	Low	Low
	Building and Construction	High	Moderate	Moderate
Tertiary sector	Tourism & Hospitality	Moderate	High	High
	Retail	High	High	High
	BFSI / NBFC	Moderate	High	High
	Health care	High	Moderate	Moderate
	Beauty and Wellness	High	High	High
	Transportation, Logistics and Warehousing	High	Low	Low
	Repair (Auto & Electronics)	High	High	High
	Digital Design / Marketing Programming	Moderate	High	High
	KPO/BPO/ Software and Hardware Services	High	High	High
	Domestic Work	High	Low	Low
	WASH (Green Jobs)	Moderate	Low	Low
	Renewable Energy (Green Jobs)	Moderate	Moderate	Moderate
	Facilities Management	High	Low	Low

High Moderate Low

Illustration 46 | Assessment of labor intensiveness, relevance, and potential for school-to-work

3.3 High, Medium, and Low Potential Sub-Sectors and Target Job Roles

This section offers a detailed analysis at the sub-sector level. It thoroughly articulates the suitability and potential fit of these sub-sectors for individuals transitioning from school-to-work. Furthermore, it provides a rationale for the classification of each sub-sector, explaining the considerations that led to their categorization as having high, medium, or low potential for school-to-work transition. The illustration below summarizes the categorization of the twenty-five evaluated sectors according to their overall potential for facilitating the transition from school-to-work.

Illustration 47 | Employment potential for school graduates by key sub-sectors

3.3.1 Nine High-Potential Sectors

1. **Crop Cultivation/ Production:** As farming in India shifts from traditional to modern techniques, new roles in areas such as nutrient management, mechanization, procurement, and Farming as a Service (FaaS) are emerging and require skilled professionals. This demand is further supported by the growth of agriculture exports and a shift towards horticulture.
2. Further, about 40 percent of India's population is still employed in agriculture and this number will remain high for some time to come. For students who join their family-owned farms, traditional farming skills are passed down from family. But they lack structured technical and market linked skills to improve productivity and income on these farms. People training in modern farming practices such as precision agriculture, seed selection and irrigation management are observed to experience an average 15-20 percent[34] increase in their yields.
3. **Dairy and Livestock:** The dairy industry in India is one of the largest in the world and employs over forty million people, most of whom are small and marginal farmers[35]. Around 25-30 percent of total dairy production in India comes from organized dairy farming, which can provide employment opportunities[36]. The formal employment opportunities in this sector are growing, particularly in the downstream value chain, for example, in dairy processing for roles such as lab technician, quality assurance and livestock health management, among others. Similarly, livestock related opportunities in poultry and other sectors are likely to grow from an employment as well as entrepreneurship perspective.
4. **Banking, Financial Services and Insurance (BFSI):** Certain advanced roles within the BFSI sector require graduate level candidates with work experience. However, with the growth of digital payments, micro-finance, small loans, there is a high demand for skilled 12th pass candidates in entry-level customer-facing roles such as QR code activation, customer activation and sales executive, particularly in small and rural banks. There is also demand for support professionals with basic accounting and finance knowledge in chartered accountant offices and finance staff in small companies. Overall, the BFSI sector presents significant opportunities for school-to-work candidates.
5. **Retail (Sales and Service):** With over fifty million individuals employed in the sector and projections indicating an increase to 59 million by 2030[37], it is a major contributor to the country's workforce. Organized retail, driven by its growth, presents attractive prospects for skilled entry-level roles in front-end sales and management positions. These positions offer good pay and career advancement opportunities, making them highly aspirational for job seekers. Unorganized retail, on the other hand, constitutes a sizable portion of the retail landscape, with around 88 percent of retail units falling under this category. While jobs in unorganized retail may not require specific skills, there is potential for improving self-employment opportunities for those who set up small shops/outlets.
6. **KPO (Knowledge Process Outsourcing)/ BPO (Business Process Outsourcing)/ Software and Hardware services:** India will witness a 35 percent[38] increase in the number of people employed in the sector over the next 10 years. Within IT, two main job roles emerge:
   a) **KPO/ BPO services**: The BPO sector is one of the largest IT recruiters in India[39]. This category hires skilled individuals for entry-level roles such as customer relationship managers and customer care executives (voice and non-voice). The emergence of KPO, offshore content moderation and IT boom in Tier two cities will drive the increase in local employment demand in this category[40]. Many roles are appropriate for school-to-work candidates.
   b) **IT Software and Hardware Services:** Within IT Software and Hardware Services, there is high-demand for roles such as data entry operators, IT help desk assistants, software testing and technical support, among others. This demand is driven by both a high-level of attrition and growth in the sector[41]. There is a strong preference for school-to-work and ITI candidates here, as college graduates do not find these jobs aspirational.
7. **Digital Design, Marketing, and Programming:** This is an emerging category with many new employment and self-employment opportunities. The emergence of web and graphic designing, social media and digital marketing, animation and content creation, independent programmers and others will create new job avenues. While the scale of job avenues in this category is limited, the rise of freelancing and work-from-home options provides opportunities for students across India.
8. **Tourism and Hospitality:** Nearly seven million individuals are employed within this sector, which is expected to increase to nine million by 2030[42]. The hospitality sector employs people across four categories: front desk/ guest management, housekeeping, food production and security management. There is high school-to-work relevance given 12th pass and well-groomed candidates with basic communication skills are hired in organized hospitality. Tourism and hospitality are also aspirational, as appropriate skilling can help create multiple upward pathways.
9. **Beauty and Wellness:** This sector comprises unorganized and micro-sized units. It is ubiquitous in urban and rural areas alike and hence witnesses high self-employment. Job roles in this sector are skill driven with no minimum education qualification. In recent years, there has also been an increase in demand for gig workers in tier-one and tier-two cities through tech aggregators. Overall, the beauty and wellness sector offer a strongly favorable environment for school-to-work candidates, especially for girls.
10. **Repair (Auto and Electronics):** The repair industry, encompassing both electronics and auto repair, holds high school-to-work relevance in India. In the auto repair sector, which includes small shops and large service centers, a sizable number of school dropouts are employed. However, the lack of formal training poses challenges to meeting industry demand. Similarly, the electronics repair industry relies on technicians for servicing consumer appliances, phones, laptops, and other electronic devices. The rise of on-demand, at-home service and technology aggregators across urban and peri-urban areas has opened opportunities for gig jobs and self-employment.

3.3.2 Nine Medium-Potential Sectors

Manufacturing sector employed an estimated 59 million individuals in 2022, which is expected to go up to 68 million by 2030[43]. Across all sub-sectors within manufacturing (for example, textile, metals, food processing, traditional artisans), the job designations remain consistent. For instance, in the production line, 70 percent of the job roles are helpers requiring unskilled individuals, while five percent are supervisors requiring highly skilled individuals or extensive experience. Both these are irrelevant to school-to-work candidates. The remaining 25 percent of job roles are relevant for a school-to-work candidate and include machine operators, machinists (such as fitters, turners), CNC operators, and a few other skilled operators (such as welders). In addition to the production line, there are quality assurance job roles that require more experience and skills compared to a 12th-pass. And lastly, the packaging unit offers unskilled roles.

[34] National Dairy Development Board (NDDB), 2017.
[35] National Dairy Development Board (NDDB). "The Indian Dairy Industry: A Study". 2019.
[36] National Dairy Development Board (NDDB)
[37] Ministry of Statistics and Programme Implementation, Government of India; Oxford Economics forecast estimates
[38] Ministry of Statistics and Programme Implementation, Government of India; Oxford Economics forecast estimates
[39] 45 percent and 21 percent Y-o-Y growth in job listings on Naukri.com and monster.com - Naukri Job Speak Report, April 2022: Monster Employment Index, April 2022
[40] Press Search, Indian Express, 2022: 'Why India's tier 2 cities will become the future tech hubs'
[41] Press Search, Times of India, 2022: 'BPO, Delivery, and data entry top jobs in demand'
[42] Ministry of Statistics and Programme Implementation, Government of India; Oxford Economics forecast estimates
[43] Ministry of Statistics and Programme Implementation, Government of India; Oxford Economics forecast estimates

Although the job designation remains consistent across sub-sectors (helpers, machinists, supervisors and so on), the role description and skills required vary depending on the sector, the size of the company and the nature of equipment utilized. Details of job potential findings for some of the critical manufacturing and other sectors were as follows:

1. **Food Processing:** India's food processing sector is one of the largest in the world and its output is expected to reach $ 535 billion by 2025-26[44], creating new job opportunities in areas such as production, research and development, quality control, marketing, and sales. According to the Ministry of Food Processing Industries, the MSMEs account for around 90 percent of the total food processing units in the country[45]. There is an opportunity for semi-skilled employment in non-mechanized processing and selling of products, making it suitable for school-to-work candidates. On the other hand, large-scale industries involved in tertiary processing of food products for creating finished goods rely heavily on mechanization and automation. These industries primarily require unskilled assembly line workers and only a few skilled machine operators on the factory shop floor (70-30 percent)[46]. There is also a strong preference amongst the large firms to hire from ITIs only.
2. **Heavy Engineering/ Iron Steel:** In the large multinational and domestic companies, there is extensive mechanization and automation. These companies primarily employ skilled candidates with skill education, graduate, or post-graduate qualifications, such as ITI or BTech. MSMEs in this sector employ semi-skilled andskilled workers in trades like welding, fitting, painting, forging, and as assistant machine operators supporting trained operators and supervisors. Given the high attrition of graduates, MSMEs are willing to hire skilled school graduates for the benefit that they may stay longer and grow internally. Often compensation levels for multi-skilled roles are attractive with growth prospects.
3. **Automotive and Auto Components:** The automotive sub-sector, like other manufacturing sub-sectors, undergoes extensive mechanization. It hires a mix of skilled (ITI graduates, engineers) and unskilled workers. MSMEs are inclined to employ skilled school graduates for potential longevity and internal growth. Larger companies prefer ITI or engineering graduates but are open to collaborating with the schooling system for various initiatives like curriculum development, apprenticeships, and infrastructure provision.
4. **Textile and Apparel:** The sector has seen a shift from unorganized to organized players, with large companies setting up manufacturing facilities. These large mills and apparel units employ 80 percent unskilled labor at minimum wages. The mill-based jobs require only short-term on-the-job training (10-15 days) and are unlikely to hire skilled workers. Skilled roles such as machine operator do not require any sophisticated training as the machines are highly automated and easy to operate. As a result, long duration courses on textile manufacturing in schools may not be highly relevant.

   However, there are job opportunities in the textile industry on the customer-facing side that are relevant for school-to-work candidates. These include opening one's own unit/shop or pursuing job roles in home-based apparel stitching units, boutiques, and tailor shops, among others. Skills suited to these opportunities can be offered in schools.
5. **Traditional:** Traditional industries include handlooms, handicrafts, coir and coir products, toy making and other traditional art forms and products. MSMEs are often engaged in the design and creation of local artforms and handicrafts. While job opportunities in MSMEs are limited with inadequate pay, there is significant potential for entrepreneurship and income enhancement through training in marketing, branding, direct-to-customer selling, and new-age technologies. Additionally, the government is providing significant support to this sector through tax incentives, subsidies, marketing support, and initiatives such as One District One Product (ODOP). With the

[44] Food Processing Industry in India, IBEF, 2020
[45] MOFPI, Annual Report, 2021-22
[46] Based on expert interview with Sector skill council

increasing demand for Made-in-India, and cultural handicrafts, and export opportunities, opportunities can be leveraged.

6. **Building and Construction:** Today in 2022, over 55 million individuals are estimated to be employed within this sector and the number is expected to go up to 72 million by 2030[47]. The construction industry employs unskilled workers at low daily-wages or high skilled qualified engineers and architects. There is low relevance for school-to-work graduates since the unskilled roles are not aspirational and offer low pay[48] and the high-skilled roles require graduate/ post-graduate qualifications.
7. On the other hand, the building sector has a substantial demand for semi-skilled workers, such as plumbers, electricians, carpenters, and fabricators. With the shift towards the use of advanced technologies and tools[49] in the industry, there is an increasing demand for the upskilling of these roles, which can allow individuals to join the organized sector and command higher prices for their services.
8. **Health care** The health care sector offers employment opportunities for school-to-work candidates for "non-clinical" roles and ancillary roles such as front office management, patient management, billing, and service. On the clinical side, nursing roles such as "General Duty Assistant" and "Home Health care Aide" are open to hiring school-to-work candidates. Further, there is scope for career progression into senior nursing roles or lab technician roles with short-term "Auxiliary Nursing and Midwifery(ANM)" and "General Nursing and Midwifery(GNM)" courses. The above listed job roles are also aspirational with good pay and make up nearly 30 percent of the total employment demand in the sector[50]
9. **Renewable Energy (Green Jobs)[51]:** Renewable energy sector in India demonstrates medium school-to-work relevance, offering employment opportunities primarily in the operation and maintenance of wind and solar power projects. This sector is expected to create one million jobs in India by 2030[52], primarily across the construction, design, installation, operation, and maintenance of wind and solar power projects. It is important to note that the majority of job opportunities in renewable energy are either at the unskilled or highly skilled ends of the skilling spectrum. However, with the growth of Decentralized Renewable Energy (DRE) sources like rooftop solar, mini- and micro-grid systems across residential and commercial complexes, there is expected to be moderate demand for semi-skilled roles like solar installers and maintenance technicians.
10. **Aquaculture and Fisheries:** A key economic activity in the coastal regions, the fisheries sector (that is, capture fishing in marine and inland bodies) has limited formal employment opportunities and employs unskilled workers. It is not aspirational with deteriorating working conditions and has no major technological advancements that require upskilling. However, aquaculture, which involves the controlled cultivation of aquatic organisms such as fish and crustaceans is witnessing high growth, as India emerges as the largest exporter of crustaceans in the world[53]. This sector is highly organized and requires large skilled labor in farm and feed management, as aquaculture technicians. This sector is struggling to meet demand due to the lack of skilled workforce and hence becomes relevant for school-to-work candidates.

[47] Ministry of Statistics and Programme Implementation, Government of India; Oxford Economics forecast estimates
[48] Based on expert interviews and field visit across six districts
[49] Based on expert interviews and field visit across six districts
[50] Quarterly Employment Survey, 2021 published by Department of Labor and Employment)
[51] "India's Expanding Clean Energy Workforce: Opportunities in The Solar and Wind Energy Sectors," - NRDC, CEEW and Sector Skill Council for Green Jobs Report, 2022
[52] To achieve India's 500 GW non-fossil fuel energy target by 2030
[53] Marine Products Export Development Authority (MAEDA)

3.3.3 Seven Low-Potential Sectors

1. **Mining and Quarrying:** The sector is set to witness this significant drop in labor requirement due to large shift towards mechanization, and automation. Mining activities are also set to decline or stagnate due to environmental concerns around certain products and practices such as coal mining. In terms of labor employed, the sector hires unskilled casual/ daily wage labor in mining and primary processing activities. These unskilled roles offer minimum wage, are not aspirational, and have hazardous work environment. Therefore, this sector is not relevant for school-to-work graduates.
2. **Rubber, Petrochemicals and Chemicals:** In each of these industries, the manufacturing processes are highly mechanized. Most job roles in large industries require specialized skills and higher education qualifications, such as a bachelor's or postgraduate degree. These industries employ a considerable number of unskilled workers for tasks such as packaging, assembly line operations, loading, and similar activities. As the labor requirements in these sectors span across the extremes of the skilling spectrum, there is less scope for school-to-work graduates. There is also limited MSME activity in these spaces.
3. **Pharmaceutical:** The pharmaceutical industry primarily demands specialized skills and higher education qualifications, often necessitating a bachelor's or postgraduate degree. While a substantial number of unskilled workers are employed for tasks like packaging and assembly line operations, the diverse skilling requirements limit opportunities for school-to-work graduates.
4. **Domestic work:** There is large demand for domestic workers for cooking and cleaning at home, primarily driven by urban and semi-urban households. The emergence of on-demand, at home, services for cleaning, caregiving, among others., primarily in tier-one cities, has furthered this growth. However, these job roles are not aspirational and require skills that can be obtained without formal training.
5. **Facilities Management:** With the advent of large building complexes, this is an emerging demand across tier-one and tier-two cities. While this demand is poised to grow, the sector overall has low potential for school-to-work graduates. These roles require no long-term skilling, and currently employ unskilled school pass-out/dropouts who are trained on the job in 10-15 days. While the sector does require supervisors, preference is for individuals who have grown through ranks or alternatively, somebody who is older and more experienced.
6. **Water, Sanitation and Health (WASH - Green Jobs):** The water, sanitation, and health sector, encompassing areas such as sanitation and hygiene, waste management, and recycling, presents limited school-to-work relevance. The sector is unorganized and characterized by hazardous working conditions, particularly in fields like e-waste management. Currently, job roles within this sector are non-aspirational and offer low pay, further diminishing its suitability for school-to-work graduates for now.
7. **Logistics and Transport:** The transport sector demonstrates low relevance for school-to-work graduates due to its heavy reliance on unskilled labor. The industry has experienced growth driven by factors such as e-commerce, third-party logistics, and the emergence of new logistics aggregators. However, the majority of job opportunities in this sector are for unskilled roles such as drivers, loaders, movers, and packers.

3.3.4 Key Job Roles, Average Pay, and Employers – Primary Sector

	Job roles	Description	Average monthly pay (Indian rupees, thousand)	Employers
Crop Cultivation	Field Assistant/ Advisory	Create product awareness among farmers & manages retailers and distributers	12-15	Input companies, Input retailers, large horticulture farmers, traders, emerging FaaS players
	Gardening and Nursery Management	Landscaping, garden management and planting	15-20	Commercial & residential spaces
	Farm management	Manage end-to-end operation of a farm (buy, sell, hire) – for large owners	18-20	Landowners who cannot manage their own farm
	Agri-equipment operator	Machine operation and basic maintenance (combine, harvester, tiller, seed drill, drone)	10-15	Machine owners, dealerships, custom hiring centers
	Procurement agent	Quality assessment to measure parameters and quote suitable price (grading/ assaying)	10-12	Traders, procurement companies (ITC Choupal), distributers
	Agri-processing supervisor	Managing machines and maintenance for primary agri-processing	7-10	Agro-processing units (MSME) in the area, self-employment
Dairy and Livestock	Milk Tester/Lab Technician	Handling and testing samples for various dairy and nutritional tests according to documented procedures	8-12	Village level centers of Saras, Amul and other local dairies
	Machine Operator (Milk Processing Plant)	Operating and maintaining machines under supervision of skilled operator	10-13	Processing units of Amul, Saras and other agro-dairy based companies
	Food Hygiene and Quality Testing	Performing periodic checks on the quality of products, ensure compliance with prescribed norms	12-15	Dairy processing units (MSME) in the area, distributers, and traders
	Veterinary Field/ Clinic Assistant	Performing periodic checks on the quality of products, ensure compliance with prescribed norms	15-20	Large dairy center, a freelancer for household livestock owners
Aquaculture and	Hatchery Technician	Breeding of mother fish (broodstock) and breeding and	10-12	Aquaculture hatchery for farming of shrimp and fish

	Job roles	Description	Average monthly pay (Indian rupees, thousand)	Employers
		nursing of young ones, live feed culture, washing/ disinfecting		
	Farm Technician	Maintain water quality, add supplements, operate aerating machines, monitor and control feeding of shrimp and fish	12-15	Aquaculture outdoor big farms for raising fish and shrimps
	Sanitation Supervisor	Maintain the quality and hygiene in the processing plant, also maintain cold chain	12-15	Seafood processing plant (MSME or large), trader/ exporter
	Shrimp processing supervisor	Ensure proper processing of shrimp (monitor activities such a beheading	12-15	Seafood processing plant (MSME or large), trader/ exporter
	Cold store technician	Manage temperature, maintain log and product, ensure first in first out	12-15	Seafood processing plant (MSME or large), trader/ exporter

3.3.5 Key Job Roles, Average Pay, and Employers – Secondary Sector

	Job roles	Description	Average monthly pay (Indian rupees, thousand)	Employers
Manufacturing - job roles are sector agnostic	Assistant Machine Operator	Operating and maintaining machine(s) under supervision of skilled operator	10-13	MSMEs in food processing, handicrafts, among others.
	Plant Maintenance & Operation	Maintaining equipment, spare parts and attending to technical issues	15-25	Machine owners, dealerships, custom hiring centers
	Auto Service/ Assembly Technician	Diagnosing and repairing vehicle parts, performing oil changes and maintenance	7-10	Local shops, automotive dealerships
Aquaculture and Fisheries	Welder/ Electrician	Wiring, earthing, socket fixtures, installing switches, among others. incl. repair and maintenance	12-14	Self-employed, small local employers, government buildings
	Plumber	Installation, repair and maintenance of pipes, valves, fittings, drainage systems	12-15	Private contractors, MSMEs, self-employed, local shops

3.3.6 Key Job Roles, Average Pay, and Employers – Tertiary sector

	Job roles	List of roles	Average monthly pay (Indian rupees, thousand)	Employers
Non-IT service sector (large companies and MSMEs)	BFSI	Sales associate/field sales agent, Insurance sales agent/LIC agent, banking operations executive (KYC executive, back-end operations, among others.), collections executive, junior accountant	10-20	Financial firms, private chambers of local CAs, major banks and insurance companies, small firms
	Beauty and wellness	Makeup therapist/Stylist, beautician, spa therapist, masseuse, nutritionist	10-11	Local salons and spas, gyms, fitness/ wellness centers
	Hospitality and Tourism	Tour guide, housekeeping, front desk, waiter, guest services, food Production, private security, tour guides, event planning, entrepreneurs (rest/guest houses)	10-17	Restaurants, cafes, bars, homestays, hotels, QSRs, resorts
	Retail	Sales associate, customer service officer, cashier, brand promoter, merchandiser, distributer sales representatives, sales, and marketing for own products	8-25	Local stores, FMCG brands, hypermarts and supermarkets
	Health care	General duty assistant, home health care aide	8-15	Big hospitals and local Clinics (Pvt. and Govt.)
	Repair	Solar technician, home appliance repair, phone/laptop repair, electronic Repair	5-8	Auto service centers, local repair shops, utility solar plants centers, pop up repair shops
Aquaculture and Fisheries	KPO/ BPO	Customer care executive (email/chat/call), content moderation, lead generation, IT recruitment, customer relationship manager	15-20	BPO centers, call centers, remote/ work from home for offshore companies
	IT services	Data Entry Operator, code testing/ Programming (C++, Java, Python), technical support, back-end developer	12-25	IT companies (MNC, local)
	Design and Media	Digital marketing associate, web (UI/UX) designer, graphic designer (Photoshop, Coral, illustrator), animator, video/sound editor or mixer	18-20	Marketing, advertising firms, media houses, print shop/ MSMEs, IT companies

3.4 14 Broad-Based Trades Can Cater to Target High, Medium Potential Job Roles

Post identification of high and medium potential sub-sectors, a logical next step was to identify the trades that could cater to the skill needs of these sub-sectors. To begin with, a study of the trades that are currently on offer as part of the NSQF system was undertaken.

NSQF trades currently being taught in schools focus on a single job role for two years. The current two-year curriculum for each trade (and linked job role) is based on the definition of that job role under NSQF. Students may cover two job roles across grades 9-10 and 11-12. This job-role based approach has been used to align the entire Indian ecosystem – from educators to employers – to a unified language of skills; a laudable goal of the policy framework as such. The following illustration carries a list of all the trades (and linked job roles) as made available on the NCERT website, from amongst which states often choose the trades that they can offer inside schools. (Note: This set of offerings may evolve in light of the shifts recommended by NEP 2020 and NCF 2023 towards a multi-skill approach)

Sector Skill Council	Trades for Grades 9 &10	Trades for Grades 11 & 12
Agriculture	AGRI - Florist	AGRI - Micro irrigation Tech
	AGRI - Greenhouse Operator	AGRI - Mushroom Grower
	AGRI - Nursery Worker	AGRI - Floriculturist (PC)
	AGRI -Beekeeper	AGRI - Floriculturist (OC)
	AGRI - Dairy Farmer	AGRI - Gardener
	AGRI - Packhouse Worker	AGRI -Medicinal Plant Grower
	AGRI - Solanaceous Crop Cultivator	AGRI -Supply Chain Field Assistant
	AGRI -Assistant Gardener	AGRI -Tuber crop Cultivator
Apparel, Makeups & Home Furnishing	AMHF-Hand Embroiderer	AMHF-Asst Designer-Home Furniture
	AMHF-Hand Embroiderer-Adda	AMHF-Self Employed Tailor
	AMHF-Sewing Machine Operator	AMHF-Special Sewing Machine Operator
Automotive Sector	AUTO - Sales Exec Dealer	Customer Relationship Executive - Telecaller
	AUTO - Showroom Host	
Banking, Financial Services & Insurance 6	BFSI - Business Correspondent	BFSI - Life Insurance Agent
	BFSI - Micro Finance Executive	
Beauty & Wellness	BEWE - Assistant Beauty Therapist	BEWE - Beauty Therapist
Construction Sector	CONS - Assistant Mason	CONS - General Mason
	PLUM -Plumber (General)-I	PLUM -Plumber (General)-II
Forestry	AGRI - Non-Timber for Production	AGRI - Forest Nursery Raiser
Gems & Jewelry	GEJE - Hand Sketch Design (Basic)	CDS Designer CAD
Health care	A - Medical Equipment Technician	A - Dental Assistant
	A - Vision Technician	A - Diet Assistant
		A - Home Health Aide
		A- General Duty Assistant
		A- X Ray Technician
Mining		MINI - Fireman
Power Sector	POWE - Energy Meter	Cable Jointer
		POWE - Line Distribution
Security	Unarmed Security Guard	ELEC-Access Control Installation Technician
Electronics	ELEC-CCTV Installation Technician	ELEC-Field Technician Computing & Peripherals
	ELEC-Install Technician Computing & Peripherals	ELEC-Solar Panel Installation Technician
	ELEC-LED Installation Technician	
	ELEC-Wireman Control Panel	
Food Processing	FOPR - Industrial Product Work	FOPR - Fruit Pulp Process Technician
	FOPR - Packing machine worker	FOPR - Jam, Jelly Ket Proc Technician
IT-ITeS	IT-ITES-Domestic CRM Non-Voice	IT-ITES-Domestic CRM Voice
	IT-ITES-Domestic Data Entry Operator	IT-ITES-Domestic IT Helpdesk Attendant
		IT-ITES-Junior Software Developer
Media & Entertainment	MEEN - Texturing Artist	MEEN - Animator
	MES Q1401 Editor Media & Entertainment	
Telecommunication	O - Optical Fiber Splicer	O - Broadband Technician
		O - Handset Repair Engineer
		O - Optical Fiber Technician
		O - Ter Equip App Develop
Retail	RETA - Cashier	RETA - Sales Associate
	RETA - Store Operations Assistant	
	RETA -Trainee Associate	
Logistics	Consign Booking Assistant	LOGI - Document Assistant
	Consign Tracking Executive	LOGI - Shipment Query Handler
	Courier Delivery Executive	LOGI - Warehouse Claims Coordinator
	Courier Pick Up Executive	
	Courier Sorter	
	LOGI - Inventory clerk	
	LOGI - Receiving Assistant	
	LOGI - Warehouse Binner	
	LOGI - Warehouse Quality	
Tourism and Hospitality	TOHO - Food Bever Trainee	TOHO - Count Sales Executive
	TOHO - Housekeeping Attendant	TOHO - Room Attendant
	TOHO - Meet Greet Officer	TOHO - Travel Consultant

Illustration 48 | Trades currently on offer under NSQF

However, conversations with industry indicated that these trades with a single job role focus do not meet industry's need. Rather, industry has a strong preference for multi-skilled individuals who can perform a variety of tasks. For example, for front-office management roles, employers across industries want candidates with an array of skillsets such as data entry and analysis, customer service, and office management techniques. In the current plan, where each job role is broken up and offered separately such as "Domestic Data Entry Operator" and "CRM Domestic Voice" – this narrow approach does not meet employers' broader skilling requirements. Similarly in Agriculture, the job roles currently offered such as "Citrus Fruit Grower", "Mango Grower", "Small Poultry Farmer" among others are too narrow and decrease students' chances of finding employment post school. Students need to be able to study a combination of agriculture, horticulture, animal husbandry/poultry and within each modern practices, to be truly valuable either in their own farm or to be employed by another large farmer.

> *Most small MSMEs in Angul are project-based business - if someone can only do welding, they're of very little use to me when there is a casting project; we take fitter ITI graduates because they learn skills fast*
>
> *– Owner, Fabrication unit, Angul district, Odisha*

In addition, two other consistent inputs have come from industry with respect to trades' curricula/ scope:

1. **Current curricula inadequate and need to be expanded:** Industry and skill education training providers share the perspective that the existing curriculum is inadequate, requiring less than a year to complete as compared to the mandated two years. There is also a prevailing sentiment that the curriculum could benefit from introducing more practical elements and diversifying overall coverage. With greater focus and potentially extended duration of school-based skilling, there is an opportunity to redesign and enhance breadth as well as depth of coverage of trades.
2. **Specific and consistent demand for improved soft skills:** Nearly all expert discussions emphasized that a comprehensive inclusion of employability and soft skills (such as communication, grooming, and digital literacy) could markedly enhance employment outcomes. As a result, there is a need to integrate a strong employability-focused curriculum into the overall course offerings, ensuring accessibility for all candidates.

In planning for future offerings in schools, there is therefore an opportunity to provide a more comprehensive and multi-skill coverage in the identified trades. This equips candidates for entry into work or academia, shifting from the prevailing role paradigm. Separately, a dedicated emphasis on soft skills, employability, and essential literacies like digital and financial is crucial, addressing a critical need of the industry. The NSDC's expansive survey, gathering over 26,000 responses, disclosed that about half reported a rise in monthly earnings, while most felt their skills gained more workplace recognition. Particularly, the Recognition of Prior Learning or RPL program markedly boosted incomes for individuals with minimal formal education.[54]

Drawing insights from extensive research on employer needs and opportunities presented above, we have identified 14 broad trades that are well-suited for sub-sectors with medium to high employment potential for school graduates. These trade categories align with employer preferences and include key trades/ job roles as specified by NSQF.

[54] State of the Education Report for India 2020 by UNESCO

14 Trades can cater to target job roles in priority sectors for school-to-work

Agriculture	1 Agriculture, with curriculum customizations basis local area need i.e., more focus towards: 1. Farm Productivity and Agronomy 2. Horticulture and Gardening 3. Dairy Farming and Livestock Health 4. Aquaculture and Fisheries	Largely targeting income enhancement opportunities + select sales/ procurement/ QA roles dominantly in input companies
Manufacturing	2 Workshop Tech and Machine Operation	Welders, fitters, machine operators etc. on shopfloor
	3 Automotive Tech and Servicing	Auto repair and servicing roles primarily
	4 Fabrication Technologies (Building/ Construction)	Plumber, electrician etc.
	5 Electronics and Hardware	Repair roles primarily for electronics, machines etc.
Services	6 BFSI	Sales roles (e.g., insurance), microfinance roles etc.
	7 Beauty and Wellness	Large self employment opportunity
	8 Front Office and Hospitality/ Tourism	Front desk and office management roles across sectors
	9 Sales and Marketing (Retail and other sectors)	Large demand for sales/ customer service roles
	10 Healthcare	GDA, ANM/GNM (nursing) and diagnostic roles
	11 Fashion and Apparel	Large self employment opportunity and design/ tailoring jobs
	12 Armed Forces and Physical Education	Defence roles, gym trainers, nutritionists etc.
Information technology	13 IT Software Development and Support	Programming as well as IT Software development and Support/ help desk jobs
	14 Digital Media and Design technologies	Graphic designing, digital marketing etc.

Illustration 49 | 14 relevant trades identified for secondary schools

The next chapter looks at the current skilling capacity in each state in light of the above understanding of where the jobs are, and which trades are relevant to be offered in schools. It forms a view on the gap between the supply of skilling capacity and demand, and hence guides towards pathways to address the gap.

04

Skill Gap Assessment Across Six STARS States

4 Skill Gap Assessment across Six STARS States

4.1 Goals of the Skill Gap Assessment Studies

In the previous chapter on "Where Are the Jobs?" relevant trades and job roles that will enable a smooth transition to work for students who pursue SE in school were identified. This chapter further links this sectoral understanding of demand of jobs to the actual scenario in each state – which sub-sectors are prevalent in each state or district and hence what are the relevant in-demand trades for that geography via-a-vis what is the current skilling supply capacity and quality? It is critical to assess this quantitative as well as qualitative "Skill Gap" for each state to be able to subsequently articulate the shifts needed to strengthen skill education.

As skill gap assessment studies were conducted across states, a set of common strategic challenges with existing SE offerings emerged. We begin this chapter by sharing these common strategic challenges which are then illustrated via six separate skill gap assessment packages for each state covering:

- Socio-demographic and economic snapshot of the state; focus sectors
- Emerging industrial parks and employment hubs; employment projections
- Current status of skill education in schools – the reach and nature of the SE offering
- A district wise view of in-demand sectors and trades vs. current SE capacity; hence the skill gap to be addressed

Having identified and illustrated the gaps in the SE strategy itself, we conclude the chapter with a set of common issues that were identified with how SE is being delivered inside classrooms today – the nature of pedagogy, assessments, teacher gaps etc.

4.2 Common SE Design Challenges across States

4.2.1 Limited Reach of SE and Distribution Not in Line with Enrollment

Across states the number of secondary schools offering SE is limited and hence, the enrollment in skill education trades relative to total students enrolled in secondary education is much behind. For example, less than 10 percent of government secondary schools in Maharashtra, Odisha, and Rajasthan offer skill-education trades, resulting in less than 10 percent of secondary students enrolling in skill-education courses. Among all the STARS states, Himachal Pradesh stands out as the only state where penetration of SE is at a healthy 27 percent, although still behind desired NEP goal of 50 percent students.

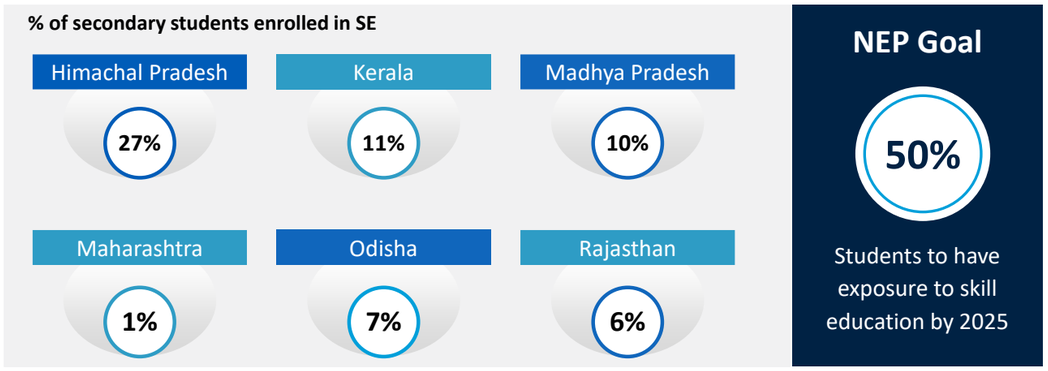
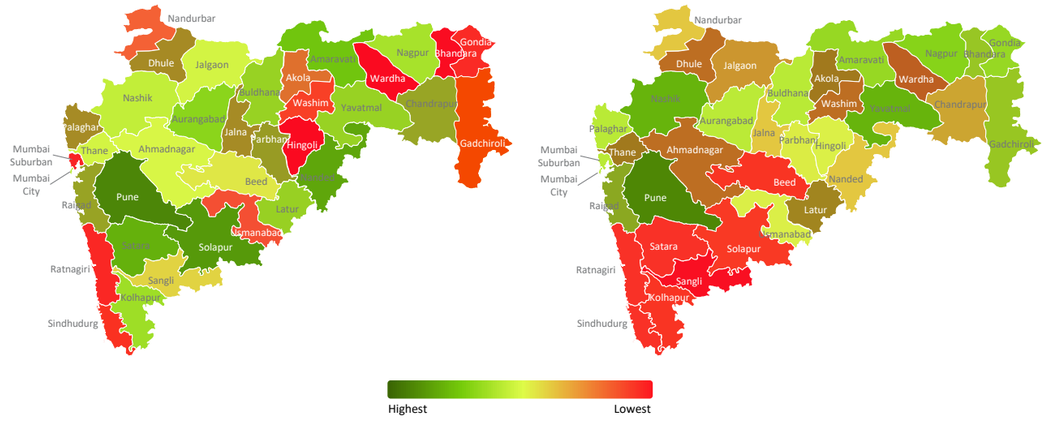


Illustration 50 | Current percentage of students enrolled in SE vs. NEP target

Alongside the overall reach being limited, the number of schools offering skill education in different districts of a state were found to not be in line with the distribution of secondary schools' enrollment itself. For example, in Maharashtra (illustration below), southern districts such as Satara, Solapur, Sangli, and others have a lower number of skill education schools relative to the student population. On the other hand, Eastern districts like Gondia and Bhandara have a higher number of skill education schools compared to the student population.

