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MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP
GOVERNMENT OF INDIA



**Sports and Society
Accelerator**

Livelihoods through Sports and Physical Activity

Opportunities and Prospects

Report
June 2026

Acknowledgements

This report emerges from the belief that sports and physical activity (SAPA) in India must now be understood not only as matters of health, recreation, participation, or high performance, but also as a serious ecosystem for livelihoods, enterprise, skills, employment, and economic growth.

The SAPA ecosystem already connects coaching, education, infrastructure, manufacturing, events, technology, tourism, media, community institutions, and local enterprise. Making these connections visible is essential if the sector is to be planned, invested in, and governed as a meaningful contributor to jobs and GDP.

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The SAPA Centre, incubated at the Sports and Society Accelerator, has been established to build new frameworks, evidence, vocabulary, and policy pathways for understanding the role of SAPA in India's social and economic development. This report is an important part of that effort.

The SAPA livelihoods framework presented in this report is intended as a baseline for a sustained and serious movement: one that recognises SAPA as a high-growth sector capable of contributing meaningfully to jobs, enterprise, skills, inclusion, productivity, and GDP.

We hope this report supports policymakers, practitioners, investors, educators, entrepreneurs, and community leaders in building the systems, standards, institutions, and evidence base required for that future. If developed with intent, India's SAPA ecosystem can help young Indians not only play, but also learn, work, lead, build, and contribute to the larger vision of *Viksit Bharat*.

Desh Gaurav Sekhri and Nandan Kamath
Co-Founders, Sports and Society Accelerator

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Introduction and Context

It is widely recognized globally that sports and physical activity (SAPA) have a profound impact on human health and wellbeing. Physical inactivity, however, is a major risk factor for non-communicable diseases and is responsible for about 5 million premature deaths annually worldwide.¹ In India, only 10% of adults engage in sport, and about ~74% of Indian adolescents (aged 11–17 years) are not engaging in World Health Organization (WHO) recommended levels of physical activity.^{2,3} The recent estimates suggest that regular participation in SAPA can prevent INR 2,50,000 crores in productivity losses due to illness and time off work.⁴

In addition to improving human health, SAPA holds transformative potential to drive social, cultural, and economic development. For example, a physically active Indian population is estimated to mobilize INR 4,50,000 crores in annual expenditure through the production and consumption of SAPA-related goods and services.⁵ Moreover, the country as a whole would benefit from the creation of meaningful

opportunities for employment and entrepreneurship in the SAPA ecosystem. In India, where the working-age population is expected to continue to grow over the next couple of decades (Figure 1), and about 42 million students across higher education levels are set to enter the workforce in the short term, SAPA holds promise as an important economic sector.⁶ With adequate policy momentum and resources, India could see an increase from 0.5% of the workforce employed in sport in 2023 to 4% in 2047. This would create up to 3 crore sports-related jobs (Figure 2).

The conversation becomes all the more important in the context of *Viksit Bharat 2047*,⁷ the vision of the Government of India, which aims to transform the country into a self-reliant and prosperous economy. With an increased focus on economic growth, job creation, social empowerment, and sustainability in the vision, the SAPA ecosystem represents a key cog that can unlock opportunities for decades to come.

¹ Whitmee, S., Green, R., Belesova, K., Hassan, S., Cuevas, S., Murage, P., Picetti, R., Clercq-Roques, R., Murray, K., & Falconer, J. (2024). Pathways to a healthy net-zero future: Report of the Lancet Pathfinder Commission. *The Lancet*, 403(10421), 67–110; Ramachandran, A., Sansanwal, K., & Chowdhary, V. (2025). *Assessing the Impact on Human Health of Net Zero Pathways: A Summary of Current Research and Methodological Recommendations*. Ashoka centre for a People-Centric Energy Transition. https://www.acpet.ashoka.edu.in/pdf/Health_Co-benefits_Scoping_Study.pdf

² World Health Organization, *WHO GUIDELINES ON PHYSICAL ACTIVITY AND SEDENTARY BEHAVIOUR* (2020), <https://iris.who.int/server/api/core/bitstreams/faa83413-d89e-4be9-bb01-b24671aef7ca/content>.

³ Among children and adolescents, the WHO recommends at least 60 minutes/day of moderate-to-vigorous physical activity through the week, alongside vigorous-intensity aerobic and str,criticallength-building exercises being incorporated into the routine at least three days a week. For adults, these recommendations stand at around 150-300 minutes of moderate-intensity or 75-150 minutes of vigorous-intensity physical activity a week for substantial health benefits.

⁴ Sports and Society Accelerator and Dalberg Advisors, *State of Sports and Physical Activity in India* (2024), <https://sports-society.org/policyreports/state-of-sports-and-physical-activity-in-india/>.

⁵ *Ibid*

⁶ Stein Emil Vollset et al., “Fertility, Mortality, Migration, and Population Scenarios for 195 Countries and Territories from 2017 to 2100: A Forecasting Analysis for the Global Burden of Disease Study,” *The Lancet* 396, no. 10258 (2020): 1285–306, [https://doi.org/10.1016/S0140-6736\(20\)30677-2](https://doi.org/10.1016/S0140-6736(20)30677-2).

⁷ Mission Statement of Viksit Bharat, Government of India,

<https://cdnbbsr.s3waas.gov.in/s3kv05b90e8875c131d0760d04c0d4d8f3/uploads/2025/08/2025080227.pdf>

Figure 1: Working age population in India (2011-2047)

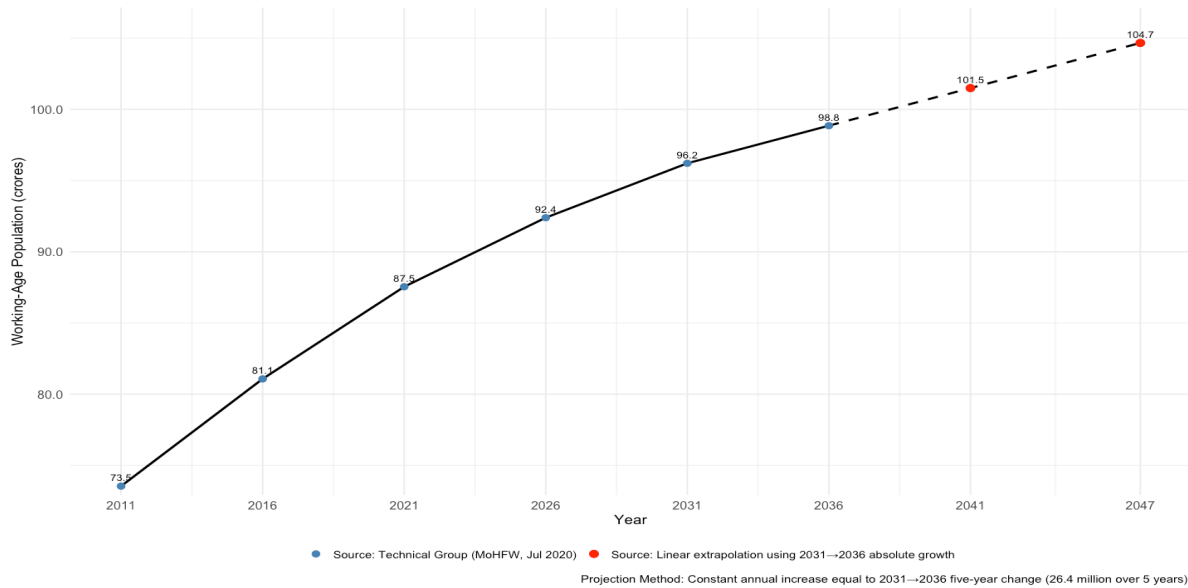
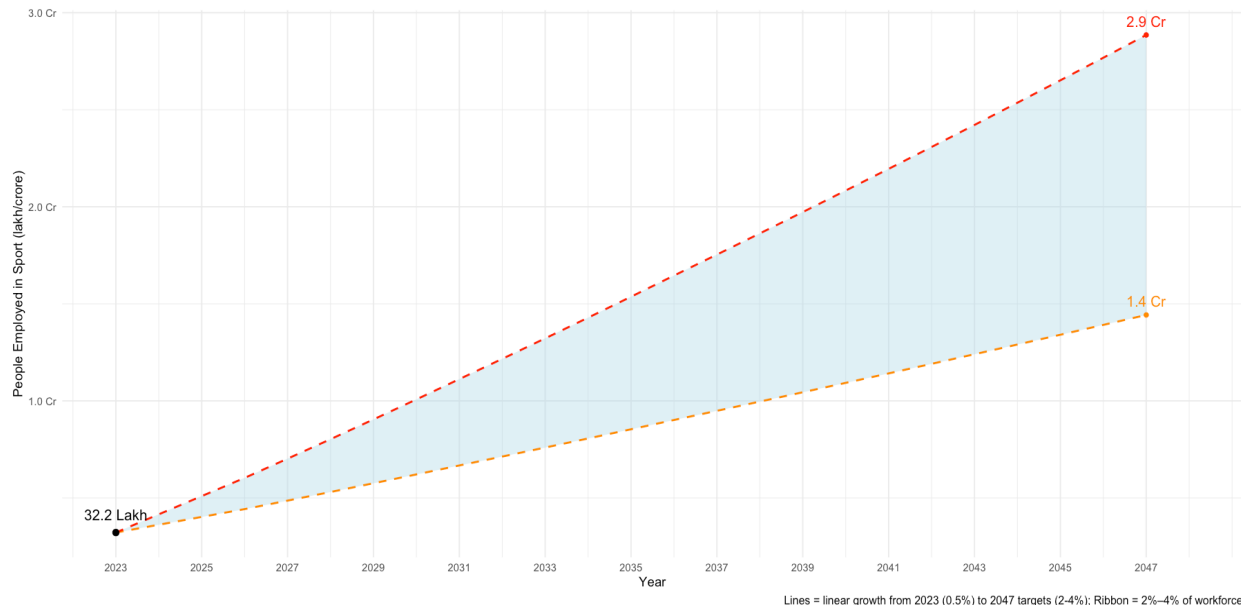