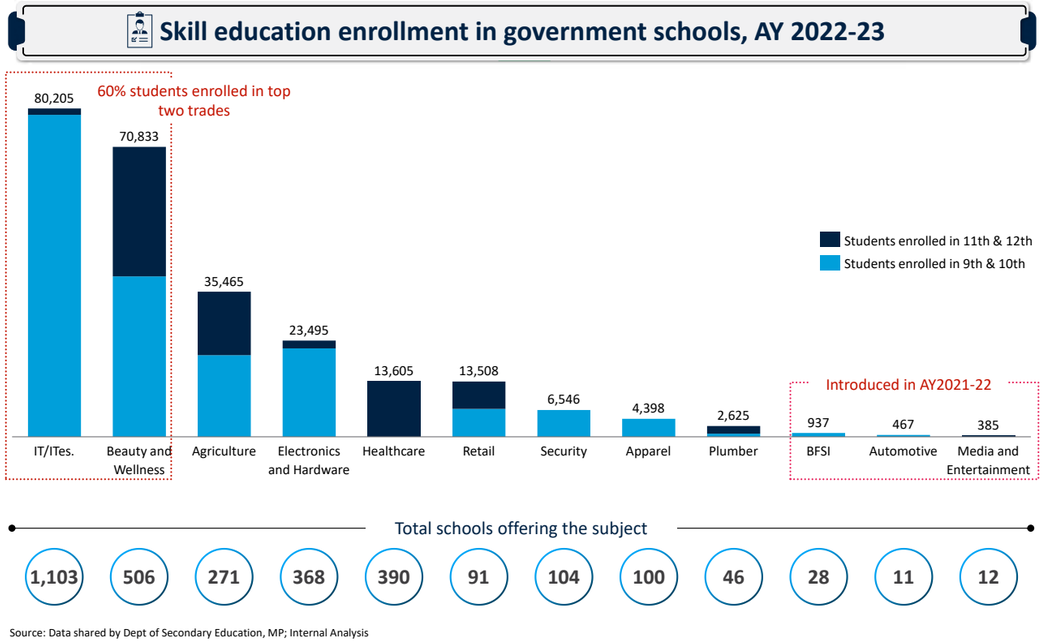


Note: 1. Includes government and aided schools
Source: UDISE 2020-21, School education department, Maharashtra, Press research, Internal analysis

Illustration 51 | Maharashtra - number of skill education schools vs. secondary enrollments in each district

4.2.2 Trade Mix Not Aligned with Future Economy Needs

The trade offerings across most states are found to be skewed towards a few trades and often do not align with the needs of the future economy. Across states, we see more than 60 percent enrollment concentrated in top two to three trades. For instance, in Madhya Pradesh, across districts, 60 percent of the enrollments is for IT and Beauty and Wellness, regardless of the current or future district level demand.



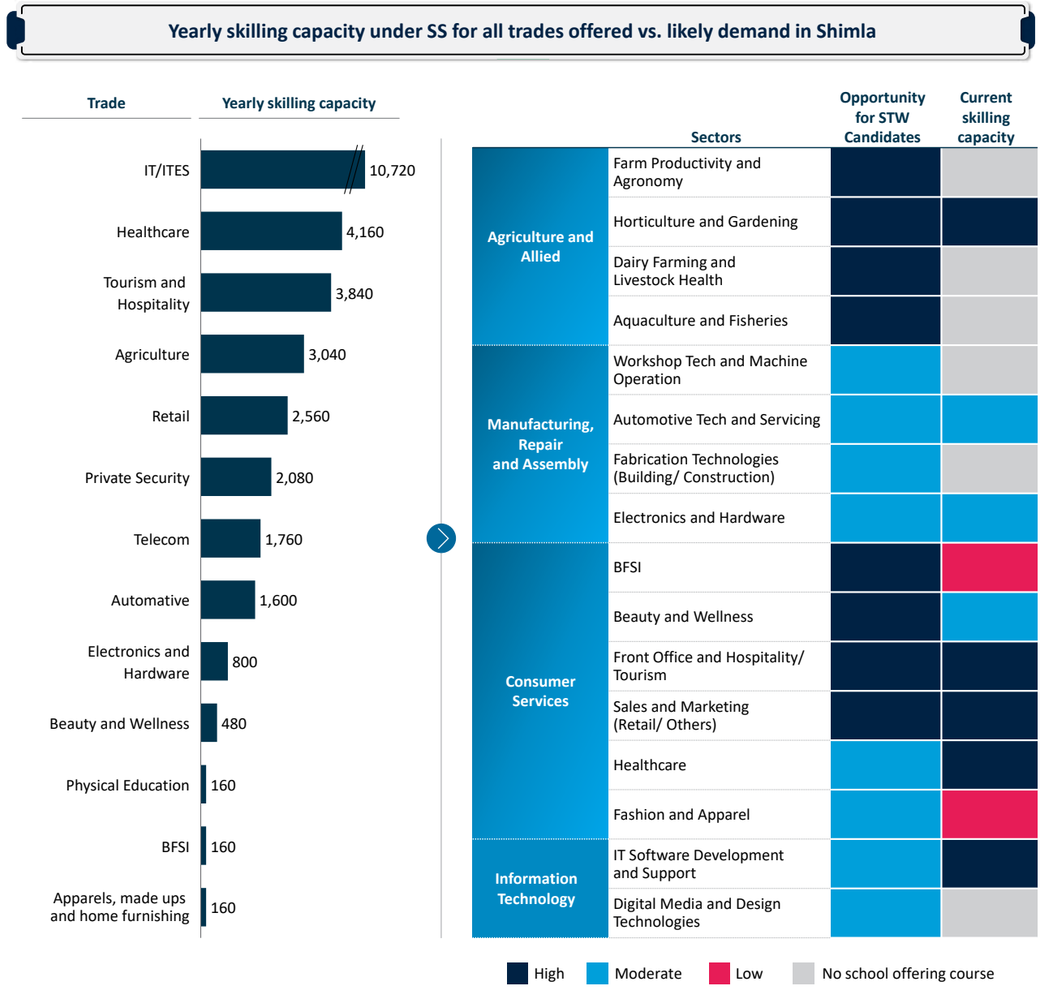
Source: Data shared by Dept of Secondary Education, MP; Internal Analysis

Illustration 52 | Madhya Pradesh – trades offered and enrollment in each trade

4.2.3 District Level Skilling Capacity Not in Line with Local Geographic Demand

In-depth primary research in select districts across states indicated a significant mismatch between the current skilling capacity for SE vs. the sub-sectors in demand locally. For example, in Shimla district, there is strong demand for BFSI and fashion/ apparel skilled school graduates, however, there is low SE capacity in these areas.

Similarly, no school in the district of Jodhpur offers a trade related to dairy production despite Jodhpur being one of the most important dairy-related districts in Rajasthan; no school offers trade related to manufacturing in Nagpur district of Maharashtra despite the trade and associated skill being relevant to the local economy and industrial area of Nagpur. An example of such a mismatch for Shimla district is illustrated below.



Note: 1. Capacity estimates only include NSQF-linked trade offerings in schools under the SS 2. Current capacity represents total number of seats available for each trade offered in SS schools in the district 3. STW to be read as School-to-work
Source: School Education Department, HP

Illustration 53 | Himachal Pradesh, Shimla – current skilling capacity vs local demand

4.3 Illustration of Strategic Gaps via State Skill Gap Assessments: Six State Packages

At a broad level, each state's skill gap assessment is a combination of six areas:

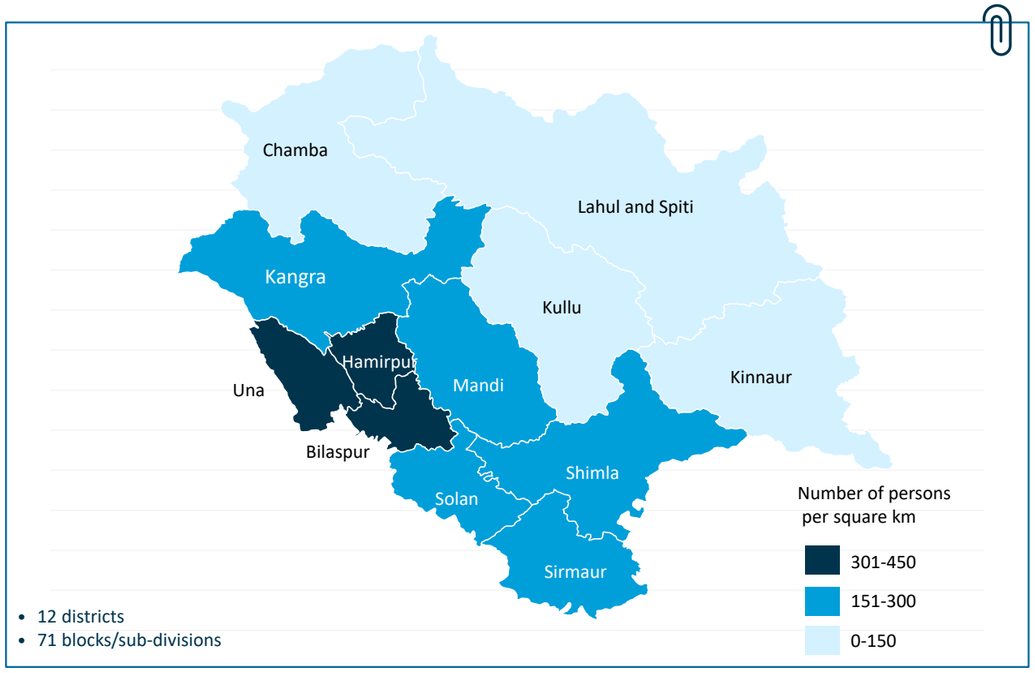
1. **Socio-demographic and economic landscape:** This section presents a comprehensive overview of the state's demographics, encompassing factors such as population size and district-wise distribution, age mix, and other relevant metrics. Next is the state's economic landscape – an analysis of the key sectors in the state based on their GVA contribution, growth trends, etc.
2. **Employment potential and future projections:** This section offers readers an overview of the expected growth or decline in employment potential of each sector by 2030. Beyond the projections, the section also digs deeper into the main drivers of growth for each sector.
3. **Education landscape:** This section offers an overview of the current state of the school education system in each state. It covers aspects such as the total number of schools, the prevalence of government schools, and the rates of student dropouts at different grades. Notably, the high dropout rates highlight the urgency of addressing the need for skilling for employment.
4. **Skill education landscape:** This section analyzes the skill education landscape, covering both school-based and non-school-based institutions. Additional emphasis is laid on school-based skill education, in line with the main report. The data highlights the nascent presence of skill education in schools. Beyond statistics available at the national level through the UDISE system, this report draws on data shared by each state to analyze the trade mix offered in these schools.
5. **District Case Study:** This section provides additional analysis for one district in each state. Various skill education initiatives require decision-making at the district level. During the process of field visits to arrive at the recommendations made in the main report, one district was analyzed in detail from each state. The district case study draws on information from school visits, combined with secondary data and official data shared by the state education department. The study analyzes the existing skill capacity in schools across trades and compares it to the demand based on industry visits and conversations. The analysis provides a view of the emerging skill gaps and potential trades that should therefore be offered within the district.
6. **Initial view on district-wise skill gaps:** Every district in each state should undertake their own skill gap analysis as illustrated via six in-depth district case studies shared in this report. However, a starting point for each district of every state is also provided in this report, based on secondary data sources. States should further validate this analysis via primary research and subsequently leverage it to determine the desired trade mix for each district.

4.3.1 Skill Gap Assessment: Himachal Pradesh

Economy Overview and Imperatives for School-to-Work

Socio-Demographic Snapshot

Himachal Pradesh is a primarily rural, mountainous state with a large schooling system and low unemployment.



Predominantly rural mountainous state in India …	• 12 districts • Population: About 7.8 million (more than 85% population in rural areas) • Literacy: 82%
… with a sizeable school education system …	• GER: 94% for secondary and 94% for higher secondary • 858 thousand students in approximately 15 thousand public schools (942 secondary; 1,923 higher secondary)
… substantial working age population and lower unemployment	• Five million people between 15-59 years • 3.67% unemployment rate compared to national average rate of about 5.1% • Worker-Population Ratio (WPR) of 70.5% (Highest in India)

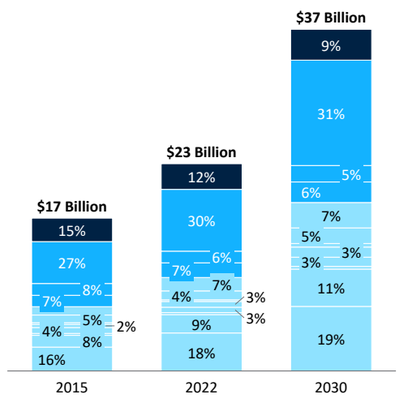
Source: Census 2011, PLFS 2019-20, UDISE 2021

Illustration 54 | HP: Socio-demographic Snapshot

Economic Snapshot

The economy is primarily driven by the Manufacturing sector which contributes to 30 percent of GVA vs. the national average of 15 percent.

Gross State Value Added by Economic Activity



		CAGR 2015-22	CAGR 2022-30
Primary Sector	Agriculture, Forestry and Fishing	1%	3%
Secondary Sector	Manufacturing	6%	8%
	Electricity, Gas and Water Supply	0%	5%
	Construction	4%	5%
Tertiary Sector	Wholesale and Retail Trade	7%	10%
	Transportation and Storage	2%	8%
	Accommodation and Food Services	-1%	12%
	Information and Communication	10%	9%
	Financial and Insurance Activities	-1%	8%
	Real Estate Activities	2%	5%
	Education and Health	6%	11%
	Other Services	7%	8%

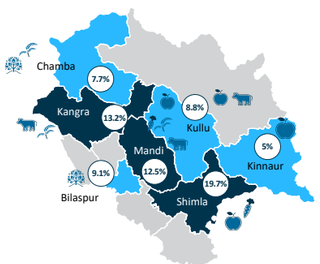
Illustration 55 | HP: Economic Snapshot

Economy by Districts

- 73 percent of manufacturing output comes from Solan.
- Kangra, Mandi, & Shimla emerge as key districts within Agriculture & Services.
- The pharmaceutical hub in Solan district (including Baddi, Barotiwala, and Nalagarh) and the developing food processing and electronics sector in Kangra and Una districts) could witness expansion from PLI investments and further enhance job creation.

Primary Sector

Crops, and Mining and Quarrying

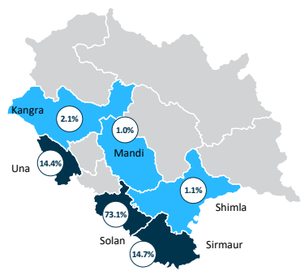


(xx) % Contribution to sector GSVA

- **Grain production:** Kangra, Mandi, Chamba (Wheat and Maize)
- **Forestry:** Chamba, Bilaspur (Timber, cedar and rosin)
- **Dairy livestock:** Kullu, Mandi
- **Horticulture:** Shimla, Mandi

Secondary Sector

Manufacturing and Construction



(xx) % Contribution to sector GVA

- 73% **manufacturing** in Solan
- Key manufacturing sectors: **Food processing, textile, medical device and electronics manufacturing**
- More than 46,000 MSMEs in Agro and Wood-based works, Wool and Textile, Ancillary activities

Tertiary Sector

Services

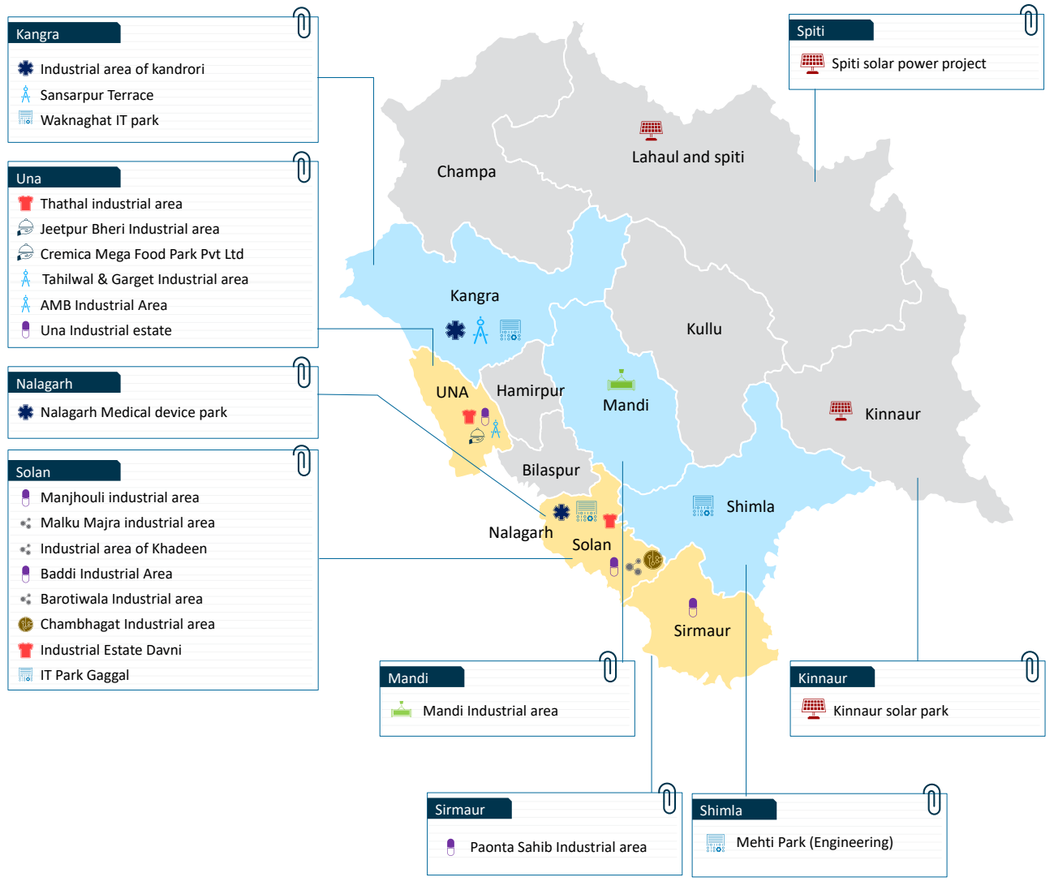
(xx) % Contribution to sector GSVA

- Key sectors include **Public administration, defence and tourism**

Note: Top districts calculated basis district's contribution to GVA of a sector at the state level
Source: Internal Analysis; based on data from Directorate of Economics and Statistics, Govt of HP

Illustration 56 | HP: Economy by districts

More Than 20 Industrial Parks Are Emerging in HP in Sectors Such as Food Processing and Renewable Energy, and Will Serve as Employment Hubs



Food
Information Technology
Engineering
Pharmaceutical
Textile
Electronics
Solar
Steel and wooden furniture
Multi-Industry
Medical Device

Source: Press Search

Illustration 57 | HP: Industrial Parks and employment hubs

Employment Snapshot & Expected Growth Areas

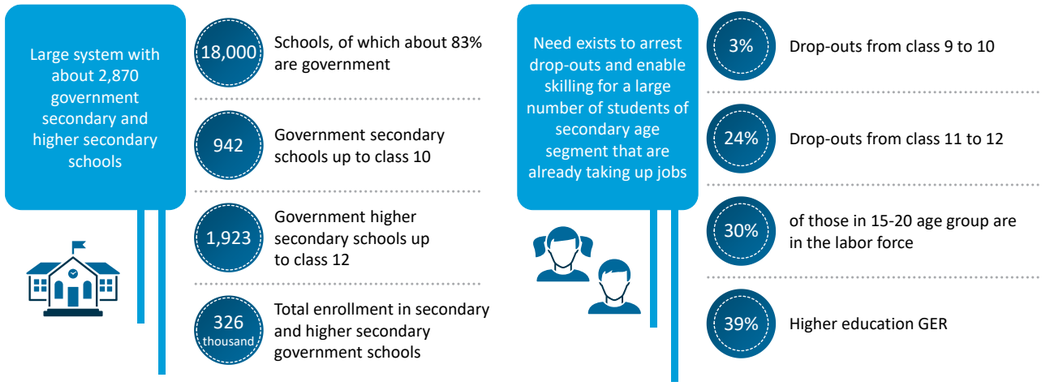
Overall, 680 thousand additional employment to be created in the state by 2030 i.e., 17 percent increase in labor demand; rapid growth expected in tertiary sector activities.

- 50 percent of the incremental demand (680 thousand) from top three districts
- 76 percent of the incremental demand will come from tertiary services across districts

Unit: thousand persons[1]	Employment Demand 2021	Employment Demand 2030	Incremental Demand[2]	Growth % 2021-30
Agriculture, Forestry, and Fishing	2,444	2,497	54	2%
Mining and Quarrying	4	3	(1)	-14%
Manufacturing	210	235	25	12%
Electricity, Gas and Water Supply	80	91	11	13%
Building and Construction	262	333	72	27%
Wholesale and Retail Trade	153	216	63	41%
Transportation and Storage	124	162	38	30%
Accommodation and Food Service Activities	22	34	12	56%
Information and Communication	33	49	16	49%
Financial, Real Estate and Professional Services	45	67	21	47%
Public Administration	247	348	101	41%
Education and Health	320	485	166	52%
Other Services	161	264	103	64%
Total	4,105	4,784	681	16%

Context of School Education in HP

Large system with 18 thousand schools that can benefit from Skill Education integration and enable students to gain better employment as well as prevent dropouts.



Source: UDISE 2020-21
1. Includes main and marginal workers
2. Incremental demand calculated by subtracting 2030 demand projections from 2021 projections

Illustration 58 | HP: School Education Landscape

Current Status of Skill Education Indicates Good Penetration in Terms of Access (Higher than National Average)

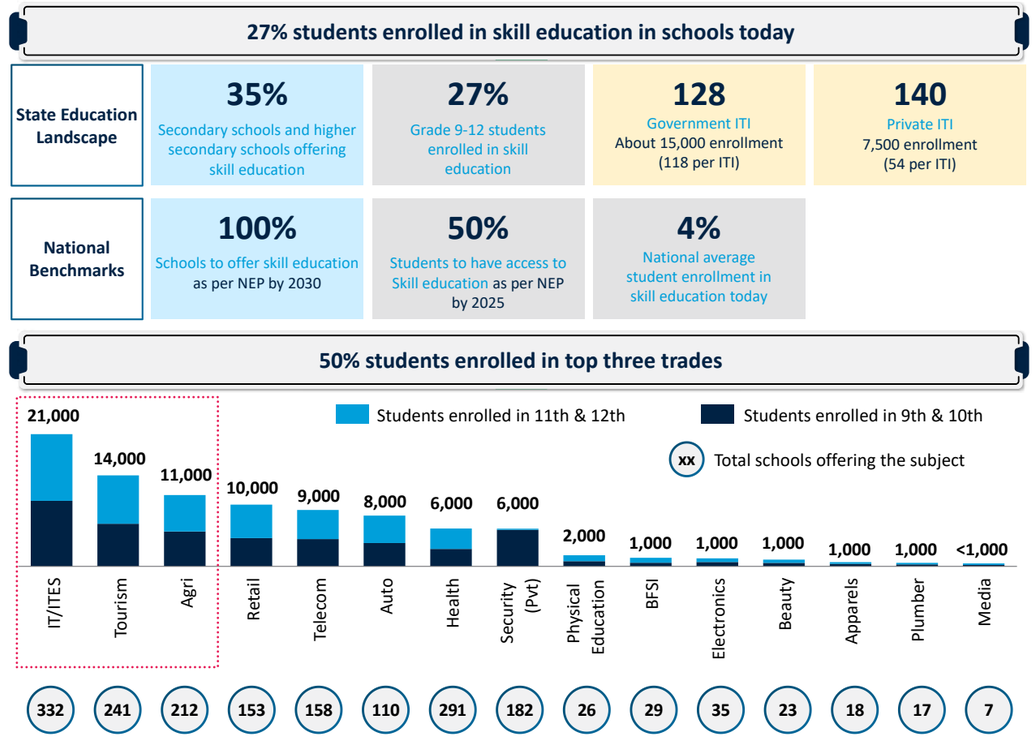
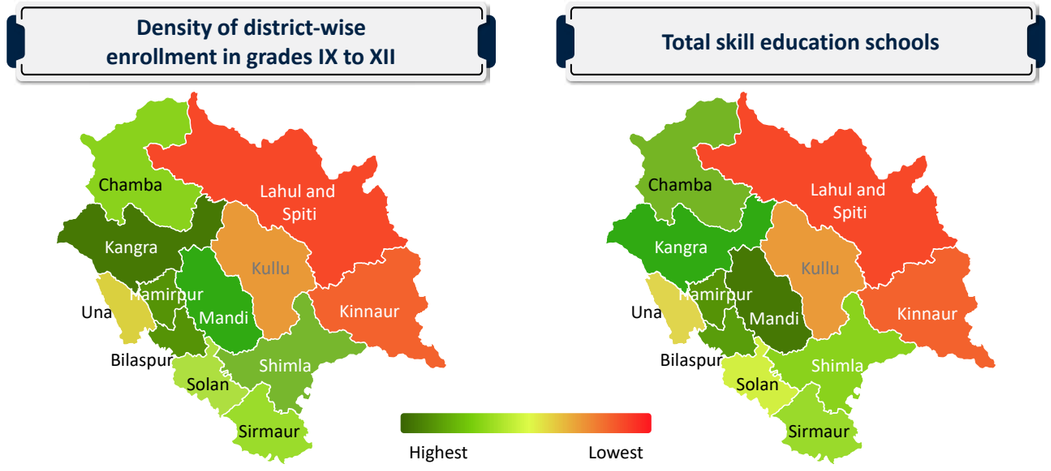


Illustration 59 | HP: Enrollment in SE - total and by trades

Presence of Skill Education Schools in the State Is also Found to Be in Line with the Overall Distribution of Secondary Grades Enrollment.



Source: UDISE 2020-21, PLFS 2020-21, DGIT 2022, Data shared by State Education Dep, Projections from Oxford Economics

Illustration 60 | HP: Distribution of secondary enrollment vs. skill education schools

State Skilling Snapshot | Clear Opportunity to Expand Skilling Capacity in Line with Demand

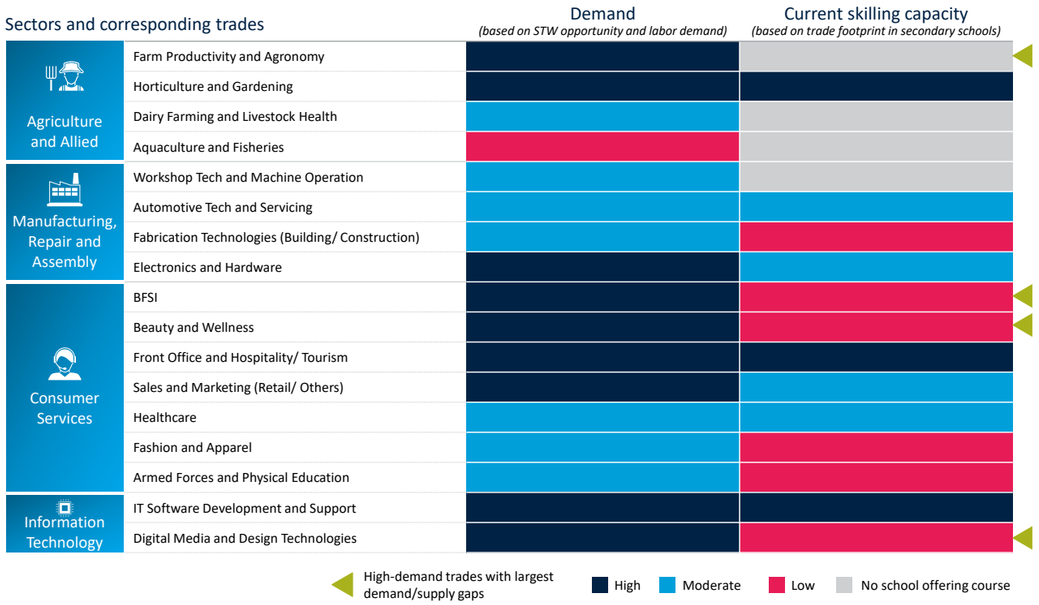
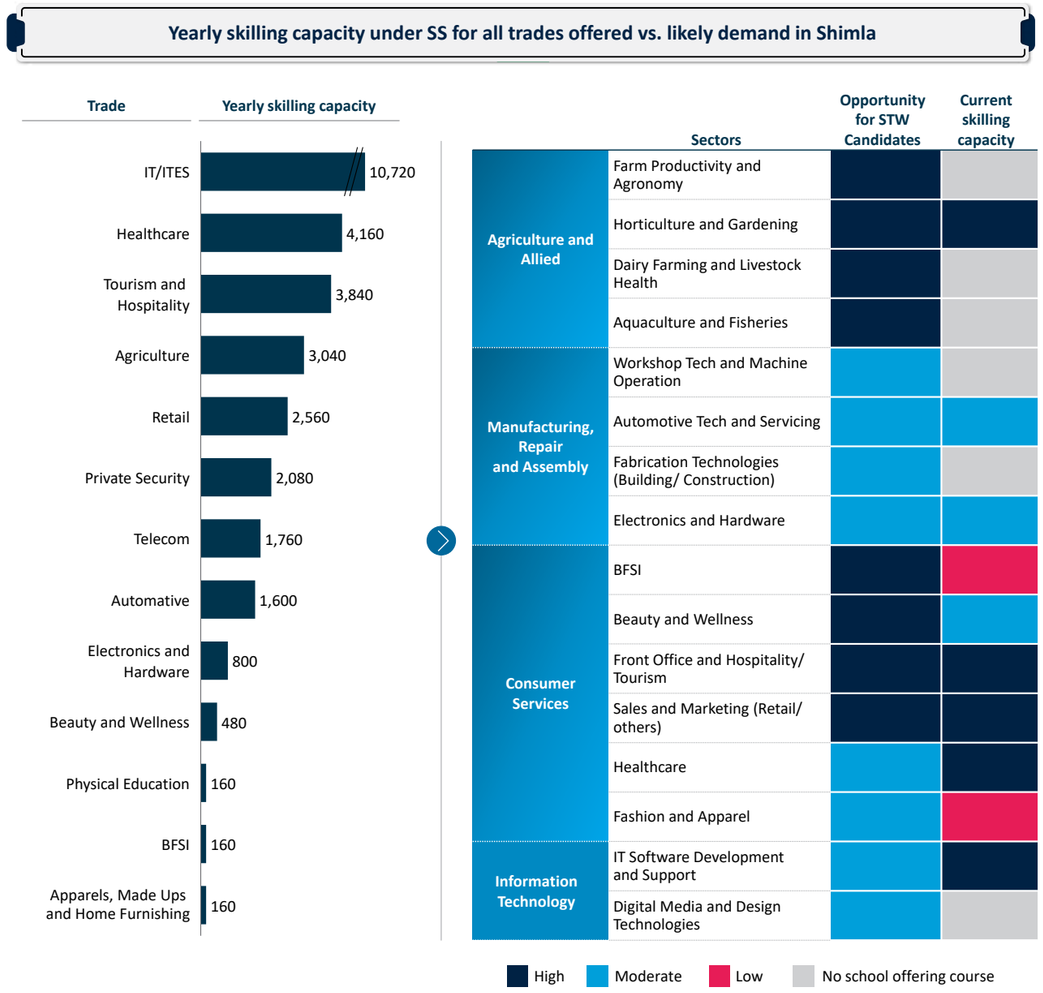


Illustration 61 | HP: State overall skilling snapshot (demand vs. supply)

However, A Significant Mismatch is Observed Between the Current Skilling Offering and Local Demand as Illustrated in the Example for Shimla Below:



Note: 1. Capacity estimates only include NSQF-linked trade offerings in schools under the SS 2. Current capacity represents total number of seats available for each trade offered in SS schools in the district 3. STW to be read as School-to-Work
Source: School Education Department, HP

Illustration 62 | HP: Illustration of demand-supply mismatch for Shimla

The above analysis for Shimla was conducted basis primary research in the district and conversations with industry present in the districts, visits to MSMEs, shopfloors, retail shops, farms, etc. A similar view has been created across all districts of the state as well, however, based on secondary research alone. This must hence be further validated by states themselves and then leveraged to determine each district's desired future trade-mix.

Sector and trade categories		Bilaspur		Chamba		Hamirpur		Kangra	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	High	Moderate	High	Moderate	Moderate	High	High	High
	Horticulture and Gardening	High	Moderate	Moderate	Moderate	Moderate	Moderate	High	High
	Dairy Farming and Livestock Health	Moderate		Moderate		Moderate		High	
	Aquaculture and Fisheries	High		Moderate		Moderate		High	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	Moderate		Low		Low		Moderate	
	Automotive Tech and Servicing	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	High	High
	Fabrication Technologies (Building/ Construction)	Moderate	Low	High	Moderate	High	Moderate	High	Moderate
	Electronics and Hardware	Moderate		Low	Moderate	Low	Moderate	Moderate	Moderate
Consumer Business and Services	BFSI	Low	Moderate	Low	Moderate	Low		High	Moderate
	Beauty and Wellness	Moderate	Moderate	Moderate	Moderate	Moderate		High	Moderate
	Front Office and Hospitality/ Tourism	Moderate	High	Moderate	High	Moderate	High	High	High
	Sales and Marketing (Retail/ others)	Moderate	Moderate	Moderate	High	Moderate	Moderate	High	High
	Healthcare	Moderate	High	Moderate	High	Moderate	High	Moderate	High
	Fashion and Apparel	Low	Low	Low	Low	Low	Moderate	Moderate	Moderate
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	Low	High	Low	High	Moderate	Moderate	Moderate	High
	Digital Media and Design Technologies	Low		Low		Moderate		Moderate	

High Moderate Low No school offering course

Sector and trade categories		Kinnaur		Kullu		Mandi		Shimla	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	High	Low	High	Moderate	High	High	High	Moderate
	Horticulture and Gardening	High	Low	High	Moderate	High	High	High	Moderate
	Dairy Farming and Livestock Health	Low		High		High		Moderate	
	Aquaculture and Fisheries	Low		Moderate		Moderate		Moderate	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	Low		Low		Moderate		Low	
	Automotive Tech and Servicing	Low	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
	Fabrication Technologies (Building/ Construction)	Low		Moderate		High	Moderate	Moderate	
	Electronics and Hardware	Low		Low	Moderate	Moderate	Moderate	Moderate	Moderate
Consumer Business and Services	BFSI	Low		Low	Moderate	High	Moderate	High	Moderate
	Beauty and Wellness	Low		Moderate	Moderate	High	Moderate	High	Moderate
	Front Office and Hospitality/ Tourism	Low	Moderate	High	High	High	High	High	High
	Sales and Marketing (Retail/ others)	Low	Low	Moderate	High	High	High	High	High
	Healthcare	Low	Moderate	Moderate	High	Moderate	High	Moderate	High
	Fashion and Apparel	Low		High	Low	Low	Moderate	Moderate	Low
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	Low	Low	Low	Moderate	Moderate	High	Moderate	High
	Digital Media and Design Technologies	Low		Low		Moderate		Moderate	

High Moderate Low No school offering course

Sector and trade categories		Sirmaur		Solan		Una		Lahaul and Spiti	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	Moderate	High	Moderate	High	Moderate	High	High	Low
	Horticulture and Gardening	Moderate	High	Moderate	High	Moderate	High	Moderate	Low
	Dairy Farming and Livestock Health	Moderate		Moderate		Moderate		Low	
	Aquaculture and Fisheries	High		Low		Moderate		Low	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	Moderate		High		High		Low	
	Automotive Tech and Servicing	Moderate	High	Moderate	High	Moderate	High	Low	
	Fabrication Technologies (Building/ Construction)	Moderate		Moderate	Low	High	Low	Low	
	Electronics and Hardware	Moderate	Moderate	High	Moderate	High	Moderate	Low	
Consumer Business and Services	BFSI	Low	Low	High	Low	Moderate	Moderate	Low	
	Beauty and Wellness	Moderate	Low	High	Low	Moderate	Moderate	Low	
	Front Office and Hospitality/ Tourism	Moderate	High	High	High	Moderate	High	High	Moderate
	Sales and Marketing (Retail/ others)	Moderate	High	High	High	Moderate	High	Low	
	Healthcare	Moderate	High	Moderate	High	Moderate	High	Low	Moderate
	Fashion and Apparel	Low	Low	Low		Low	Low	Moderate	
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	Low	High	Moderate	High	Moderate	High	Low	Low
	Digital Media and Design Technologies	Low		Moderate		Low		Low	

High Moderate Low No school offering course

Illustration 63 | HP: District-wise view of demand vs. current skilling capacity

Summary of Recommended Next Steps for Himachal Pradesh

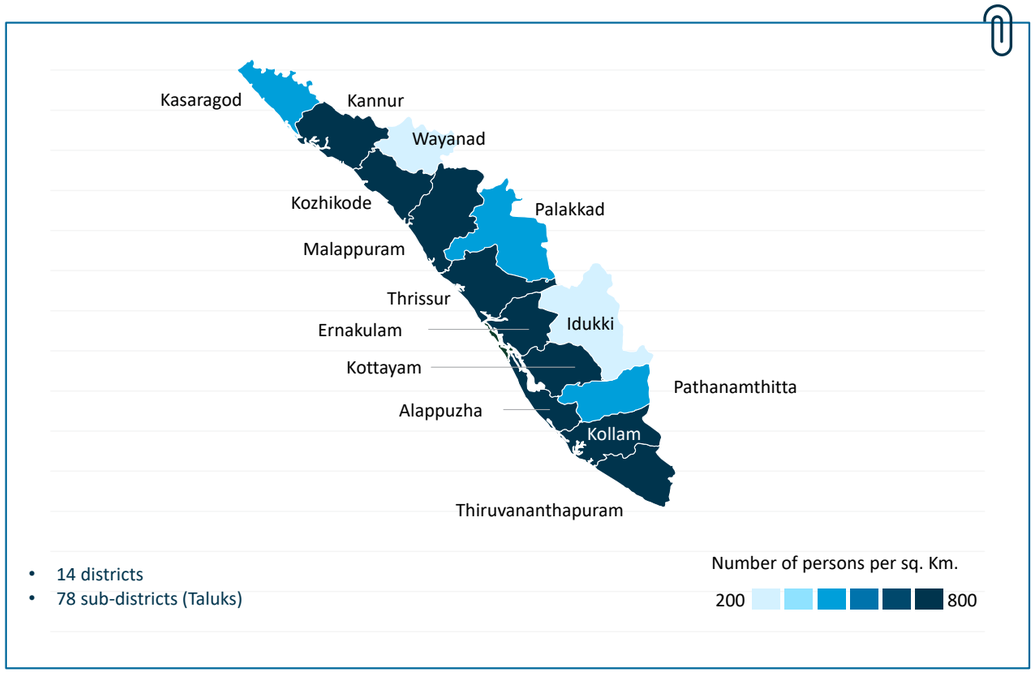
- Build a three to five year plan to strengthen supply of skill education across the 35 percent or 652 secondary/ higher secondary schools across districts
- In parallel, plan to ensure 100 percent of the secondary schools (or about 2500 schools) offer employability skills related courses over the next few years (in line with NEP goals)
- Direct effort towards building capabilities around key trades for each district such as BFSI and Beauty & Wellness in Mandi, Farm productivity and agronomy in Shimla among others (refer district-wise trade recommendation included as part of this chapter)
- Validate and finalize priority trades in collaboration with DEO/BEO and local industry officials to ensure alignment with local industry needs, map trades school by school with district consultations
- Collaborate with State Board to accommodate revamped trade subjects and strengthen assessments
- Onboard knowledge partners as necessary to build out new trade curricula, support with training of teachers, assessments planning etc.; In parallel, plan for hiring of teachers with the required qualifications and setting up labs
- Prepare budget estimates for the plan and enable availability of funds via existing state and central mechanisms (e.g., STARS budget, state budget etc.)

4.3.2 Skill Gap Assessment: Kerala

Economic Overview and Imperatives for School-to-work

Socio-demographic Snapshot

Kerala, located on the southwestern coast of India, is a densely populated state with much higher unemployment compared to national average.



- 14 districts
- 78 sub-districts (Taluks)

Predominantly coastal state in India …

- Population: About 33 million (52% in rural)
- High income state with lowest poverty across India
- Literacy: Approximately 94%
- 2.1 million population lives outside India and contribute significantly to state's economy through remittances

… with a sizeable school education system …

- 1.7 million students in public schools
- Approximately 300 till grade 10th and more than 1,000 till grade 12th; 5,000 public schools

… substantial working age population and very high unemployment

- 21.3 million people between 15-59 years
- 10% unemployment rate compared to national average rate of about 5.1%

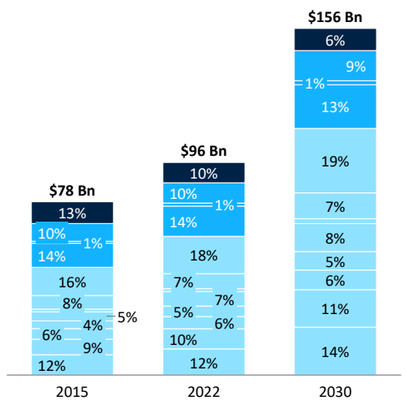
Source: Census 2011, CMIE, UDISE 2021, Economic Review by government of Kerala

Illustration 64 | Kerala: Socio-demographic Snapshot

Economic Snapshot

Kerala's economy is predominantly services-led, with a GSDP of $96 billion, growing only at a CAGR of four percent over the last seven years. The state's largest five districts account for 50 percent of the state's GDP.

Gross State Value Added by Economic Activity



		CAGR 2015-22	CAGR 2022-30
Primary Sector	Agriculture, Forestry and Fishing	-1%	1%
Secondary Sector	Manufacturing	2%	6%
	Electricity, Gas and Water Supply	6%	4%
	Construction	3%	5%
Tertiary Sector	Wholesale and Retail Trade	4%	8%
	Transportation and Storage	1%	8%
	Accommodation and Food Services	0%	9%
	Information and Communication	7%	10%
	Financial and Insurance Activities	4%	9%
	Real Estate Activities	2%	7%
	Education and Health	4%	9%
	Other Services	4%	9%

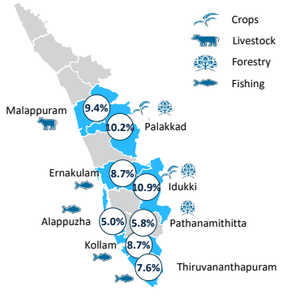
Illustration 65 | Kerala: Economic Snapshot

Economy by Districts

- Plantation crops drive the primary sector
- Secondary sector is driven by cottage industry, with an emerging textiles sector
- Tourism is a prominent component of the tertiary sector
- Ernakulam's robust IT infrastructure, especially around Infopark in Kochi, makes it poised for growth in the IT hardware and electronics sector, while Palakkad and Alappuzha's food processing industries could see expansion under the PLI food products category.

Primary Sector

Agriculture, Forestry and Fishing

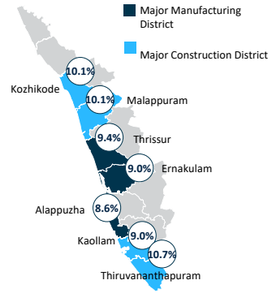


XX % Contribution to GSVA for Primary Sector

- **Primary sector** contributes to only 10% of state GDP
- **Agriculture** accounts for 50% of the GSDP in Wayanad, Pathanamthitta and Idukki
- 75% of cropped area is covered by plantation crops (Coconut, rubber, cardamom, rice)
- **Fisheries:** Kollam, Ernakulam

Secondary Sector

Manufacturing and Construction

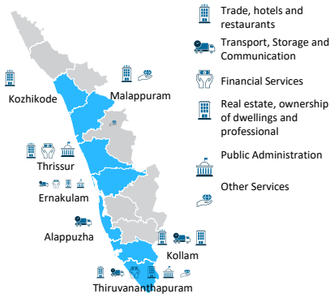


XX % Contribution to GSVA for Secondary Sector

- **Manufacturing** contributes to 25% of state's GVA
- **Coir, marine products:** Alappuzha
- **Tiles:** Thrissur
- **Upcoming industries:** technical textile, seafood and marine processing

Tertiary Sector

Services



XX % Contribution to GSVA for Tertiary Sector

- **Service sector** accounts of 65% of state's GVA vs. national average of 52%
- **Key sectors:** Trade, tourism, real estate make 20% of state GSDP.
- **Other sectors:** Healthcare, banking, education

Source: Real Gross Value Added, at constant value (2015), MOSPI, GoI; Oxford Economics Estimates
1. Real Gross Domestic Product, 2022 at constant value (2015), MOSPI, GoI; Oxford Economics Estimates

Illustration 66 | Kerala: Economy by districts

30+ Industrial Parks Across Kerala Likely to Drive Employment and Skill Demand

- 10 upcoming Mega projects expected to create 60K direct employment with focus on sectors such as marine and food processing, textiles, general engineering, rubber, and wood products etc.
- 50 percent of total MSME employment comes from agro-based and textile-based MSMEs

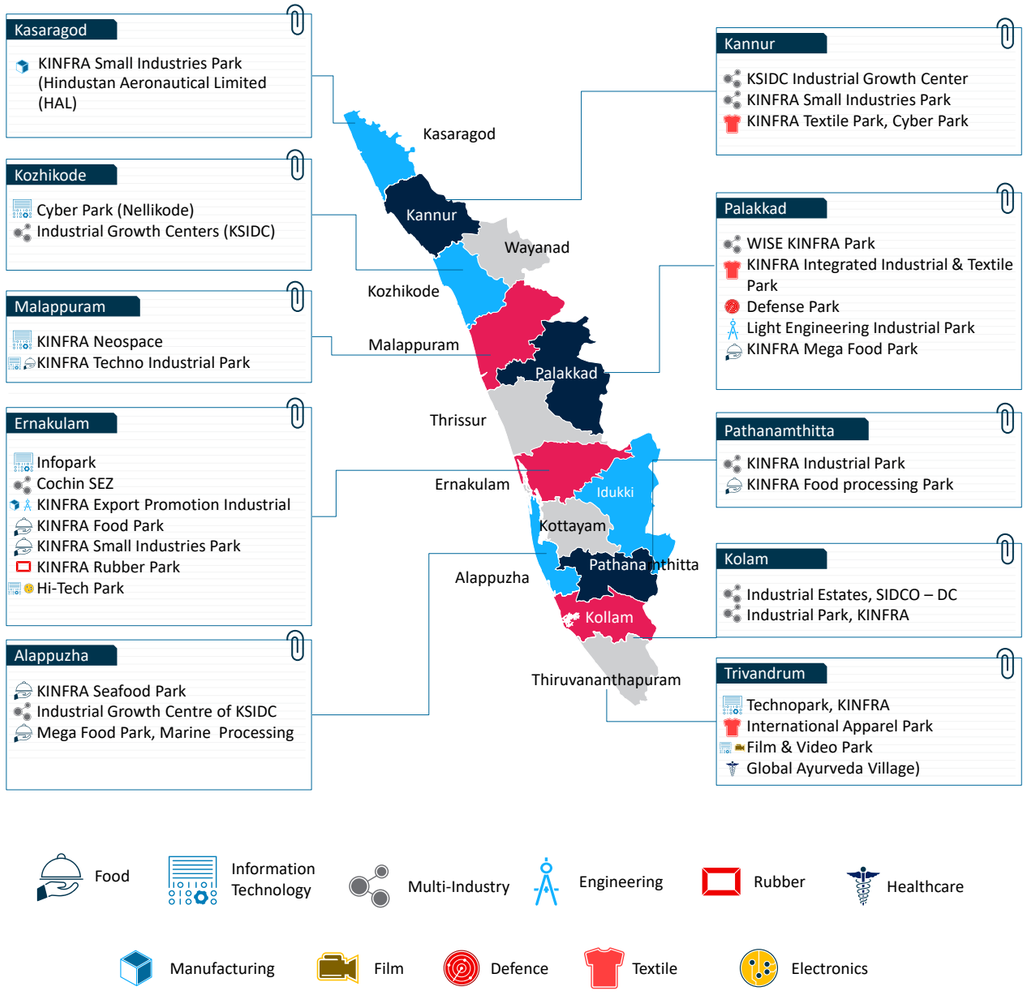


Illustration 67 | Kerala: Industrial Parks and employment hubs

Employment Snapshot and Expected Growth Areas

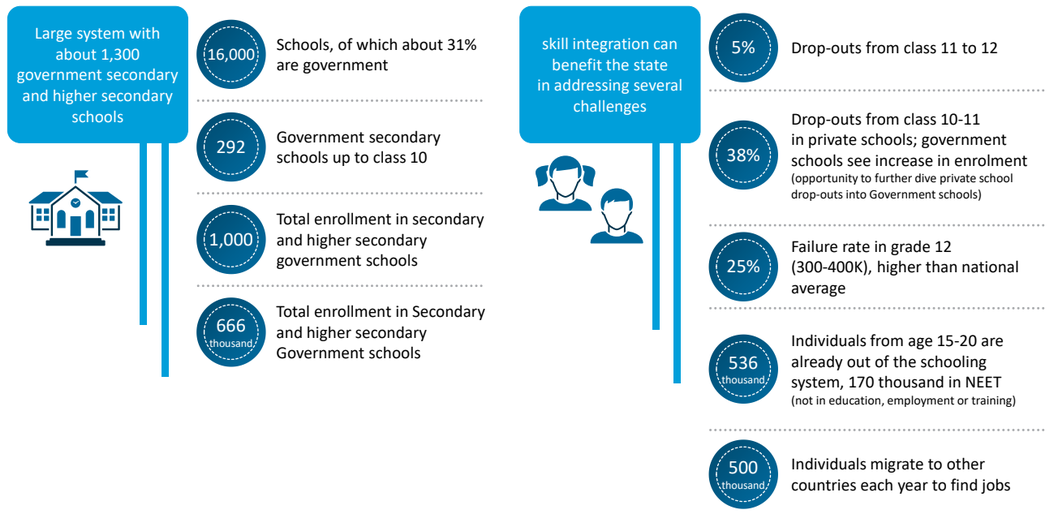
Overall, 670 thousand additional employment to be created in the state by 2030 i.e., five percent increase in labor demand; rapid growth expected in tertiary sector activities

- 90 percent of the workforce employed: 18 percent from primary, 27 percent from secondary, 45 percent from service
- 87 percent employment of workforce in unorganized sector: 30 percent skilled, 38 percent self-employed, 32 percent salaried
- 50 percent of the incremental 670K demand from top three districts
- Secondary sector employment demand driven by Construction and Building activities

Unit: thousand persons[1]	Employment Demand 2021	Employment Demand 2030	Incremental Demand[2]	Growth %2021-30
Agriculture, Forestry, and Fishing	9,096	7,877	(1,218)	-13%
Mining and Quarrying	21	18	(4)	-17%
Manufacturing	1,145	1,137	(8)	-1%
Electricity, Gas and Water Supply	91	107	16	18%
Building and Construction	2,099	2,477	378	18%
Wholesale and Retail Trade	1,060	1,235	175	16%
Transportation and Storage	1,020	1,193	173	17%
Accommodation and Food Service Activities	125	158	33	26%
Information and Communication	350	489	138	39%
Financial, Real Estate and Professional Services	501	774	272	54%
Public Administration	621	909	288	46%
Education and Health	1,149	1,572	424	37%
Other Services	487	711	223	46%
Net Total	**17,278**	**17,946**	**667**	**5%**

Context of school education in Kerala

Large system with 16.5 thousand schools that can benefit from Skill Education integration to reduce higher secondary drop-out as well as failure rates, and support those in the age group of 15-20 seeking employment.



Source: Census 2011, PLFS 2020, Oxford Economics, Internal Analysis Refer to appendix for detailed methodology; UDISE 2020-2021
1. Includes main and marginal workers
2. Incremental demand calculated by subtracting 2030 demand projections from 2021 projections

Illustration 68 | Kerala: School Education Landscape

Status of Skill Education in Kerala

There are two modes for delivery of skill education in schools in Kerala – VHSE (Vocational Higher Secondary Schools) and THS/THSS (Technical High Schools and Higher Secondary Schools).

VHSE comes under the Directorate of General Education, Kerala (detailed further below) whereas THS/ THSS comes under the Department of Technical Education.

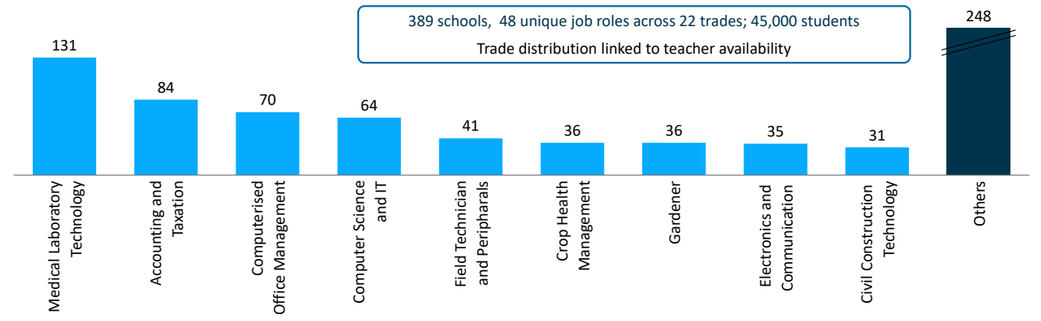
- VHSE offer skill education courses only for grades 11th-12th (negligible skill education offering in Kerala in grades ninth-tenth)
- Skill education teachers are permanent employees with a specific skill set, unlike other states[1] - hence choice of trades offered in schools is determined basis available teacher skills.

Details of the VHSE Offering Are Further Described Below.

Only 11% students enrolled in skill education in schools today

State Education Landscape	**11%** Secondary schools and higher secondary schools offering SE (294)	**3%** Students enrolled in SE (41 thousand)	**149** Government ITI 23,000 enrollment (155 per ITI)	**314** Private ITI 11,000 enrollment (35 per ITI)
National Benchmarks	**100%** Schools to offer SE as per NEP by 2030	**50%** Students to have access to SE as per NEP by 2025	**4%** National average student enrollment in SE today	

Skill education offered only in 11-12th



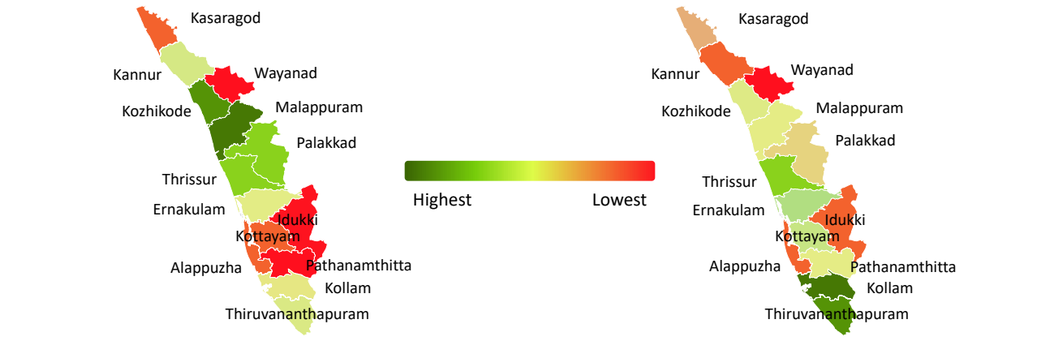
Source: UDISE+2021-2022, PLFS 2020-21, DGIT 2022, Data shared by State Education Dep, Projections from Oxford Economics
1. Note: "Others" includes 10 trades with 20-30 schools each

Illustration 69 | Kerala: Enrollment in SE - total and by trades

Presence of Skill Education Schools in the State Not Found to Be In-Line with Overall Distribution of Secondary Grades Enrollment

Government and government aided student enrollment in 9-12th, AY 2022-23

Number of skill education higher secondary schools, AY 2022-23



- Commercially active districts with high enrollment such as Malappuram, Kannur and Kozhikode do not have enough VHSS
- Kollam has the highest number of VHSS (52), despite limited enrollment and industrial activity

Source: Dept of General Education, Kerala; Internal Analysis; Press search

Illustration 70 | Kerala: Distribution of secondary enrollment vs. skill education schools

Potential Future Focus Areas for Skill Development in Kerala

Secondary research was done to understand the demand for skills in different sectors across all the different districts in Kerala. In terms of overall sectoral trends, key focus areas for jobs and skill development include:

- IT sector, which is likely to see 45 percent increase in labor requirement over the next 10 years
- Traditional industries, such as coir and coir products manufacturing, handicrafts and handloom, khadi and village industries, cashew industry etc. which together employ about 1.7 million people and will grow
- Service sectors such as BFSI, retail, repair, and tourism which will also witness a 35-45 percent increase in labor requirement
- Income enhancement and skilled employment opportunity in the agriculture and allied sectors to enable modern agriculture practices to be adopted.

State Skilling Snapshot | Clear Opportunity to Expand Skilling Capacity in Line with Demand

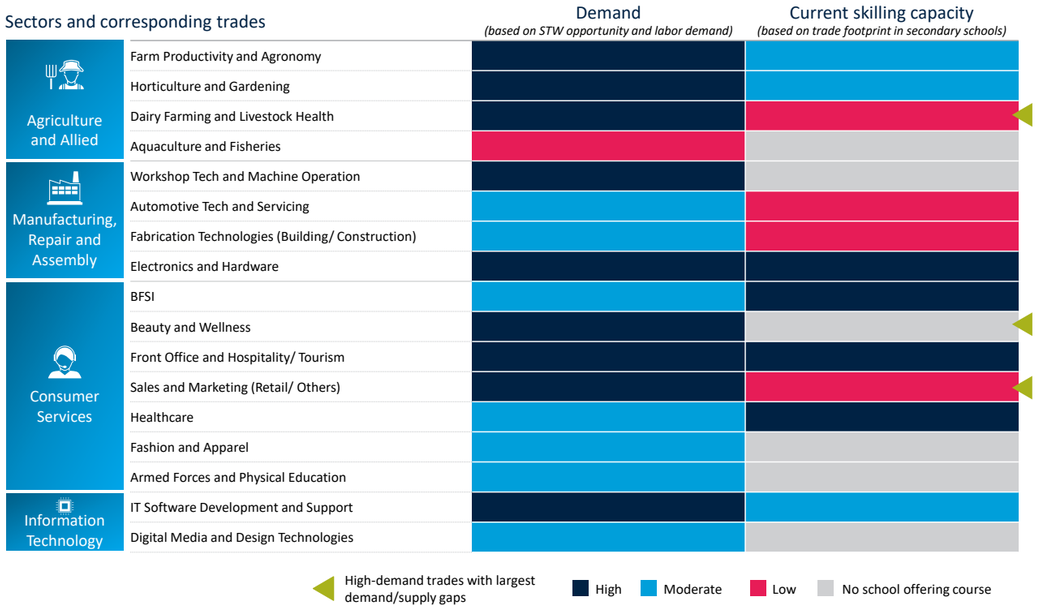


Illustration 71 | Kerala State overall skilling snapshot (demand vs. supply)

Need to Better Match the SE Capacity with Skill Demand Basis Local Economy as Expansion of SE Is Planned

Secondary research was undertaken to assess if available skilling capacity in a given district is in line with the demand for skills based on the local economy. An example for Kollam district is illustrated below which indicates significant mismatch.

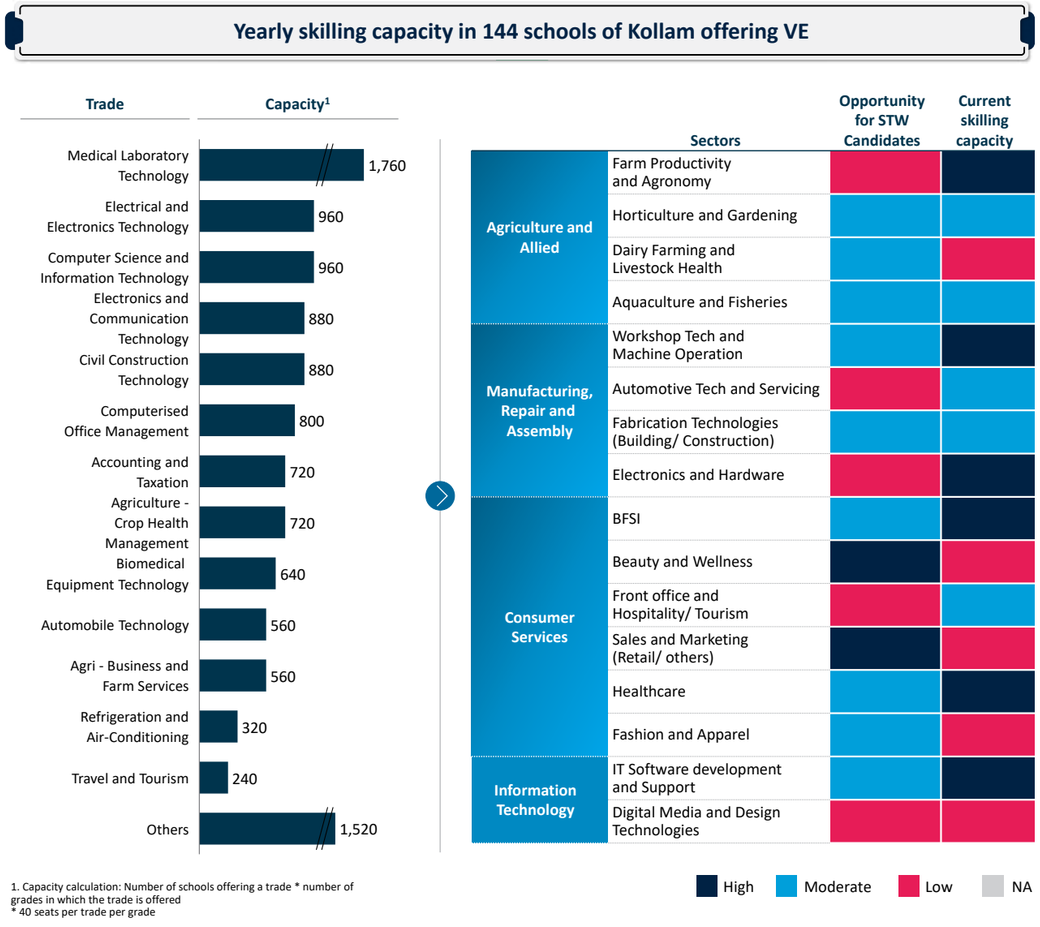


Illustration 72 | Illustration of demand-supply mismatch for Kollam

The above analysis for Kollam & other districts below was conducted basis secondary research. This must hence be further validated by states themselves and then leveraged to determine each district's desired future trade-mix.

Sector and trade categories		Malappuram		Ernakulam		Trivandrum		Kozhikode		Thrissur	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	Low	High	Low	High	Low	High	Moderate	Moderate	Moderate	High
	Horticulture and Gardening	Low	High	Low	Moderate	Low	Moderate	Low	Moderate	Moderate	Moderate
	Dairy Farming and Livestock Health	Moderate	Moderate	Moderate		Moderate	Moderate	Moderate	Moderate	Low	Moderate
	Aquaculture and Fisheries	Moderate	Low	Moderate	High	Moderate	High	Moderate	Moderate	Low	Moderate
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	High	Moderate	High	Low	High	Moderate	Low	High	High	Low
	Automotive Tech and Servicing	Moderate	Moderate	High	Low	Moderate		High	Low	High	Low
	Fabrication Technologies (Building/ Construction)	Moderate	Low	High	Low	Moderate	Moderate	High	Low	High	Low
	Electronics and Hardware	Moderate	High	High	High	Moderate	High	Moderate	High	Moderate	High
Consumer Business and Services	BFSI	Moderate	High	High	High	High	High	Moderate	High	High	High
	Beauty and Wellness	High		High		High	Moderate	High		High	Low
	Front Office and Hospitality/ Tourism	Moderate	Low	High	Moderate	High	High	Moderate	Low	High	Moderate
	Sales and Marketing (Retail/ others)	High		High		High		High	Moderate	High	
	Healthcare	High	High	High	High	High	High	Moderate	High	High	High
	Fashion and Apparel	Moderate	Low	High	Moderate	High	Low	Moderate	Low	High	Low
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities									
Information Technology	IT Software Development and Support	Moderate	Moderate	High	Moderate	High	Moderate	High	High	High	High
	Digital Media and Design Technologies	Low	Low	High	Moderate	High	Low	High	High	Moderate	Moderate

High Moderate Low No school offering course

Sector and trade categories		Palakkad		Kollam		Kannur		Alappuzha		Kottayam	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	High	High	Low	High	Moderate		Moderate	High	High	High
	Horticulture and Gardening	High	High	Moderate	Moderate	Moderate	High	Moderate	High	High	Moderate
	Dairy Farming and Livestock Health	Low	High	Moderate	Low	Moderate	Moderate	Moderate	Low	Moderate	Moderate
	Aquaculture and Fisheries	Low	Low	Moderate	Moderate	Low	Moderate	High	Low	Moderate	Low
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	High	Moderate	Moderate	High	Low	Low	Moderate	Low	Moderate	Low
	Automotive Tech and Servicing	Moderate	Low	Low	Moderate	Low	Low	Moderate	High	High	
	Fabrication Technologies (Building/ Construction)	High	Low	Moderate	Moderate	High	Low	Moderate	High	Moderate	Low
	Electronics and Hardware	High	High	Low	High	Low	High	Moderate	Low	Low	High
Consumer Business and Services	BFSI	Moderate	High	Moderate	High	Moderate	High	Moderate	High	Moderate	High
	Beauty and Wellness	Moderate		High		Moderate	Moderate	High		High	
	Front Office and Hospitality/ Tourism	Moderate	Moderate	Low	Moderate	Moderate		High	Moderate	Moderate	Moderate
	Sales and Marketing (Retail/ others)	Moderate	Low	High	Low	High		Moderate	High	Moderate	
	Healthcare	High	High	Moderate	High	High	High	High	Low	Moderate	High
	Fashion and Apparel	High		Moderate	Low	High	Moderate	High		Moderate	
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities									
Information Technology	IT Software Development and Support	Moderate	High	Moderate	High	High	High	Moderate	High	Moderate	Moderate
	Digital Media and Design Technologies	Moderate		Low	Low	Moderate	Low	Moderate		Low	Moderate

High Moderate Low No school offering course

Sector and trade categories		Kasaragod		Pathanamthitta		Idukki		Wayanad	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	Low	Low	Moderate	High	Moderate	High	High	High
	Horticulture and Gardening	Moderate	High	Low		High	High	Low	High
	Dairy Farming and Livestock Health	Low	Moderate	Moderate	Moderate	Moderate		Low	High
	Aquaculture and Fisheries	Moderate	Low	Low		Low		Low	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	Moderate	Low	High	High	High	High	Moderate	
	Automotive Tech and Servicing	Low		Low	Low	Low	Low	Low	
	Fabrication Technologies (Building/ Construction)	Moderate		Low	Moderate	Low	Low	Low	
	Electronics and Hardware	Low	High	High	High	Low	High	Moderate	High
Consumer Business and Services	BFSI	Low	High	Moderate	High	Low	High	Low	Low
	Beauty and Wellness	Moderate		Moderate		Low		Low	
	Front Office and Hospitality/ Tourism	Low	Moderate	Low	Low	High		High	
	Sales and Marketing (Retail/ others)	Moderate		Moderate	High	Low		Low	
	Healthcare	Low	High	Low	High	Low	Moderate	Low	High
	Fashion and Apparel	High	Low	High	Low	Moderate	Moderate	Moderate	
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	Moderate	High	Moderate	High	Moderate	Moderate	Moderate	Moderate
	Digital Media and Design Technologies	Low		Low	Low	Low		Low	Low

High Moderate Low No school offering course

Illustration 73 | Kerala: District-wise view of demand vs. current skilling capacity

Potential Next Steps for Kerela

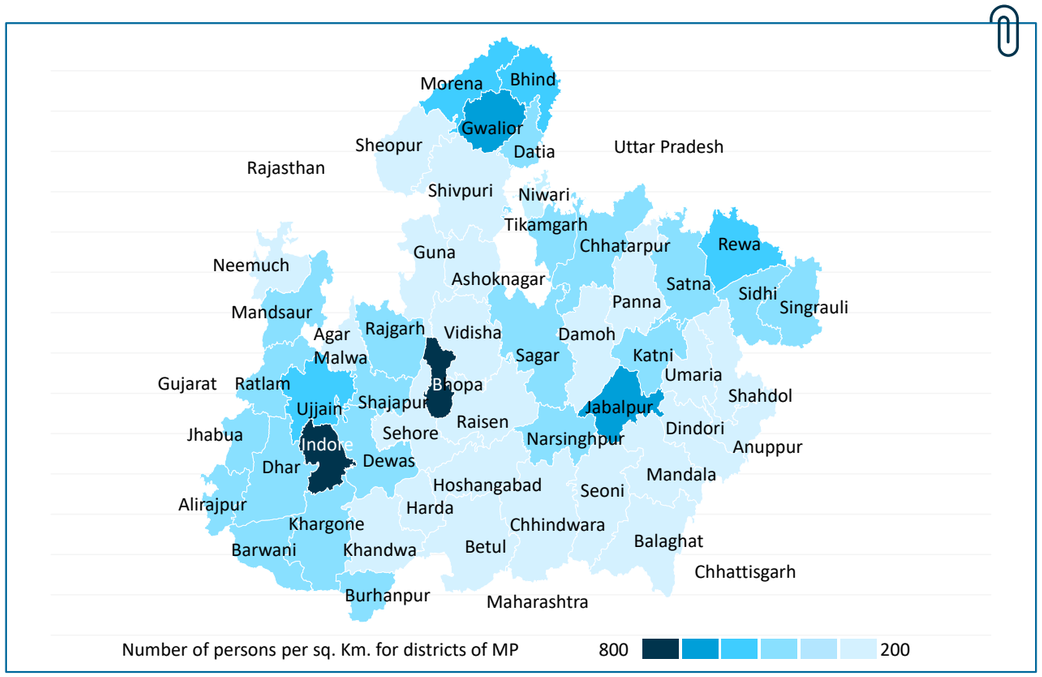
- Build a three to five year plan to **expand the supply of skill education** from 11 percent or 294 schools to up to 30 percent or about 800 secondary/ higher secondary schools across districts
- In parallel, plan to ensure 100 percent of the secondary schools (or about 2600+ schools) offer employability skill-related courses over the next few years (in line with NEP goals)
- **Direct effort towards building capabilities around key trades** for each district such as Workshop tech and machine operation/ Automotive tech and servicing in Ernakulam, Beauty and wellness in Thrissur and Kollam among others (*refer to district-wise trade recommendation included as part of this chapter)*
- **Validate and finalize priority trades in collaboration with DEO/BEO and local industry officials** to ensure alignment with local industry needs, map trades school by school with district consultations
- **Collaborate with the State Board to accommodate revamped trade subjects and strengthen assessments**
- **Onboard knowledge partners as necessary to build out new trade curricula, support with training of teachers, assessments planning etc.**; in parallel, plan for hiring of teachers with the required qualifications and setting up labs
- **Prepare budget estimates for the plan** and enable availability of funds via existing state and central mechanisms (e.g., STARs budget, state budget etc.)

4.3.3 Skill Gap Assessment: Madhya Pradesh

Economy Overview and Imperatives for School-to-Work

Socio-demographic Snapshot

Madhya Pradesh is a landlocked state with a large, marginalized population.



Centrally located landlocked state

- Population: 78 million (72% reside in rural)
- 25% of area under forest cover, specifically in south-east region (larger than any other state)

… with a significant socially or economically marginalized population

- Nearly one-third is from scheduled tribes or castes
- Approximately 23 million people (32%) live below poverty line
- Approximately six million (8%) belong to tribal or live in remote regions

… and substantial working age population

- Approximately 35 million people between 15-59 years (50%)
- 3% unemployment rate compared to national average rate of about 5.1%

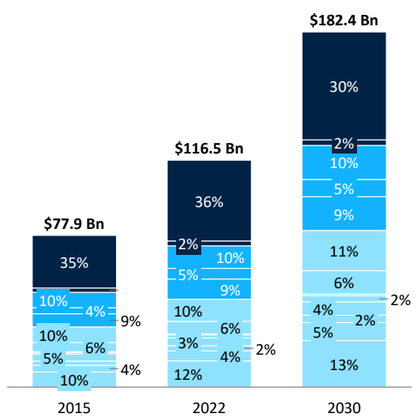
Source: Census 2011, UDISE 2021, Planning Commission Poverty Estimates, 2011–2012, Statistical profile of Scheduled Tribes in `India, 2013

Illustration 74 | Madhya Pradesh: Socio-demographic Snapshot

Economic Snapshot

Madhya Pradesh has an agriculture-led $116 billion[1] state economy growing steadily at six percent CAGR

Gross State Value Added by Economic Activity



		CAGR 2015-22	CAGR 2022-30
Primary Sector	Agriculture, Forestry and Fishing	6%	4%
	Mining and Quarrying	2%	2%
Secondary Sector	Manufacturing	5%	6%
	Electricity, Gas and Water Supply	8%	7%
	Construction	7%	8%
Tertiary Sector	Wholesale and Retail Trade	5%	9%
	Transportation and Storage	4%	9%
	Accommodation and Food Services	0%	9%
	Information and Communication	11%	10%
	Financial and Insurance Activities	2%	8%
	Real Estate Activities	3%	6%
	Education and Health	6%	9%
	Other Services	8%	9%

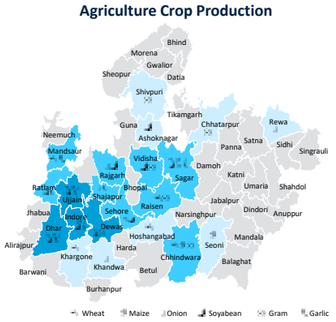
Illustration 75 | Madhya Pradesh: Economic Snapshot

Economy by Districts

- Agriculture is dominant across districts in MP
- Manufacturing and Services focused around five main industrial and commercial hubs
- Indore and Dewas, with their strong industrial foundations and an added push via PLI, are set for growth in textiles, pharmaceuticals, and food processing, while Bhopal holds potential in the IT hardware and electronics manufacturing sectors.