Figure 2: Indian workforce employed in SAPA (2023-2047)



32.2 Lakh = 0.5% of total workforce in 2023-2024 (IBEF, 2024); 64.33 crore = Total employment in 2023-2024 (RBI KLEMS Database); 5-Year population projections for 2021-2036: Technical Group (MoHFW, Jul 2020); Population for 2023: Government of India PIB; Population for 2048: Vollset et al., 2020; Population for 2047: Projected as 1598.66 million using linear trend between 2036 (1522.3M) and 2048 (1605.6M); 2-4% targets in 2047: Aspirational, based on other major sporting economies (IBEF, 2024)

India’s SAPA ecosystem is embedded in a complex network of relationships affected by a variety of economic, political, ecological, technological, and social dynamics. However, it has tended not to be viewed as a serious

economic contributor by decision makers or the public. The Indian Brand Equity Foundation (IBEF) notes that traditionally, sports are viewed more as leisure activities than as promising careers.⁸ For example, the

⁸ <https://ibef.org/research/case-study/sports-as-a-profession-in-india-and-its-economic-impact>

ASER Centre's 2023 *Beyond Basics* report indicates that a mere 1.2% of Indian children and youth aspire to become sportspersons.⁹ This statistic is noteworthy not just because of the low number, but also because 'sportsperson' was the only career in the survey associated with SAPA, indicating that employment in the sector is often associated solely with being an athlete.¹⁰

Nevertheless, there have been many encouraging developments in India's SAPA ecosystem. Recent projections for SAPA's contribution to India's GDP have been optimistic, ranging from ~USD 40 Billion in 2030 to ~USD 130 Billion by 2047 (Figure 3).¹¹ India's National Sports Policy (NSP) 2025 (also known as *Khelo Bharat Niti*) recognises sports as a driver of social and economic development. Under its "Sports for Economic Development" pillar, it focuses on sports tourism, equipment manufacturing, and entrepreneurship.¹² It also seeks to establish "sports as a viable career option for youth" by proposing pathways to mainstream sports and allied services as career options. These policy directions are backed by growing fiscal

commitment. The Union Budget 2026-27 increased the Ministry of Youth Affairs and Sports (MYAS) allocation to INR 4,479.88 crore, with INR 500 crore earmarked for a dedicated initiative for sports goods manufacturing.¹³ In the same budget, Khelo India Mission was launched to transform the sports sector over the next decade, building on the systematic nurturing of sports talent set in motion through the Khelo India programme.¹⁴

Sport manufacturing in particular has received policy momentum, with plans to expand exports from USD 497 Million in 2025 to USD 660 Million in 2026 and increase support for goods manufacturing clusters in Meerut and Jalandhar, which drive nearly 82% of India's sports goods production.^{15,16} In August 2025, "Sports Goods Manufacturing" was formally included in the Allocation of Business Rules, 1961, under the MYAS. This inclusion provides sports manufacturing the same policy status as other national industries and builds towards the vision of the NSP 2025.¹⁷ Strategic investments in SAPA are likely to facilitate growth across allied sectors such as tourism, manufacturing, event management,

⁹ ASER Centre, *Annual Status of Education Report (Rural) 2023: Beyond Basics (2023)*, 62. <https://asercentre.org/wp-content/uploads/2022/12/ASER-2023-Report-1.pdf>.

¹⁰ Similarly, while recent policy documents have highlighted livelihoods within SAPA, particularly among coaches and athletes, there is growing opportunity to expand recognition of the wider career opportunities within the ecosystem.

¹¹ 2047 marks India's 100th year of political sovereignty, and has come to represent an important watershed moment and policy marker for the country across sectors - labelled *Viksit Bharat*. For more, see reports such as:

[https://www.niti.gov.in/sites/default/files/2025-](https://www.niti.gov.in/sites/default/files/2025-04/Working%20Paper%20on%20Strategic%20Imperatives_04042025_NEW.pdf)

[04/Working%20Paper%20on%20Strategic%20Imperatives_04042025_NEW.pdf](https://www.niti.gov.in/sites/default/files/2025-04/Working%20Paper%20on%20Strategic%20Imperatives_04042025_NEW.pdf)

[https://darpg.gov.in/sites/default/files/Viksit Bharat 2047 Governance Transformed.pdf](https://darpg.gov.in/sites/default/files/Viksit%20Bharat%202047%20Governance%20Transformed.pdf)

¹² Government of India, *Khelo Bharat Niti (2025)*, https://yas.gov.in/sites/default/files/Khelo-Bharat-Niti-2025_0.pdf

¹³ PIB Delhi, "India's Strengthened Sports Ecosystem," Press Information Bureau, February 18, 2026,

<https://www.pib.gov.in/www.pib.gov.in/Pressreleaseshare.aspx?PRID=2229477>.

¹⁴ *Ibid*

¹⁵ ANI, "India's Sports Market to Grow at 10-12% CAGR by 2030, Exports to Surge to \$660 Million in FY26: Report," *The Economic Times*, July 24, 2025, <https://economictimes.indiatimes.com/news/sports/indias-sports-market-to-grow-at-10-12-cagr-by-2030-exports-to-surge-to-660-million-in-fy26-report/articleshow/122871714.cms>.

¹⁶ More generally, employment in India is driven by the sectors of manufacturing (98M workers across sub-sectors), construction / infrastructure (68M workers), and travel & hospitality (39M workers).

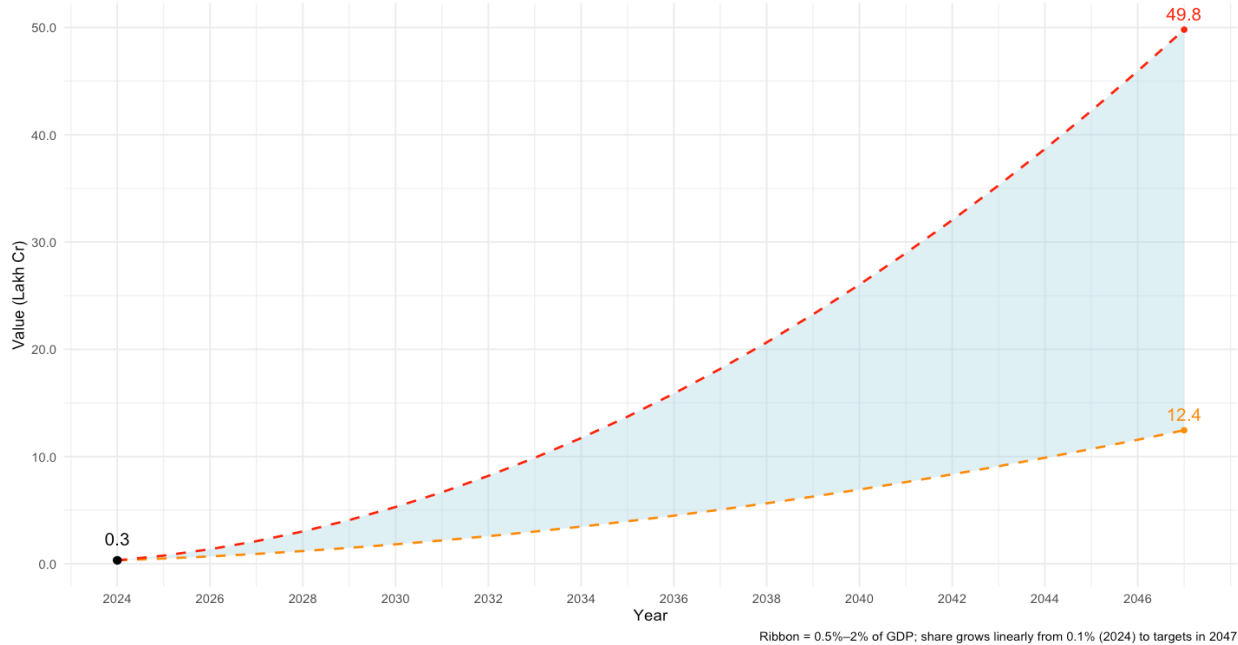
<https://www.praxisga.com/insights/education-and-employability/harnessing-india-s-skilling-revolution-trends-in-vocational-training>

¹⁷ Dr. Mansukh Mandaviya Pitches for 'Garv Se Swadeshi' at First-Ever Sports Goods Manufacturing Conclave, Government of India (2025), <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2162255®=3&lang=2>

and infrastructure, particularly as India aspires to host mega sporting events like the

Olympic Games and has won the right to host the 2030 Commonwealth Games.¹⁸

Figure 3: SAPA sector's GDP contributions (2024-2047)



324.11 lakh crore = 2024-25 GDP (NSO, MoSPI); INR 0.3 lakh crore = 0.1% of GDP (IBEF, 2024); INR 2490 lakh crore = USD 30 trillion (NITI Aayog); 0.5–2% targets by 2047 (IBEF, 2024; KOMG, 2020; UK Gov, 2024); GDP interpolated linearly 2024–2047

These moves have been echoed by State policies that have been increasingly discussing sports and their interlinkages with other sectors over the last few years. They have looked to encourage a broader base of human resources to support the SAPA ecosystem through upskilling, job creation, and entrepreneurship.

The state of Uttar Pradesh, in its sports policy from 2023, outlined key objectives that included promoting “a flourishing sports industry in the state by facilitating companies and start-ups in areas like equipment,

technology, and services” while leveraging schemes such as “One District, One Product” (ODOP) further to develop sports manufacturing hubs such as Meerut and beyond.¹⁹ This is also evident in the Draft Odisha Sports Policy, 2024, which focuses on building on its successes through encouraging sports tourism, incentivizing sports goods manufacturing, and promoting a culture of sports research and development.²⁰ Meghalaya, in its 2019 sports policy, emphasised creating “a pool of qualified manpower for sport” across management, coaching, athletes, and referees as well.²¹

¹⁸ One recent example of just such an investment is the recently established Bharat Centre for Olympic Research and Education (BCORE) at Rashtriya Raksha University, funded by the Government of India, to produce research and curricula pertaining to the field of Olympic studies.