Primary Sector

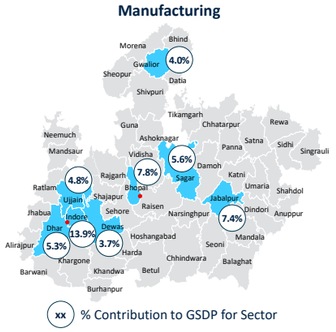
Agriculture Crop Production



- Contributes to 38% of state GVA vs. 20% national average
- **Crop production:** Makes 45% of state GDP
- **Milk production:** Third largest producer of milk
- Mining: Diamond, copper, manganese, coal, limestone

Secondary Sector

Manufacturing

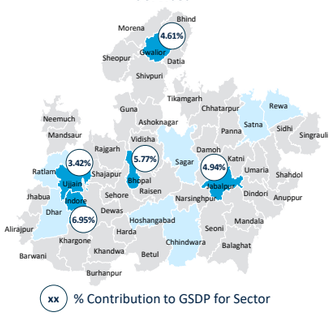


xx % Contribution to GSDP for Sector

- **Major industrial hubs:** Bhopal, Gwalior, Indore, Jabalpur, Ujjain (Largely driven by Pithampur and Mandideep)
- **Major sub-sectors:** Food-processing, textile, auto and auto components, pharma, plastic products, engineering products

Tertiary Sector

Services



xx % Contribution to GSDP for Sector

- Contributes to 40% of state GVA
- IT, Tourism, Retail and wholesale trade driving the services sector in the 5 major commercial hubs (Bhopal, Gwalior, Indore, Jabalpur, Ujjain)

Source: Real Gross Value Added, at constant value (2015), MOSPI, GoI; Oxford Economics Estimates; India Agriculture Survey 2019-20, DA&FW; Department of Planning, Statistics and Economics, MP

1. Real Gross Domestic Product, 2022 at constant value (2015), MOSPI, GoI; Oxford Economics Estimates

Illustration 76 | Madhya Pradesh: Economy by districts

110+ Industrial Parks Primarily in Food Processing, Electronics, Textiles, and Information Technology; Likely to Drive Employment and Skill Demand

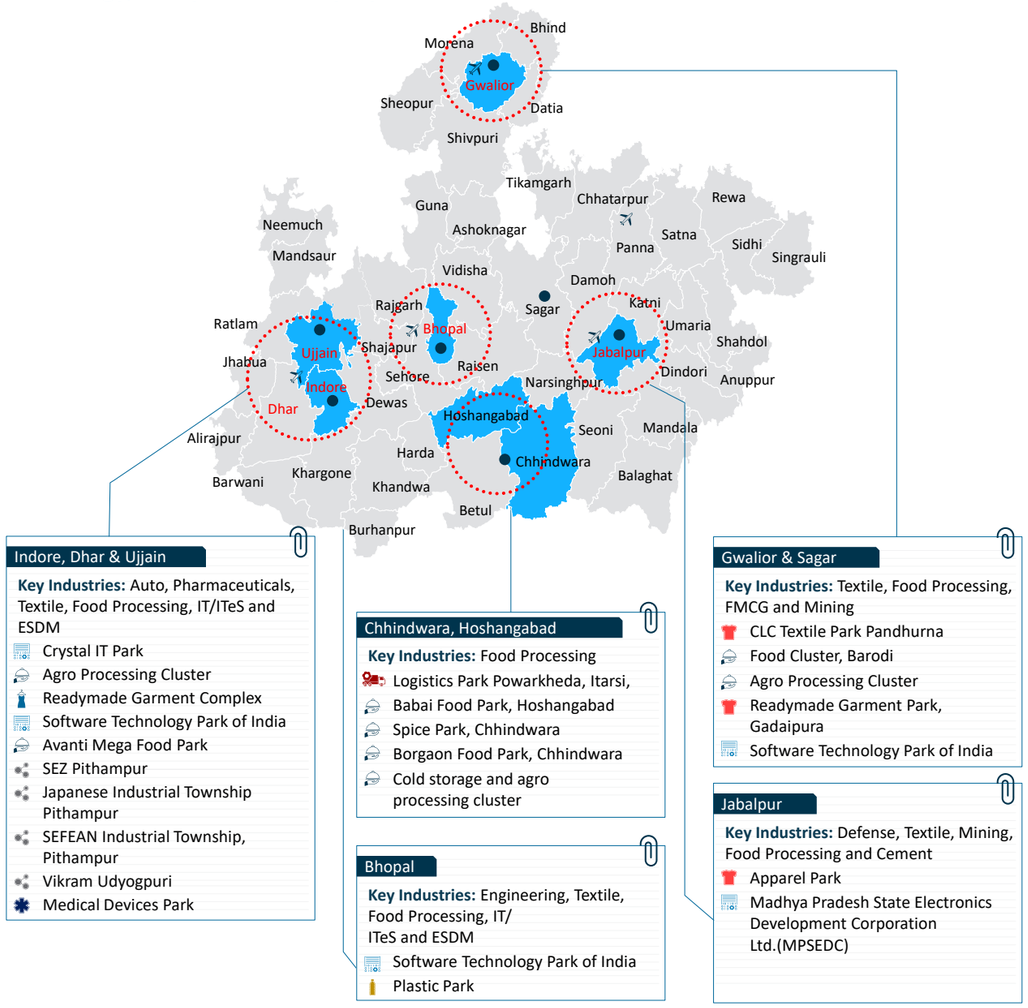


Illustration 77 | Madhya Pradesh: Industrial Parks and employment hubs

Source: Press Search, Internal Analysis

Employment Snapshot and Expected Growth Areas

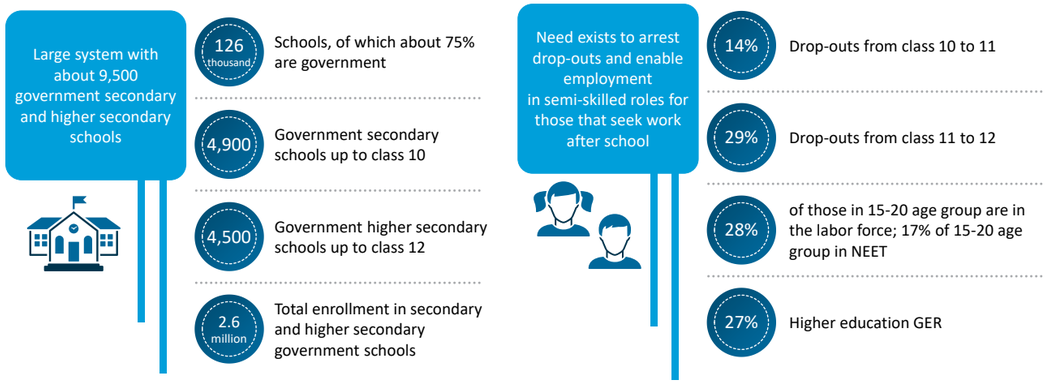
Overall, incremental employment demand of 7.3 million (20+ percent increase in labor demand) by 2030, driven by the manufacturing sector.

- 50 percent of incremental demand to come from top 10 districts
- The services sector is also expected to experience a growth of 35-50 percent in labor demand
- Agriculture sector is projected to continue to employ around 60 percent of the state's population

Unit: thousand persons[1]	Employment Demand 2021	Employment Demand 2030	Incremental Demand[2]	Growth % 2021-30
Agriculture, Forestry, and Fishing	28,453	29,273	820	3%
Mining and Quarrying	503	788	285	57%
Manufacturing	5,137	6,956	1,819	35%
Electricity, Gas and Water Supply	446	587	141	32%
Building and Construction	1,776	1,877	101	6%
Wholesale and Retail Trade	1,632	2,367	735	45%
Transportation and Storage	728	958	230	32%
Accommodation and Food Service Activities	120	166	46	38%
Information and Communication	92	124	32	35%
Financial, Real Estate and Professional Services	345	465	120	35%
Public Administration	1,445	1,975	530	37%
Education and Health	1,192	1,823	631	53%
Other Services	3,597	5,439	1,842	51%
Net Total	45,465	52,798	7332	21%

Context of School Education in Madhya Pradesh

Large system with 132 thousand schools that can benefit from Skill Education integration to prevent dropouts as well as provide better employment.



Source: Census 2011, PLFS 2020, Oxford Economics. Refer to appendix for detailed methodology; UDISE 2021-22
1. Includes main and marginal workers
2. Incremental demand calculated by subtracting 2030 demand projections from 2021 projections

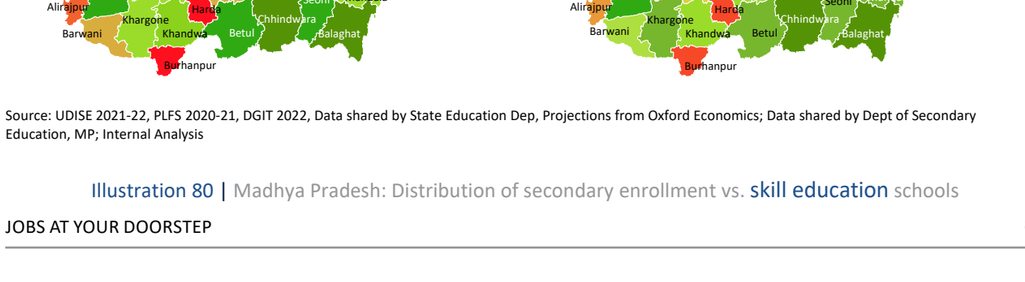
Illustration 78 | Madhya Pradesh: School Education Landscape

Current Status of SE Indicates Lower Penetration as Compared to National Average

Only 8% students enrolled in skill education in schools today

State Education Landscape	**12%** Secondary schools and higher secondary schools offering skill education (1,195)	**8%** Students enrolled in skill education (208 thousand)	**195** Government ITI: About 29,000 enrollment (149 per ITI)	**882** Private ITI 40,000 enrollment (45 per ITI)
National Benchmarks	**100%** Schools to offer skill education as per NEP by 2030	**50%** Students to have access to skill education as per NEP by 2025	**4%** National average student enrollment in skill education today	

60% enrollment concentrated in two trades - IT and Beauty



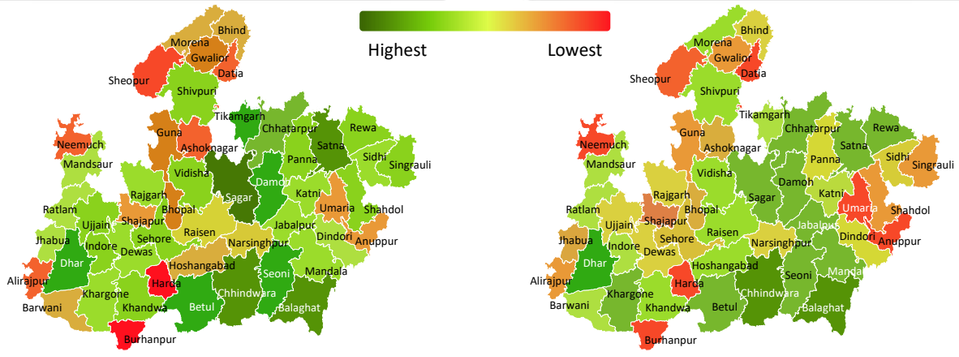
Source: Data shared by Dept of Secondary Education, MP; Internal Analysis

Illustration 79 | Madhya Pradesh: Enrollment in SE - total and by trades

Distribution of Skill Education Schools in the State Found to Be In-Line with Overall Distribution of Secondary Grades Enrollment

Government student enrollment in 9-12th, AY 2022-23

Number of skill education schools, AY 2022-23



Source: UDISE 2021-22, PLFS 2020-21, DGIT 2022, Data shared by State Education Dep, Projections from Oxford Economics; Data shared by Dept of Secondary Education, MP; Internal Analysis

Illustration 80 | Madhya Pradesh: Distribution of secondary enrollment vs. skill education schools

State Skilling Snapshot | Clear Opportunity to Expand Skilling Capacity in Line with Demand

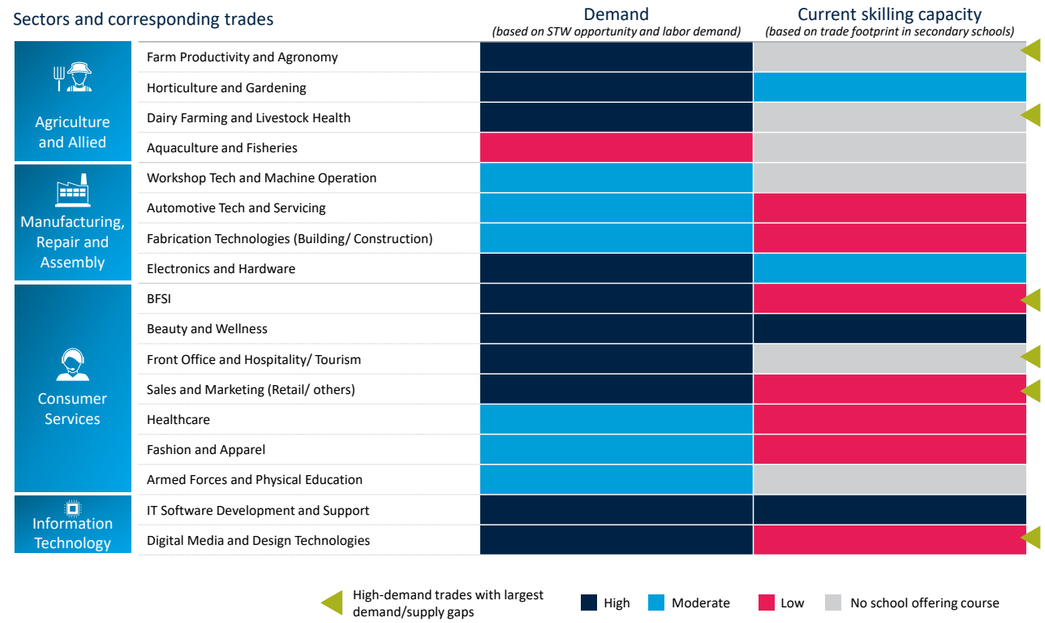
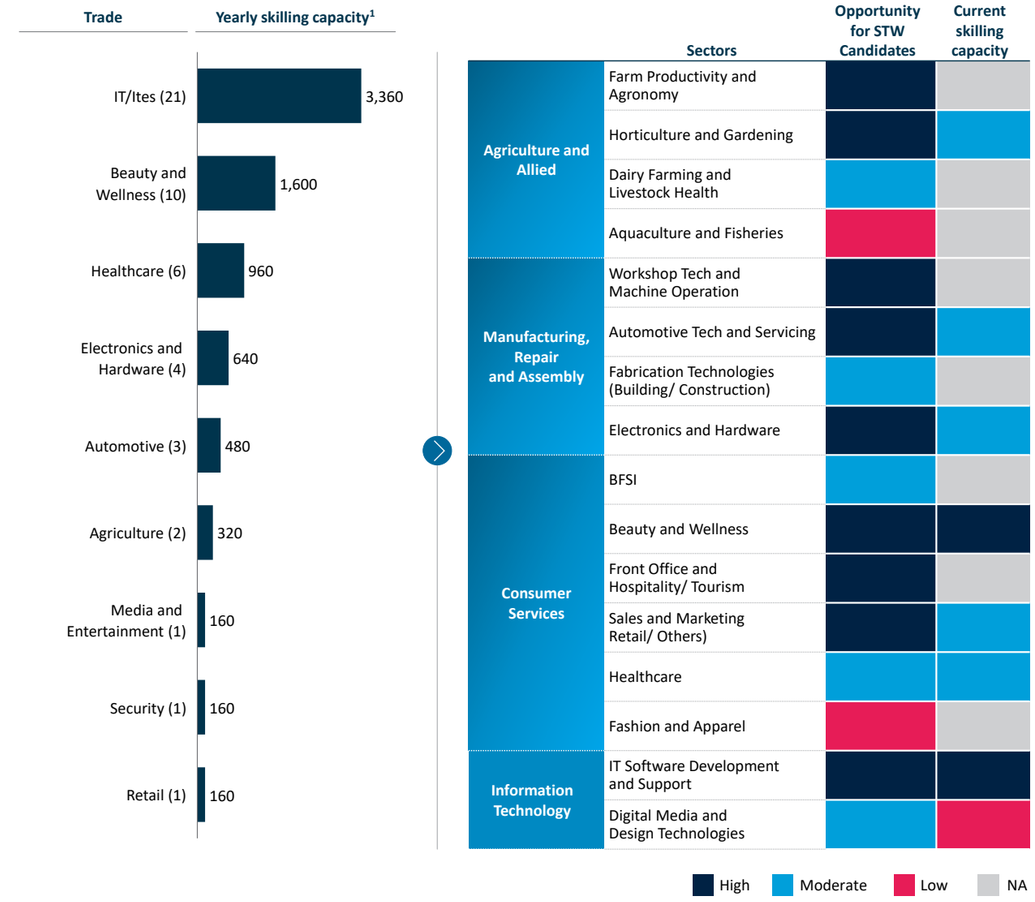


Illustration 81 | Madhya Pradesh State overall skilling snapshot (demand vs. supply)

However, a Significant Mismatch Is Observed Between the Current Skilling Offering and Local Demand as Illustrated in the Example for Indore Below:

Yearly skilling capacity under SS for all trades vs. likely demand in Indore



1. Calculation: no of schools offering a trade * no of grades in which the trade is offered * 40 seats per trade per grade
Source: Dept of School Education, MP; Internal Analysis

Illustration 82 | Illustration of demand-supply mismatch for Indore

The above analysis for Indore was conducted basis primary research in the district and conversations with industry present in the districts, visits to MSMEs, shopfloors, retail shops, farms etc. A similar view has been created across all districts of the state as well, however, based on secondary research alone. This must hence be further validated by states themselves and then leveraged to determine each district's desired future trade-mix.

Sector and trade categories		Sheopur		Morena		Bhind		Gwalior		Datia	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	Moderate		High		Moderate		High		Moderate	
	Horticulture and Gardening	Moderate		Low		Low		Moderate	Low	Low	Low
	Dairy Farming and Livestock Health	High		High		High		High		Moderate	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	Moderate		High		High		High		Low	
	Automotive Tech and Servicing	Low		High		Low		Moderate		Moderate	
	Fabrication Technologies (Building/ Construction)	Moderate		Moderate		Moderate	Low	Moderate		Low	
	Electronics and Hardware	Low	Moderate	High	High	High	Moderate	High	Moderate	Low	Moderate
Consumer Business and Services	BFSI	Low		Moderate		Moderate	Low	High		High	Low
	Beauty and Wellness	Moderate	Moderate	High	Moderate	High	High	High	Moderate	High	High
	Front Office and Hospitality/ Tourism	Moderate	Low	Moderate	Low	Moderate	Moderate	High	Low	High	Low
	Sales and Marketing (Retail/ Others)	Moderate		Moderate	Low	Moderate		High	Low	Moderate	Low
	Healthcare	Low	Moderate	High	Low	Moderate	Moderate	High	Moderate	Low	Moderate
	Fashion and Apparel	Moderate	Low	High	Moderate	High	Moderate	High		High	
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities									
Information Technology	IT Software Development and Support	Moderate	High	High	High	Moderate	High	High	High	Moderate	High
	Digital Media and Design Technologies	Low		Moderate		Moderate		Moderate	Low	Low	

High Moderate Low No school offering course

Sector and trade categories		Shivpuri		Guna		Ashoknagar		Tikamgarh		Chhatarpur	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	High		High		High		High		High	
	Horticulture and Gardening	Moderate	Moderate	High	High	Moderate	Moderate	Moderate	Low	Moderate	Moderate
	Dairy Farming and Livestock Health	High		Moderate		Low		High		Moderate	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	Moderate		Moderate		Low		High		Moderate	
	Automotive Tech and Servicing	Moderate		Low		Low		Low		Low	
	Fabrication Technologies (Building/ Construction)	Moderate	Low	Moderate		Moderate		Low	Moderate	Moderate	Low
	Electronics and Hardware	High	Moderate	Moderate	Moderate	Low	Moderate	Moderate	Low	High	Moderate
Consumer Business and Services	BFSI	Moderate		Moderate	Low	Low	Low	Low		Moderate	Moderate
	Beauty and Wellness	Moderate	Moderate	High	High	Moderate	High	Moderate	Moderate	Moderate	Moderate
	Front Office and Hospitality/ Tourism	High	Low	Moderate	Low	High		Moderate	Low	Moderate	Low
	Sales and Marketing (Retail/ Others)	Moderate		Moderate	Low	Moderate		Moderate		Moderate	Low
	Healthcare	Moderate	Moderate	Low	Moderate	Moderate		Low	Moderate	Moderate	Low
	Fashion and Apparel	High	Moderate	High		Moderate		Moderate	Low	High	
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities									
Information Technology	IT Software Development and Support	High	High	High	High	Moderate	High	High	High	High	High
	Digital Media and Design Technologies	Moderate		Moderate		Low		Low	Low	Moderate	

High Moderate Low No school offering course

Sector and trade categories		Panna		Sagar		Damoh		Satna		Rewa	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	Moderate		High		High		High		High	
	Horticulture and Gardening	Low	Moderate	Moderate	Moderate	Low	Low	Moderate	Low	Moderate	Moderate
	Dairy Farming and Livestock Health	Moderate		Moderate		Moderate		High		High	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	High		Moderate		High		High		High	
	Automotive Tech and Servicing	Low		Moderate	Low	Low		High		Moderate	Low
	Fabrication Technologies (Building/ Construction)	High	Low	Moderate		Low		Moderate	Low	Moderate	Low
	Electronics and Hardware	Low	High	High	Moderate	Moderate	High	High	Moderate	High	Moderate
Consumer Business and Services	BFSI	Low		High	Low	Moderate	Moderate	High		High	
	Beauty and Wellness	Low	High	High	High	High	Moderate	High	Moderate	Moderate	Moderate
	Front Office and Hospitality/ Tourism	High	Low	Moderate	Low	Moderate	Low	High	Low	Moderate	Low
	Sales and Marketing (Retail/ Others)	Low		High	Low	Moderate		Moderate	Moderate	Moderate	Low
	Healthcare	Low	Low	High	Moderate	Moderate	Moderate	High	Low	High	High
	Fashion and Apparel	Low	Low	High		Low		High	Moderate	Low	
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities									
Information Technology	IT Software Development and Support	Moderate	High	High	High	Moderate	High	High	High	High	High
	Digital Media and Design Technologies	Low		Moderate		Low		Moderate		Moderate	

High Moderate Low No school offering course

Sector and trade categories		Umaria		Shahdol		Anuppur		Siddhi		Singrauli	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	Low		Moderate		Low		Low		Low	
	Horticulture and Gardening	Low	Low	Low	High	Low	Low	Moderate	Moderate	Moderate	Low
	Dairy Farming and Livestock Health	Low		Low		Low		Moderate		Low	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	High		High		High		Moderate		High	
	Automotive Tech and Servicing	Low		Low		Low		Low		Moderate	
	Fabrication Technologies (Building/ Construction)	Moderate	Low	Low		Moderate		Moderate	Low	Moderate	
	Electronics and Hardware	Low	Low	Moderate	Moderate	Low	Moderate	Moderate	Low	Moderate	Moderate
Consumer Business and Services	BFSI	Low		Moderate		Low	High	Low		Moderate	
	Beauty and Wellness	Moderate	Moderate	High	Low	High	High	Moderate	High	High	Moderate
	Front Office and Hospitality/ Tourism	High	Low	Moderate	Low	High	Low	Moderate	Low	Moderate	Low
	Sales and Marketing (Retail/ Others)	Moderate	Low	Moderate	Moderate	High		Low		Moderate	Low
	Healthcare	Low	Moderate	Moderate		Low	Moderate	Moderate	Moderate	Moderate	Moderate
	Fashion and Apparel	Low		High	Low	Moderate		High	Low	Low	Low
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities									
Information Technology	IT Software Development and Support	Moderate	High	High	High	Moderate	Moderate	Moderate	High	High	High
	Digital Media and Design Technologies	Low		Moderate		Moderate		Low		Moderate	Low

High Moderate Low No school offering course

Sector and trade categories		Neemuch		Mandsaur		Ratlam		Ujjain		Shajapur	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	Low		High		High		High		High	
	Horticulture and Gardening	High	Low	High	Moderate	High	Moderate	High	Low	Moderate	Moderate
	Dairy Farming and Livestock Health	Moderate		Moderate		Moderate		High		High	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	Moderate		Moderate		High		High		High	
	Automotive Tech and Servicing	Low		Low		High		Moderate		High	
	Fabrication Technologies (Building/ Construction)	High		Moderate	Low	Moderate		High		Low	
	Electronics and Hardware	Low	Low	Moderate	Moderate	Moderate		High	Moderate	Moderate	
Consumer Business and Services	BFSI	Moderate		Moderate		High		High		Moderate	
	Beauty and Wellness	High	High	High	Low	High	Moderate	High	Moderate	High	Low
	Front Office and Hospitality/ Tourism	Moderate	Low	Moderate	Low	Moderate	Low	High	Low	Moderate	Low
	Sales and Marketing (Retail/ Others)	High		Moderate	Moderate	High		High	Low	Moderate	
	Healthcare	Low	Moderate	Moderate	High	Moderate	Moderate	High	Moderate	Moderate	Moderate
	Fashion and Apparel	High		High	Low	High	Low	High		Low	
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities									
Information Technology	IT Software Development and Support	Moderate	High	High	High	High	High	High	High	High	High
	Digital Media and Design Technologies	Moderate		Moderate	Low	Moderate		Moderate	Low	Moderate	

High Moderate Low No school offering course

Sector and trade categories		Dewas		Jhabua		Alirajpur		Dhar		Khargone	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	High		Moderate		Low		High		High	
	Horticulture and Gardening	Moderate	Moderate	Moderate	Low	Moderate	Low	High	Low	Moderate	Moderate
	Dairy Farming and Livestock Health	High		Low		Low		High		Moderate	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	High		Low		Moderate		High		High	
	Automotive Tech and Servicing	Moderate		Low		Low		High		Low	
	Fabrication Technologies (Building/ Construction)	High		Moderate		Moderate		Moderate		Moderate	
	Electronics and Hardware	Moderate	Moderate	Low	Moderate	Low	Low	High		High	Low
Consumer Business and Services	BFSI	High		Low		Low		High		High	
	Beauty and Wellness	High	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	High	Moderate
	Front Office and Hospitality/ Tourism	Moderate	Low	Moderate	Low	Moderate	Low	High	Low	High	Low
	Sales and Marketing (Retail/ Others)	High		Low	Moderate	Low		Moderate		High	
	Healthcare	Moderate	Moderate	High	Moderate	Moderate	High	High	Moderate	High	Moderate
	Fashion and Apparel	Low	Low	High		High		Low		Low	Low
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities									
Information Technology	IT Software Development and Support	High	High	Moderate	High	Moderate	High	High	High	High	High
	Digital Media and Design Technologies	Moderate		Low	Low	Low		Moderate		Low	Low

High Moderate Low No school offering course

Sector and trade categories		Barwani		Khandwa		Burhanpur		Rajgarh		Vidisha	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	Low		Moderate		Low		High		High	
	Horticulture and Gardening	High	Moderate	High	Moderate	High	Low	High	Low	Low	Moderate
	Dairy Farming and Livestock Health										
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	Moderate		Moderate		High		Moderate		High	
	Automotive Tech and Servicing	Low		Low		Low		Low		Low	
	Fabrication Technologies (Building/ Construction)	Low		Low	Low	Moderate	Low	Moderate	Low	Low	
	Electronics and Hardware	Moderate		Moderate	Moderate	Low	Low	Moderate	Moderate	Moderate	Moderate
Consumer Business and Services	BFSI	Moderate		Moderate		Low		Moderate		Moderate	
	Beauty and Wellness	Moderate	Moderate	High	Moderate	High	Low	Moderate	Moderate	High	High
	Front Office and Hospitality/ Tourism	Moderate	Low	High	Low	High	Low	High	Low	Moderate	Low
	Sales and Marketing (Retail/ Others)	Low	Low	Moderate	Moderate	High	Low	Moderate		Moderate	Low
	Healthcare	High	Moderate	Moderate	Moderate	Low	Moderate	High	Moderate	Moderate	Moderate
	Fashion and Apparel	High		Moderate		Low	Low	High	Moderate	Moderate	
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities									
Information Technology	IT Software Development and Support	Moderate	High	Moderate	High	High	High	High	High	High	High
	Digital Media and Design Technologies	Moderate		Moderate		Moderate		Low		Moderate	Low

High Moderate Low No school offering course

Sector and trade categories		Bhopal		Sehore		Raisen		Betul		Harda	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	Moderate		High		High		High		Moderate	
	Horticulture and Gardening	Low	Low	Moderate	Moderate	Low	Moderate	Low	Moderate	Low	Moderate
	Dairy Farming and Livestock Health	Moderate		High		Moderate		Moderate		Low	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	High		High		High		Moderate		High	
	Automotive Tech and Servicing	High	Low	Moderate	Low	Moderate		Low		Low	
	Fabrication Technologies (Building/ Construction)	High		Moderate	Low	Low	Low	Low	Low	Moderate	
	Electronics and Hardware	High	Moderate	Moderate	Low	Moderate	Low	High	High	High	
Consumer Business and Services	BFSI	High		High		High		Moderate		Low	
	Beauty and Wellness	High		High	Moderate	High	Moderate	High	High	High	Low
	Front Office and Hospitality/ Tourism	High	Low	High	Low	High	Low	Moderate	Low	Moderate	Low
	Sales and Marketing (Retail/ Others)	High	Moderate	Moderate	Low	Moderate		Moderate	Low	Low	Low
	Healthcare	Moderate	Moderate	Low	Moderate	Moderate	High	Moderate	Moderate	Moderate	Moderate
	Fashion and Apparel	High		Low	Moderate	Low	Moderate	Moderate		High	
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities									
Information Technology	IT Software Development and Support	High	High	High	High	High	High	Moderate	High	High	High
	Digital Media and Design Technologies	Moderate		Moderate	Low	Moderate	Low	Low		Low	

High Moderate Low No school offering course

Sector and trade categories		Hoshangabad		Katni		Jabalpur		Narsimhapur		Dindori	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	High		Moderate		High		Moderate		Moderate	
	Horticulture and Gardening	Low	Low	Moderate	Low	Moderate	Moderate	Low	Moderate	Low	
	Dairy Farming and Livestock Health	Low		Low		Low		Low		Low	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	High		High		High		High		Low	
	Automotive Tech and Servicing	Low		High		Moderate	Low	Moderate		Low	
	Fabrication Technologies (Building/ Construction)	Moderate		Low	Low	High	Low	Moderate		Moderate	
	Electronics and Hardware	Moderate	Moderate	Moderate	Moderate	High	High	Moderate	Moderate	Low	Moderate
Consumer Business and Services	BFSI	High		Moderate	Moderate	High		Moderate		Low	
	Beauty and Wellness	High	Moderate	High		High	High	Moderate	Moderate	Moderate	High
	Front Office and Hospitality/ Tourism	High	Low	Low	Low	High	Low	Moderate	Low	Moderate	Low
	Sales and Marketing (Retail/ Others)	High	Moderate	Moderate	Moderate	High	Moderate	Moderate		Low	
	Healthcare	Low	Moderate	Low	Moderate	Moderate	High	Low	Moderate	Moderate	Moderate
	Fashion and Apparel	High	Low	Low		High	Moderate	Low	Moderate	High	
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities									
Information Technology	IT Software Development and Support	High		High		High	High	Moderate		High	High
	Digital Media and Design Technologies	Moderate		Moderate	Low	Moderate	Low	Low		Low	

High Moderate Low No school offering course

Sector and trade categories		Mandla		Chhindwara		Seoni		Balaghat		Niwari	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	Moderate		High		High		High		Low	
	Horticulture and Gardening	Low	Moderate	High	High	Low	Moderate	Low	Moderate	Low	
	Dairy Farming and Livestock Health	Low		Moderate		Low		Low		Moderate	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	High		High		Low		High		High	
	Automotive Tech and Servicing	Low		Moderate		High		Low		Low	
	Fabrication Technologies (Building/ Construction)	Moderate		Moderate	Low	Low	Low	Moderate	Low	Moderate	Low
	Electronics and Hardware	Low	Low	High	Moderate	Moderate	Moderate	High	High	Low	Low
Consumer Business and Services	BFSI	Low		High	Low	Moderate		Moderate		Low	
	Beauty and Wellness	Moderate	High	High	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Low
	Front Office and Hospitality/ Tourism	Moderate	Low	High	Moderate	High	Moderate	Moderate	Moderate	High	
	Sales and Marketing (Retail/ Others)	Low		Moderate	Low	Low	Low	Low		Low	Low
	Healthcare	High	High	High	High	High	Moderate	High	High	Low	Low
	Fashion and Apparel	High		Moderate	Moderate	High		Moderate		High	Moderate
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities									
Information Technology	IT Software Development and Support	Moderate	High	High	High	Moderate	High	High	High	Moderate	High
	Digital Media and Design Technologies	Low	Low	Moderate	Low	Low		Low	Low	Low	

High Moderate Low No school offering course

Illustration 83 | Madhya Pradesh: District-wise view of demand vs. current skilling capacity

Potential Next Steps for Madhya Pradesh

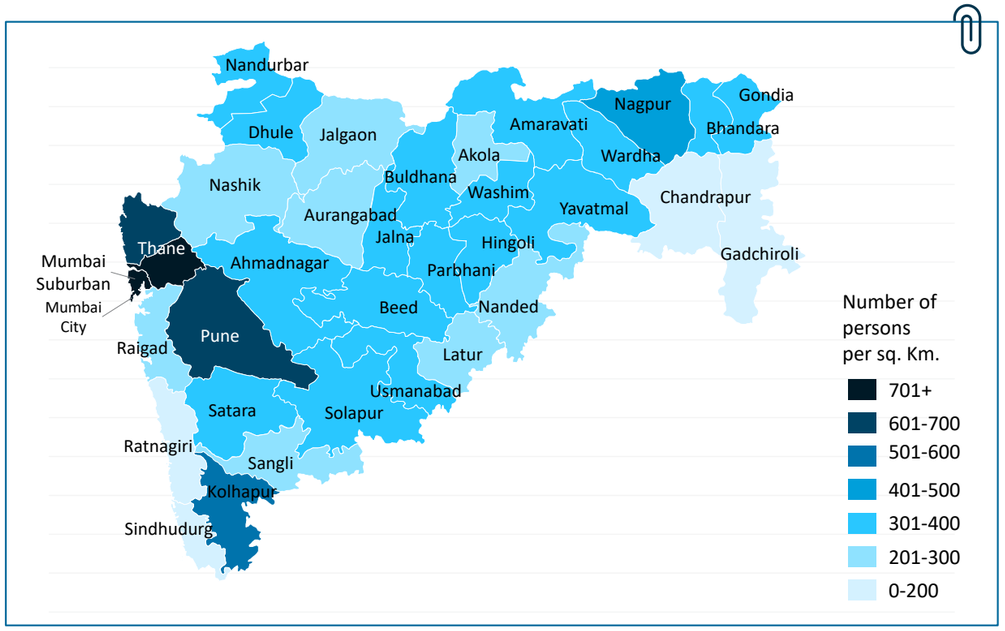
- Build a three to five year plan to **expand supply of skill education** from 12 percent or about 1195 schools to up to 30 percent or about 3000 secondary/ higher secondary schools across districts
- In parallel, plan to ensure 100 percent of the secondary schools (or about 10,000 schools) offer employability skill related courses over the next few years (in line with NEP goals)
- **Direct effort towards building capabilities around key trades** for each district such as Farm productivity and agronomy in Betul, Hoshangabad, Jabalpur, and Raisen; BFSI in Bhopal, Raisen, and Sehore among others *(refer district-wise trade recommendation included as part of this chapter)*
- **Validate and finalize priority trades in collaboration with DEO/BEO and local industry officials** to ensure alignment with local industry needs, map trades school by school with district consultations
- **Collaborate with State Board to accommodate revamped trade subjects and strengthen assessments**
- **Onboard knowledge partners as necessary to build out new trade curricula, support with training of teachers, assessments planning etc.**; in parallel, plan for hiring of teachers with the required qualifications and setting up labs
- **Prepare budget estimates for the plan** and enable availability of funds via existing state and central mechanisms (e.g., STARS budget, state budget etc.)

4.3.4 Skill Gap Assessment: Maharashtra

Economy Overview and Imperatives for School-to-Work

Demographic Snapshot[1]

Maharashtra is a high-income state with large industry presence and sizeable school education system.



Predominantly industrialized state in India …

- Population: About 112.4 million (45% population in urban areas)
- Literacy: Approximately 82%
- 50 million migrants in 2011 (Highest in India)

… with a sizeable school education system …

- GER: Approximately 94% (secondary) and 71% (higher secondary)
- Approximately 6 million students in public schools
- Approximately 66,000 public schools in the state; about 1,500 till grade 10th and about 500 till grade 12th

… substantial working age population and lower unemployment

- 70 million people between 15-59 years
- 3.2% unemployment rate compared to national average rate of about 5.1%

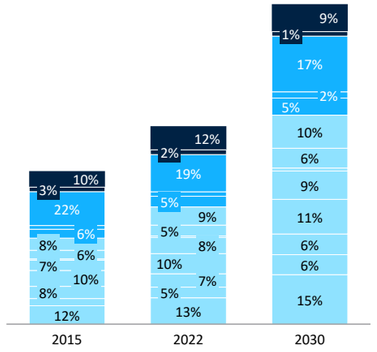
1. Census 2011, PLFS 2019-20, UDISE 2020-2021
Note: Government and government aided schools both included

Illustration 84 | Maharashtra: Socio-demographic Snapshot

Economic Snapshot[1]

With an economy of $ 343 billion[2], Maharashtra is the largest contributor to the country's economy (13 percent). About 46 percent of total state GSDP contribution comes from Mumbai, Pune, and Thane districts.

Gross State Value Added by Economic Activity



		CAGR 2015-22	CAGR 2022-30
Primary Sector	Agriculture, Forestry and Fishing	6%	2%
	Mining and Quarrying	1%	-1%
Secondary Sector	Manufacturing	1%	6%
	Electricity, Gas and Water Supply	3%	5%
	Construction	3%	7%
Tertiary Sector	Wholesale and Retail Trade	6%	9%
	Transportation and Storage	3%	9%
	Accommodation and Food Services	2%	10%
	Information and Communication	7%	8%
	Financial and Insurance Activities	3%	8%
	Real Estate Activities	1%	6%
	Education and Health	6%	9%
	Other Services	5%	9%

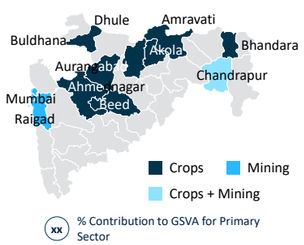
Illustration 85 | Maharashtra: Economic Snapshot

Economy by Districts[3]

- Agriculture spread across central and northern region
- Major urban hubs dominate secondary and tertiary sectors
- Pune and Nashik, renowned for their automobile manufacturing, are ideal for the PLI scheme, whereas Mumbai and Thane, as key industrial and financial centers, stand to gain in IT hardware, pharmaceuticals, and electronics.

Primary Sector

Top districts contributing to agriculture and mining

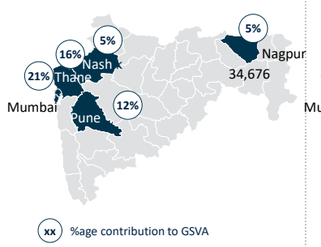


(xx) % Contribution to GSVA for Primary Sector

- **More than 70% of the total output comes from three districts** and more than 50% of the total agriculture output comes from nine districts
- **Crop production:** Jowar, Arhar, cotton, sugarcane, soyabean
- 80% of Aurangabad's total population is dependent on agriculture
- **Mining:** Oilfield (Mumbai), limestone (Chandrapur)

Secondary Sector

Top districts contributing to manufacturing industry

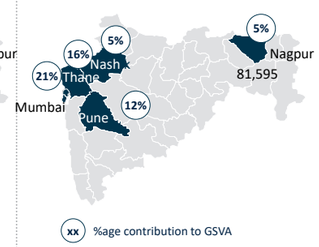


(xx) %age contribution to GSVA

- **About 60% od the total output comes from five districts**
- **Key industries:** Auto and automotive, pharma and chemicals, food processing, electronics
- **Other industries:** Soyabean processing (Amravati), machine manufacturing units (Ahmednagar)
- **Emerging sectors:** Plastic and wine processing

Tertiary Sector

Top districts contributing to tertiary industry



(xx) %age contribution to GSVA

- About 60% of the total output comes from five districts
- **Transport, Financial services, Real Estate, and Trades** make 50% of state's GDP
- **Other key services:** IT and ITES, Hospitality

1. Real Gross Value Added, at constant value (2015), MOSPI, GoI; Oxford Economics Estimates
2. Real Gross Domestic Product, 2022 at constant value (2015), MOSPI, GoI; Oxford Economics Estimates
3. Internal Analysis; based on data from Directorate of Economics and Statistics, Govt of Maharashtra

Illustration 86 | Maharashtra: Economy by districts

720+ Industrial Parks in Maharashtra to Act as Employment Hubs Across Key Sectors

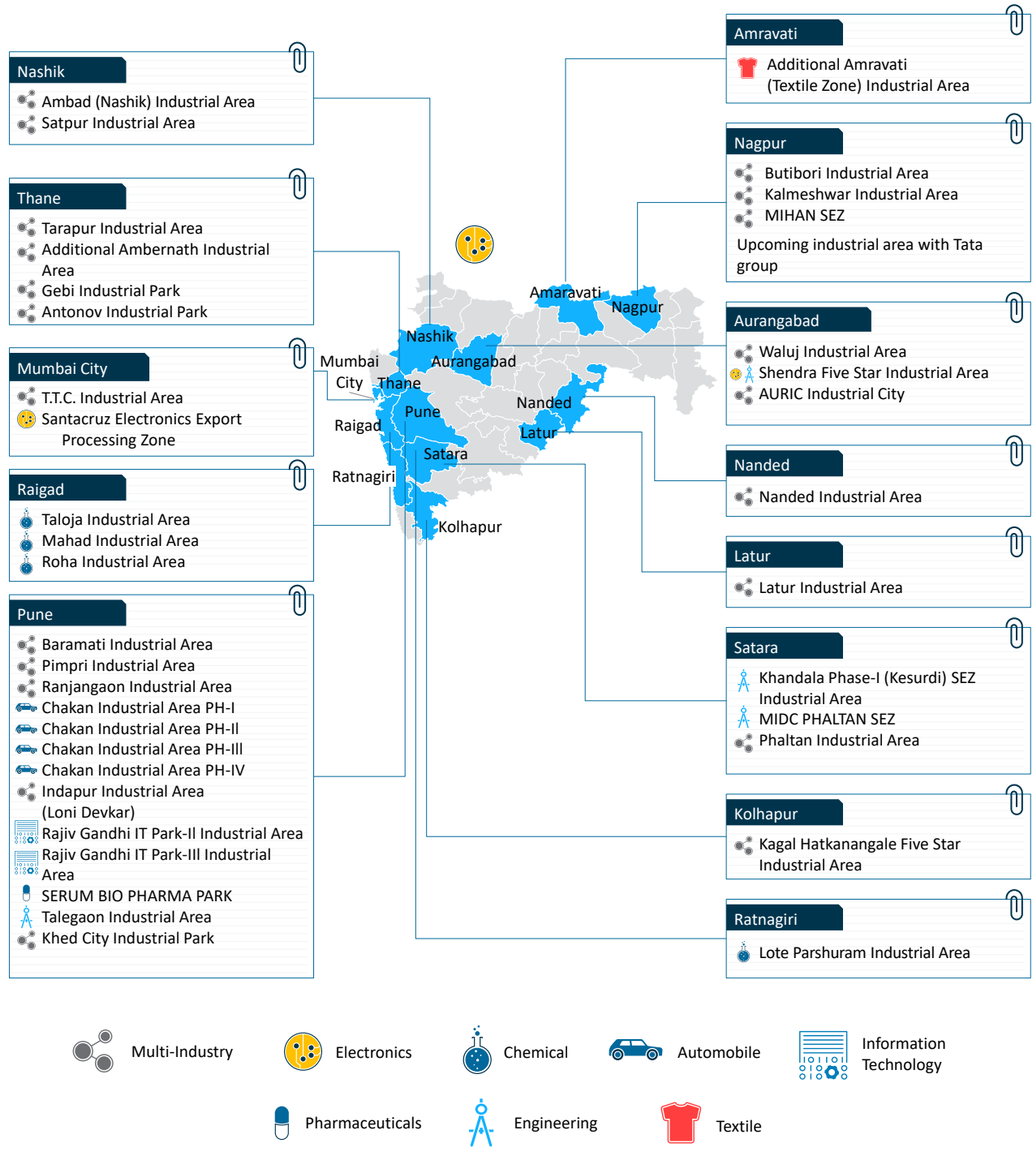


Illustration 87 | Maharashtra: Industrial Parks and employment hubs

Employment Snapshot and Expected Growth Areas

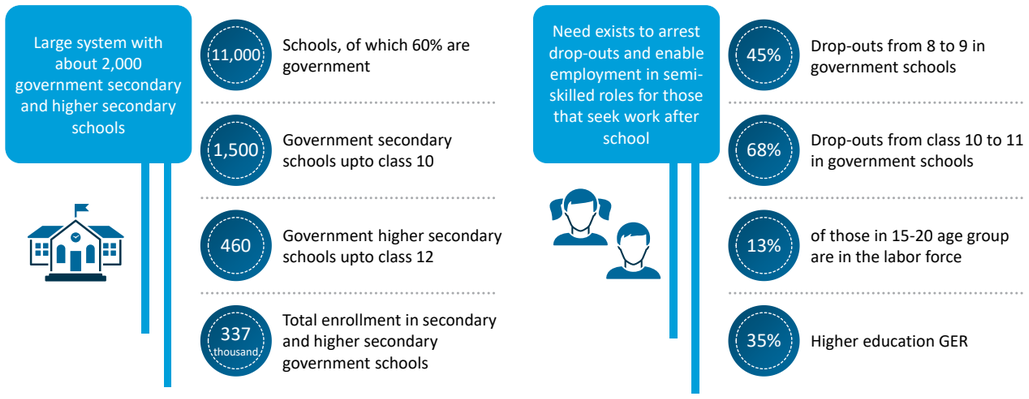
13 million net incremental employment demand is estimated between 2021 and 2030 across the state, driven by manufacturing.

- 35 percent of the current workforce is in the urban areas, primarily engaged in manufacturing, retail and other services.
- 45 percent of people in the state are self-employed, while another 30 percent are salaried.
- Of the 13 million incremental employment demand, 7.3 million is from top three districts.

Unit: thousand persons[1]	Employment Demand 2021	Employment Demand 2030	Incremental Demand[1]	Growth % 2021-30
Agriculture, Forestry, and Fishing	25,945	25,013	(932)	-4%
Mining and Quarrying	285	480	195	68%
Manufacturing	15,196	21,011	5,815	38%
Electricity, Gas and Water Supply	219	262	44	20%
Building and Construction	2,795	3,181	386	14%
Wholesale and Retail Trade	3,493	4,347	854	24%
Transportation and Storage	2,327	3,063	735	32%
Accommodation and Food Service Activities	328	456	127	39%
Information and Communication	726	1,033	307	42%
Financial, Real Estate and Professional Services	1,097	1,653	556	51%
Public Administration	4,142	5,942	1,800	43%
Education and Health	2,037	2,815	778	38%
Other Services	4,359	6,658	2,299	53%
Total	**62,948**	**75,914**	**12,965**	21%

Context of School Education in Maharashtra

Large system with 110 thousand schools that can benefit from Skill Education integration and provide better employment as well as prevent dropouts.



Source: Census 2011, PLFS 2020, Oxford Economics. Refer to appendix for detailed methodology; UDISE 2021-22
1. Includes main and marginal workers
2. Incremental demand calculated by subtracting 2030 demand projections from 2021 projections

Illustration 88 | Maharashtra: School Education Landscape

Current Status of Skill Education Indicates Low Penetration in Terms of Access

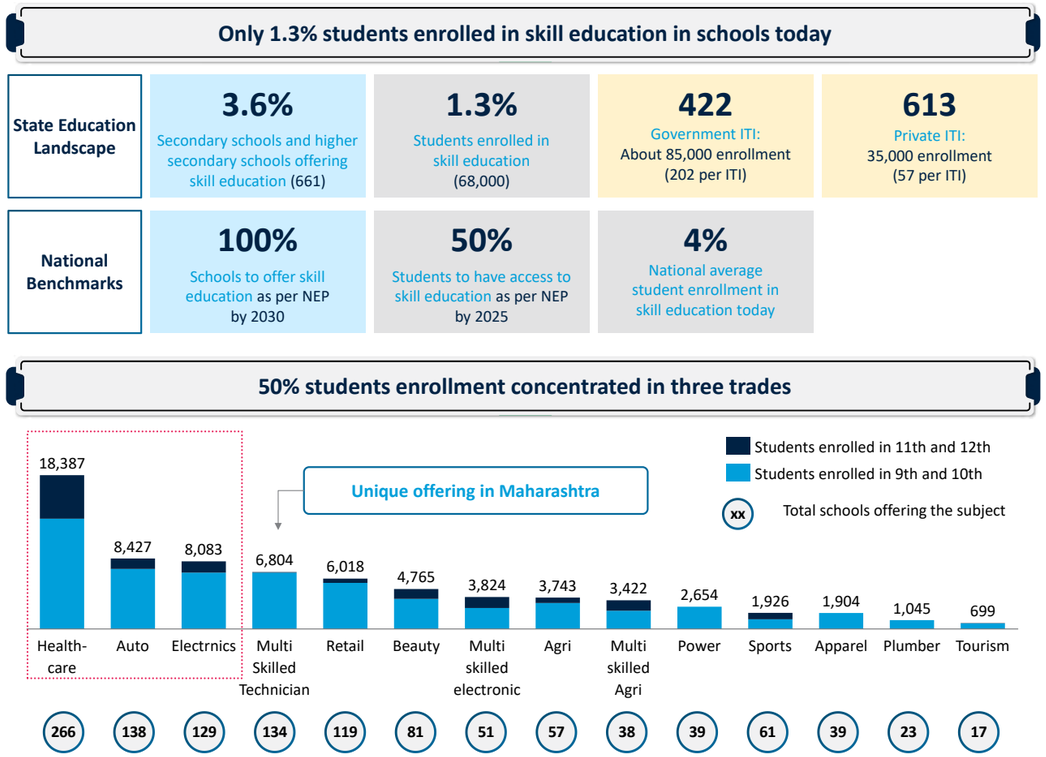
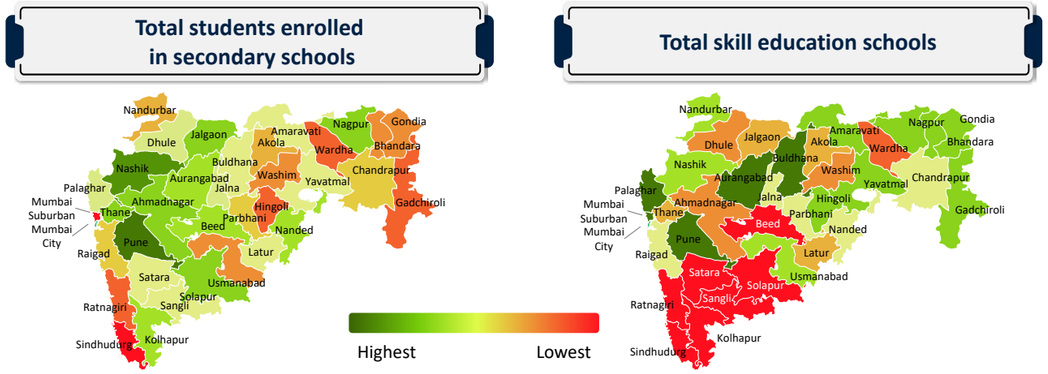


Illustration 89 | Maharashtra: Enrollment in SE - total and by trades

Distribution of Skill Education Schools in the State Not Found to Be In-Line with Overall Distribution of Secondary Grades Enrollment – Needs to Be Addressed



- Southern districts such as Satara, Solapur, Sangli etc. have significantly lesser skill schools as compared to student population
- Eastern districts like Gondia, Bhandara etc. have an excess of skill schools compared to student population

Note: Government and government aided schools both included

Illustration 90 | Maharashtra: Distribution of secondary enrollment vs. skill education schools

State Skilling Snapshot | Clear Opportunity to Expand Skilling Capacity in Line with Demand

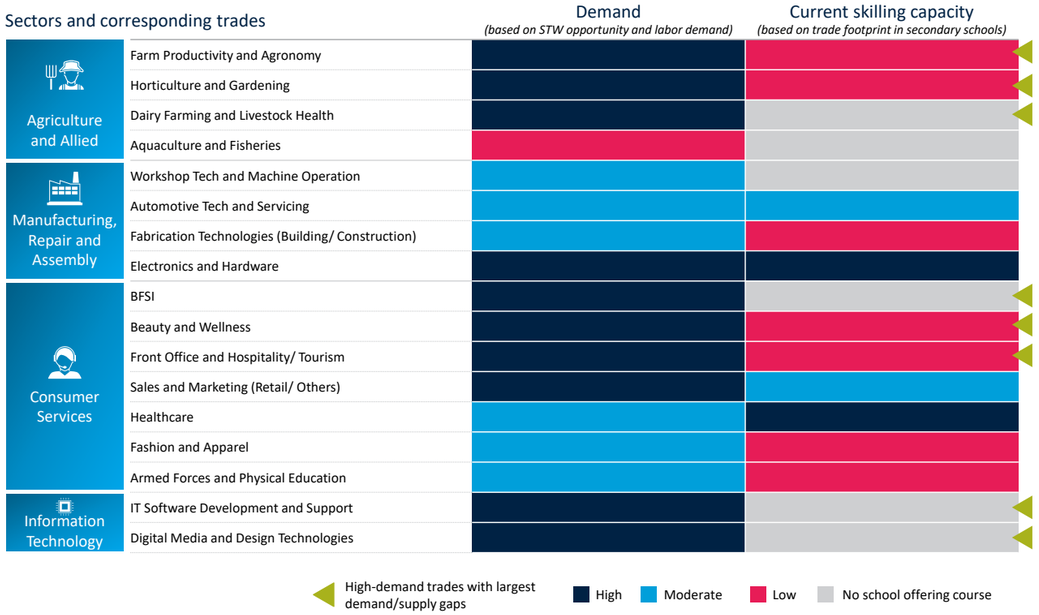
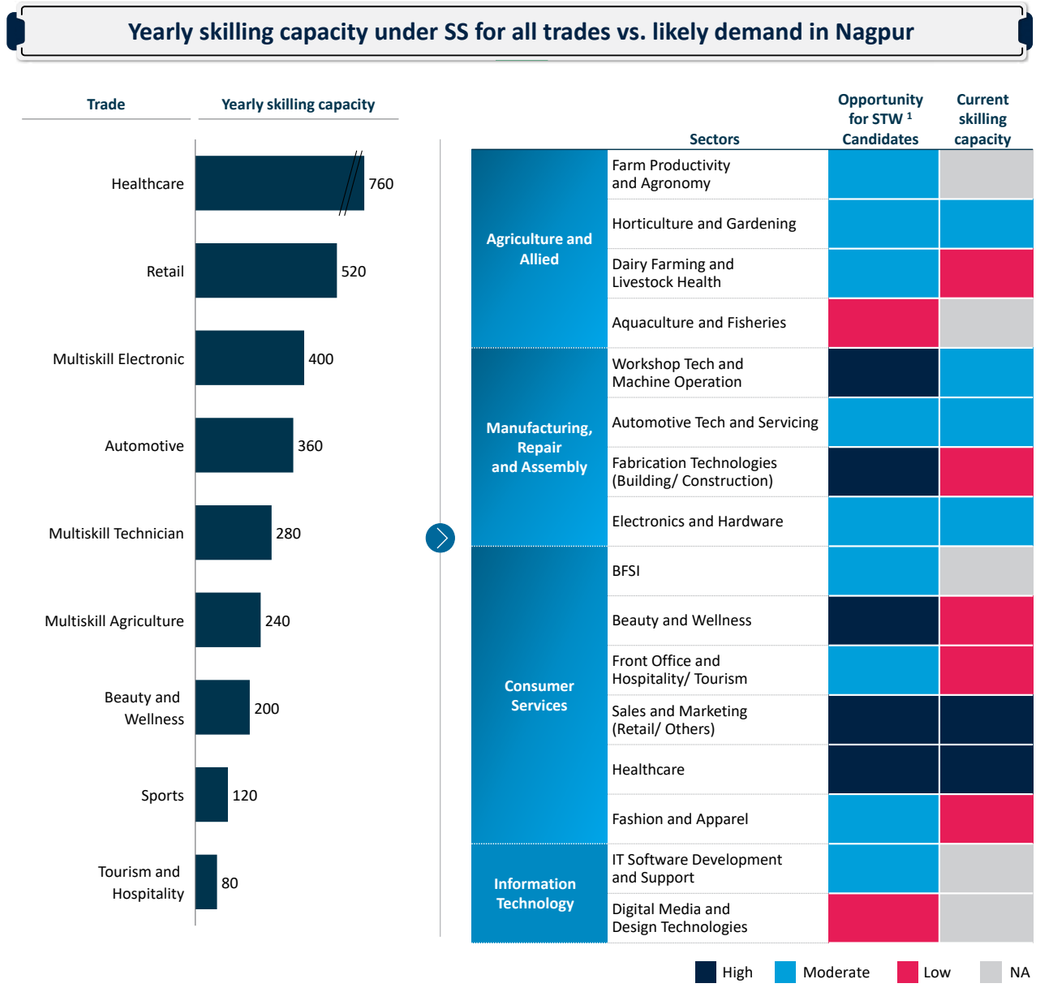


Illustration 91 | Maharashtra State overall skilling snapshot (demand vs. supply)

In addition, a significant mismatch is observed between the current skilling offering and local demand as illustrated in the example for Nagpur below:



Note: 1. STW- School to work 2. Capacity estimates based on duration of each course offered
Source: School education department, Maharashtra

Illustration 92 | Illustration of demand-supply mismatch for Nagpur

The above analysis for Nagpur was conducted basis primary research in the district and conversations with industry present in the districts, visits to MSMEs, shopfloors, retail shops, farms etc. A similar view has been created across all districts of the state as well, however, based on secondary research alone. This must hence be further validated by states themselves and then leveraged to determine each district's desired future trade-mix.

Sector and trade categories		Ahmednagar		Akola		Amravati		Aurangabad	
		District Relevance	Current Capacity	District Relevance	Current Capacity	District Relevance	Current Capacity	District Relevance	Current Capacity
Agriculture and Allied	Farm Productivity and Agronomy	High		Moderate		High		High	
	Horticulture and Gardening	High	Low	Moderate	Low	High	Moderate	High	High
	Dairy Farming and Livestock Health	High	Low	Low	Low	Moderate	Moderate	High	High
	Aquaculture and Fisheries	High		Low		Moderate		Moderate	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	Moderate	Low	Low	Low	Moderate	Moderate	High	High
	Automotive Tech and Servicing	Moderate	High	Low	Low	Moderate	Low	High	High
	Fabrication Technologies (Building/ Construction)	Moderate	Low	Low	Low	Moderate	Low	Moderate	Low
	Electronics and Hardware	Moderate	Low	Low	Low	Moderate	Moderate	High	Moderate
Consumer Business and Services	BFSI	High		Moderate		Moderate		High	
	Beauty and Wellness	Moderate	Low	Moderate	Low	High	High	High	Moderate
	Front Office and Hospitality/ Tourism	High	Low	Low	Low	Low	Low	High	High
	Sales and Marketing (Retail/ others)	Moderate	Low	Moderate	High	Moderate	High	High	Moderate
	Healthcare	Moderate	Moderate	High	Moderate	Moderate	High	Moderate	Moderate
	Fashion and Apparel	High	Low	Moderate	Low	Moderate	Moderate	High	Low
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	Low		Low		Moderate		High	
	Digital Media and Design Technologies	Low		Low		Moderate		High	

High Moderate Low No school offering course

Sector and trade categories		Bhandara		Bid		Buldana		Chandrapur	
		District Relevance	Current Capacity	District Relevance	Current Capacity	District Relevance	Current Capacity	District Relevance	Current Capacity
Agriculture and Allied	Farm Productivity and Agronomy	Moderate		High		High		Moderate	
	Horticulture and Gardening	Low	High	High	Moderate	High	High	Moderate	Low
	Dairy Farming and Livestock Health	Moderate	Low	High	Low	Moderate	Moderate	Low	Moderate
	Aquaculture and Fisheries	Low		High		Moderate		High	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	Moderate	Moderate	Moderate	Low	Moderate	Moderate	Low	Moderate
	Automotive Tech and Servicing	Low	Moderate	Moderate	Low	Moderate	Moderate	Low	Moderate
	Fabrication Technologies (Building/ Construction)	Low	Low	Moderate	Low	Low	Low	Moderate	Low
	Electronics and Hardware	Low	High	Moderate	Moderate	Moderate	High	Low	Moderate
Consumer Business and Services	BFSI	Low		Low		Low		Moderate	
	Beauty and Wellness	Low	Low	Moderate	Low	Low	High	Moderate	Low
	Front Office and Hospitality/ Tourism	Low	Low	Low	Low	Moderate	High	Moderate	Low
	Sales and Marketing (Retail/ others)	Low	High	Moderate	Low	Moderate	Moderate	Moderate	Moderate
	Healthcare	Moderate	Low	Moderate	Low	Moderate	Moderate	Moderate	Moderate
	Fashion and Apparel	Low	Low	Moderate	Moderate	Moderate	Low	Moderate	Low
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	Low		Low		Low		Low	
	Digital Media and Design Technologies	Low		Low		Low		Low	

High Moderate Low No school offering course

Sector and trade categories		Dhule		Gadchiroli		Gondiya		Hingoli	
		District Relevance	Current Capacity	District Relevance	Current Capacity	District Relevance	Current Capacity	District Relevance	Current Capacity
Agriculture and Allied	Farm Productivity and Agronomy	Moderate		Moderate		Low		Moderate	
	Horticulture and Gardening	Moderate	Moderate	Low	Moderate	Low	High	Moderate	High
	Dairy Farming and Livestock Health	Moderate	High	Low	High	Low	High	Low	Moderate
	Aquaculture and Fisheries	Moderate		Moderate		High		Moderate	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	Moderate	Low	Moderate	Low	Low	Low	Low	Moderate
	Automotive Tech and Servicing	Moderate	Low	Low	Low	Low	Moderate	Low	Moderate
	Fabrication Technologies (Building/ Construction)	Moderate	Low	Low	Low	Low	Low	Low	Low
	Electronics and Hardware	Moderate	Low	Low	Moderate	Low	High	Low	High
Consumer Business and Services	BFSI	Moderate		Low		Low		Low	
	Beauty and Wellness	Moderate	Low	Low	High	Low	Moderate	Low	Moderate
	Front Office and Hospitality/ Tourism	Low	Low	Low	Low	Moderate	Low	Moderate	Low
	Sales and Marketing (Retail/ others)	Moderate	Low	Low	Low	Low	Low	Low	Low
	Healthcare	High	Moderate	Moderate	High	Moderate	High	Moderate	Moderate
	Fashion and Apparel	Moderate	Low	Low	Low	Low	Low	Low	Low
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	Low		Low		Low		Low	
	Digital Media and Design Technologies	Low		Low		Low		Low	

High Moderate Low No school offering course

Sector and trade categories		Jalgaon		Jalna		Kolhapur		Latur	
		District Relevance	Current Capacity	District Relevance	Current Capacity	District Relevance	Current Capacity	District Relevance	Current Capacity
Agriculture and Allied	Farm Productivity and Agronomy	High		High		Moderate		High	
	Horticulture and Gardening	High	Low	High	Moderate	Moderate	Low	Moderate	Low
	Dairy Farming and Livestock Health	High	Low	Moderate	Moderate	High	Low	Moderate	Low
	Aquaculture and Fisheries	High		High				Moderate	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	Moderate	High	Moderate	Low	High	Low	Moderate	Moderate
	Automotive Tech and Servicing	Moderate	Moderate	Moderate	Moderate	High	Low	Low	Low
	Fabrication Technologies (Building/ Construction)	Moderate	Low	Low	Low	High	Low	Low	Low
	Electronics and Hardware	Moderate	Moderate	Moderate	Low	High	Low	Moderate	Low
Consumer Business and Services	BFSI	Moderate		Low		High		Moderate	
	Beauty and Wellness	High	Moderate	Low	Low	High	Low	Moderate	Moderate
	Front Office and Hospitality/ Tourism	Moderate	Low	Moderate	Low	High	Low	Low	Low
	Sales and Marketing (Retail/ others)	High	Low	Low	Low	High	Low	Moderate	Low
	Healthcare	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
	Fashion and Apparel	High	Low	Moderate	Moderate	High	Low	Moderate	Low
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	Low		Low		Low		Moderate	
	Digital Media and Design Technologies	Low		Low		Low		Moderate	

High Moderate Low No school offering course

Sector and trade categories		Mumbai		Nagpur		Nanded		Nandurbar	
		District Relevance	Current Capacity	District Relevance	Current Capacity	District Relevance	Current Capacity	District Relevance	Current Capacity
Agriculture and Allied	Farm Productivity and Agronomy	Low		Moderate		High		Moderate	
	Horticulture and Gardening	Low	Low	Moderate	Moderate	High	Low	Low	Low
	Dairy Farming and Livestock Health	Low	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Moderate
	Aquaculture and Fisheries	Moderate		Low		Moderate		Low	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	High	Moderate	High	High	Moderate	Low	Moderate	Low
	Automotive Tech and Servicing	High	Low	Moderate	Moderate	Moderate	Low	Low	Moderate
	Fabrication Technologies (Building/ Construction)	High	Low	High	Moderate	Moderate	Low	Low	Low
	Electronics and Hardware	High	High	Moderate	Moderate	Moderate	Low	Low	Low
Consumer Business and Services	BFSI	High		Moderate		Moderate		Low	
	Beauty and Wellness	High	Low	High	Moderate	Moderate	Low	Low	Low
	Front Office and Hospitality/ Tourism	High	Low	Moderate	Moderate	Moderate	Low	Low	Moderate
	Sales and Marketing (Retail/ others)	High	Low	High	Moderate	Moderate	Low	Low	Moderate
	Healthcare	Moderate	Moderate	High	Moderate	Moderate	Moderate	Moderate	Low
	Fashion and Apparel	High	Low	Moderate	Moderate	Moderate	Low	Low	Moderate
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	High		Moderate		Moderate		Low	
	Digital Media and Design Technologies	High		High		Moderate		Low	

High Moderate Low No school offering course

Sector and trade categories		Nashik		Osmanabad		Parbhani		Pune	
		District Relevance	Current Capacity	District Relevance	Current Capacity	District Relevance	Current Capacity	District Relevance	Current Capacity
Agriculture and Allied	Farm Productivity and Agronomy	High		Moderate		Moderate		High	
	Horticulture and Gardening	High	Low	Moderate	Low	Moderate	Moderate	High	High
	Dairy Farming and Livestock Health	High	Moderate	High	Low	Moderate	Low	High	Low
	Aquaculture and Fisheries	Low		Moderate		Moderate		Low	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	High	High	Low	Low	Low	Low	High	Moderate
	Automotive Tech and Servicing	High	High	Low	Low	Low	Low	High	High
	Fabrication Technologies (Building/ Construction)	High	Low	Low	Low	Low	Low	High	Low
	Electronics and Hardware	High	High	Low	High	Low	High	High	Moderate
Consumer Business and Services	BFSI	High		Low		Low		High	
	Beauty and Wellness	High	High	Low	Low	Moderate	Low	High	Low
	Front Office and Hospitality/ Tourism	High	Low	High	Low	Low	Low	High	High
	Sales and Marketing (Retail/ others)	High	Low	Low	Low	Moderate	Low	High	High
	Healthcare	Moderate	Moderate	High	Moderate	Moderate	Moderate	Moderate	Low
	Fashion and Apparel	High	Low	Moderate	Low	Moderate	Low	High	Moderate
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	Low		Low		Low		High	
	Digital Media and Design Technologies	Low		Low		Low		High	

High Moderate Low No school offering course

Sector and trade categories		Sindhudurg		Solapur		Thane		Wardha	
		District Relevance	Current Capacity	District Relevance	Current Capacity	District Relevance	Current Capacity	District Relevance	Current Capacity
Agriculture and Allied	Farm Productivity and Agronomy	Moderate		High		Low		Moderate	
	Horticulture and Gardening	Low		High	Low	Low	Low	Moderate	Low
	Dairy Farming and Livestock Health	Low		High	Low	Moderate	Low	Low	Low
	Aquaculture and Fisheries	Moderate		High		Moderate		Low	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	Low		High	Low	High	Moderate	Moderate	Moderate
	Automotive Tech and Servicing	Low		High	Low	High	Low	Moderate	Low
	Fabrication Technologies (Building/ Construction)	Low		High	Low	High	Low	Low	Low
	Electronics and Hardware	Low		High	Low	High	High	Moderate	Low
Consumer Business and Services	BFSI	Low		High		High		Low	
	Beauty and Wellness	Low		High	Low	High	Low	Low	Low
	Front Office and Hospitality/ Tourism	Moderate		High	Low	Moderate	Low	Low	Low
	Sales and Marketing (Retail/ others)	Low		High	Low	High	High	Low	Low
	Healthcare	Moderate		Moderate	Low	Moderate	Moderate	High	Low
	Fashion and Apparel	Low		High	Low	High	Low	Low	Low
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	Low		Low		High		Low	
	Digital Media and Design Technologies	Low		Low		High		Low	

High Moderate Low No school offering course

Sector and trade categories		Raigarh		Ratnagiri		Sangli		Satara	
		District Relevance	Current Capacity	District Relevance	Current Capacity	District Relevance	Current Capacity	District Relevance	Current Capacity
Agriculture and Allied	Farm Productivity and Agronomy	Low		Low		High		Moderate	
	Horticulture and Gardening	Low	Low	Moderate		High	Low	Moderate	Low
	Dairy Farming and Livestock Health	Low	Moderate	Low		High	Low	High	Low
	Aquaculture and Fisheries	Low		Moderate		Low		High	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	High	Low	Moderate		Moderate	Low	Moderate	Low
	Automotive Tech and Servicing	High	Low	Moderate		Moderate	Low	Moderate	Low
	Fabrication Technologies (Building/ Construction)	Moderate	Low	Low		Moderate	Low	Moderate	Low
	Electronics and Hardware	High	Low	Moderate		Moderate	Low	Moderate	Low
Consumer Business and Services	BFSI	Moderate		Low		Moderate		Moderate	
	Beauty and Wellness	Moderate	Moderate	Low		Moderate	Low	Moderate	Low
	Front Office and Hospitality/ Tourism	High	Low	Moderate		Low	Low	Moderate	Low
	Sales and Marketing (Retail/ others)	Moderate	Low	Low		Moderate	Low	Moderate	Low
	Healthcare	Moderate	Moderate	Moderate		Moderate	Low	Moderate	Low
	Fashion and Apparel	Moderate	Low	Moderate		Moderate	Low	Moderate	Low
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	Low		Low		Low		Moderate	
	Digital Media and Design Technologies	Low		Low		Low		Moderate	

High Moderate Low No school offering course

Sector and trade categories		Washim		Yavatmal	
		District Relevance	Current Capacity	District Relevance	Current Capacity
Agriculture and Allied	Farm Productivity and Agronomy	Moderate		High	
	Horticulture and Gardening	Moderate	Moderate	High	Moderate
	Dairy Farming and Livestock Health	Low	Moderate	Moderate	Moderate
	Aquaculture and Fisheries	Low		High	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	Low	Low	Moderate	Moderate
	Automotive Tech and Servicing	Low	Moderate	Moderate	Low
	Fabrication Technologies (Building/ Construction)	Low	Low	Low	Low
	Electronics and Hardware	Low	Low	Moderate	High
Consumer Business and Services	BFSI	Low		Moderate	
	Beauty and Wellness	Low	Moderate	Moderate	High
	Front Office and Hospitality/ Tourism	Moderate	Low	Moderate	Low
	Sales and Marketing (Retail/ others)	Low	Moderate	Moderate	Moderate
	Healthcare	Moderate	Moderate	Moderate	High
	Fashion and Apparel	Low	Low	Moderate	Moderate
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities			
Information Technology	IT Software Development and Support	Low		Low	
	Digital Media and Design Technologies	Low		Low	

High Moderate Low No school offering course

Illustration 93 | Maharashtra: District-wise view of demand vs. current skilling capacity

Potential Next Steps for Maharashtra

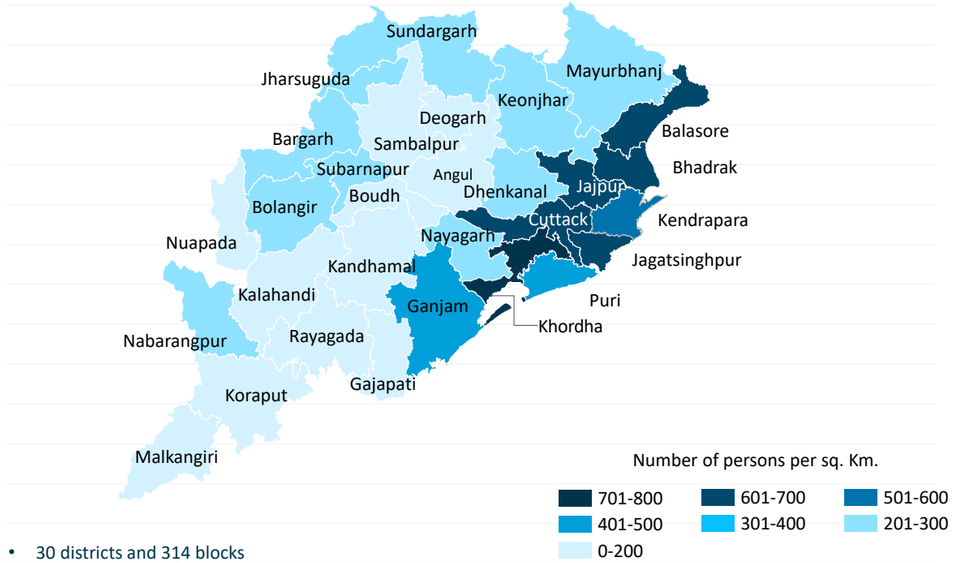
- **Build a three to five year plan to expand supply of skill education** from approximately four percent (about 661 schools) to up to 30% (about 5,500 secondary/higher secondary schools) across districts I**n parallel, plan to ensure 100 percent of the secondary schools (or about 18,300 schools) offer employability skill** related courses over the next few years (in line with NEP goals)
- **Direct effort towards building capabilities around key trades** for each district such as Workshop tech/ automotive tech and servicing in Raigarh; Dairy farming and livestock/ Horticulture and gardening in Sangli among others *(refer district-wise trade recommendation included as part of this chapter)*
- **Validate and finalize priority trades in collaboration with DEO/BEO and local industry officials** to ensure alignment with local industry needs, map trades school by school with district consultations
- **Collaborate with State Board to accommodate revamped trade subjects and strengthen assessments**
- **Onboard knowledge partners as necessary to build out new trade curricula, support with training of teachers, assessments planning etc.**; in parallel, plan for hiring of teachers with the required qualifications and setting up labs
- **Prepare budget estimates for the plan** and enable availability of funds via existing state and central mechanisms (e.g., STARS budget, state budget etc.)

4.3.5 Skill Gap Assessment: Odisha

Economy Overview and Imperatives for School-to-Work

Demographic Snapshot

Odisha is a low-income coastal state with low literacy rate and a large share of marginalized population.



- 30 districts and 314 blocks

Predominantly tribal and coastal state in India …

- Population: About 42 million (22% tribal)
- Literacy: Approximately 73%

… with a sizeable school education system …

- GER: Approximately 85% (secondary) and 46% (higher secondary)
- Approximately six million students in public schools
- Approximately 55,000 public schools in the state; about 10,000 till grade 10th and about 2,500 till grade 12th

… substantial working age population and lower unemployment

- 17.5 million people between 15-59 years
- 2.6% unemployment rate compared to national average rate of about 5.1%

Source: Census 2011, UDISE 2021, PLFS 2019-20, Directorate of Economics and Statistics, Odisha

Illustration 94 10 | Odisha: Socio-demographic Snapshot

Economic Snapshot

With a $ 66.5 billion economy as of 2022, Odisha has experienced high growth at six percent CAGR over the last seven years[1]. 10 districts account for 65 percent of the GSDP.