¹⁹ Uttar Pradesh Khel Niti (2023), https://invest.up.gov.in/wp-content/uploads/2023/03/SPORTS_200323.pdf

²⁰ Draft Odisha Sports Policy, (2024), <https://sports.odisha.gov.in/sites/default/files/2024-09/Communication%20of%20Draft%20Sports%20Policy%20to%20OOA%20and%20others.pdf>

²¹ Meghalaya State Sports Policy (2019), https://meghalaya.gov.in/sites/default/files/documents/Meghalaya_State_Sports_Policy_2019.pdf

These ideas are echoed through the Telangana Sports Policy, 2025, which refers to enhancing the fields of sports science, technology, medicine, tourism, and media.²² These ideas, along with a focus on athlete-centric ecosystems, also reinforce the need for trained and skilled human resources within the sector.

There remains, however, a tacit assumption that job creation opportunities within the Indian SAPA ecosystem emerge mainly from the player economy employing coaches, athletes, health professionals, and managers, or spectators and fans purchasing match tickets and merchandise.²³ Facilitating the growth and development of India's SAPA ecosystem thus requires illustrating to stakeholders—particularly government and policymakers—about the far-reaching employment opportunities associated with SAPA. Specifically, a more robust discussion is needed on the livelihood impacts of India's SAPA ecosystem, which builds on the momentum of documents like NSP 2025 and incorporates the National Education Policy (NEP) 2020, which reimagines vocational education, and the Draft National Skill Development and Entrepreneurship Policy 2025, which identifies sports as a priority skilling sector.²⁴

The NEP specifically outlines sports as a key component of experiential learning, operationalized by the National Curriculum Framework for School Education (NCF-SE)²⁵, which integrates physical education as a core

component of school education. At the higher education level, this is reflected in an emphasis on multidisciplinary education through initiatives such as academic credit banks, credit-based learning, and recognition of prior learning, which are highlighted to ensure an ecosystem that allows different professions to be pursued. This is complemented by the Draft Skill Development and Entrepreneurship Policy, which calls for flagship upskilling and reskilling programmes in sports and recognizes sports manufacturing as an area to increase the income of the self-employed. Many of these credit systems are proposed to be operationalized through mechanisms discussed under the Draft *Shram Shakti Niti 2025* – National Labour and Employment Policy of India by the Ministry of Labour and Employment (MoLE).²⁶ These include an India Skills Credit System (ISCS) in collaboration with the Ministry of Skill Development and Entrepreneurship (MSDE) and NITI Aayog to promote lifelong learning.

Moving these items forward involves not only identifying the wide range of economic sectors associated with SAPA, such as tourism, manufacturing, media, construction, education, and information technology (among others), but also providing examples of associated occupations across skill levels. Investing in the SAPA sector will have many knock-on effects that reverberate in the rest of the economy; teams, leagues, and spectators stimulate the food and beverage, transport, and hospitality sectors both during and after

²² Telangana Sports Policy (2025), https://satg.telangana.gov.in/public/frontendpages/images/Sports_Policy_English.pdf

²³ In addition to the broad pathways of direct sports careers and allied or related sectors, a third and uniquely relevant pathway in India is how sports participation supports access to non-sport careers, especially in uniformed services (police, military, paramilitary). This is driven by strong cultural and institutional links between sporting excellence and recruitment processes. These connections are further reinforced through welfare policies and schemes for athletes and coaches at both the state and national levels.

²⁴ The focus is on reskilling, upskilling, and emerging roles.

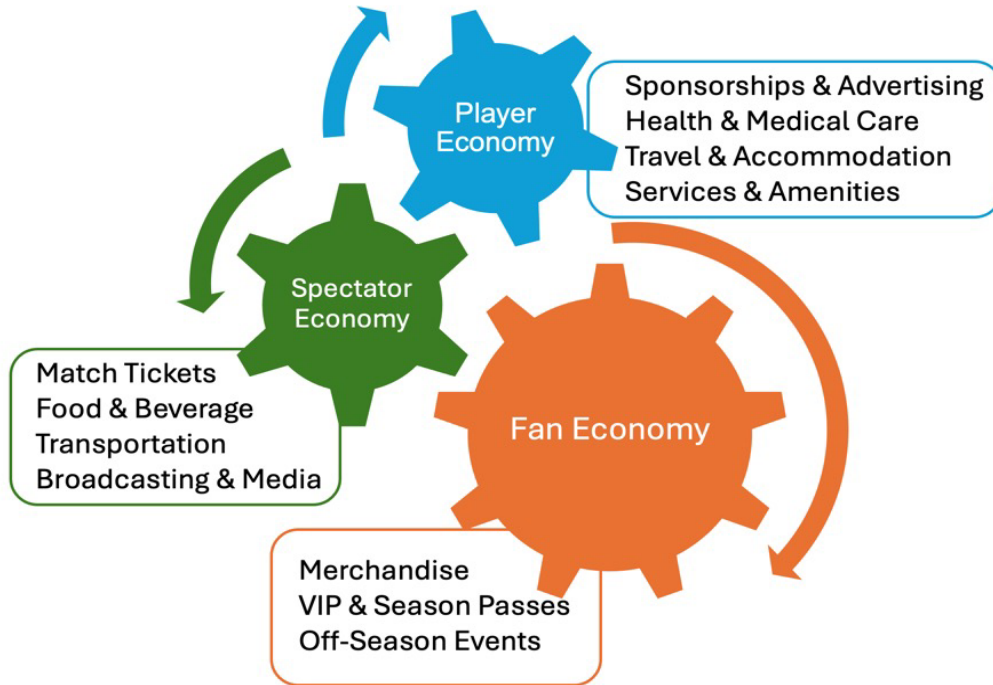
²⁵ The NCF-SE is key to operationalizing the vision of the NEP, https://www.education.gov.in/sites/upload_files/mhrd/files/infocus_slider/NCF-School-Education-Pre-Draft.pdf

²⁶ Shram Shakti Niti, (2025), https://labour.gov.in/sites/default/files/draft_-_mole_le_policy_-_v1.0.pdf

games. Sport broadcasting and media platforms keep fans engaged off-season, while players and management hire full-time support and maintenance staff in professional

and personal contexts. Depicting and quantifying these kinds of drivers is essential to understanding the full scope of the SAPA sector's job creation potential (Figure 4).

Figure 4: Example drivers of job creation in the SAPA ecosystem



While a few estimates and projections of the employment creation prospects in India's SAPA sector have emerged in the last couple of years (e.g., KPMG's 2025 report on the business of sport in India²⁷ and Google-Deloitte's 2024 report²⁸ on unlocking India's sport potential), the methodologies underlying these estimates are not publicly available.²⁹ Moreover, the reports do not

discuss the types of occupations created, their permanence, or the interconnectedness of the whole SAPA ecosystem. This is because their focus appears to be less on livelihoods and more on the Indian SAPA sector's economic value creation potential more generally.

In order to build off these efforts and create a sustained discourse about employment and livelihoods creation in the SAPA sector, the

²⁷ KPMG, *Sportlight: The Business of Sports in India* (KPMG, 2025),

<https://assets.kpmg.com/content/dam/kpmgsites/in/pdf/2025/09/sportlight-the-business-of-sports-in-india.pdf>.

²⁸ Deloitte and Google, *Think Sports: Unlocking India's \$130B Sports Potential* (2024),

https://services.google.com/fh/files/misc/think_sports_unlocking_indias_usd130b_sports_potential.pdf.

²⁹ In terms of GDP, Google-Deloitte (2024) suggest a projected growth from USD 52B in 2023 to USD 130B by 2047, while KPMG (2025) point to a more modest growth from USD 19B in 2025 to USD 40B by 2030. In terms of employment, Google-Deloitte suggest a growth from 4.7M people employed in sport in 2023, to 10.5M in 2030. KPMG, meanwhile, discuss employment estimates and projections in a more context-specific manner. For example, they suggest the Indian Premier League (IPL) alone creates about 30,000 temporary jobs each season. Additionally, they note that sports Global Capability Centres will employ 15000-20000 Indian professionals by 2030, and that sports-related industries manufacturing, retail, media, and events are expected to generate ~100,000 new jobs across urban and rural markets (timelines unspecified).

Sports and Physical Activity Centre (SAPA Centre) at the Sports and Society Accelerator (SSA) has developed a first-of-its-kind SAPA Livelihoods Toolbox for the Indian context, consisting of a database outlining sectors and occupations as well as static and dynamic visualizations to highlight relationships between occupations, sectors, and SAPA contexts. Transparent, versatile, and publicly available, the SAPA Livelihoods Toolbox is designed to support policy planning and implementation in its current form, with the ultimate goal of analyzing job creation, highlighting key contributing SAPA activities, and modelling resilience to external threats and events in future phases of work.

In this report, we describe the methodology underlying the toolbox, its analytical

capabilities, our preliminary findings, and next steps. In doing so, we also delineate a new set of concepts and a vocabulary to shape the discourse around employment and livelihood creation in India's SAPA sector. In Section 1, we review Sport Satellite Accounting, the primary approach used globally to assess the employment contributions of the SAPA sector. In Section 2, we describe the development of our methodology, situating our approach in relevant academic and grey literature as well as government resources. In Section 3, we provide a snapshot of our preliminary insights, explaining the potential implications of our findings for decision makers. In Section 4, we discuss the strengths and limitations of our approach and identify pathways forward.