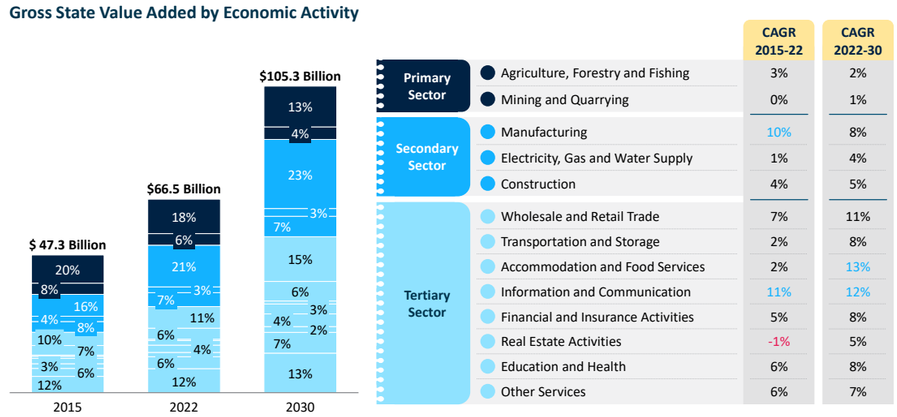
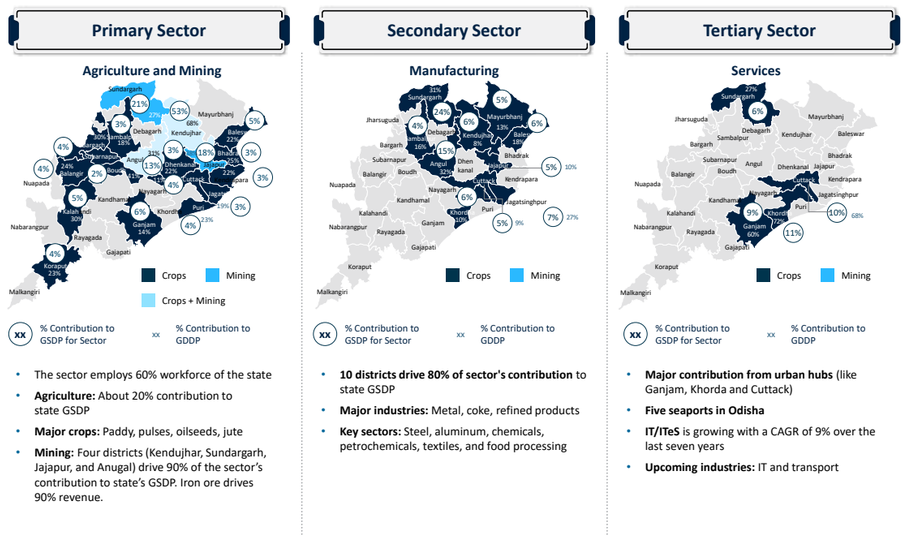


Illustration 9511 | Odisha: Economic Snapshot

Economy by Districts

- Agriculture is fragmented and spread across various districts of the state
- Mining is limited to only four districts
- Manufacturing is driven by districts in and around the mining belt
- Urban hubs dominate the tertiary sector
- Jharsuguda and Angul, with their mineral abundance and industrial activities, are ripe for expansion in specialty steel and chemicals, and Khordha and Cuttack, focusing on manufacturing, are set to benefit across various PLI scheme sectors



Source: Real Gross Value Added, at constant value (2015), MOSPI, GoI; Oxford Economics Estimates; 2011-12 GSDP-Directorate of Economics and Statistics, Govt of Odisha; Odisha Economic Survey 2021-22; Primary Analysis
1. CAGR for FY 2015-2022

Illustration 9612 | Odisha: Economy by districts

100+ Industrial Parks, Sector Clusters, and Private Industrial Estates to Act as Employment Hubs within Emerging Sectors Such as IT and Manufacturing

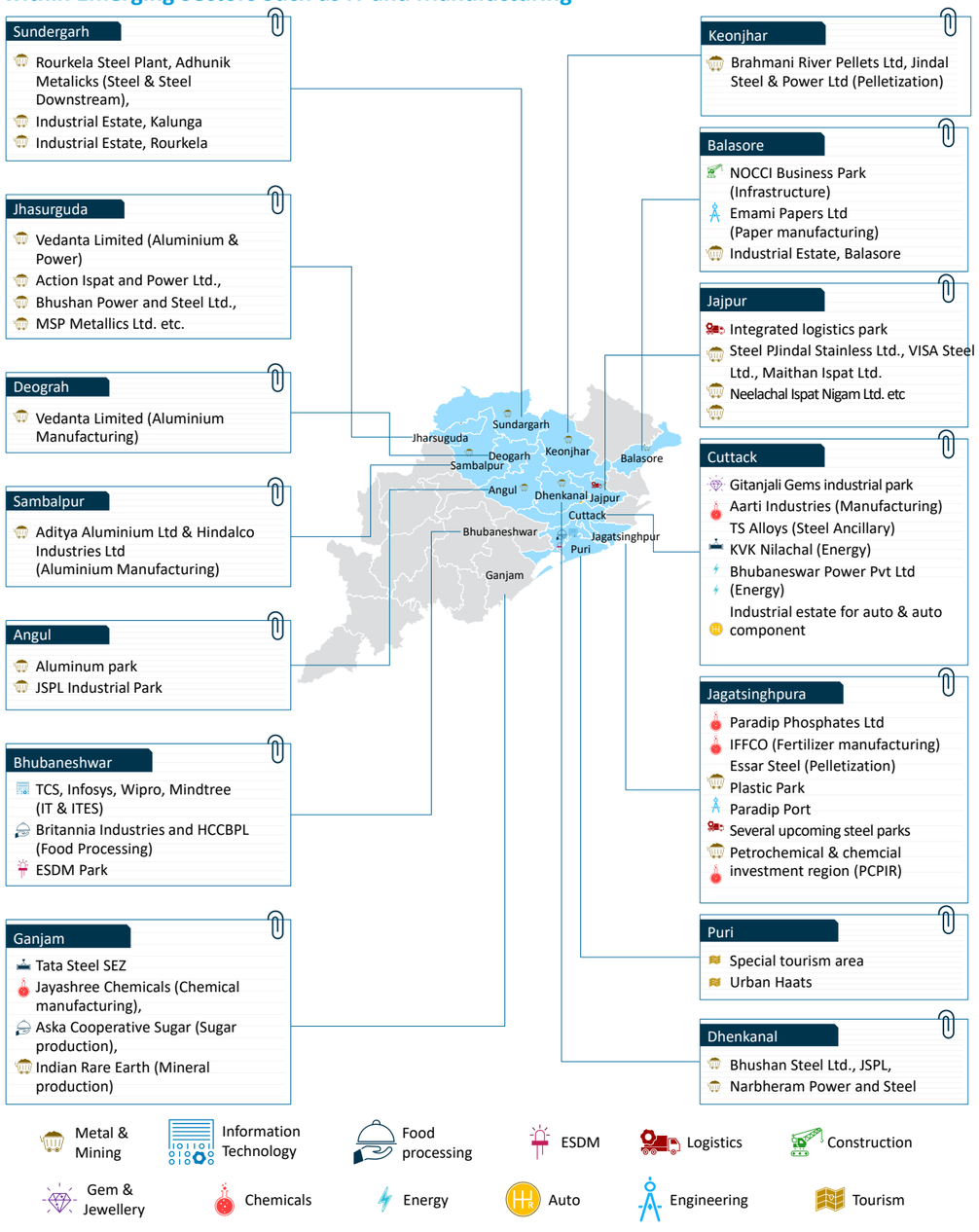


Illustration 97 13 | Odisha: Industrial Parks and employment hubs

Employment Snapshot and Expected Growth Areas

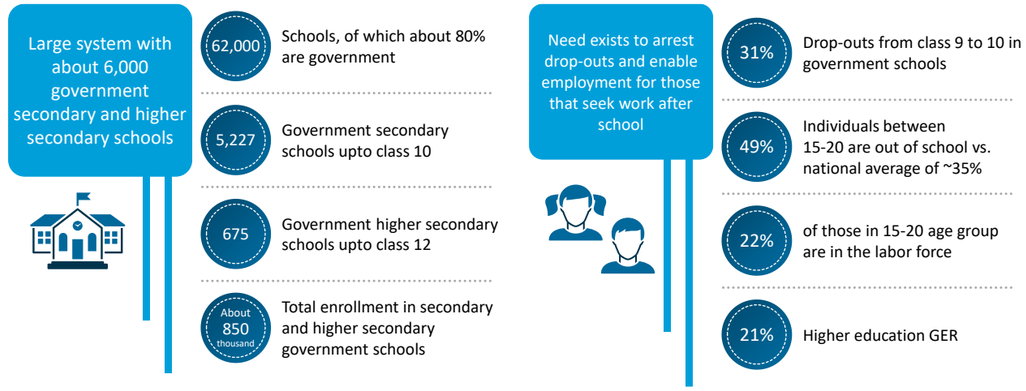
2.3 million net incremental employment demand projected between 2021 and 2030, driven primarily by secondary and tertiary sector activities.

- 86 percent of the state workforce is engaged in the rural economy
- 56 percent of the workforce is self-employed
- Employment in mining, transportation, and tourism likely to grow by more than 40 percent
- 60 percent incremental employment demand will come from the top 10 districts

Unit: thousand persons[1]	Employment Demand 2021	Employment Demand 2030	Incremental Demand[2]	Growth %2021-30
Agriculture, Forestry, and Fishing	9,806	9,020	(786)	-8%
Mining and Quarrying	511	850	339	66%
Manufacturing	1,752	2,221	469	27%
Electricity, Gas and Water Supply	120	131	11	9%
Building and Construction	932	1,035	103	11%
Wholesale and Retail Trade	844	1,099	255	30%
Transportation and Storage	591	872	281	48%
Accommodation and Food Service Activities	94	139	45	47%
Information and Communication	82	102	21	25%
Financial, Real Estate and Professional Services	219	239	20	9%
Public Administration	502	672	170	34%
Education and Health	882	1,204	322	36%
Other Services	2,485	3,516	1,031	42%
Total	**18,820**	**21,099**	**2,279**	**12%**

Context of School Education in Odisha

Large system with 64 thousand schools that can benefit from Skill Education integration to prevent dropouts as well as provide better employment



Source: Census 2011, PLFS 2020, Oxford Economics. Refer to appendix for detailed methodology; UDISE 2021-22
1. Includes main and marginal workers
2. Incremental demand calculated by subtracting 2030 demand projections from 2021 projections

Illustration 9814 | Odisha: School Education Landscape

Current Status of SE Penetration is Low, Although Slightly Higher than National Average

Only 7% students enrolled in skill education in schools today

State Education Landscape	**10%** Secondary schools and higher secondary schools offering skill education (949)	**7%** Students enrolled in skill education (103 thousand)	**73** Government ITI About 19,000 enrollment (260 per ITI)	**450** Private ITI 35,000 enrollment (78 per ITI)
National Benchmarks	**100%** Schools to offer skill education as per NEP by 2030	**50%** Students to have access to skill education as per NEP by 2025	**4%** National average student enrollment in skill education today	

50% students enrolled in top three trades

There are ~950 such schools in Odisha, offering 11 unique trades; reaching ~0.1Million students

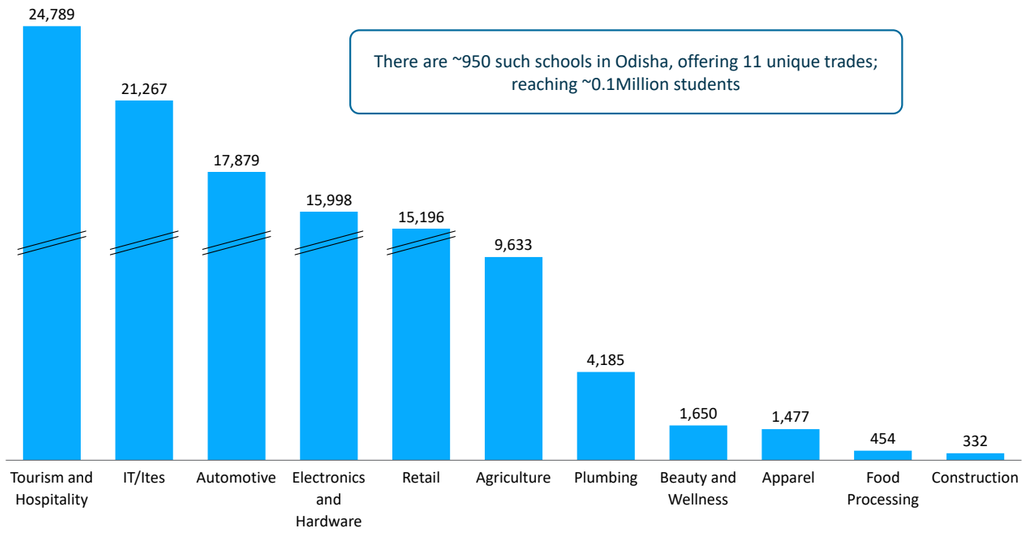


Illustration 9915 | Odisha: Enrollment in SE - total and by trades

While NSQF Is the Dominant Skill Education Delivery Model, Odisha Also Has About 218 Government Vocational Higher Secondary Schools with 5.5 Thousand Students As Well

Skill education under NSQF (lab equipped self-sufficient skill schools)	**Government skill education higher secondary schools with skill stream**
Trade introduced as an optional subject from Class IX to XII based on SS recommendation; chosen instead of third language subject	Trade introduced as a separate stream in Class XI and XII; chosen instead of Science, Commerce or Arts streams
Schools which offer skill subjects are selected based on highest enrollment and availability of two rooms	Schools which offer skill subjects are selected based on availability of two rooms
Skill trainers are empaneled by private VTP companies deliver curricula; One VT teaches one trade	Skill trainers are empaneled by government to deliver curricula; One VT teaches one trade
NCERT books distributed for trade subjects; NSDC/SSC certification provided to successful students	OSBTPP books distributed for trade subjects; CHSE Class XII passing certification provided to successful students
Skill trainer empowered to run; responsible for facilitating lectures, guest sessions, field exposure and mandatory 80hour OJT	Skill trainer empowered to run; responsible for facilitating lectures, lab sessions, and administrative tasks related to skill delivery such as student applications

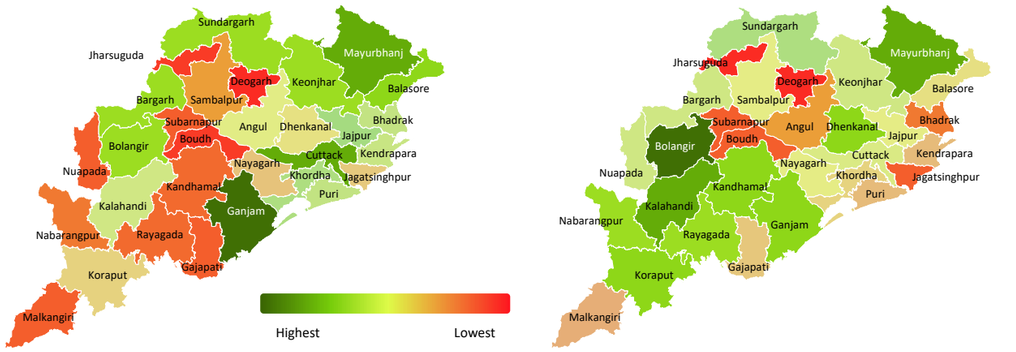
Illustration 10016 | Skill Education Models in Odisha

SE offered under the Government Vocational Higher Secondary Education plan is more closely aligned with the in-depth skill education model that several countries follow worldwide. These schools offer SE as a separate stream, similar to science, arts, and others. While this model can ensure the success of STW by reducing dropouts and enhancing opportunities for STW candidates, there are two major gaps – lack of full-fledged labs with up-to-date equipment(s) and missing higher education linkages. In-depth SE programs like this one can be successful with the availability of proper lab infrastructure, resources, and higher education linkages.

Distribution of Skill Education Schools in the State Not Found to Be In-Line with Overall Distribution of Secondary Grades Enrollment

Density of district-wise enrollment in grades IX to XII

Total skill education schools



- South-Western districts such as Kandhamal, Rayagada, and Koraput have a significant oversupply of skill education schools compared to student population
- North-eastern distrcits such as Balasore, Bhadrak, and Kendrapara have an undersupply of skill schools compared to student population

Source: UDISE 2021-2022, PLFS 2020-21, DGIT 2022, Data shared by State Education Dep, Projections from Oxford Economics
Note: "Others" includes 10 trades with 20-30 schools each; UDISE 2020-21, PLFS 2020-21. OSBTPP is the Odisha State Bureau of Textbook Preparation & Production

Illustration 10117 | Odisha: Distribution of secondary enrollment vs. skill education schools

State Skilling Snapshot | Clear Opportunity to Expand Skilling Capacity in Line with Demand

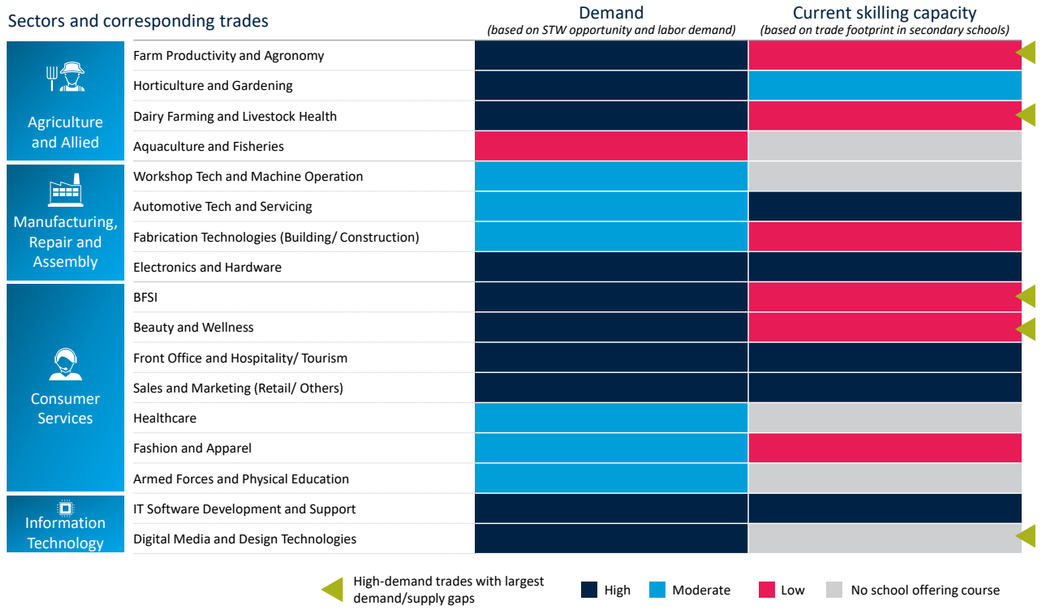
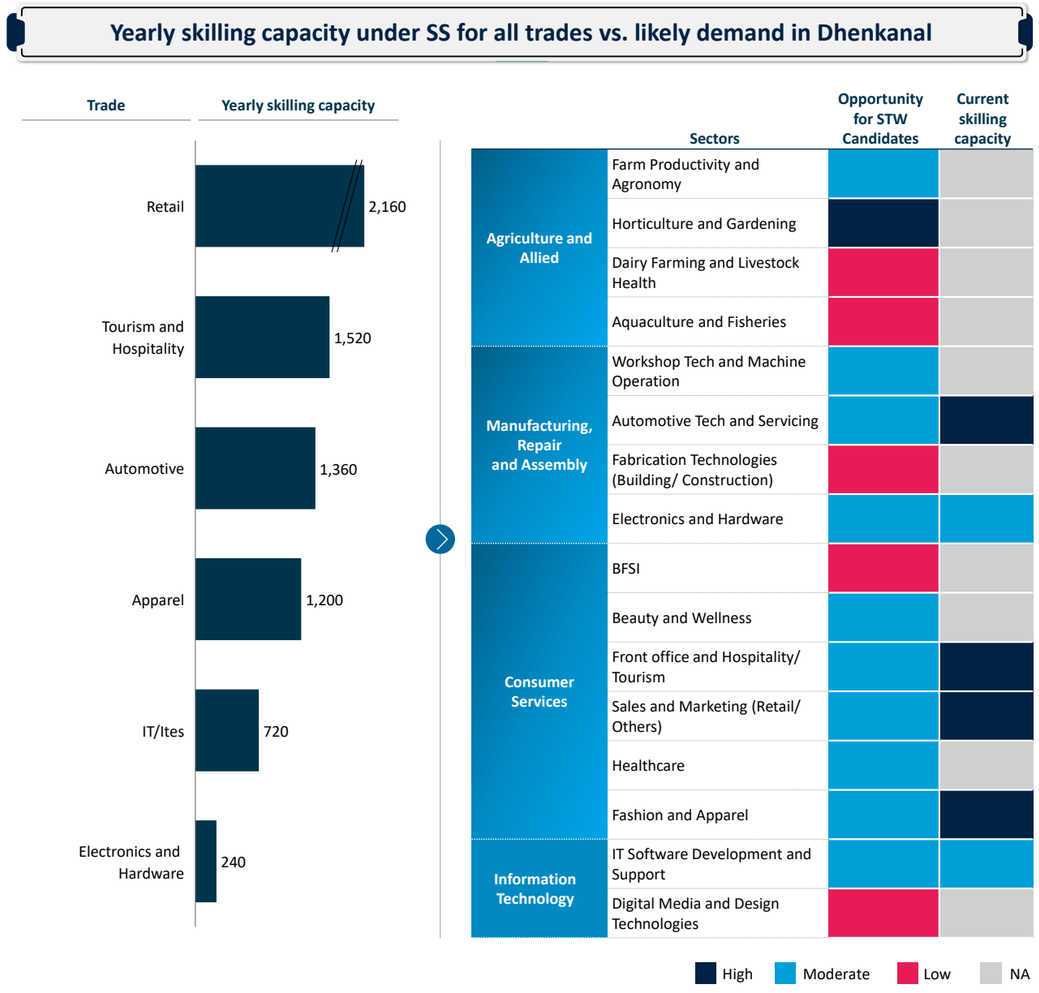


Illustration 102 18| Odisha State overall skilling snapshot (demand vs. supply)

In Addition, a Significant Mismatch Is Observed Between the Current Skilling Offering and Local Demand as Illustrated in the Example for Dhenkanal Below:



Note: 1. Capacity estimates only include NSQF-linked trade offerings in schools under the SS 2. Current capacity represents total number of seats available per year for each trade offered in SS schools in the district 3. STW to be read as School-to-work
Source: District Education office, Dhenkanal; OSEPA; Primary Analysis; Internal Analysis

Illustration 19103| Illustration of demand-supply mismatch for Dhenkanal

The analysis for Dhenkenal and Angul was conducted basis primary research in the district and conversations with industry present in the districts, visits to MSMEs, shopfloors, retail shops, farms etc. A similar view has been created across all districts of the state as well, however, based on secondary research alone. This must hence be further validated by states themselves and then leveraged to determine each district's desired future trade-mix.

Sector and trade categories		Angul		Balasore		Balgarh		Bhadrak	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	High		High		High		High	
	Horticulture and Gardening	High		Moderate		Moderate	High	Moderate	Low
	Dairy Farming and Livestock Health	Low		Moderate		Low		Low	
	Aquaculture and Fisheries	Low		Low		Moderate		Low	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	High		Moderate		Moderate		Low	
	Automotive Tech and Servicing	Moderate	Low	Moderate	Low	Moderate	Moderate	Moderate	High
	Fabrication Technologies (Building/ Construction)	Low		Low		Low	Low	Low	
	Electronics and Hardware	High	High	Moderate	High	Moderate		Moderate	Low
Consumer Business and Services	BFSI	Low		Moderate		Low		Low	
	Beauty and Wellness	Moderate	Low	Moderate		Moderate		Moderate	Moderate
	Front Office and Hospitality/Tourism	Low	High	High	Moderate	Moderate	Moderate	Moderate	High
	Sales and Marketing (Retail/Other Sectors)	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	
	Healthcare	Moderate		High		Moderate		Moderate	
	Fashion and Apparel	Low		High		Low		Moderate	
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	Moderate	Moderate	Moderate	High	Low	High	Low	Moderate
	Digital Media and Design Technologies	Low		Low		Low		Low	

High Moderate Low No school offering course

Sector and trade categories		Bolangir		Boudh		Cuttack		Deogarh	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	High		High		Moderate		High	
	Horticulture and Gardening	Moderate	High	Moderate		Moderate		Moderate	Moderate
	Dairy Farming and Livestock Health	Low		Moderate		Moderate		Moderate	
	Aquaculture and Fisheries	Moderate		Low		Low		Low	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	Low		Low		Moderate		Low	
	Automotive Tech and Servicing	Moderate	High	Low	High	High	High	Low	Low
	Fabrication Technologies (Building/ Construction)	Moderate	Low	Low		Moderate		High	
	Electronics and Hardware	Moderate	Moderate	Low	High	High		Low	Moderate
Consumer Business and Services	BFSI	Low		Low		Moderate		Low	
	Beauty and Wellness	Moderate	Low	Low		High		Low	
	Front Office and Hospitality/Tourism	High	High	Low	Low	High		Moderate	Low
	Sales and Marketing (Retail/Other Sectors)	Moderate	High	Low		High	High	Low	
	Healthcare	Moderate		Low		High		Low	
	Fashion and Apparel	Low	Low	Low		High		Low	
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	Moderate	High	Low	Moderate	High	High	Low	Moderate
	Digital Media and Design Technologies	Low		Low		Moderate		Low	

High Moderate Low No school offering course

Sector and trade categories		Dhenkanal		Gajapati		Ganjam		Jagatsinghpur	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	Moderate		Moderate		High		Moderate	
	Horticulture and Gardening	High		Moderate		High	Moderate	Low	
	Dairy Farming and Livestock Health	Low		Low		Moderate		Moderate	
	Aquaculture and Fisheries	Low		Moderate		High		Low	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	Moderate		Low		High		High	
	Automotive Tech and Servicing	Moderate	High	Low	High	High	High	Moderate	High
	Fabrication Technologies (Building/ Construction)	Moderate		High	High	Moderate	Moderate	Low	
	Electronics and Hardware	Moderate	Moderate	Moderate	Moderate	High	Moderate	Moderate	Moderate
Consumer Business and Services	BFSI	Low		Low		Low		Low	
	Beauty and Wellness	Low		Moderate		High	Moderate	Moderate	
	Front Office and Hospitality/Tourism	Moderate	High	Low	Low	Moderate	High	High	
	Sales and Marketing (Retail/Other Sectors)	Moderate	High	Low	Moderate	High		Moderate	High
	Healthcare	Moderate		Moderate		High		Moderate	
	Fashion and Apparel	Moderate	High	Low	Moderate	Moderate		Low	
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	Moderate	Moderate	Low	Moderate	Moderate	High	Moderate	Moderate
	Digital Media and Design Technologies	Low		Low		Low		Low	

High Moderate Low No school offering course

Sector and trade categories		Jajpur		Jharsuguda		Kalahandi		Kandhamal	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	Moderate		Low		High		High	Low
	Horticulture and Gardening	Moderate		Low		Moderate	High	High	High
	Dairy Farming and Livestock Health	Moderate		Low		Low		Moderate	
	Aquaculture and Fisheries	Low		Low		Moderate		Low	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	High		High		Low		Low	
	Automotive Tech and Servicing	Moderate	High	Moderate	Low	Moderate	Low	Moderate	Moderate
	Fabrication Technologies (Building/ Construction)	Moderate		High		Moderate	Low	High	High
	Electronics and Hardware	Moderate	Low	Moderate	Moderate	Moderate	High	Moderate	Moderate
Consumer Business and Services	BFSI	Low		Low		Low		Low	
	Beauty and Wellness	Low		High		Low	Moderate	Low	Moderate
	Front Office and Hospitality/Tourism	High	High	Moderate	Moderate	Moderate		Low	High
	Sales and Marketing (Retail/Other Sectors)	Moderate	Low	Moderate	Moderate	Moderate		Moderate	
	Healthcare	High		Low		High		Moderate	
	Fashion and Apparel	Low		Low		High		Low	
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	Moderate	Moderate	Moderate	Moderate	Low	High	Low	High
	Digital Media and Design Technologies	Low		Low		Low		Low	

High Moderate Low No school offering course

Sector and trade categories		Kendrapara		Keonjhar		Khordha		Koraput	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	High		High		Moderate		High	Low
	Horticulture and Gardening	Moderate		High		Moderate		High	High
	Dairy Farming and Livestock Health	Low		Low		Low		Low	
	Aquaculture and Fisheries	Low		Low		Low		Low	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	Low		Moderate		Moderate		Moderate	
	Automotive Tech and Servicing	Moderate	Low	Moderate	High	High	Low	Moderate	Moderate
	Fabrication Technologies (Building/ Construction)	Low	High	Low	Low	Moderate		High	High
	Electronics and Hardware	Moderate	Moderate	High	High	High	Moderate	Moderate	
Consumer Business and Services	BFSI	Low		Low		Moderate		Low	
	Beauty and Wellness	Low		Moderate	Low	High	Low	Moderate	Moderate
	Front Office and Hospitality/Tourism	High		High		High	Moderate	Moderate	High
	Sales and Marketing (Retail/Other Sectors)	Moderate		Moderate	High	High	High	Moderate	
	Healthcare	Moderate		High		Moderate		High	
	Fashion and Apparel	Moderate		Moderate		High		Low	
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	Low	Moderate	Low	High	High	High	Low	High
	Digital Media and Design Technologies	Low		Low		Moderate		Low	

High Moderate Low No school offering course

Sector and trade categories		Nuapada		Puri		Rayagada		Sambalpur	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	High		Moderate		High		High	
	Horticulture and Gardening	Moderate	High	High		High	Moderate	Moderate	
	Dairy Farming and Livestock Health	Low		Moderate		Low		Low	
	Aquaculture and Fisheries	Low		Low		Low		Low	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	Low		Moderate		Moderate		Moderate	
	Automotive Tech and Servicing	Moderate	High	High	Low	Moderate	High	Moderate	Moderate
	Fabrication Technologies (Building/ Construction)	High	Low	Moderate		High	High	High	Moderate
	Electronics and Hardware	Low	High	High		High	High	High	Moderate
Consumer Business and Services	BFSI	Low		Moderate		Low		Low	
	Beauty and Wellness	Low	Moderate	Moderate		Moderate	Moderate	High	
	Front Office and Hospitality/Tourism	Low		High	Low	Moderate	High	Moderate	Moderate
	Sales and Marketing (Retail/Other Sectors)	Moderate	Moderate	High	Low	Moderate		Moderate	High
	Healthcare	Low		High		Moderate		Moderate	
	Fashion and Apparel	Low		High		Low	Low	Low	Moderate
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	Low	Moderate	Moderate	Low	Low	Moderate	Moderate	High
	Digital Media and Design Technologies	Low		Low		Low		Low	

High Moderate Low No school offering course

Sector and trade categories		Sonepur		Sundergarh	
		District Relevance	Current skilling capacity	District Relevance	Current skilling capacity
Agriculture and Allied	Farm Productivity and Agronomy	High		High	Low
	Horticulture and Gardening	Moderate	Moderate	High	
	Dairy Farming and Livestock Health	Low		Low	
	Aquaculture and Fisheries	Moderate		Low	
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation	Low		High	
	Automotive Tech and Servicing	Low	High	High	High
	Fabrication Technologies (Building/ Construction)	Low		High	
	Electronics and Hardware	Low	Low	High	Moderate
Consumer Business and Services	BFSI	Low		Low	
	Beauty and Wellness	Low		High	Low
	Front Office and Hospitality/Tourism	Low	Moderate	Moderate	High
	Sales and Marketing (Retail/Other Sectors)	Low		High	Low
	Healthcare	Low		High	
	Fashion and Apparel	Low	Low	Low	
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities			
Information Technology	IT Software Development and Support	Low	Moderate	Moderate	High
	Digital Media and Design Technologies	Low		Low	

High Moderate Low No school offering course

Illustration 20104 | Odisha: District-wise view of demand vs. current skilling capacity

Potential Next Steps for Odisha

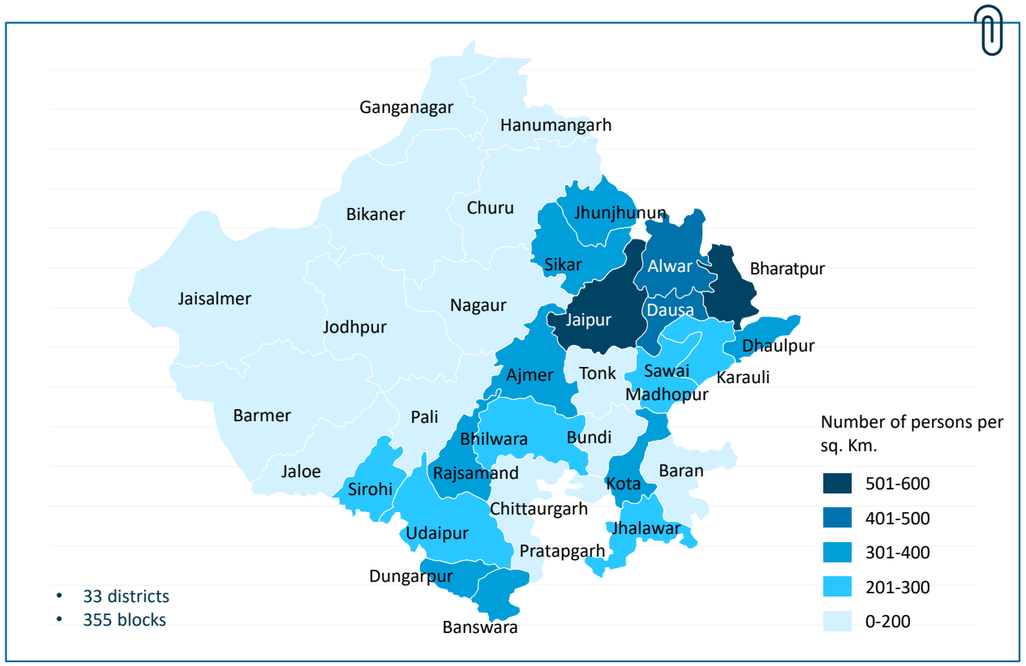
- **Build a three to five year plan to expand supply of skill education** from approximately 10% (about 949 schools) to up to 30% (about 2,850 secondary/higher secondary schools) across districts
- I**n parallel, plan to ensure 100 percent of the secondary schools (or about 9,500 schools) offer employability skill** related courses over the next few years (in line with NEP goals)
- **Direct effort towards building capabilities around key trades** for each district such as Workshop, tech, and manufacturing in Angul, Farm productivity and agronomy in Balgarh, Bhadrak, among others *(refer district-wise trade recommendation included as part of this chapter)*
- **Validate and finalize priority trades in collaboration with DEO/BEO and local industry officials** to ensure alignment with local industry needs, map trades school by school with district consultations
- **Collaborate with State Board to accommodate revamped trade subjects and strengthen assessments**
- **Onboard knowledge partners as necessary to build out new trade curricula, support with training of teachers, assessments planning etc.**; in parallel, plan for hiring of teachers with the required qualifications and setting up labs
- **Prepare budget estimates for the plan** and enable availability of funds via existing state and central mechanisms (e.g., STARS budget, state budget etc.)

4.3.6 Skill Gap Assessment: Rajasthan

Economy Overview and Imperatives for School-to-Work

Socio-Demographic Snapshot[1]

Rajasthan is a predominantly rural state with sizable school education system and large working population.



Predominantly rural desert state in India …

- Population: About 70 million
- Literacy: Approximately 67%

… with a sizeable school education system …

- GER: Approximately 84% (secondary) and 62% (higher secondary)
- Approximately nine million students in public schools (About 2.5 million in secondary; 1.1 million in high school)
- Approximately 69,000 public schools in the state (16,000 secondary; 11,700 high school)

… substantial working age population but high unemployment

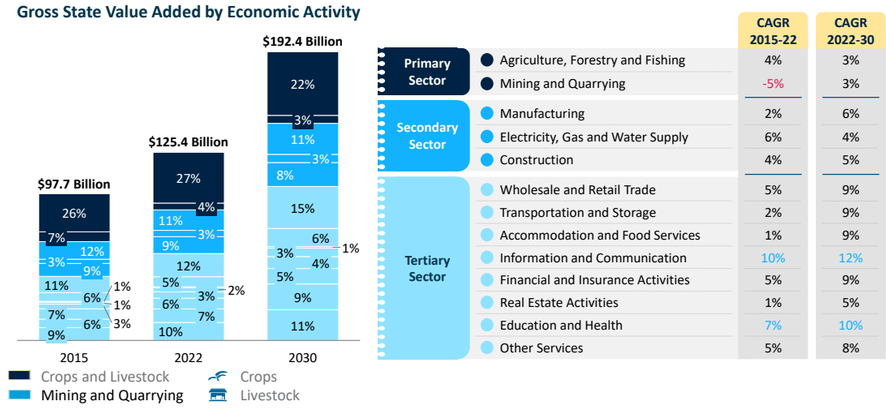
- 24 million people between 15-59 years
- 4.5% unemployment rate compared to national average rate of about 5.1%

1. As per the Aadhar Statistics, 2021/2022; Census of India 2011

Illustration 105 21| Rajasthan: Socio-demographic Snapshot

Economic Snapshot[1]

Rajasthan is the seventh largest contributor to India's GDP (five to six percent), with a $125 billion economy, growing at four percent CAGR over last seven years.