The Traditional Approach: Sport Satellite Accounts

Understanding the most common approaches used to measure the economic and employment contributions of SAPA is a useful starting point in developing a new methodology for the Indian context.³⁰

These approaches also provide a useful benchmark to understand how SAPA is actually classified and measured globally, as either a standalone activity or subsumed within themes such as culture or tourism.

Efforts to classify sport and measure its economic contributions generally seek to capture its contribution to Gross Domestic Product (GDP) and role in job creation simultaneously. While exact approaches diverge based on national contexts, our research reveals that the Sport Satellite Account (and its variants) is the only globally accepted method for understanding the contributions of SAPA to a country or region's GDP or employment.

First developed in the 1980s, satellite accounts were standardized in the global United Nations System of National Accounts in 1993. The System of National Accounts describes global, national, and sub-national economies,³¹

while satellite accounts enable analysts to quantify the size of a particular activity in relation to the total market economy.³² Satellite accounts are compiled to see details of cross-cutting accounts that aren't readily seen in national statistics, and allow policymakers and other stakeholders to have a deeper picture of the national economy.³³ The concept of satellite accounts underwent successive revisions in 2008 and 2025, with the latest revision formally switching the term to "thematic and extended" accounts, though the term is not yet widely used.³⁴

Development of the Sport Satellite Account by the European Union

Sport Satellite Accounts were first developed by the Austrian Presidency of the European Union (EU) in 2006, with the goal of making the contribution of sport more visible and promoted in EU policies. An early study emerging from this project revealed that sport contributed 407 billion euros (or 3.7%) to the EU GDP, and employed about 5.4% of the labour force in 2004.³⁵

³⁰ Countries in the middle east have also started defining the impact of sport through their vision of the sport economy, including hosting events, and measuring through tourism and infrastructure.

³¹ While the System of National Accounts has been enormously successful in popularizing concepts such as GDP, which is the most widely used economic statistic globally, the approach has been criticized for missing crucial areas such as unpaid and volunteer work, environmental services, pollution and geopolitical instability, and income and wealth distribution. <https://www150.statcan.gc.ca/n1/pub/13-605-x/2020001/article/00002-eng.htm>

³² <https://unstats.un.org/unsd/nationalaccount/glossresults.asp?gID=493>

³³ What's a Satellite Account?: <http://bea.gov/sites/default/files/2021-07/whats-a-satellite-account-V6.pdf>

³⁴ As of now, it appears that no country has fully moved entirely to the thematic/extended accounts approach for all sectors. Rather, many continue using or developing satellite accounts under the 2008 framework while preparing for transition to the 2025 iteration of the system of national accounts. The switch has been made to offer flexibility with assessment. For example, extended accounts can be used for special purposes like monitoring unpaid household work and the state of the environment. For more, see: https://unstats.un.org/unsd/nationalaccount/docs/2025_SNA_Pre-edit.pdf

³⁵ For more, see: Die makroökonomischen Effekte des Sports in Europa <https://sl1nk.com/zb0dg75>

In the EU, the creation of a Sport Satellite Account is measured through the 'Vilnius definition of sport', which represents the crucial building block in measuring the output of sport in terms of economic value and jobs, and is based on the EU's Classification of Products by Activity (CPA) system. Until 2023, the Vilnius definition distinguished sport into three layers: the 'statistical' definition (how it is explicitly defined in the national accounts); the 'narrow' definition (everything in the statistical definition, and all goods and services required for doing sport, i.e. sports goods and infrastructure); the 'broad' definition (everything in the narrow and statistical definition, as well as the products and services which have a direct or indirect link to sport, like sport tourism, media, and medical care).³⁶

The definition has undergone three iterations from 2006 to its latest version in 2023, which moved away from the three-tiered framework (i.e., statistical, narrow, broad) towards 'characteristic goods' (an expanded version of the statistical definition), and 'connected goods' (goods that are connected indirectly or directly to sport).³⁷ This change brings the Sport Satellite Account in line with the methodologies underlying the EU's Tourism and Environmental Satellite Accounts. The new definition also includes a distinction between passive and active sport, including expenditure associated with direct

participation (e.g., spending on sports services including equipment) and passive consumption (e.g., attending events as a spectator).³⁸

Importantly, the Vilnius definition also includes employment associated with all the goods and services included in the Sport Satellite Account.³⁹ According to the latest data from the EU, sport directly (via people working in sport services or education) and indirectly (via industries which support sport) contributes 9.27 million jobs (3.8 % of total employment). Notably, the high percentage of employment relative to GDP (2% through direct effects alone) indicates that sport is a significant driver of job creation in the EU.⁴⁰ Several sources of employment data are used to calculate sports satellite accounts. In Austria, for example, employment data about the public sector are published by the Austrian central state and the federal states or Statistik Austria, while employment in private companies with large shares in the sports sector was solicited via interview.⁴¹

Adapting the EU Approach: Japan, New Zealand, and Australia

Other countries like Japan, New Zealand, and Australia have assessed the impact of the sports industry on the economy and livelihoods based on the Sport Satellite

³⁶ For more on the old methodology, see: <https://ec.europa.eu/eurostat/web/sport/methodology>

³⁷ Themistoklis Kokolakis and Anna Kleissner, *EU Sport Satellite Account: Research into Estimating the Economic Value of Sport in the EU* (European Union, 2025), 23, <https://ec.europa.eu/eurostat/documents/3888793/22121382/KS-01-25-041-EN-N.pdf/c8266460-9f1a-affd-f288-d2669de405d2?version=1.0&t=1756987715084>.

³⁸ *Ibid*

³⁹ In the EU, the calculation integrates sport-related data into the Eurostat Multinational Input-Output Tables (MNIOT). Sport-related output, intermediate consumption, and final demand are extracted from their original sectors and reallocated to sport-specific satellite sectors to avoid double counting. This involves inserting new sport-specific rows and columns into the national input-output tables, balancing them using algorithms such as RAS, and then calculating direct and indirect effects on GDP, gross value added (GVA), and employment through multipliers.

⁴⁰ Kokolakis and Kleissner, *EU Sport Satellite Account: Research into Estimating the Economic Value of Sport in the EU*, 20.

⁴¹ Unpublished manuscript provided following personal communication with SportsEconAustria.

Account (e.g., GDP, employment). They borrow from the EU approach, but differ in terms of the components of the calculation, owing to differences in the national classifications of jobs and services and national priorities that shape the understanding of SAPA.

While Japan uses a Sport Satellite Account approach, its analysis does not currently extend to employment or consumer spending.⁴² Shoji et al. (2019)⁴³ suggest this is because Japan does not follow the EU's classification of products and services, and therefore relies entirely on its own input-output⁴⁴ tables and the international System of National Accounts.

Australia undertook its most recent sport sector evaluation in 2020,⁴⁵ using insights from the approaches of the United Kingdom and the EU and the Vilnius definition of sport as a foundation for their analysis, though they do not describe their assessment as a Sport Satellite Account. A key difference lies in how sport is classified: Australia relies on the Australian and New Zealand Standard Industrial Classification (ANZSIC) list, where sport is classified as a larger part of the Sport,

Fitness, and Recreation industry. In comparison, the EU's classification classifies a wider range of activities under 'sport', including activities like horse and dog racing, which are not included in the ANZSIC list. The Australian assessment also recognises that including many sports-related activities (like the EU does) is not possible, given the relative lack of easily available public data. Further, and unlike the EU, the Australian assessment also excludes sectors that would not be "significantly different" in the absence of sport, such as transport services and wholesale services.⁴⁶

Another noteworthy example comes from New Zealand, where the last assessment of SAPA was undertaken in 2023.⁴⁷ Like Australia, this assessment was not referred to as a Sport Satellite Account, and used the National Income Accounting (NIA) methodology used by Sport England and the United Kingdom more generally in the 1990s, prior to the introduction of the Vilnius definition framework.⁴⁸ The New Zealand assessment recognised the three Vilnius definitions of sport (statistical, narrow, and broad), highlighting that their main analysis was based on the 'broad definition'. The

⁴² Sport Industry Research Centre, *Sport Satellite Account: Research into a New Measure for Estimating the Value of Sport: Feasibility and Methodology* (Sheffield Hallam University, 2024), 5, https://assets.publishing.service.gov.uk/media/66fad688e84ae1fd8592eb9d/Feasibility_Report_DCMS_14_9_2024_accessible.pdf.

⁴³ Hiroto Shoji et al., "Construction of a Sport Satellite Account in Japan, Version 3 : Development of a Japanese Version of SSA and Estimation of Sport GVA," *Journal of Japan Society of Sports Industry* 29, no. 3 (2019): 3_199-3_209, https://doi.org/10.5997/sposun.29.3_199.

⁴⁴ An input-output table is a means of presenting a detailed analysis of the process of production and the use of goods and services (products) and the income generated in that production.

⁴⁵ KPMG, *Sports Industry Economic Analysis* (2020), <https://www.infrastructure.gov.au/sites/default/files/documents/sports-industry-economic-analysis.pdf>.

⁴⁶ Given these foundations, the Australian assessment defines the industry, segments it into nine parts including sports operations, education and training, and sports media. Then, to estimate the size of the segments they use the Australian National Accounts as a starting framework and use input-output tables, employment data, expenditure surveys, secondary data, and economic modelling to demonstrate sports' impact and growth opportunities.

⁴⁷ Themistoklis Kokolakis et al., *An Assessment of the Economic Importance of Sport and Active Recreation in Aotearoa New Zealand* (Sheffield Hallam University ; Lincoln University, 2023), https://sportnz.org.nz/media/wiplgpuo/2_sport-nz-economic-report-final-version-110723.pdf.

⁴⁸ For more on the NIA methodology, see: <https://sportengland-production-files.s3.eu-west-2.amazonaws.com/s3fs-public/economic-value-of-sport-in-england-1.pdf?VersionId=rWg9SU524uJGqt1pf93dJEyHnwo1cS3h>

assessment recommended the creation of a separate Sport and Active Recreation Satellite Account for New Zealand with more detailed employment data for a more comprehensive future assessment.⁴⁹

Despite the popularity of the Sport Satellite Account, the sources cited above recognise that while it provides valuable insights into the sport economy by capturing its direct and indirect economic effects, it has certain limitations. For example, it is unable to capture effects related to volunteering, the social impact of education, or the development of life skills. Indeed, the approach is not intended to assess an activity's contributions if they cannot be monetized in the Input-Output framework, making up the calculations of the account.⁵⁰

SAPA as a Subsection of Other Satellite Accounts

Instead of developing a dedicated Sport Satellite Account, some countries include the production and consumption of SAPA as a subsection within another satellite account. The most prominent example of this is in Canada, where sport is classified as a sector within its Culture Satellite Account (CSA), which measures the economic importance of culture, arts, heritage, and sports in the Canadian economy.⁵¹ The CSA distinguishes between the key domains that make up the account (i.e., culture products and sports products), calculating their respective

contributions to GDP and job creation, and contributions to international trade (i.e., imports and exports). Culture products in the CSA include calculations of written and published works, heritage and libraries, film and videos, and visual and applied arts. Sport products consist of organized sport, informal sport, education and training, governance, funding, and professional support. While these lists do not include all of the potential activities associated with culture or sport, the employment and economic contribution associated with each domain are calculated based on these categories. In sport, for example, employment is associated with the classification "occupations in art, culture, recreation and sport", which includes sports management roles, coaches, and jobs in fitness centres and recreational facilities.

South Africa's approach to assessing the economic contribution of sport is spread across multiple satellite accounts, as it does not treat sport as the subject of a single satellite account. The country measures sporting and recreation activities distinctly as a division in its industrial classification system; however, related services like sports manufacturing, sports tourism, and sports media are spread out across multiple classifications and as subclasses within their respective satellite accounts (i.e., manufacturing, tourism, media).⁵² In addition, the South African Department of Sports, Arts and Culture distinguishes between categories like motor-related sport, agriculture-related

⁴⁹ The NIA methodology enabled their sport and active recreation economy to be disaggregated into seven sectors: consumers; commercial sport; commercial non-sport; voluntary sports sector; local government; central government; and international trade. For each of these, the income and expenditure accounts were calculated to derive overall consumer expenditure, gross value added, and employment.

⁵⁰ Kokolakakis and Kleissner, *EU Sport Satellite Account: Research into Estimating the Economic Value of Sport in the EU*, 21.

⁵¹ You can find the latest Canadian CSA here: <https://www.canada.ca/en/canadian-heritage/corporate/publications/general-publications/culture-satellite-account.html>

⁵² For the classification, see: <https://www.sars.gov.za/types-of-tax/pay-as-you-earn/employment-tax-incentive-eti/standard-industrial-classification-codes/>

sport, and team sports - as well as measuring their individual contributions to the country's GDP.⁵³ In addition, sports-related GDP and livelihood impacts can also be found in the country's Tourism Satellite Account (TSA), where the economic impact of "sports and recreational activities" is calculated as a distinct category.⁵⁴

In the United States, there is also no single 'sports industry' represented in the national accounts. Instead, sport-related activities are spread across several North American Industrial Classification System (NAICS) codes, the most direct being Spectator Sports (7112) and Fitness and Recreational Sports Centers (71394), both within the Arts, Entertainment, and Recreation super-sector. Related activities are classified under sporting goods manufacturing (33992/339920), retail (45911/459110), broadcasting, and event management.⁵⁵ As a result, official statistics usually present sport through the broader lens of 'recreation,' and count them through unique approaches, including as part of the Outdoor Recreation Satellite Account, which consists of activities from recreational biking, boating, and gardening to field sports, sporting events, and activities to support them.⁵⁶

Analyses of SAPA's Contributions in India

At this stage, India does not have a dedicated Sport Satellite Account or any other *unified approach* to calculating the share of

employment associated with the SAPA sector. While recent reports from consulting groups such as Google-Deloitte (2024) and KPMG (2025) have provided some estimates and projections for economic activity and employment in Indian SAPA,⁵⁷ these are proprietary analyses which are not explained in detail or publicly available. Moreover, resources such as the National Classification of Occupations include few examples of SAPA-related professions, and data from surveys such as the India Brand Equity Foundation only provide approximate estimates of the percentage of Indians employed in sport.⁵⁸ While sparse, existing references suggest that about 0.5% of India's workforce is currently employed in sport.

In addition to understanding the approaches being used globally to assess employment in sport, it is also useful to examine the current accounting practices used by other, similar sectors in the Indian ecosystem. For example, India measures sector-wide output for tourism (TSA) and non-profit institutions (NSA) via satellite accounts. Despite being distinct from SAPA, these satellite accounts draw on data pertaining to organizations like youth sports clubs, sports associations, and public participation in SAPA.⁵⁹ Both satellite accounts follow internationally standardized methods of reporting, specifically those set up through the United Nations Statistical Commission.

⁵³ See: https://static.pmg.org.za/220420Mapping_Study.pdf

⁵⁴ The 2023 TSA for South Africa is available here: <https://www.statssa.gov.za/publications/Report-04-05-07/Report-04-05-072021.pdf>

⁵⁵ NAICS classification: <https://www.naics.com/search/>

⁵⁶ While researchers can aggregate data through this and related accounts, the entire contribution to economic activity and livelihoods is currently not available at a national level to the best of our knowledge. You can find the Outdoor Account here: https://www.bea.gov/sites/default/files/2024-11/orsa1124_0.pdf

⁵⁷ See footnotes 27 and 28

⁵⁸ See: <https://ibef.org/download/Sports-Profession-India-Economic-Impact.pdf>

⁵⁹ See: https://mospi.gov.in/sites/default/files/publication_reports/Final_Report_Non-Profit_Institutions_30may12.pdf

The latest data from the Indian TSA (2015–16) indicated tourism contributes 5% on average to the GDP, and has a 13–14% share in jobs, including the direct and indirect effects of tourism.⁶⁰ Part of the contribution to the TSA emerges directly from sport or sports-related activities. For example, the definition of a ‘Leisure Trip’ includes “sightseeing, attending sporting and cultural events, non-professional active sports, adventure sports, recreational activities, cultural activities...summer camps, dining out, visiting spas and other establishments specialising in well-being and fitness...among other such activities.”⁶¹ Another example is the definition of “recreation, religious, cultural and sporting activities”, which includes “...sporting activities; and medical and health-related activities.”⁶² Moreover, the TSA also lists sports throughout separate categories, including as part of other trips (like a business trip for participation in professional sports), or the purchase of sports items during or for the purposes of the trip. Future research could undertake a closer analysis of SAPA-related entries in India’s TSA and NSA in order to identify the relative contribution to these activities, as well as identify any potentially missing areas.

Like SAPA, tourism and non-profit activities have multiple direct and indirect impacts across different sectors (e.g., construction, manufacturing, event creation and management), which holds particular salience when developing methodology to assess the employment impacts of Indian SAPA. Tourism and sport (though less so in the case of

physical activity) also share important structural features, such as seasonal and event-driven employment, strong linkages with hospitality, transport, and retail, and a high incidence of informal and part-time work. “Sports activities and amusement and recreation activities” are considered a distinct division under the National Industrial Classification (NIC), and while there is a further distinction for activities of sports clubs, the overall division also considers traditionally non-sporting recreation like visits to amusement parks.⁶³

There is thus a pressing opportunity to develop a dedicated methodology to understand the employment contributions of the SAPA sector relevant to the Indian context. While the Sport Satellite Account has been successful in the EU, the approach has some limitations that require further consideration. First, the primary goal of the Sport Satellite Account is to delineate the SAPA sector’s economic contribution to a country’s GDP, with employment as a secondary consideration. Moreover, the Sport Satellite Account’s main goal is to account for past contributions. Developing a Sport Satellite Account for India would provide a useful roadmap leading to the present, demonstrating how India’s SAPA ecosystem has fared in terms of employment and economic contributions thus far. Indeed, such an undertaking would add much-needed weight and transparency to current estimates that the Indian SAPA sector employs about 0.5–0.9% of the country’s workforce.

⁶⁰ See: <https://www.data.gov.in/keywords/TSA> and <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2076960> for Tourism data.

⁶¹ NCAER, *The Third Tourism Satellite Account of India, 2015-16* (Government of India, 2018), 10, <https://tourism.gov.in/sites/default/files/2020-04/Tourism%20Satellite%20Account%20of%20India%20for%20reference%20year%202015-16.pdf>.

⁶² NCAER, *The Third Tourism Satellite Account of India, 2015-16*, 13.

⁶³ See: https://mospi.gov.in/sites/default/files/main_menu/national_industrial_classification/nic_2008_17apr09.pdf

As SAPA is diffuse, labour-intensive, and rich in seasonal, informal, and community-based livelihoods, an ecosystem perspective to understanding employment would highlight the wide range of roles, skills, and expertise associated with SAPA-related activities such as building a stadium or hosting an event. Such an approach would have to be sensitive to a potential dearth of publicly available data (requiring interviews and other creative methods to pull together disparate data sources) and take stock of the wide-ranging conditions of employment in SAPA. Understanding the range of occupations and quantifying how central or essential they are to the SAPA ecosystem would also enable policymakers to formalise jobs that are currently informal, thus creating job protection and better working conditions. It would also enable decision makers to understand where the most pressing skills and resource gaps are within SAPA.

Network Analysis for a SAPA Ecosystems Approach

While accounting approaches like the Sport Satellite Account provide valuable macro-level measures of sport's contribution to an economy, they are limited in that they do not capture the relationality and context-specific nature of job creation. Our decision to adopt an ecosystem approach is grounded in a view that value (economic, sociocultural, or otherwise) in SAPA is co-created by many different actors, and that no single actor produces value in

isolation. These relationships between and among SAPA actors necessitate understanding the interconnectedness of the whole sport ecosystem, including the number and variety of actors and sectors across a wide range of SAPA contexts.⁶⁴ An ecosystem perspective also lends itself well to network analysis, which takes a relational perspective to understanding the structure and dynamics of a system.⁶⁵ This offers a nuanced approach to exploring the range of potential occupations associated with different segments of SAPA in India.