		CAGR 2015-22	CAGR 2022-30
Primary Sector	Agriculture, Forestry and Fishing	4%	3%
	Mining and Quarrying	-5%	3%
Secondary Sector	Manufacturing	2%	6%
	Electricity, Gas and Water Supply	6%	4%
	Construction	4%	5%
Tertiary Sector	Wholesale and Retail Trade	5%	9%
	Transportation and Storage	2%	9%
	Accommodation and Food Services	1%	9%
	Information and Communication	10%	12%
	Financial and Insurance Activities	5%	9%
	Real Estate Activities	1%	5%
	Education and Health	7%	10%
	Other Services	5%	8%

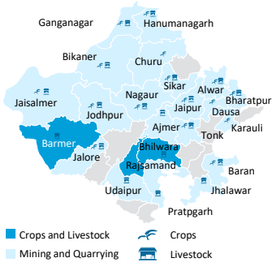
Illustration 106 22| Rajasthan: Economic Snapshot

Economy by District[2]

- Agriculture fragmented across the state
- Mining is limited to three districts (Barmer, Bhilwara, Rajamand)
- Five top districts (Jodhpur, Jaipur, Ajmer, Udaipur and Alwar) emerge as key contributors for manufacturing and services output
- Four emerging sectors: Renewable energy (Solar), Electronics System Design and Manufacturing (ESDM), IT and ITES, and Medical and health
- Jaipur and Alwar, emphasizing solar energy and minerals, could witness growth due to PLI in specialty steel and chemicals, while Jodhpur and Bikaner hold promise for the renewable energy sector, especially solar PV modules

Primary Sector

Crops, and Mining and Quarrying



- **Agriculture:** Highly fragmented industry – prominent in northwest region (wheat, bajra, maize, cotton, rapeseed and mustard)
- **Milk production:** Largest producer in India; spread across the state
- **Mining:** 70% of mining output comes from three districts. Barmer alone accounts for 50% of mining in the state (zinc, lead, copper, limestone)

Secondary Sector

Manufacturing and Construction

- **Manufacturing:** 60% output from three districts (Alwar, Jaipur, Bhilwara)
- **Key industries:** Handicrafts, Textiles, Auto, Minerals and Gems and Jewelry

Tertiary Sector

Services

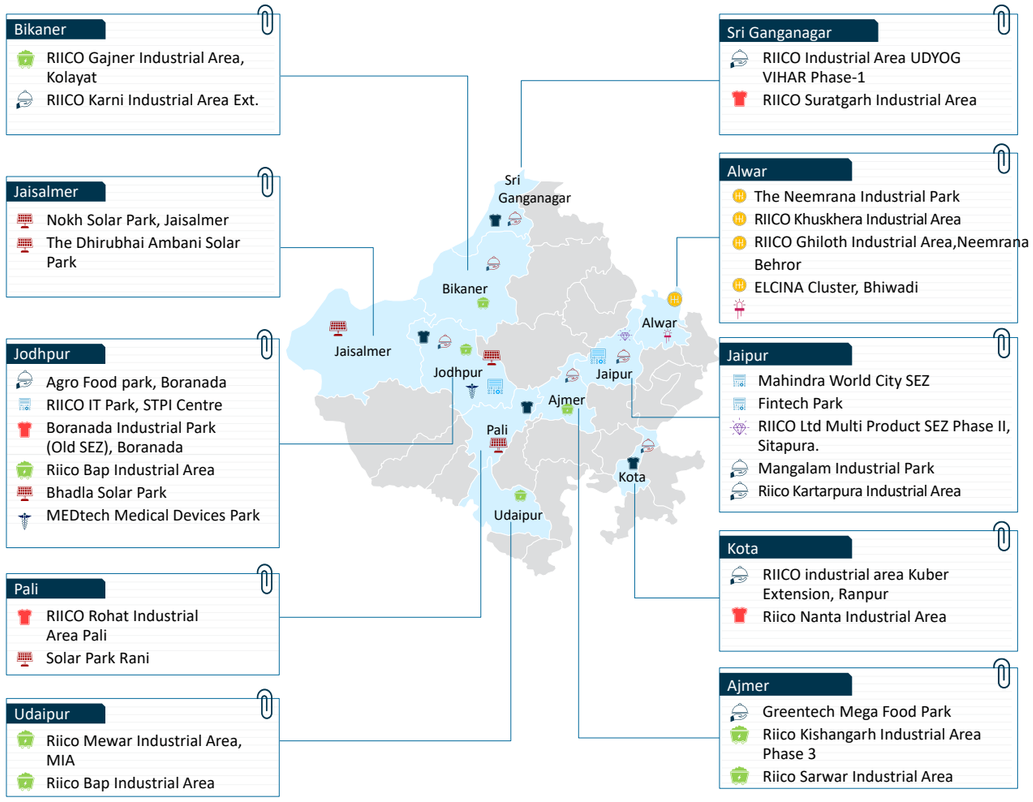
- 41% tertiary services come from six districts (mainly tier two cities)
- Tourism and related services are the major contributor
- Jaipur has an emerging IT hub

1. Real Gross Value Added, at constant value (2015), MOSPI, GoI; Oxford Economics Estimates
2. Internal Analysis; based on data from Directorate of Economics and Statistics, Govt of Rajasthan

Illustration 23107| Rajasthan: Economy by districts

30+ Industrial Parks Will Act as Employment Hubs for IT Services and Manufacturing

- The state government has taken several initiatives to promote the IT industry, such as the RIICO IT parks in Jaipur, Jodhpur, and Kota.
- Manufacturing clusters focused on Textile, Solar, Food Processing, and Gems and Jewelry.



Source: Press research

Illustration 10824| Rajasthan: Industrial Parks and employment hubs

Employment Snapshot and Expected Growth Areas

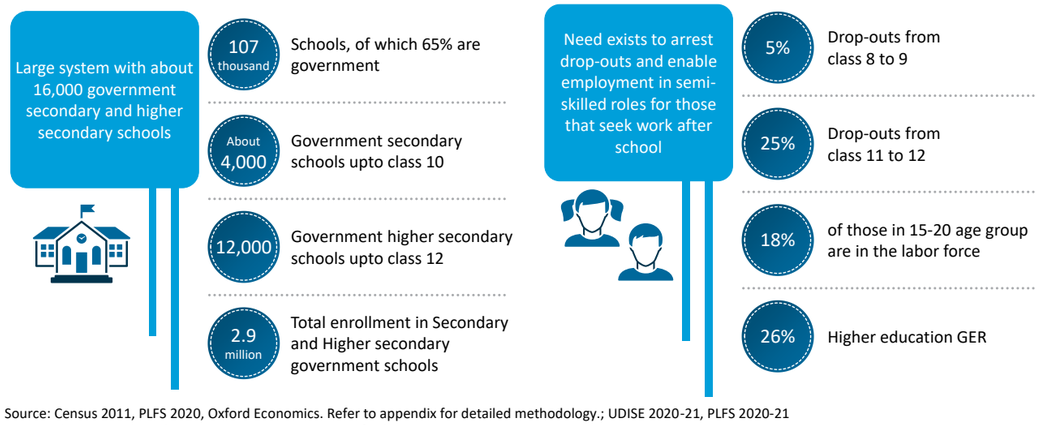
Five million incremental employment demand will be generated between 2021 and 2030 across the state [1].

- Agriculture projected to see a fall in demand for labor by approximately 600 thousand
- Manufacturing to witness 50 percent y-o-y growth and make up 55 percent of the incremental demand (2.9 million).
- Services such as retail, tourism, BFSI and IT will witness over 45 percent growth by 2030
- 40 percent incremental demand to be from top five districts. 25 percent incremental demand from Jaipur alone.

Unit: '000s'[2]	Employment Demand 2021	Employment Demand 2030	Incremental Demand[3]	Growth % 2021-30
Agriculture, Forestry, and Fishing	19,939	19,349	(591)	-3%
Mining and Quarrying	612	959	347	57%
Manufacturing	5,848	8,703	2,856	49%
Electricity, Gas and Water Supply	379	404	26	7%
Building and Construction	2,496	2,708	211	8%
Wholesale and Retail Trade	2,082	2,994	912	44%
Transportation and Storage	846	1,169	324	38%
Accommodation and Food Service Activities	145	220	75	52%
Information and Communication	116	170	53	46%
Financial, Real Estate and Professional Services	372	545	174	47%
Public Administration	1,424	1,950	526	37%
Education and Health	823	1,007	184	22%
Other Services	1,848	1,906	58	3%
Net Total	36,930	42,083	5,153	14%

Context of School Education in Rajasthan

Large system with 107 thousand schools that can benefit from Skill Education integration and enable students to gain better employment as well as prevent dropouts.



Source: Census 2011, PLFS 2020, Oxford Economics. Refer to appendix for detailed methodology.; UDISE 2020-21, PLFS 2020-21
1.Internal estimates based on Census 2011, PLFS 2020, Oxford Economics
2. Includes main and marginal workers
3. Incremental demand calculated by subtracting 2030 demand projections from 2021 projections

Illustration 109 25| Rajasthan: School Education Landscape

Current Penetration of Skill Education is Low

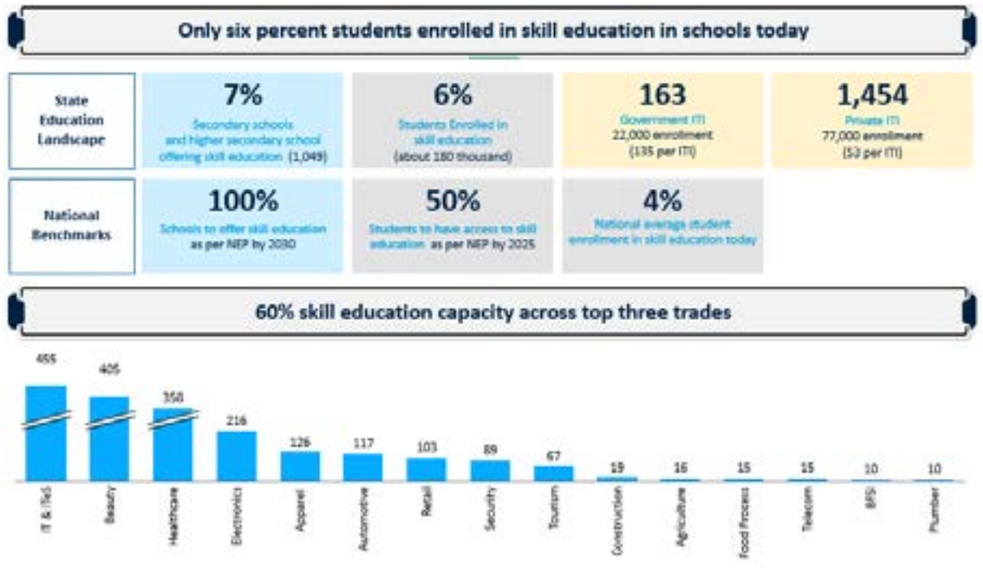
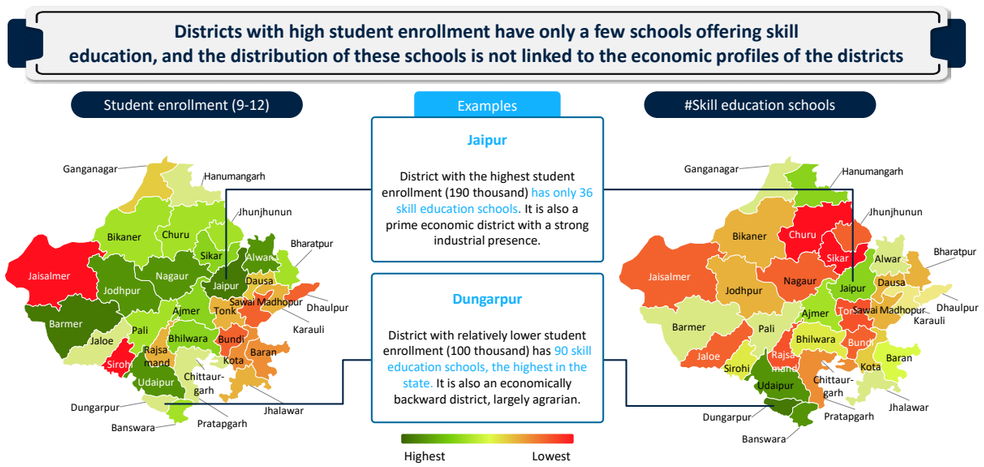


Illustration 26110 | Rajasthan: Enrollment in SE - total and by trades

Even in schools that offer SE, a unique challenge was observed in Rajasthan (which was not seen in any other STARS state) whereby there was no dedicated slot for skill education in the school timetable. Skill education was taken up as an “additional” subject by students over and above other regular subjects, leading to increased academic burden for student opting for skill education, and also logistical challenges for VTPs in scheduling skill education classes. As a result, these classes were often conducted in an ad hoc manner, typically during free periods or after regular school hours.

Presence of Skill Education Schools in the State Not Found to Be In-Line with Overall Distribution of Secondary Enrollment



Source: UDISE 2020-21, PLFS 2020-21, DGIT 2022, Data shared by State Education Dep, Projections from Oxford Economics; Press search

Illustration 111 27| Rajasthan: Distribution of secondary enrollment vs. skill education schools

State Skilling Snapshot | Clear Opportunity to Expand Skilling Capacity in Line with Demand

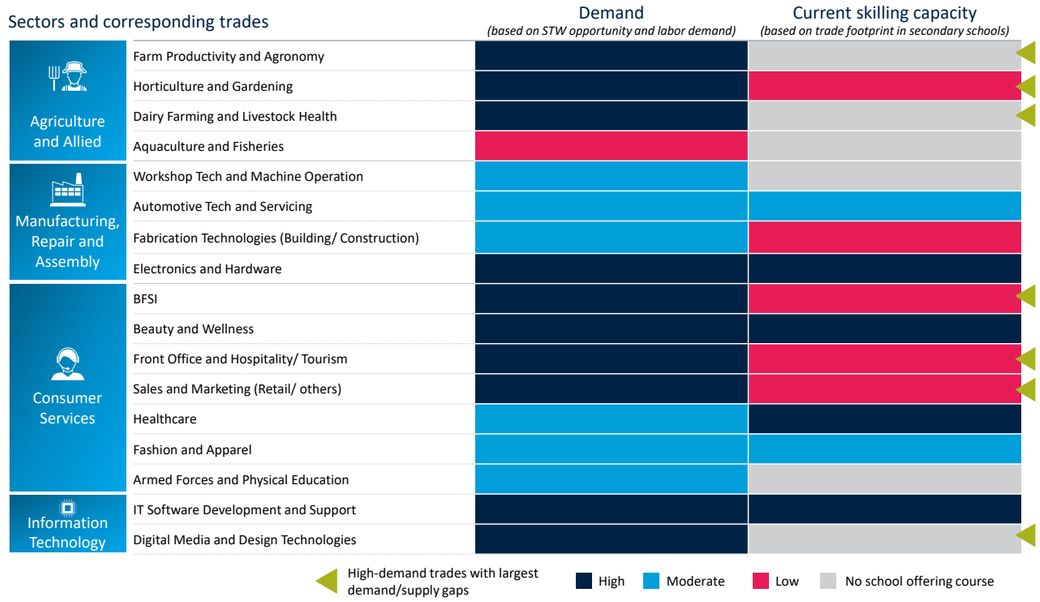
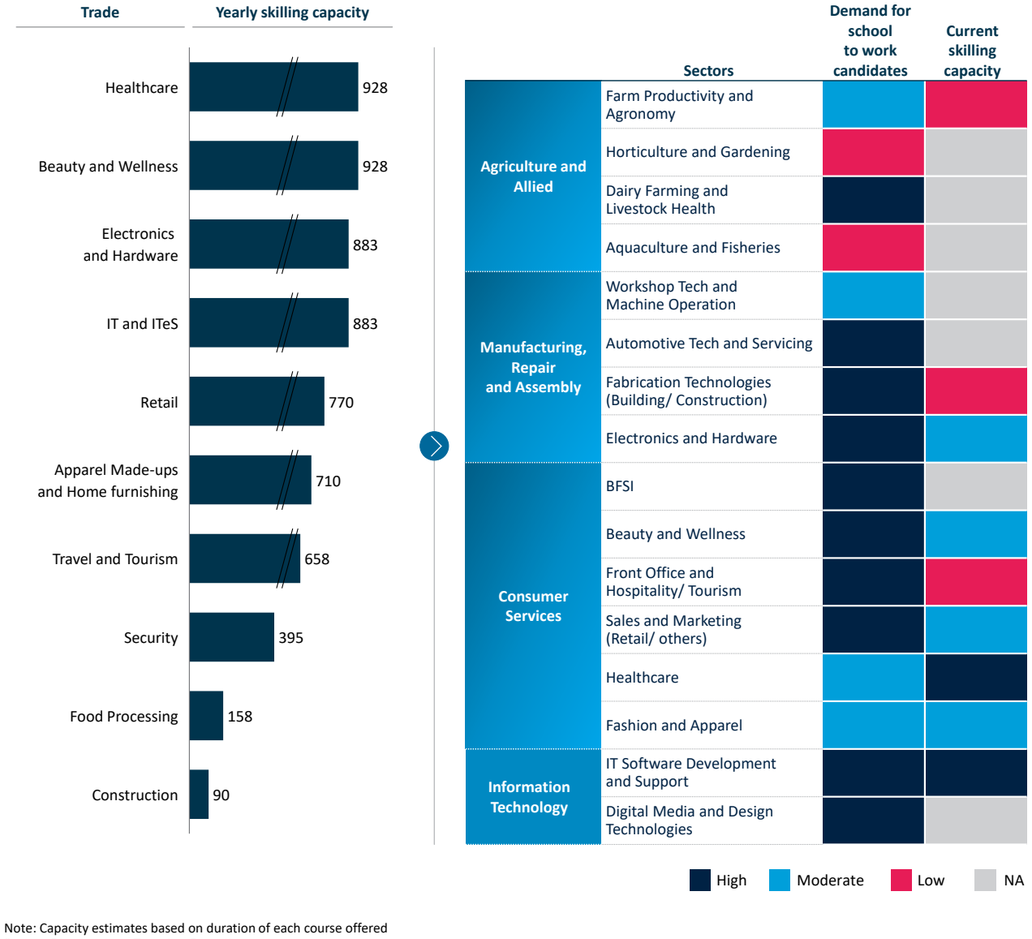


Illustration 28112 | Rajasthan State overall skilling snapshot (demand vs. supply)

In Addition, a Significant Mismatch Is Observed Between the Current Skilling Offering & Local Demand as Illustrated in the Example for Jodhpur Below :

Yearly skilling capacity under SS for all trades vs. likely demand in Jodhpur



Note: Capacity estimates based on duration of each course offered
Source: Directorate of Technical Education

Source: Internal Analysis

Illustration 11329 | Illustration of demand-supply mismatch for Jodhpur

The above analysis for Jodhpur was conducted basis primary research in the district and conversations with industry present in the districts, visits to MSMEs, shopfloors, retail shops, farms etc. A similar view has been created across all districts of the state as well, however, based on secondary research alone. This must hence be further validated by states themselves and then leveraged to determine each district's desired future trade-mix.

Sector and trade categories		Ajmer		Alwar		Banswara		Baran	
		Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance
Agriculture and Allied	Farm Productivity and Agronomy		High		High		Moderate		High
	Horticulture and Gardening		Moderate		Moderate		Low		Low
	Dairy Farming and Livestock Health		High		High		Moderate		Moderate
	Aquaculture and Fisheries		Low		Low		Low		Low
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation		Moderate		High		Moderate		Moderate
	Automotive Tech and Servicing	Moderate	High	Moderate	High	High	Moderate		Moderate
	Fabrication Technologies (Building/ Construction)		Moderate		Moderate		High		Low
	Electronics and Hardware	Low	High		High	High	High	High	Moderate
Consumer Business and Services	BFSI	Low	High	Low	High		Low		Low
	Beauty and Wellness	High	High	High	Moderate	High	Low	Low	Low
	Front Office and Hospitality/ Tourism	Low	High	Low	Moderate	Moderate	Low		Low
	Sales and Marketing (Retail/ others)	Low	High	Moderate	Moderate		Low		Low
	Healthcare	High	Moderate	High	High	High	Moderate	High	Low
	Fashion and Apparel		Low		Low	Moderate	High	Low	Low
	Armed Forces and Physical education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	High	Moderate	High	Moderate	High	Low	High	Low
	Digital Media and Design Technologies		Moderate		Moderate		Low		Low

High Moderate Low Zero capacity

Sector and trade categories		Barmer		Bharatpur		Bhilwara		Bikaner	
		Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance
Agriculture and Allied	Farm Productivity and Agronomy		Moderate		High		High		High
	Horticulture and Gardening		Moderate		Low		Moderate	Moderate	Moderate
	Dairy Farming and Livestock Health		High		Moderate		High		High
	Aquaculture and Fisheries		Low		Low		Low		Low
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation		High		Moderate		High		Moderate
	Automotive Tech and Servicing	Low	Moderate		Moderate	Moderate	Moderate	Low	Moderate
	Fabrication Technologies (Building/ Construction)	Moderate	High	Low	High		High		Moderate
	Electronics and Hardware	Moderate	High	Low	High	High	High	Low	High
Consumer Business and Services	BFSI	Low	Low		Moderate		Moderate		High
	Beauty and Wellness	High	Low	Moderate	Moderate	High	Moderate	High	Moderate
	Front Office and Hospitality/ Tourism		Low	Low	Low	Low	Low	Low	Moderate
	Sales and Marketing (Retail/ others)		Low	Low	Moderate		Moderate		Moderate
	Healthcare	High	High	Low	Moderate	High	Moderate	High	Moderate
	Fashion and Apparel	Moderate	High		High		High		Moderate
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	High	Low	High	Low	High	Low	High	Moderate
	Digital Media and Design Technologies		Low		Low		Low		Moderate

High Moderate Low Zero capacity

Sector and trade categories		Bundi		Chittorgarh		Churu		Dausa	
		Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance
Agriculture and Allied	Farm Productivity and Agronomy		High		High		Moderate		High
	Horticulture and Gardening		Moderate		Moderate	Low	Moderate		Low
	Dairy Farming and Livestock Health		Moderate		Moderate		Moderate		Moderate
	Aquaculture and Fisheries		Low		Low		Low		Low
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation		Moderate		Moderate		Low		Low
	Automotive Tech and Servicing		Moderate		Moderate		Moderate		Moderate
	Fabrication Technologies (Building/ Construction)				Moderate		Moderate	Low	Moderate
	Electronics and Hardware	Low	Moderate		Moderate	Moderate	Moderate		Moderate
Consumer Business and Services	BFSI		Low		Moderate		Moderate		Low
	Beauty and Wellness		Low	Moderate	Moderate	High	Moderate	High	Low
	Front Office and Hospitality/ Tourism		Low		High		Low	Low	Low
	Sales and Marketing (Retail/ others)	Low	Low	Low	Moderate	Low	Moderate		Low
	Healthcare		Low	Moderate	Moderate	High	Moderate	High	Low
	Fashion and Apparel	Moderate		Moderate	High		Moderate		Moderate
	Armed Forces and Physical education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	High	Moderate	Low	Moderate	Moderate	Low	Moderate	Low
	Digital Media and Design Technologies		Low		Moderate		Low		Low

High Moderate Low Zero capacity

Sector and trade categories		Dholpur		Dungarpur		Ganga Nagar		Hanumangarh	
		Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance
Agriculture and Allied	Farm Productivity and Agronomy		Moderate		Moderate		High		High
	Horticulture and Gardening		Low		Low		Moderate	Low	Moderate
	Dairy Farming and Livestock Health		Moderate		Moderate		High		High
	Aquaculture and Fisheries		Low		Low		Low		Low
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation		Low		Low		Low		Low
	Automotive Tech and Servicing		Moderate		Moderate		Moderate		
	Fabrication Technologies (Building/ Construction)				High	Moderate		High	
	Electronics and Hardware	High	Moderate	High	Moderate	Moderate	Moderate	High	Moderate
Consumer Business and Services	BFSI		Low		Low		High		High
	Beauty and Wellness	High	Low	High	Low	High	Moderate	High	Moderate
	Front Office and Hospitality/ Tourism	Moderate	Low	Low	Low		Low	Low	Low
	Sales and Marketing (Retail/ others)	Low	Low		Low	Moderate	Moderate		Moderate
	Healthcare	Low	Low	High	Low	Low	Moderate	Moderate	Moderate
	Fashion and Apparel	Moderate		High	High	High		Moderate	
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	Low	Low	High	Low		Low	High	Low
	Digital Media and Design Technologies		Low		Low		Low		Low

High Moderate Low Zero capacity

Sector and trade categories		Jaipur		Jaisalmer		Jalore		Jhalawar	
		Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance
Agriculture and Allied	Farm Productivity and Agronomy		High		Low		Moderate		Moderate
	Horticulture and Gardening		Moderate		Moderate		Moderate	Low	Low
	Dairy Farming and Livestock Health		High		Moderate		Moderate		Moderate
	Aquaculture and Fisheries		Low		Low		Low		Low
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation		High		Moderate		Low		Low
	Automotive Tech and Servicing	Low	High	Moderate	Moderate		Moderate		High
	Fabrication Technologies (Building/ Construction)		High						
	Electronics and Hardware	Low	High		Moderate	High	High		Moderate
Consumer Business and Services	BFSI		High		Low		Low		Low
	Beauty and Wellness	Moderate	High	Low	Low	High	Low	Moderate	Low
	Front Office and Hospitality/ Tourism	Low	High	Low	Low		Low	Moderate	Low
	Sales and Marketing (Retail/ others)	Low	High	Low	Low	Moderate	Low		Low
	Healthcare	Moderate	High	Moderate	Low	Moderate	Low	Moderate	Low
	Fashion and Apparel		Moderate	Low	Low		Moderate		High
	Armed Forces and Physical education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	Moderate	High	High	Moderate	Moderate	Low	High	Low
	Digital Media and Design Technologies		High		Low		Low		Low

High Moderate Low Zero capacity

Sector and trade categories		Jhunjhunu		Jodhpur		Karauli		Kota	
		Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance
Agriculture and Allied	Farm Productivity and Agronomy		High		Moderate		Moderate		Moderate
	Horticulture and Gardening	Low	Moderate		Moderate		Low		Low
	Dairy Farming and Livestock Health		High		High		Moderate		Moderate
	Aquaculture and Fisheries		Low		Low		Low		Low
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation		Low		High		Moderate		High
	Automotive Tech and Servicing		High		High		High		High
	Fabrication Technologies (Building/ Construction)			Low	High		Low		Moderate
	Electronics and Hardware		Moderate	Moderate	High	High	Moderate	Low	High
Consumer Business and Services	BFSI	Low	Moderate		High		Low		High
	Beauty and Wellness	High	Moderate	High	High	High	Low		High
	Front Office and Hospitality/ Tourism		Moderate	Low	High		Moderate		Moderate
	Sales and Marketing (Retail/ others)		Moderate	Moderate	High		Low		High
	Healthcare	High	Low	High	High	High	Low	Low	High
	Fashion and Apparel		Low	Low	Low	Low	Low		High
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	High	Low	High	High	High	Moderate	Moderate	High
	Digital Media and Design Technologies		Low		High		Moderate		High

High Moderate Low Zero capacity

Sector and trade categories		Nagaur		Pali		Pratapgarh		Rajsamand	
		Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance
Agriculture and Allied[1]	Farm Productivity and Agronomy		High		Moderate		Moderate		Moderate
	Horticulture and Gardening	Moderate	Moderate		Moderate	Low	Low	Low	Low
	Dairy Farming and Livestock Health		High		High		Low		Moderate
	Aquaculture and Fisheries		Low		Low		Low		Low
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation		Low		High		Low		Low
	Automotive Tech and Servicing		High		High		Moderate		Moderate
	Fabrication Technologies (Building/ Construction)				Moderate	Low		Low	Moderate
	Electronics and Hardware		High		Moderate	Moderate	Moderate	Moderate	Moderate
Consumer Business and Services	BFSI		High		High		Low		Low
	Beauty and Wellness	Moderate	Moderate	Low	Moderate	Moderate	Low	High	Low
	Front Office and Hospitality/ Tourism		Moderate	Moderate	Moderate		Low	Low	Low
	Sales and Marketing (Retail/ others)	Low	Moderate	Low	Moderate	Moderate	Low	Low	Low
	Healthcare	High	High	High	High	High	Low	High	Low
	Fashion and Apparel				Low			Low	High
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities							
Information Technology	IT Software Development and Support	Moderate	Moderate	High	Moderate	High	Low	Low	Low
	Digital Media and Design Technologies		Moderate		Moderate		Low		Low

High Moderate Low Zero capacity

Sector and trade categories		S. Madhopur		Sikar		Sirohi		Tonk		Udaipur	
		Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance	Current skilling capacity	Demand relevance
Agriculture and Allied	Farm Productivity and Agronomy		High		High		Low		High		Moderate
	Horticulture and Gardening		Low	Low	Low		Low		Moderate	High	Low
	Dairy Farming and Livestock Health		High		High		Moderate		Moderate		High
	Aquaculture and Fisheries		Low		Low		Low		Low		Low
Manufacturing, Repair and Assembly	Workshop Tech and Machine Operation		Low		Low		Low		Low		Moderate
	Automotive Tech and Servicing	High	Moderate		High	Low	Moderate		Moderate		High
	Fabrication Technologies (Building/ Construction)		Low		Low	Low	Low				High
	Electronics and Hardware		Moderate		High		Moderate	Moderate	Moderate		High
Consumer Business and Services	BFSI		Low		Moderate		Low	Low	Moderate		High
	Beauty and Wellness	Moderate	Low	Moderate	Moderate	High	Low	Low	Moderate	Moderate	Moderate
	Front Office and Hospitality/ Tourism	Low	Low	Low	Moderate	Low	Low	Low	Low	Low	High
	Sales and Marketing (Retail/ others)		Low	Moderate	Moderate	Low	Low	Low	Low	Moderate	High
	Healthcare	Moderate	Low	Moderate	Moderate	Moderate	Low	Low	Low	Moderate	High
	Fashion and Apparel		Low		High		High			High	High
	Armed Forces and Physical Education	Can offer this course if the district is motivated towards preparing students for defence/fitness activities									
Information Technology	IT Software Development and Support	High	Low	Moderate	Moderate	High	Low	Low	Low	High	High
	Digital Media and Design Technologies		Low		Moderate		Low		Low		High

High Moderate Low Zero capacity

Illustration 30114| Rajasthan: District-wise view of demand vs. current skilling capacity

Potential Next Steps for Rajasthan

- **Build a three to five year plan to expand supply of skill education** from approximately seven percent (about 1,049 schools) to up to 30% (about 4,500 secondary/higher secondary schools) across districts
- I**n parallel, plan to ensure 100 percent of the secondary schools (or approximately 15,000 schools) offer employability skill** related courses over the next few years (in line with NEP goals)
- **Direct effort towards building capabilities around key trades** for each district such as Dairy farming and livestock in Ajmer, Barmer and Alwar; Manufacturing, repair, and assembly related trades in Churu among others
- **Validate and finalize priority trades in collaboration with DEO/BEO and local industry officials** to ensure alignment with local industry needs, map trades school by school with district consultations
- **Collaborate with State Board to accommodate revamped trade subjects and strengthen assessments**
- **Onboard knowledge partners as necessary to build out new trade curricula, support with training of teachers, assessments planning etc.**; in parallel, plan for hiring of teachers with the required qualifications and setting up labs
- **Prepare budget estimates for the plan** and enable availability of funds via existing state and central mechanisms (e.g., STARS budget, state budget etc.)

4.4 Common Gaps in SE Delivery Across States

4.4.1 Gaps in Hands-on or Experiential Learning – Labs, Pedagogy and Curricula

Several school visits highlighted the need to establish full-fledged, up-to-date labs with appropriate equipment(s) – both quantity and quality. For example, typewriters were found where computers would have been more appropriate for learning or old cars from 1990s models were found in automotive labs. Labs across many states either lacked the required number or quality of equipment(s). Well-equipped labs, consisting of modern and high-quality equipment(s), will truly enable students to gain valuable practical experience.

Outdated retail and healthcare lab setup in the same room as the school doesn't have space for two separate labs

Illustration 315 | Vocational labs as observed during school visits

Further, the current pedagogy focuses on rote based learning. Instead, focusing on application-oriented learning through case studies, practical examples and simulation can enhance the learning and placement outcomes. For example, for office assistant roles, today the focus is often on narrow data entry skills whereas industry needs skills with respect to data entry, computer operations, basic tool operations, database handling, etc. This gap in curricula and pedagogy to make it practice-based in line with industry ask needs to be addressed.

4.4.2 Assessments Have Scope to be More Rigorous and Truly Test Hands-on Learning

While the assessments are typically conducted via external assessors provided by Sector Skill Councils (SSCs), the rigor with which they assess the students varies significantly. Field visits and observations indicated that assessments consist of three components - projects or models, written exams, and viva voce. The project exercises are often theoretical and do not help with student learning. For example, students may be asked to showcase different computer parts on chart papers. Further students may be asked to write computer syntaxes and commands using pen and paper instead of performing exercises in computer labs.

In addition, concessions towards students are often made on account of limited infrastructure or limited instructional time. However, easier assessments also create a vicious loop leading back to non-rigorous delivery and lower student engagement. To make the assessments more effective, there is opportunity for far greater rigor in testing student's skills as well as a shift towards more in-depth practical assessments.

4.4.3 Greater Focus & Coverage Needed for General Employability Skills

During interviews, employers often cited the lack of general employability skills such as soft or communication skills, digital literacy, and financial literacy in new graduates. This gap is exacerbated for students undergoing skill education, as they often enter the workforce sooner, with many entering jobs immediately after school.

Across states, industry stakeholders have pointed gaps with professional grooming of school graduates. For example, school graduates placed in the tourism and hospitality industry were not aware of basic grooming etiquettes and had to be trained on the job. Further, BFSI sector has pointed challenges with understanding of basic numerical skills amongst the school graduates. For example, banking sales agents typically struggle with basic simple interest rate calculations, required while selling credit cards or opening bank accounts for customers. Lack of employability skills also hampers the salary potential of these school graduates. In a textile shop, salary of workers who did not know English was 25-30 percent lower than the ones who knew English.

4.4.4 Gaps in Local Industry Linkages Need to be Addressed

The current system has very weak industry linkages with little to no involvement from industry players. Guest lectures and field visits, although infrequent, are often premised on personal relationships with no institutional engagement or follow-ups. There is no structured industry involvement for curricula iteration or adaptation, infrastructural and placement support. This is due to two factors. First, the responsibility of establishing industry partnerships is left to individual teachers, who often have neither time nor the influence necessary to deliver on this responsibility. Second, industry stakeholders often do not find it in their interest to invest time and effort into engaging students, especially on short-term engagements (such as the seven day on-job-training prescribed as part of the NSQF courses in schools).

To create successful engagement with the industry, it is necessary to establish clear, meaningful partnerships at all stages of skill education delivery. Conversations with auto industry stakeholders in Indore and Pithampur, Madhya Pradesh indicated strong awareness and willingness towards forging partnerships with ITIs and Polytechnics; however, industry has limited awareness about school-based skill education, nor have they been structurally and systematically been reached out to for partnerships by the school system stakeholders. Increasing industry awareness towards skilled school graduates and providing students with employability certifications that find recognition with industry can help unlock this engagement.

4.4.5 Delivery Through VTPs Needs to be Strengthened

At present, trades under NSQF are provided through contracts with VTPs. Teachers or VTs are recruited and supervised by the VTPs. While the VTP model is beneficial for adapting to the industry's changing demands, challenges have been observed with VT accountability given they are currently not seen as the responsibility of the school leadership and hence are neither mentored nor held accountable for quality of their work. Further VT compensation structures are not in-line with the demands and may need re-examining. For instance, a VT teaching IT/ITeS trade may be in high demand due to emerging IT industry and therefore, might need higher compensation.

4.4.6 Perception of Skill Education Needs to be Changed

While globally true, in India, there is an overpowering narrative around skill education being for students who are weak and would have dropped out. The result is that many students who want to or can benefit more from skill education than mainstream education run to conventional streams like arts, commerce, or STEM. Concerted efforts are needed towards re-branding skill education. For instance, Meister schools in Korea meaning “master of trades.” Other names used across countries are technical education and 21st century skills education, among others.

05

Recommendations: Nine Key Action Areas to Address the Skill Gaps

5 Recommendations: Nine Key Action Areas to Address the Skill Gaps

In the previous chapter, through the skill gap assessment across the six STARS states, a core set of nine design and delivery related challenges emerged. In this chapter, we outline the key recommendations to address these challenges and develop a strong SE model in the STARS states and the country more broadly.

5.1 Expand Access to Skill Education via Skill Hubs

As stated earlier, currently approximately 8 percent[53] of secondary schools in India (government and government aided) offer skill education under the Samagra Shiksha Initiative for skill education schooling. The NEP 2020 targets expanding this number to 100 percent by 2030 and giving 50 percent of students' exposure to skill education by 2025. To meet the immediate-term goal of giving more students access to skill education, governments can transform large secondary schools into "Skill hubs[55]" – centers of skill education excellence that are co-created by the school education system, skill education ecosystem, and industry. Over time, skill education can be expanded to all schools.

What is Skill Hub?

Skill Hubs are nodal skill centers identified to provide skill development and skill education training opportunities to target population segments from class sixth to eighth (introduction to world-of-work through orientation, industry visits, bag-less days), ninth to twelfth (aimed at exposing students to skill development avenues), school dropouts and out-of-education (aimed for academic credit, mainstreaming back to education and or apprenticeship and employment linkages).

Over a period of time these Skill Hubs will associate with adjoining education and skilling institutions (spokes) over a district, or a cluster of adjacent districts, to provide access to skill development training at hub location or at spoke location. (Pradhan Mantri Kaushal Vikas Yojana, Ministry of Skills Development and Entrepreneurship, government of India)

Such adjoining institutions in the vicinity of the Skill Hub may leverage the infrastructure and resources available at the associated Hub for their In-school, drop-outs, and out-of-education candidates in the 15-29 age cohort.

In the initial phase, 5,000 such skill hubs will be identified in the country from across the education and skill ecosystems.

However, the expansion of skill education to 100 percent schools (as articulated in NEP 2020) will take time, since currently just 8 percent[53] schools offer it. The expansion must be done strategically – in a phased manner. As states expand skill education in schools, they should consider a few guiding principles such as:

- Target covering 20-30 percent secondary schools in each district to begin with as an ambitious but achievable goal; this will ensure equitable spread across the state and in different districts (states that are already at a better starting point than this, such as HP, should aim to expand further as well as improve trade selection).

[55] https://www.pmkvyofficial.org/skill-hub

[53] According to UDISE 2021-22 data, there are 1,61,130 secondary and higher secondary schools in India, comprising 1,17,439 government schools and 43,691 government-aided schools. Of these, 13,206 schools (13,090 government and 116 government-aided) offer skill education programs. This accounts for 8% (13,206/1,61,130) of the total schools

- Ensure that the priority of covering as many schools as possible does not restrict the possibility of offering a higher number of trades, sections, and choice in large schools – breadth must be balanced with depth and student choice.
- Prioritize schools that have grades ninth to twelfth but also do not completely leave out schools that end at grade tenth (if present in the state in significant numbers). A hub-and-spoke model can be considered for such schools with SE offering within the school for grades ninth and tenth and linkages to skill hub / other schools for grades 11-12.

5.2 Offer a Revised Set of Broad-Based Trades Targeting Multiple Job- Roles Per Trade

A view on the relevant sectors and trades for school-to-work graduates has been shared in this report (refer Chapter on "Where Are the Jobs"), with the largest opportunities being available in the Services sector. Agriculture follows next with income enhancement opportunity in addition to a few modern farming job roles such as farm advisory/ agri-equipment operators. Lastly, manufacturing opportunities are available for school-to-work graduates primarily in MSMEs.

We also looked at how the trades being taught in schools today focus on a single job-role over two years for each trade. However, both NEP 2020 and NCF 2023 have recommended a broader, multi-skill approach. This multi-skill approach, where students can cover multiple skills covering multiple job roles within a trade, is also what industry needs to be able to deploy its entry-level hires in a variety of roles. Additionally, from a student's perspective, a multi-skill approach increases employability choices and career flexibility.

14 broad-based trades that can serve these needs have also been shared in this report. These include agriculture, workshop tech and machine operation, automotive tech and servicing, fabrication technologies (construction), electronics and hardware, BFSI, beauty and wellness, front office and hospitality, sales, and marketing (retail and other sectors), health care, fashion and apparel, armed forces and physical education, IT software development and support, digital media, and design technologies. These trades are also listed earlier in illustration 5.