(Social) Network Analysis in Sports Research

While network analysis is a widely accepted approach across the natural and social sciences, it has received relatively little pickup in sports-related fields.⁶⁶ Networks themselves can refer to a conceptual topology (a space of relations), mathematical objects analyzed through a set of computational techniques based on graph theory, or a relational dataset depicting inscriptions left by interactions (e.g., a Twitter network).⁶⁷ At a basic level, a network consists of points (called “nodes” or “vertices”) and lines (“links” or “ties”). The analysis of a network considers how the pattern and strength of connections among entities shape system behavior. Such analyses can identify key nodes (through measures of centrality, for example), reveal subgroups or communities within a system, or assess the overall structure (through density

⁶⁴ Markus Buser et al., “Toward a Sport Ecosystem Logic,” *Journal of Sport Management* 36, no. 6 (2022): 534–47.

⁶⁵ Laura Turnbull et al., “Connectivity and Complex Systems: Learning from a Multi-Disciplinary Perspective,” *Applied Network Science* 3, no. 1 (2018): 11, <https://doi.org/10.1007/s41109-018-0067-2>.

⁶⁶ Exceptions include studies like Ramachandran et al., (2024), who use network analysis and quantitative science mapping techniques to examine the development of the field of somatotyping and talent identification and development systems. Aishwarya Ramachandran et al., “Using a Mixed-Methods Approach to Examine the Expanding Reach of Body Classification into the Twenty-First Century,” *Journal of Sport History* 51, no. 1 (2024): 1–31.

⁶⁷ Stephen M. Chignell, “A Missing Link? Network Analysis as an Empirical Approach for Critical Physical Geography,” *Canadian Geographies / Géographies Canadiennes* 67, no. 1 (2023): 52–73, <https://doi.org/10.1111/cag.12767>; Tommaso Venturini et al., “What Do We See When We Look at Networks,” *arXiv Preprint arXiv:1905.02202*, 2019.

or connectivity). This makes it possible to uncover roles, clusters, and pathways of influence or flows that aren't visible from individual attributes alone.

A search of the peer-reviewed literature reveals that social network analysis (SNA), involving the analysis of patterns of interaction between social actors in social networks, is the most commonly used method in sports-related research. Wasche et al. (2017)⁶⁸ describe six distinct categories of SNA research in sport: competition networks that map who plays against whom, interaction networks that capture direct interpersonal exchanges, inter-organizational networks to describe links between clubs, federations, sponsors, and other institutions, intra-organizational networks to focus on relationships inside a single entity, affiliation networks link actors to shared memberships or events (e.g., athletes belonging to the same academy); and social-environment networks encompass broader contextual ties: family, community, media, that influence sport participants.

The inherent nature of team sports offers plenty of scope to assess networks and understand their dynamic nature. Clemente et al. (2015)⁶⁹ and Ribeiro et al. (2017)⁷⁰ suggest that SNA is useful for understanding tactical and/or performance analysis, especially in

sports like football, and may be used to evaluate individual (micro) and collective (macro) performance data. Focusing on shared leadership of sports teams, Fransen et al. (2015)⁷¹ suggest that SNA can enable the investigation of formal and informal hierarchies within a team structure, which in turn dictate outcomes on the field. More recently, Parnell et al. (2021)⁷² used network theory to explore how social ties are employed for recruitment in the football industry. They found that sporting directors draw upon several strategies from network theory, including closure (a closed network consisting of pre-existing relationships), strength of weak ties (reaching out to people outside an individual's closest network), structural holes (presence of a broker), and temporal embeddedness (changing relationships over time).

Beyond competitive contexts, Wasche and Woll (2010)⁷³ use network analysis to better understand the actors and organizations participating in regional sports tourism networks. Regional sports tourism, as an interorganizational network (a social network between organizations), is based on mutual trust among involved regional actors with more or less power and influence. In a subsequent study, they found that single actors in regional sports tourism are embedded in organizational network

⁶⁸ Hagen Wäsche et al., "Social Network Analysis in Sport Research: An Emerging Paradigm," *European Journal for Sport and Society* 14, no. 2 (2017): 138–65.

⁶⁹ Filipe Manuel Clemente et al., "General Network Analysis of National Soccer Teams in FIFA World Cup 2014," *International Journal of Performance Analysis in Sport* 15, no. 1 (2015): 80–96, <https://doi.org/10.1080/24748668.2015.11868778>.

⁷⁰ João Ribeiro et al., "Team Sports Performance Analysed Through the Lens of Social Network Theory: Implications for Research and Practice," *Sports Medicine* 47, no. 9 (2017): 1689–96, <https://doi.org/10.1007/s40279-017-0695-1>.

⁷¹ Katrien Fransen et al., "Who Takes the Lead? Social Network Analysis as a Pioneering Tool to Investigate Shared Leadership within Sports Teams," *Social Networks* 43 (October 2015): 28–38, <https://doi.org/10.1016/j.socnet.2015.04.003>.

⁷² Daniel Parnell et al., "Football Worlds: Business and Networks during COVID-19," *Soccer & Society* 22, nos. 1–2 (2021): 19–26, <https://doi.org/10.1080/14660970.2020.1782719>.

⁷³ Hagen Wäsche and Alexander Woll, "Regional Sports Tourism Networks: A Conceptual Framework," *Journal of Sport & Tourism* 15, no. 3 (2010): 191–214, <https://doi.org/10.1080/14775085.2010.513146>.

structures and do not act in isolation, with mutual trust, reliability, and cooperation acting as the glue holding the relationships between actors together.⁷⁴

In sum, research employing network analysis in the sports literature is relatively limited and often focused on social networks among players, teams, and/or coaches. While there is growing interest in understanding and localizing the economic activity and employment generation of sport and sporting events,⁷⁵ there has been little foray into mapping employment related to SAPA or exploring the diversity of relational structures that make up the SAPA ecosystem beyond performance and organizational coordination.

The Socio-Economic Dynamics of Network Analysis

While relatively few studies are focused on using network analysis to understand employment in sport, there are exceptions. Parnell et al. (2018; 2021)⁷⁶, for example, examine how aspects of network theory show up in recruitment processes within elite football. There are also a number of studies in the social sciences that use network analysis to examine employment patterns and livelihood outcomes. These studies often examine the social value and economic significance of networks in jobs, providing insights into which aspects of social networks most support employment and economic activity.

Early research by Granovetter (1973)⁷⁷ theorized that networks form a crucial part of securing jobs and can play a decisive role in connecting information and nodes. His notion of the ‘strength of weak ties’ argues that weaker ties (e.g., acquaintances) can be more important than strong ties (e.g., family) for certain outcomes like securing a job because weak ties often bridge otherwise disconnected clusters in a network. Authors like Burt (1992)⁷⁸ highlight the important brokering role that certain nodes can play, providing unique or new information and connecting networks or otherwise unlinked groups. Reflecting on how larger networks can increase the availability of jobs by increasing access to information and resources, Lin (2001)⁷⁹ suggests that networks provide information about potential opportunities for job seekers, and aid employers of potential candidates for particular skill-sets through referrals or endorsements via existing employees or networks. Situating networks within social capital theory, he notes that the resources or people placed within these networks can translate into tangible advantages in the labour market.

While these contributions emphasize the social mechanisms of opportunity, labour economics research has extended network perspectives to capture the economic value of networks at larger scales, focusing on industries, firms, and flows of workers. In understanding the economic value of

⁷⁴ Hagen Wäsche et al., “Quality in Regional Sports Tourism: A Network Approach to Strategic Quality Management,” *Journal of Sport & Tourism* 18, no. 2 (2013): 81–97, <https://doi.org/10.1080/14775085.2013.826593>.

⁷⁵ Geoffrey Propheter, “Professional Sports as Economic Activity Magnets: Some Evidence from Employment Microdata,” *Journal of Urban Affairs* 41, no. 6 (2019): 842–52, <https://doi.org/10.1080/07352166.2019.1572454>.

⁷⁶ Daniel Parnell et al., “The Emergence of the Sporting Director Role in Football and the Potential of Social Network Theory in Future Research,” *Managing Sport and Leisure* 23, nos. 4–6 (2018): 242–54; Parnell et al., “Football Worlds: Business and Networks during COVID-19.”

⁷⁷ Mark S. Granovetter, “The Strength of Weak Ties,” *American Journal of Sociology* 78, no. 6 (1973): 1360–80.

⁷⁸ Ronald S. Burt, *Structural Holes* (Harvard University Press, 1992), JSTOR, <http://www.jstor.org/stable/j.ctv1kz4h78>.

⁷⁹ Nan Lin, *Social Capital: A Theory of Social Structure and Action*, Structural Analysis in the Social Sciences (Cambridge University Press, 2001), 20, Cambridge Core, <https://doi.org/10.1017/CBO9780511815447>.

networks, studies often extend this worldview to macroeconomic scales. Hidalgo et al.'s (2007)⁸⁰ concept of “product space”, for example, refers to a network that maps the relationships between industries based on the capabilities needed to produce them (such as technical know-how, specialized labour force, climate, regulatory systems, or supply chains). They show that complex, high-value industries are dense with several interconnected nodes at the centre, while simpler industries are at the periphery of this space. Countries occupy different positions in the network based on their existing industries. Those located near the dense core have more opportunities to expand into related high-value sectors, while those on the periphery face more limited pathways. They use the example of apples and pears to show this proximity in a network. They argue that a country that produces and exports apples has many of the same skills and infrastructure needed to produce a pear, such as trained workers, storage, and transport systems. These capabilities can be easily redeployed to a related product; however, they would not be of much use in producing something like copper wires or home appliances, which require an entirely different set of capabilities.

Focusing on the United Kingdom, O’Clery and Kinsella (2022)⁸¹ estimate the size and variety of a labour pool available to an industry (e.g., food production, plastics and chemicals, transport, and manufacturing). They introduce a new metric - cluster employment - that measures the size of the labour pool and

the number of workers with relevant skills available to an industry. Using network analysis, they group industries by common skills and labour transferability (termed ‘clusters’) and show that these clusters can be useful in predicting industry-city employment growth. Anderson (2017)⁸² used data from an online labour platform to identify clusters of skills and workers to explain how workers with diverse and synergistic skill combinations earn significantly higher wages. Their findings demonstrate how network structures can reveal the economic value of skill configuration, which, when applied to Indian SAPA, might provide a useful way to identify and map the specific combination of skills required by occupations across the sector.

Proposing the concept of ‘livelihood landscapes’, Cinner and Bodin (2010)⁸³ suggest a methodological framework to map occupations and their interrelationships. Metrics such as network density, level of centralization, and connectedness were used to understand livelihood diversification in tropical coastal communities. They found that in regions where fishing or farming was a central occupation, networks were more centralized around a few key occupations. In areas with greater economic opportunity, networks were more diverse and less dependent on a single job, especially reducing dependence on natural resource-based occupations. This approach shows how network analysis can capture the changing structure of livelihoods and supporting

⁸⁰ C. A. Hidalgo et al., “The Product Space Conditions the Development of Nations,” *Science* 317, no. 5837 (2007): 482–87, <https://doi.org/10.1126/science.1144581>.

⁸¹ Neave O’Clery and Stephen Kinsella, “Modular Structure in Labour Networks Reveals Skill Basins,” *Research Policy* 51, no. 5 (2022): 104486, <https://doi.org/10.1016/j.respol.2022.104486>.

⁸² Katharine A. Anderson, “Skill Networks and Measures of Complex Human Capital,” *Proceedings of the National Academy of Sciences* 114, no. 48 (2017): 12720–24, <https://doi.org/10.1073/pnas.1706597114>.

⁸³ Joshua E. Cinner and Örjan Bodin, “Livelihood Diversification in Tropical Coastal Communities: A Network-Based Approach to Analyzing ‘Livelihood Landscapes,’” *PloS One* 5, no. 8 (2010): e11999.

activities across communities as they grow and diversify.

Lee et al. (2020)⁸⁴ examined the relationships among job roles requiring similar skills in Singapore's technology industry, identifying the centrality of roles by connecting them to particular skills, as well as the connectedness between skills that occur across job roles. Their primary goal was to assist job seekers, recruiters, and agencies wanting to understand the dynamics of the sector, and their mapping found that job skills in the technology roles overlap considerably across roles and are well-connected to each other. These findings support individuals to easily upskill and help employers identify job roles where existing employees can be redeployed without additional skills training. Similar studies identifying common skills across jobs and industries using network analysis have also been conducted in fields like computer science.⁸⁵

In the Indian context, some studies show how network effects have played increasingly important roles in labour market outcomes, especially because of their crucial role in spreading information in casual and informal settings. Iversen et al. (2009)⁸⁶ propose that employers use employee networks as screening and incentive mechanisms to improve recruitment quality. Using National Sample Survey Office data from 1999–2000, they sampled employment in large urban centres (Delhi, Mumbai, Ahmedabad, Chennai). Disaggregating by workers' origin,

location, and industry, they showed that employers relied on trusted networks, evidenced by concentrated migration from the same places into the same industries, to filter hires for low-skilled jobs.

Further Indian examples of network effects on employment include Munshi and Rosenzweig (2006),⁸⁷ who found a high prevalence of referrals—around 70% in blue collar jobs (especially through relatives or community members), compared to white collar jobs at 44%—in their study of the Dadar area of Mumbai. In Kolkata, Beaman and Magruder (2012)⁸⁸ found that around 45% of the employed people in their sample had helped a friend or relative find a job with their current employer. While these studies demonstrate the significance of social networks in facilitating positive employment outcomes, they do not use network analysis methods to understand the potential occupations associated with a particular sector or industry. This underscores a gap in the literature, as the role of networks in understanding employment and related outcomes remains limited across sectors and skill levels in India.

Taken together, the literature on network analysis can provide a novel and useful way to describe connections within sport beyond the playing field. Applying network analysis approaches to SAPA can reveal how jobs are generated, distributed, and sustained across the SAPA ecosystem.

⁸⁴ See: https://ink.library.smu.edu.sg/cgi/viewcontent.cgi?article=6651&context=sis_research

⁸⁵ Mehrdad Maghsoudi, "Uncovering the Skillsets Required in Computer Science Jobs Using Social Network Analysis," *Education and Information Technologies* 29, no. 10 (2024): 12759–80.

⁸⁶ Vegard Iversen et al., "Job Recruitment Networks and Migration to Cities in India," *The Journal of Development Studies* 45, no. 4 (2009): 522–43.

⁸⁷ Kaivan Munshi and Mark Rosenzweig, "Traditional Institutions Meet the Modern World: Caste, Gender, and Schooling Choice in a Globalizing Economy," *American Economic Review* 96, no. 4 (2006): 1225–52.

⁸⁸ Lori Beaman and Jeremy Magruder, "Who Gets the Job Referral? Evidence from a Social Networks Experiment," *American Economic Review* 102, no. 7 (2012): 3574–93.

This approach is particularly relevant for India, where SAPA employment is growing, and where network mapping can help make

visible forms of work that are currently overlooked and create targeted opportunities for growth.

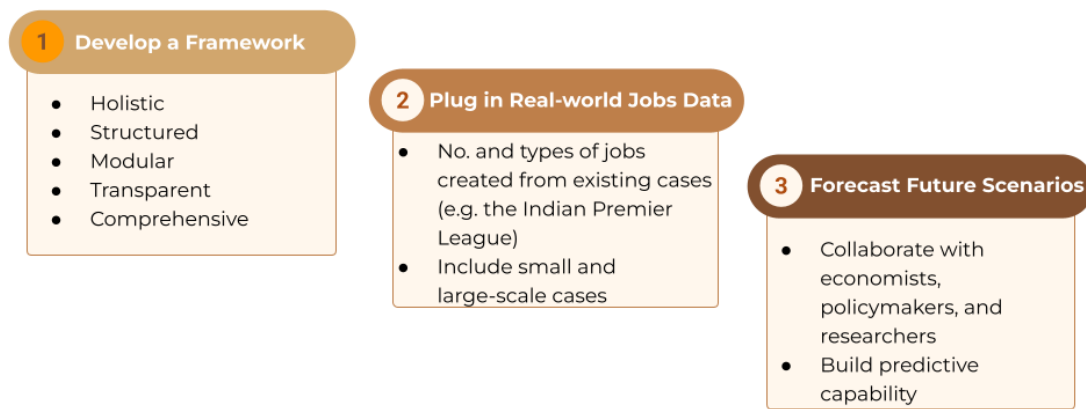
A New Approach: SAPA Livelihoods as an Ecosystem

Encouraging recent policy and economic developments warrant the development of a methodology to depict the current state of SAPA employment and livelihoods creation, and importantly, where it can go in the decades to come. To meet this need and move toward understanding SAPA livelihoods as an ecosystem, SSA has developed a pilot version of the SAPA Livelihoods Toolbox. The underlying methodology combines multiple approaches, including hierarchical classification, network analysis, and interactive visualization. The development of the Toolbox is divided into three distinct phases (Figure 5).

Phase 1 has been completed, and focused on developing a framework for the toolbox.

This involved methodology design, database development, and network visualizations and analysis. Phase 2 will consist of expanding cases and plugging in real-world data about job creation from existing SAPA-related cases (via document and database analysis, interviews with stakeholders). This process will also help to refine the framework developed in Phase 1. Phase 3 will focus on operationalizing the tool, collaborating with economists, policymakers, and other experts to forecast future scenarios and inform policies and investments. The following sections detail the steps taken in Phase 1, from database development to preliminary network visualizations.

Figure 5: Three-phase approach to developing the SAPA Livelihoods Toolbox



Database Development

Case Identification

The first phase began with a visioning exercise, thinking of various entities (or 'cases') likely to be created through the development of the Indian SAPA ecosystem. Drawing on readings of the grey and academic literature, including the SAPA Centre's existing

reports on SAPA, a list of six cases was selected to represent a range of sectors and scales across the SAPA ecosystem.⁸⁹ This list is preliminary and is intended to be a representative (not comprehensive) list of sport *and* physical activity contexts. It is meant to aid in developing the pilot version of the Toolbox, and will be expanded in future phases (Figure 6).

Figure 6: Six illustrative cases used to represent the SAPA livelihoods ecosystem

6 Illustrative Cases



Occupation Identification and Classification

Next, a list of related SAPA occupations was developed for each case. While somewhat overlapping in their meaning, in this report, the term 'occupation' is used to denote a broader category of work that groups similar jobs by required skills or duties (e.g., sales associate, market research analyst), while the term 'job' refers to a specified position

associated with a specified employer or organization (e.g., sales associate working in 'X' organization).

Occupations were identified based on existing reports, internet searches, and expert knowledge. Each occupation was classified according to its status as an "archetypal" profession associated with each specific case.