Delivering such broad-based trades well would require enhancing student choice with respect to the amount of time that they can dedicate to skill education. In many other countries, students can spend up to 50 percent or more time on SE whereas in India that benchmark is currently at <20 percent. Students should have the option to choose if they wish to study SE in depth or acquire a particular skill in a basic manner only. State Boards would need to be involved and aligned when enabling such choices for students. For example, if a student wishes to study Health care vocation deeply, they should be able to acquire skills for hospital roles such as "General Duty Assistant", but also understand diagnostics and study basics of biology that may open other opportunities (e.g. lab technician) and allow progression in health care related roles in the future. However, at the same time, if another student wishes to only learn skills related to hospital roles, then that option may also be open for them. State Boards will need to make such decisions and education departments will need to enable the school principals, teachers, and dedicated counsellors, where possible, to guide students in making these choices with upfront clarity on implications for future career or higher education pathways.

Skill education curriculum at the secondary level also needs to be customized to align with higher education pathways. Specifically, the subject schema for students studying skill education should be aligned with the eligibility criteria for relevant higher education. In the current skill education model, many relevant higher education pathways are blocked for students post Grade 12. For example, in health care, nursing is a popular career aspiration for students. However, the skill education elective for health care is often offered only to students who do not study Biology in grades 11 and 12. This limits future relevant pathways for skill education students. Further, the eligibility criteria for nursing programs (for example, B. Sc. Nursing) assigns no credit for studying health care in grades 11 and 12, with the criteria only referencing traditional academic subjects such as Biology, Chemistry, and Physics. Changes will be required in both the school education and

higher education system to correct such misalignments. In this case, the school system can allow students the choice to pursue logical pairs such as Biology and Health care trade, while institutions offering nursing programs can decide on the type of credit and recognition, they want to confer on the skill education elective/ subjects for health care. Similarly, skill education pathways in school and the relevant higher education should be aligned for all trades as they are redeveloped. It is expected that a set of pathways will not be accessible post SE (e.g., B Tech which requires Physics, Chemistry, Math) and such information about which future pathways will remain open vs. not should also be made available to students as they make their choice to pursue SE or not.

5.3 Realign Trades to School Mapping Basis Local Economy, Leverage Skill Hubs

The demand (in terms of job potential and employer requirements) for each trade is different all over the country. There are variations at the state, district, and block levels because needs vary based on the local economy. Job prospects for trades like agriculture and manufacturing are particularly sensitive to local context. However, at the same time, some sectors, and linked trades, for example, sales and marketing, health care, banking, and financial services, can be considered "universal" as they all have a strong footprint in most geographies. Hence, job-roles related to these trades (such as sales associates and general duty assistants) are in demand everywhere. Overall, the trade mix for a given district or block will typically be a combination of both "local" and "universal" trades.

State governments need to enable district-level offices to lead trade-mapping. Hyperlocal economic data is difficult to gather at-scale. Further, even granular datasets can sometimes mask nuances of the job market. For example, even within the same sector (like food processing as an example), the degree of mechanization varies widely across geographies. This has a deep impact on both current job availability and prospects. Hence, trade mapping should not be just a top-down exercise, even if it is data-driven. Bottom-up inputs from district officers are crucial, and a well-executed trade mapping will need to be driven by efforts at the district-level.

There are three factors to consider beyond the local economy need – school capacity constraints, student aspirations, and existing skilling footprint.

First, at a school-level, infrastructure and capacity constraints are a challenge. Some geographies only have small-scale schools. For example, Pahargarh is an administrative block in Madhya Pradesh's Morena district. It has no government secondary schools with more than 200 students across grades 11-12. Hence, most schools might be limited to offering just zero to one trade. Madhya Pradesh has five such blocks (out of 319 in total). Another 20 blocks have just one school large enough to offer at least two trades. Trade mapping is challenging in these geographies. In these blocks, offering students choice is a challenge. Should just one to two trades (deemed to have high potential) be replicated across all schools to offer students employment prospects at the cost of breadth? Or should each school be assigned one trade from a district-level menu of five to six trades? In this scenario some schools may prefer trades other than the one they are assigned. All these choices are further complicated by students potentially not being able to travel too far.

One alternative for these blocks is to explore the idea of dedicated Skill Hubs. These would be dedicated, residential skill education schools that could be set-up with specific industry partners. These hubs can attract skill education oriented students from all over the block (or even district), and hence achieve sufficient scale to offer choice across four to five trades in one location.

Second, the local trade mix should also cater to student aspirations. Often student aspirations go beyond their immediate local economic context. Such aspirations should be factored in to offer true student choice and prepare students for pathways beyond their immediate surroundings (for example, if they choose to migrate). Creating some skilling capacity in forward-looking technology-linked trades could fall in such a category.

Third, the existing trade footprint in schools is also a crucial factor to consider during trade mapping. While overall penetration of skill education in schools is low, at a particular school and block level many geographies already have significant skill education offerings and hence existing equipment and labs present in schools, an eco-system of VT trainers teaching them etc. As skill education is expanded, new trade launches should complement and enhance the existing footprint instead of ignoring it. For example, if specific trades – say Health care or Beauty and Wellness – have already been launched in a few schools in a block, the other schools in the block should consider launching other high-potential trades that complement the existing offerings. While every school should get a say in what it wishes to offer, there is also a competing broader objective of offering reasonable student choice at a block level so that students can choose from a broader menu of trade across schools.

Given the interlinkage between state-level factors and local variations, trade mapping requires strong coordination across levels of government. We recommend a balanced approach as illustrated below. In this approach, the union and state governments together define a "universe" of trades for district-level decision-makers to choose from. Each district then shortlists its own "menu" based on comparing the local economic context with the existing skilling footprint. New trades are then assigned to each school from this "menu," after accounting for all other factors through a consultative process with schools (factors such as capacity constraints, student aspirations, and existing trade offerings in target or nearby schools).

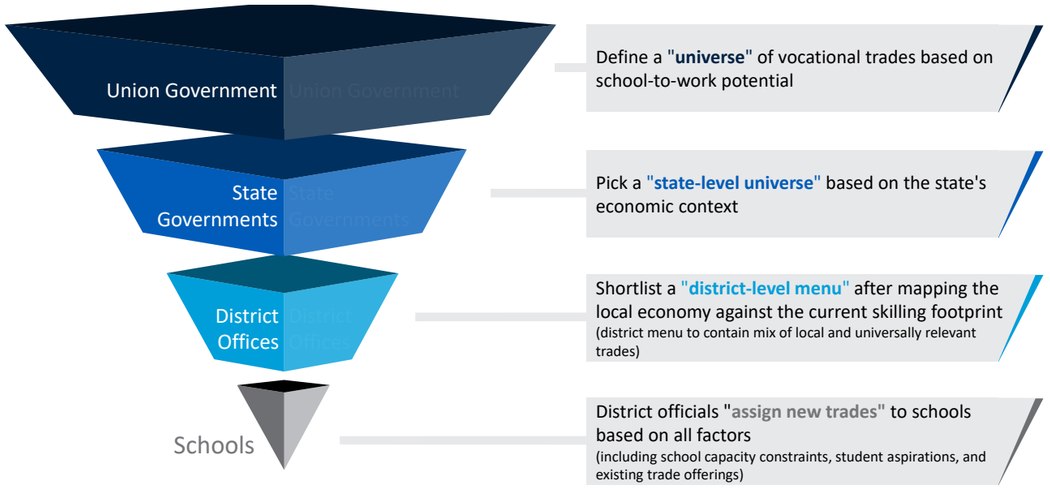


Illustration 116 | Approach for trade mapping

5.4 Focus on Employability Skills Along with Technical Skills

In addition to core technical skills, employers require individuals to be trained in basic employability skills such as soft skills, digital literacy, and financial literacy, among others. The current employability skills courses, if any, are not sufficient and there is a need to broaden the learning outcomes of the course(s) based on evolving industry demands.

There are already many platforms available for strengthening delivery of employability skills.

First, there are core academic subjects that are relevant to employer needs. For example, English, Computer Science, and Mathematics, all address components of communication, digital literacy, and problem-solving required by employers. However, the design and delivery of these core academic courses can be evolved to align better with employability needs.

Second, currently, the skill education curriculum for NSQF subjects in schools includes employability skills as a separate topic to be covered (in 110 out of the 300 instructional hours per subject per year). However, instead of or along with teaching employability skills as separate topics, they can also be embedded in the pedagogy and assessments of technical topics.

Third, employability related activities outside the classroom can be crafted as coherent learning journeys. School students typically participate in a variety of activities outside classrooms. Skill education l subjects also incorporate industry exposure through internships or on-the-job-trainings. These experiences can be tied together into coherent employability-focused learning journeys through pedagogical tools such as reflection exercises and careful sequencing of activities.

Fourth, recently launched courses in many states cover some select employability related skills. However, new subjects typically focus on one or two such areas such as “soft skills” or “entrepreneurship skills” only. A well-designed employability skills course needs to be more interdisciplinary, covering diverse learning areas from financial literacy to life skills to workplace communication to process to start one's own business. Further, such a course should ideally be taught by dedicated teachers who have the core competencies to teach diverse learning areas and are not distracted by the priorities of any other subjects. The exhibit below summarizes some of these ideas.

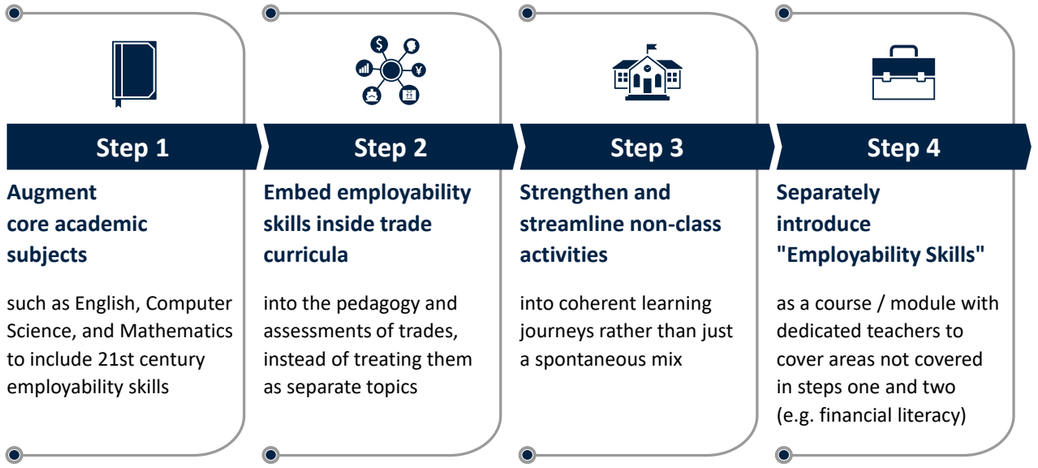


Illustration 117 | Avenues to enhance employability skills offering

5.5 Enhance Hands-On Learning Infrastructure and Focus on Experiential Pedagogy

To enable true hands-on learning, the infrastructure and pedagogy associated with skill education need to be strengthened significantly.

Lab infrastructure policies need to be revamped to align with evolving industry trends. Lab facilities play a crucial role in providing hands-on training for skill education trades. However, many schools currently face challenges with sub-optimal lab conditions, including limited space and outdated or irrelevant equipment, such as old machinery in repair labs and a shortage of computers in IT labs. Therefore, there is a critical need to enhance the quality of lab infrastructure. In addition, the maintenance of skill education labs are equally vital due to the need for consumables on a daily basis as well as their rapid ageing compared to regular school infrastructure. Skill education labs need to adapt swiftly to evolving industry demands. Overall, three main considerations for the policy design of skill education lab infrastructure are:

1. **Frequency of updating of** skill education **labs should align with the evolving industry trends.** A change in policy is required when it comes to designing policy for the maintenance and updating of skill education lab infrastructure. Typically, one-time, or capital expenditures on labs are not refreshed for several years after the initial investment. However, for skill education, the policy needs to adapt to explicitly allow shorter refresh cycles (for example, five years) for infrastructure procurement. This change will ensure that skill education labs can be updated promptly to align with the ever-changing requirements of the industry.
2. **Industry involvement for lab design and infrastructural support.** Involving industry experts ensures that skill education labs stay current and relevant to real-world industry needs. Further, it might not be feasible to create full-fledged labs in all schools either due to budgetary or space constraints. Therefore, skill labs and industry partnerships are crucial. As outlined in NEP 2020, Skill labs can be set up in select schools in a hub-and-spoke model and the other nearby schools to use the facility. Further, secondary schools can collaborate with ITIs, PTs, and local industries to avail lab infrastructure as well as organize industry visits and OJTs.
3. **Separate fund for consumables in** skill education **labs.** Skill education lab consumables fall under the general school fund which often leads to limited or no fund for the skill education labs. Therefore, at a policy level, consumables for skill education labs can be provided a separate fund with more budget to ensure hands-on practical training.

Also, pedagogy has the potential to be more experiential and hands-on. Currently, about70 percent of classroom time is dedicated to theory lectures. Even within the remaining 30 percent allocated for lab work, the presence of inadequate and outdated equipment often results in content-based lectures and note-taking by students. This should be shifted towards more hands-on learning.

5.6 Build Mechanisms to Engage Qualified Teachers/Trainers with Industry Experience

At present, trainers under NSQF are provided through contracts with VTPs (Vocational Training Providers). Teachers or VTs are recruited and supervised by the VTPs. While the VTP model is beneficial for adapting swiftly to the industry's changing demands, there are disparities in the teaching skills and motivation of these VTs, resulting in inconsistent delivery of skill education across states, districts, and schools. There are three fundamental opportunities to ensure a quality standardized teaching experience:

1. **To attract best talent, VT compensations need to be re-examined:** Having both industrial qualifications and teaching experience is crucial for VTs as it enables them to effectively deliver hands-on, industry-linked education. In many instances, VTs have industry expertise but lack formal teaching qualifications such as a B.Ed. or extensive teaching experience. This deficiency in pedagogical skills results in the delivery of theoretical and content-heavy lectures, which deviate from the expected hands-on learning in skill education. Since the demands of each trade vary, it may also be required to revisit the compensation structure of VTs and adjust it for each trade separately. For instance, a VT teaching IT/ITeS trade may be in high demand due to emerging IT industry and therefore, might need higher compensation. This will ensure that the best pool of VTs is hired for delivery of skill education in schools.
2. **Enhance VT accountability:** It is essential to establish clear rules and responsibilities for VTs and ensure their full accountability in the delivery and success of skill education trades. Currently, in many schools, VTs are not seen as the responsibility of the school leadership and hence are neither mentored nor held accountable for quality of their work. While VTs may not be solely responsible for all the outcomes the state seeks from skill education, their performance can still be monitored, both by the school leadership as well as a broader governance structure set up by the state. Given the contractual nature of the VTs, consequences can be attached to outcomes more easily to incentivize the right sets of behaviors.

3. **Dedicated teachers/ VTs for employability skills:** Currently, employability courses lack dedicated teachers, resulting in inconsistent delivery by existing teachers or VTs who are not uniformly trained. Given the significance of employability skills in the eyes of employers, dedicated trainers should be considered to ensure consistent and effective delivery of these courses, which are equally important as the skill education trades themselves.
4. **Redesigning teacher trainings in the** skill education **context:** Skill education teachers require industry-relevant skills, which evolve frequently. Hence, the teacher training model needs to reflect this rapid evolution of requirements. Trainings for skill education teachers need to be more frequent. Since skill education trainers also come from an industry background, they require additional trainings on topics such as pedagogy and classroom management (compared to academic teachers who receive this exposure pre-service).

5.7 Strengthen Assessments to Test for Hands-On Skills

Currently, the assessment framework allocates 50 percent of the weightage to practical assessments, 40 percent to theoretical assessments, and 10 percent to other internal assessments. However, despite this balanced distribution, practical assessments face a significant challenge. While the assessments are typically conducted via external assessors provided by SSCs, the rigor with which they assess the students varies significantly. Field visits and observations indicated that often concessions towards students are made on account of limited infrastructure or limited instructional time. However, easier assessments also create a loop leading back to non-rigorous delivery and lower student engagement. To make the assessments more effective, there is a need for far greater rigor in testing students' skills as well as a shift towards more in-depth practical assessments as opposed to superficial ones. Within the 50 marks designated for practical assessments, a substantial 30 marks are devoted to rote-based memorization testing and vivas, leaving a mere 20 marks for the actual practical exam out of 100. This design can be tweaked, with more marks allotted to practical assessments based on demonstration of skills.

S.No	Methods of Assessment	Weightage (Maximum Marks)	Minimum Qualifying Marks
1	Theory examination (Written test)	30	10
2	Practical test and oral test/ viva voce	50	17
3	Continuous comprehensive evaluation	20	Will be included only if the student qualifies individually in both theory and practical
Total		100	

Type of Assessment	Skills and Practical	Marks Allotted
1 Hands-on Skill/ Demonstration for Skill Competency	**A.** Spotting: Part 1 for example, naming different equipment	10
	A. Spotting: Part 2 for example, identifying waste and segregating	10
	B. Practical Task 1/Practical Task 2 for example, room preparation for new patient, create patient daily care plan	15
	C. Communication and personal grooming skills, such as communication, listening, and presentation skills	5
2 VIVA Voce	**D.** Viva Voce, for example: explaining the role of a PCA in transferring a urine sample to the lab and describing the steps of handwashing	10

Actual practical assessments for 20 marks only

Currently, 30 out of 50 marks are non-practical

Illustration 118 | Health care SSC assessment framework for HSSC grades[56]

[56] National Qualification Register: https://nqr.gov.in/sites/default/files/Annexure percent207 percent20QA percent20of percent20Assessment percent20in percent20HSSC.pdf

Learnings from different countries also illustrate the need for more practical assessments. In many other countries with robust school-to-work models, assessments are practical in nature. For instance, in the United States, the equivalent trade of GDA, known as Certified Nursing Assistant (CNA), includes comprehensive practical assessments where students actively perform tasks instead of merely listing or answering questions about them.

From an implementation standpoint, currently assessors are incentivized based on volume, specifically the number of students assessed, with a fee per student assessed. This at times results in assessors focusing on quantity over quality. Therefore, there is a need to reconsider this incentive structure, decoupling it from the quantity of students assessed, and instead linking it to quality. One example could be mandating a minimum amount of time for each student assessment to ensure thorough and accurate evaluations.

Further, as new broad-based trades are developed, assessments might span multiple sectors and involve multiple SSCs. To implement this, the National Skill Development Council (NSDC) will have to support the development of new trades/ qualification packs even spanning multiple Sector Skill Councils (for example when dealing with overlapping areas in sales and BFSI). In such scenarios, one lead SSC may be allocated to each trade and be tagged with collaborating SSCs that input into the assessment design and conduction process. However, NSDC will need to create systems for collaboration between different Sector Skill Councils to develop, undertake, and release certifications for such trades.

5.8 Develop a Deep and Ongoing Partnership with Industry

At present, NSQF recommends a seven-day OJT after 12th-grade exams for all students, with a full-fledged apprenticeship only for the top two students. However, this approach has its challenges. The seven-day OJT offered to all (except top two students) is inadequate due to its short duration and needs to be revised. There is an additional provision for "apprenticeships" within the NSQF model, which allows students to engage with employers for several weeks (as compared to the seven day on-job-training). However, this opportunity is made available to only two students per trade per school. Additionally, both on-job-trainings and apprenticeships are offered after the 12th grade when students are out of school and already seeking employment, making it less valuable for their career prospects. In some cases, students from one trade pursue OJT opportunities in other unrelated trades. Moreover, even when students are at the industry establishment for OJT, they may find themselves without meaningful tasks, leaving them idle without learning opportunities.

There are two main reasons industry linkages have been difficult to establish several years. First, teachers are expected to identify and formalize internship opportunities by themselves. They are unable to devote sufficient time to industry engagement due to their academic responsibilities. Further, even when teachers do reach out, they are doing so in an individual, fragmented capacity rather than an at-scale systemic approach. Often individual teachers also cannot truly engage with employer concerns such as legal liabilities and compensation negotiations. Second, industry stakeholders often ask what they would get from investing the time and effort needed to host students for short one-week engagements. A potential solution to address these issues is for state governments to take initiatives to support schools in establishing formal industry partnerships. Not only are state-level partnerships with high profile industry stakeholders valuable in themselves, but they could also set the precedent for schools to forge more local partnerships at their level. These partnerships could offer longer-duration, full-summer OJT programs for students post-grade 11. This would provide students with more substantial and relevant work experience, better preparing them for future careers. One potential pathway for the state to implement these industry partnerships is through cross departmental partnerships. The state's Department of Education can engage other departments such as Industries and Commerce and even district administration to engage employers in systematic dialogue. An additional benefit of a state-led model is that existing provisions such as the Apprenticeship Act can also be implemented more effectively.

In addition, industry partnerships are vital for creating detailed skill taxonomies at the local level (i.e., categorization and organizations of skills by type, relevance, and complexity, aiding in workforce development and job matching) as well as forecasts (i.e., expected number of opportunities across these skills/ job roles). This will help governments in periodically calibrate trade offerings, as well as in capacity planning (e.g., how many schools in a district should offer a particular trade). Additionally, industries must be encouraged to use Corporate Social Responsibility (CSR) funds to enhance infrastructure in schools and skill hubs, benefiting both community engagement and brand perception.

Learnings from other countries also showcase the value of industry partnerships. Successful skill education models globally focus extensively on such partnerships. E.g., Meister Schools in South Korea sign MoUs with industry players like Samsung and Hyundai to hire a definitive number of students. These industry players along with relevant skill ministries also help them develop and revise curricula basis evolving industry needs. They also regularly send experts from their organizations to take guest lectures. National-level core research agency and Korean Research Institute for Skill Education and Training along with industry players and relevant government ministries are also involved to ensure the stable operation of Meister Schools.

Similarly, going forward, states can take initiative and support districts in establishing formal partnership with relevant industries and educational institutions. These partnerships can support schools across a range of domains such as curricula development, guest lectures, field visits, internships, and placement opportunities. A critical aspect to keep in mind is the formalization of these partnerships – as evidenced in MoUs between Samsung and Meister Schools in South Korea among other examples.

Beyond state-level support, local capacity will be required to implement industry integration initiatives. Significant governance capacity is required for initiatives such as sourcing internships, matching students to them, monitoring operations during internships, and collecting feedback from employers and students after the internship. Block and school-level capacity will need to be created to conduct these activities. Currently, teachers are left to arrange these of their own initiative, which leads to variable and low-quality implementation.

5.9 Change Perceptions Around SE, Effectively Counsel Students and Parents

While globally true, in India, there is an overpowering narrative around skill education being for students who are weak and would have dropped out. The result is that many students who want to or can benefit more from skill education than mainstream education run to conventional streams like arts, commerce, or STEM.

Multiple factors lead to the stigmatized perception around skill education. First, there is no vocal proponent of the benefits of skill education including school education stakeholders primarily because the topic has not been prioritized leading to a general lack of awareness. In schools, teachers, and principals themselves often do not understand the benefits and tradeoffs of picking a skill education pathway. Hence, students do not receive appropriate counselling. Second, often the positioning for skill education focuses on how it is “easy scoring” and suited for children who are facing challenges in general academics. This narrative then percolates down to students and parents. Third, there are also legitimate concerns about whether students pursuing skill education in school accidentally miss access and eligibility for higher education pathways.

All these issues need to be addressed to shift perceptions around skill education. This will require both – fundamentally strengthening the value proposition of skill education by improving its design and delivery and in parallel building a more accurate and empowering narrative around it.

Other countries have shown examples of creating more empowered narratives around skill education. For instance, Meister Schools in Korea meaning “master of trades.” Other names used across countries are technical education and 21st century skills education, among others. To conduct a similar rebranding exercise for skill education India, there needs to be a dedicated communication strategy to create awareness amongst key stakeholders (for example, parents, students) and ensure there is sufficient uptake of the

courses and for the right reasons. Each state should create an effective communication and branding strategy for skill education. For example, skill education can be renamed (alternatives include “professional learning” and “applied learning”). Monthly outreach plans and door-to-door campaigns can be explored. Additional exposure can be provided through an informative website and by organizing visits for parents to skill education labs in schools. A customized approach will be required depending on the context of each state.

Beyond perceptions, there is also a need for strong career counseling for students and parents. Making career choices is neither an easy nor a natural decision for a student or the parent. Several factors play into this decision. In secondary school, a student's decisions are primarily influenced by three key stakeholders: peers, teachers, and parents. Peer influence can be substantial, particularly when students are uncertain about their career goals. Teachers often have insights into their students' classroom performance but may not be fully aware of their socio-economic backgrounds and constraints. Additionally, teachers and principals may harbor biases influenced by their own backgrounds and job success metrics, such as increasing enrollment in their classes. This partial perspective can result in biased recommendations that do not necessarily align with a student's genuine interests and abilities. Conversely, parents possess a comprehensive understanding of their child's abilities, constraints, and unique circumstances. However, they often lack awareness and knowledge about the full range of educational and career options available to their child. To address these challenges, counselling plays a crucial role for both students and parents.

Counselling serves to raise awareness about various educational and career options based on a student's interests, capabilities, and constraints. Counselling is not a one-time conversation for a student or parents but a series of conversations over a period of time. Effective counselling also requires specialized skills. Hence, it is important to onboard dedicated counselors as they can provide high quality and impartial guidance ensuring that students make well-informed decisions about their future paths. School teachers often do not have the time or the skill to do so and also may hold inadvertent subjective biases. Career counselling has taken center stage in various policies and programs including NEP, NCF and STARS, underlining its utmost significance, and must be executed effectively as states strengthen alternate pathways for students.

Guidelines on Career Counselling in Schools

NEP 2020 presses importance of career counselling in identifying student interests and talents as well as helping them make informed career choices

SS has shared end-to-end contours for implementation of counselling in schools

- The initiative has provisioned one Academic Resource Person (ARP) for career counselling per block for the existing 7,116 blocks under SS
- Additional grant up to 5 lakhs is provided to block resource center to expand support to secondary grades under SS[1]

STARS (SIG 5.1) recommend states to develop a program that provides one-on-one guidance to students based on their aspirations and academic interests including training on soft skills

Note: 1. BRC guidelines, Ministry of Education, Government of India

Illustration 119 | Key policy guidelines on career counselling in schools

06

Path Forward: Where to Begin Immediately?

6 Path Forward: Where to Begin Immediately?

Nine key action areas to address the skill gaps and strengthen skill education have been discussed in the previous chapter. This chapter aims to turn this expansive agenda for skill education into an achievable, phased plan of action across key stakeholders: State Governments, Central Ministries and other national organizations, broader ecosystem, especially the industry. For each action area, immediate steps and long-term plans have been culled out separately.

6.1 Action Agenda for State Governments: Short Term and Long Term

As states begin to plan their roadmap of action, a set of efforts can be initiated immediately whereas others require the state leadership teams to strategically step back and make bold decisions to undertake a set of policy and design shifts (e.g. enabling student choice to study skill education in depth percent) or Board reforms required strengthen assessments approach. Keeping this in mind, the suggestive path forward for states has been divided into short term or immediate and long-term priorities. While the long-term priorities may be executed and deliver results later in time, deliberations, and planning towards those should also begin in states at the earliest.

Action area	Where to begin immediately?	What to plan for the long term?
Expand access to skill education via skill hubs	• Establish additional Skill Hubs to expand access to skill education in states; focus on large schools to begin with (>40 enrollment per grade across ninth - twelfth) • Can prioritize efforts in a few districts to begin with; choose districts with varied economies to enable holistic learning via pilot efforts (service-heavy, manufacturing heavy, urban multi-sectoral economy etc.)	• Aim to have about 20-25 percent schools in each block established as Skill Hubs. • Consider a set of "Dedicated" Skill Hubs where only skill education is offered and no other academic streams (especially useful to enable multiple trades to be offered in blocks with only sub-scale schools that can individually only offer zero to one trade)
Revised set of broad-based trades targeting multiple job roles per trade	• Start process to reassess current trades portfolio at state level and finalize future trade basket relevant for the state • Begin redevelopment of a few trades • Initiate convergence conversations with higher education, technical education, and other departments as necessary to ensure vertical mobility and necessary career progression for students who choose to take up skill education.	• Revamp all trades over a period of three to four years to ensure shift from current narrow job-role focused trades to multi-skilling trades in industry domains. Take necessary support from PSSCIVE or internal / external experts and knowledge partners and ensure depth of content is such that students may choose subjects in line with the flexibility offered by NCF 2023 (up to three skill education subjects in classes 11 and 12 to build in-depth skills and knowledge) percent • Setup institutionalized processes for refreshing the state's trade mix every five years

Action area	Where to begin immediately?	What to plan for the long term?
Re-align trades to school mapping basis local economy; leverage skill hubs	• For all upcoming Skill Hubs/ skill education schools, select trades relevant to local economy using the insights and approach shared in this report	• For existing skill education schools/ Skill Hubs, review current trade mix and make changes, if required, to sync with local economy demand (e.g. shutting some trades/ adding new ones); make shifts only where critical and suitably move existing lab infra etc. to other schools as appropriate • Set-up an ongoing process for district skill education officers to propose trades for upcoming Skill Hubs/ skill education schools in line with the local economy; build district officers' capacity to refresh skill gap studies from time to time.
Focus on employability skills along with technical skills	• Begin offering employability and entrepreneurship skills as a separate three to four hour capsule per week – pilot in a few districts to begin with. • Leverage a panel of experts/ Knowledge Partners to help develop the content, outcome tracking mechanisms, conduct teacher trainings etc. • Can launch as a Pilot in a subset of secondary schools/ districts to begin with, and then scale up to the entire state	• Aim to offer employability skills as a subject with appropriate weightage in Board exams • Revamp trade curricula to ensure employability skills are embedded within the pedagogy of the trade • Aim to develop/ refine and roll-out Business English, Applied Mathematics and Computer Science offerings in states to address employability skills that can squarely fit within these subjects
Enhance hands-on learning infrastructure & focus on experiential pedagogy	• For planned new Skill Hubs, set up high quality labs with industry input for up-to-date equipment	• Consider revisions to the trade curricula & pedagogical approach, providing greater weightage for practical or experiential over theoretical learning
Build mechanisms to engage qualified teacher/trainers with industry experience	• Put in place strong governance mechanisms to monitor performance of VTPs; ensure school leaders take interest at school level to monitor trainers from VTPs as well	• Consider revisions to service terms and incentives to enable onboarding higher quality teachers/ trainers (e.g., for courses such as IT/ ITeS with trainer talent shortage)
Strengthen assessments to test for hands-on skills	• Ensure that the 50 percent marks allocated for practical assessment in the assessment framework today indeed test practical skills via hands-on exercises and not theoretical questions • Ensure availability of required infrastructure/ equipment to	• Initiate dialogue with SSCs to ensure rigorous practical skills testing – advocate for changing incentives from a structure that is linked to number / quantity of students assessed today to the quality of assessments • Undertake Board reforms to strengthen the aspect of skill

Action area	Where to begin immediately?	What to plan for the long term?
	enable practice-based assessments	education assessments that is managed by the State Board
Develop a deep and ongoing partnership with industry	• For new skill hubs, establish industry partnerships for all trades offered in a Skill hub to enable OJTs, guest lectures, placements etc. – set-up these partnership MoUs at state level, district level, and local block level	• Expand the pool of industry partners as well as deepen industry relationships across levels (block/ district/ state levels) to ensure mentorship/ projects/ placement support for students. • Establish state level relationships with industries department, MSME department etc. as a pathway to unlock industry partnerships institutionally at scale and to stay current with industry needs which should influence revamp of trades portfolio and curricula.
Change perception around SE; effectively counsel students and parents	• Proactively invest in improving the perception of Skill Education - build internal buy-in amongst teachers/ principals on its importance and train them to appropriately guide students. • Establish a well-functioning Career Counselling system in the state; pilot in a subset of schools/ districts to begin with; hire dedicated counsellors in line with MoE recommendations and state budgets.	• Consider implementing a SE communication and branding strategy as needed. For example, consider renaming Skill Education as Professional Education etc. Monthly outreach plans and door-to-door campaigns can be explored.

Some of the immediate action steps can be initiated by the states leveraging budgets available as part of the STARS project over the next one to two years. In parallel, internal discussions towards the long-term actions should also be initiated. Successful implementation of the long-term policy and board reforms will require political buy-in. This long-term commitment is crucial for a conducive and sustainable long-term implementation.

States should also look to bolster their Skill Education teams at State and district levels to drive this action agenda including setting up a dedicated Project Management Unit or Working Group headed by a senior official that drives the agenda in mission mode.

6.2 Action Agenda for Central Ministries and Other National Organizations

In addition to action that states should initiate, Central Ministries as well as other stakeholders and organizations in the ecosystem such as NCERT, NSDC etc. will need to play distinct roles to make the vision of large-scale integration of skill education in secondary schools a reality. Some key next steps for different stakeholders are articulated below.

Central Ministries (e.g., Ministry of Education, Ministry of Skill Development and Entrepreneurship)

- Broaden the construct of NSQF trades offered in skill education schools to cover multiple job roles and skills within each trade. As mentioned earlier, this will cater to the industry's demand for students with broad-based skills. Central Ministries will need to provide guidance / direction to curricula building organizations (such as PSSCIVE) and regulatory authorities (such as NCVET) to approve such new broad-based trades. This will imply NCVET approving a new set of Qualification Packs (QPs) corresponding for each new trade. These QPs can leverage the same underlying National Occupational Standards (NOSs). However, the NOSs will need to be grouped together or packaged in line with a revised, broader scope for each trade. NSQF recognition of the revamped trades will enable acceptability by employers and provide better employment prospects for students.
- Foster collaboration amongst various Sector Skill Councils to undertake assessments and certifications for the new set of trades that may be developed. Some trades may straddle across multiple Sector Skill Councils requiring collaboration (for example, a functional trade like Sales and Marketing may benefit from the involvement of multiple SSCs)
- Develop and disseminate a national narrative on the benefits of school-to-work transitions with the aim to raise awareness and understanding of the benefits of skill education and drive wider acceptability and at-scale execution by states.

Curricula Development Bodies (NCERT, SCERT, PSSCIVE)

- Support/ lead the development of revised skill education teaching-learning material for new trades, with a hands-on practical pedagogical approach that is suitable for the target segment and school education. Collaborate deeply with industry and other experts/ knowledge partners while building out the new curricula and ensure a considerable time is allocated to On-the-Job trainings, projects etc.

National Skill Development Corporation and Sector Skill Councils

- Encourage and support the development of new trades/ qualification packs even when they span across multiple Sector Skill Councils (as mentioned earlier, a common trade such as sales and marketing will span various SSCs including Retail, BFSI, and apparel among others). One lead SSC may be allocated to each trade along with collaborating SSCs that input into the trade design process.
- Put in place systems for collaboration between different Sector Skill Councils to develop and undertake assessments, and certifications for such trades.
- Ensure assessment design holistically tests for practical understanding and skills and not theory or rote understanding.
- Expand the pool of assessors to include industry professionals and put in place process checks and balances to ensure authenticity of assessments conducted. Consider incentives that link to the quality and not quantity of assessments conducted.
- Can consider rolling out a mechanism that recognizes and promotes school-to-work pathways by awarding national certifications for schools based on placement outcomes and other relevant parameters, hence encouraging best-performing schools.

6.3 Action Agenda for Broader Ecosystem, Especially Industry

Industry and industry associations

Come forth to actively collaborate with state education departments, central curricula building bodies and skill education schools in a variety of areas such as:

- Providing practical exposure to students by offering apprenticeship opportunities, field visits, OJT opportunities, guest lectures, and seminar, etc. This will provide students with the much-required hands-on experience.
- Providing job linkages through placement and/or internship opportunities; conducting placement drives.
- Supporting development and/or review of curricula for trades to ensure it is in line with industry requirements, and evolving technologies, and trends.
- Supporting with set up of lab infrastructure for skill education courses by providing guidance on the relevant set of equipment and resources required and providing budgetary support where possible etc.
- Serve as Anchor Partners for a set of flagship Skill Hubs. Industry can provide the necessary funding, resources, and expertise to ensure the success of these schools which can then serve as a model for other skill education schools in the country.

For effective industry partnerships, a dedicated team led by a senior official, such as the Education Secretary, is essential to swiftly implement recommendations. Support from other governmental agencies such as investment facilitation bodies will further enable firm up industry partnerships across regions. Without strategic leadership and programmatic execution, these initiatives risk stagnation and slowdown overall progress – often a challenge observed across sectors and governments.

Separately, a coalition/ consortium/ guild of key industry players could also come together and work collaboratively to provide comprehensive support in implementing skill education in schools in a particular area or sub-sector. The end-to-end support can help create a sustainable and effective skill education system that meets the needs of both the industry and the students. By pooling their resources and expertise, the coalition can provide a cohesive approach to strengthening skill education in the country.

Non-Governmental Organizations and Civil Society Organizations

- Can support a variety of areas within states as they execute on the suggested skill education reform agenda e.g. supporting curricula development in line with local socio-economic realities of a district, supporting communication/ mobilization efforts, supporting career counselling related efforts especially to promote the participation of women and marginalized groups and contextualizing them to the needs of the local region, support teacher/ trainer capacity building efforts etc.
- Support impact assessments of key interventions related to the proposed skill education approach.

Multilaterals and Philanthropists

- Support the state/ central government's efforts in funding projects, particularly pilot launches. This can help identify gaps and areas of improvement in the proposed solutions, as well as demonstrate their effectiveness in enhancing employability.
- Facilitate cross-ministry partnerships and collaboration between different government bodies and industries, bringing together stakeholders, and resources to create a comprehensive and effective solution for school-to-work transitions.
- Provide technical assistance to help states with skill gap assessments, trade identification, curricula design, on-ground delivery, monitoring, evaluation, and other areas that require specialized expertise.

- Supporting the development and dissemination of a national narrative on the benefits of school-to-work can help change social attitudes towards skill education and encourage more students to pursue such courses, leading to greater employability.
- Support the development of public goods, tools, and long-term programs that address systemic challenges in skill education, such as increasing awareness of its benefits, improving its positioning, and creating sustainable models for scaling up successful interventions.

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