⁸⁹ Sports and Society Accelerator. (2025), Building Skills and Livelihoods through Sports and Physical Activity (SAPA), *Sports and Society Accelerator*, <https://sports-society.org/policyreports/building-skills-and-livelihoods-through-sports-and-physical-activity-sapa>; Royal Challengers Bengaluru & Sports and Society Accelerator. (2025). Sports-Forward Nation. *Sports and Society Accelerator*. <https://sports-society.org/policyreports/sports-forward-nation>

In other words, the occupations listed do not represent the full range of potentially-associated jobs, as this will require studying data from real-world cases.⁹⁰

A classification system was developed to group each occupation based on its related Theme and Sub-Theme. For example, in the case of a Professional League, the occupation 'Director of Sport' was assigned a sub-theme of Operations & Management and a Theme of League Personnel (see Table 1 for additional examples and Figure 7 for a box and arrow depiction of the classification structure). After an initial list of occupations had been developed for each case, the lists of occupations were standardized so that their names and categorizations were consistent across cases. The approximate salary (INR) was also estimated for each occupation based on Internet sources, though the exact values will vary depending on geographical and sectoral context.

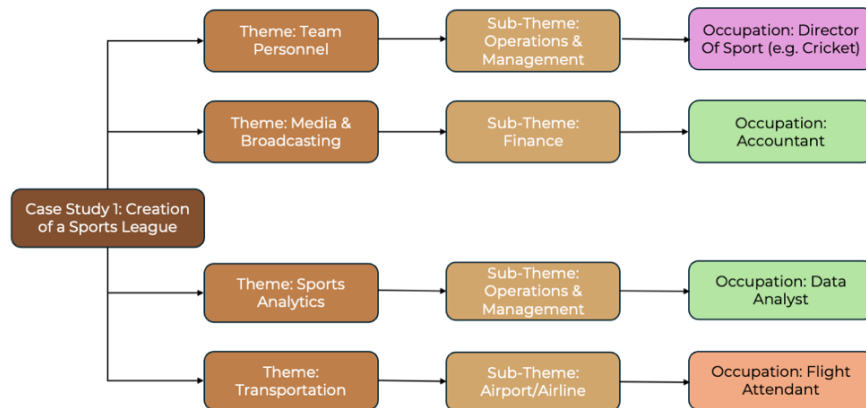
Some occupations will be filled by a single person (e.g., there would likely be only one Director of Sport in a Professional League). Others will be filled by multiple people (e.g., multiple Athletes on each team, and multiple teams in a league). To note this difference, a column indicating the presence of a *multiplier* was added to the database, which denotes whether or not an occupation is likely to be filled by a single job or multiple jobs. For the latter, a multiplier value can be added to accurately estimate the total number of jobs created in each case - the exact number would be dependent on the context. For example, a Professional League is likely to employ one Director of Sport, but multiple athletes and multiple physiotherapists. The *multiplier* column thus facilitates future analyses aimed at estimating the number of jobs created from the development of the SAPA ecosystem.

Table 1: Examples of classification structure for SAPA occupations and their classification for a Professional League

Case	Theme	Sub-theme	Occupation	Multiplier
Professional League	League Personnel	Operations & Management	Director of Sport	Single Job
Professional League	Team Personnel	Players & Agents	Athlete	Multiplier
Professional League	Team Personnel	Health & Medical	Physiotherapist	Multiplier

90

Figure 7: Box and arrow figure representing an example of hierarchical structure



Developing a New Vocabulary

Meaningfully describing the potential range and extent of job creation in the Indian SAPA ecosystem reveals a need for a new conceptual terminology to describe an occupation's *directness*, *temporality*, and *spatiality*. Mobilizing these concepts can lead to the identification of occupations essential to India's SAPA ecosystem, as well as relevant skill and/or education levels, so policy and resources (e.g., investments in skilling programs) are directed where they are most needed strategically.

Directness describes the causal link between SAPA investments and employment. Following common approaches used in research analyses of job creation,⁹¹ each occupation was categorized as either direct, indirect, or induced based on the following definitions:

- **Direct:** Employment created to fulfill the demand for a product or service. For example, in the case of the creation of a sports league, it refers to those occupations involved in the core operations and activities of the sports

league. These roles are essential for the league to function and are typically employed by the league or its teams.

- **Indirect:** An occupation that produces or supplies the goods and services needed by the workers with direct occupations. For example, this includes occupations that support the core operations of the league but are not directly involved in the day-to-day management or execution of league activities. These roles are often employed by third-party vendors.
- **Induced:** Employment created by the additional personal spending (e.g., eating at a restaurant) by both direct and indirect workers is classified as an induced occupation. In the league example, this includes occupations created as a result of the economic activity created by direct and indirect occupations associated with the league. They are supported by the increased spending and economic activity that the league induces.

Temporality refers to the duration and timing of employment. Each occupation was classified as one of the following:

⁹¹ Vinod Vasudevan et al., "Estimating Direct, Indirect, and Induced Employment from Highway Construction in India," *Frontiers in High-Speed Rail Development*, 2021, 545-568.

- **Permanent:** These occupations typically offer year-round employment with consistent hours and responsibilities. Employees in full-time roles often have stable salaries, benefits, and job security. Examples include coaches, fitness trainers, and sports management professionals who work throughout the year.
- **Non-permanent:** This is a broad category including both seasonal and temporary employment. Seasonal occupations are tied to specific periods, often aligned with sports seasons or events. These roles usually have a defined start and end date, leading to fluctuating employment based on the time of year. Examples may include positions like lifeguards, retreat instructors, or event staff for tournaments. Temporary employment refers to short-term, one-off positions intended to fill immediate needs, cover absences, or support short projects. Examples may include construction workers required to build a stadium or sports facility, or volunteers supporting the hosting of a sports event. All indirect employment was classified as Non-permanent, given the nature of their relationship to the case (see Annex).

Spatiality refers to the location and centrality of an occupation within the SAPA ecosystem. The location of an occupation in the network of economic activity can influence its connections, interactions, and importance within the SAPA ecosystem. Each occupation was classified as one of the following:

- **Central:** These can span multiple SAPA sectors and connect across value chains. Examples may include physiotherapists and event managers.
- **Peripheral:** These can be confined to a single activity or niche, with limited

spillover effects to other SAPA sectors. Examples may include referees in a specific sport.

For a more detailed discussion of the assumptions underlying the development of the SAPA Livelihoods Toolbox, see 'Caveats and Assumptions' in the Annex.

Alignment with the National Classification of Occupations

To align the analysis with existing national and international schema, each occupation was matched to a respective occupation in the National Classification of Occupations (NCO) 2015. The NCO is a comprehensive framework developed by the Government of India to categorize and classify various occupations in the country. It serves multiple purposes, including aiding in labor market analysis, facilitating skill development initiatives, and enhancing employment services by providing standardized occupational information (e.g., Skill Level; Educational Requirements). The NCO 2015 is the latest version of the NCO and is crucial for policymakers, researchers, and educators as it helps in understanding workforce dynamics and aligning training programs with industry needs. The NCO 2015 aligns with frameworks such as the National Skills Qualifications Framework (NSQF), developed by the MSDE, and the International Standard Classification of Occupations (ISCO), developed by the International Labour Organization (ILO). This alignment ensures that the NCO 2015 is compatible with global occupational classifications, facilitating international comparisons and enhancing the understanding of labor market trends across countries.

For each occupation in the SAPA database, the NCO 2015 was searched until the most relevant match was found. For each match, the

relevant NCO 2015 Code, Title, Family, Group, Sub-Division, and Division were recorded. The NCO 2015 also provided information on Skill Level and Educational Requirements, which were also recorded for each occupation. Detailed information on these categories can be found in the NCO 2015 documentation.⁹² Not all occupations in the SAPA database had an exact match in the NCO 2015, so the confidence level of the match was recorded (Low, Medium, High) as a qualitative measure of uncertainty and to help target future efforts at refining the SAPA database.

Network Construction

A major goal of this study was to understand not just the number and types of occupations created by the development of India's SAPA ecosystem, but also the relationships among sectors. This was accomplished using a network analysis approach, which uses graph theory mathematics to understand patterns in relational data. To do so, the SAPA database was reconceptualized as a two-mode (or bipartite), multiplex network (i.e., a network with two types of nodes and multiple types of links) (Figure 8). Cases (one type of node) were linked to occupations (another type of node) based on the type(s) of economic relationship(s) they possess (i.e., direct, indirect, induced). For example, the Professional League (case) was linked to 'Director of Sport' (occupation). Each case and occupation was represented by a single node in the network. For occupations that occurred

across multiple contexts within a case (e.g., the League Office, Team Office, Media & Broadcasting, Merchandising & Retail, etc., would all employ an IT Director), the frequency of their occurrence was calculated.

An R code script was written to convert the database from spreadsheet format to network format. This was then imported into *Gephi*, a free and open-source software for network analysis and visualization.⁹³ We used Force Atlas 2, a continuous, force-directed layout that reorganizes the nodes based on the weight of their linked relationships.⁹⁴ This results in a network graph where more closely connected nodes are positioned closer together, and more loosely connected nodes are positioned further away. This layout facilitates visual analysis of node spatiality and network structure.⁹⁵ Each link was coloured based on the type of economic relationship it had with the respective Case (i.e., direct, indirect, or induced). Standard network metrics (e.g., degree, centrality, and betweenness centrality) were computed in *Gephi*. The network information and layout was subsequently exported to *Retina*, a free web-based tool for hosting interactive network visualizations.⁹⁶ This allows users to explore the network graph, search and filter the data, change the size and color of nodes based on different variables, and export their own visualizations. The *Retina* visualization was configured so that key information appears in a pop-up when the user selects a node (e.g., Sub-theme, Estimated Salary, etc.).

⁹² See: <https://dge.gov.in/dge/nco-2015>

⁹³ Mathieu Bastian et al., "Gephi: An Open Source Software for Exploring and Manipulating Networks," *Demonstration Papers, Proceedings of the International AAAI Conference on Web and Social Media* 3, no. 1 (2009): 361–62, <https://doi.org/10.1609/icwsm.v3i1.13937>.

⁹⁴ Mathieu Jacomy et al., "ForceAtlas2, a Continuous Graph Layout Algorithm for Handy Network Visualization Designed for the Gephi Software," *PLOS ONE* 9, no. 6 (2014): e98679, <https://doi.org/10.1371/journal.pone.0098679>.

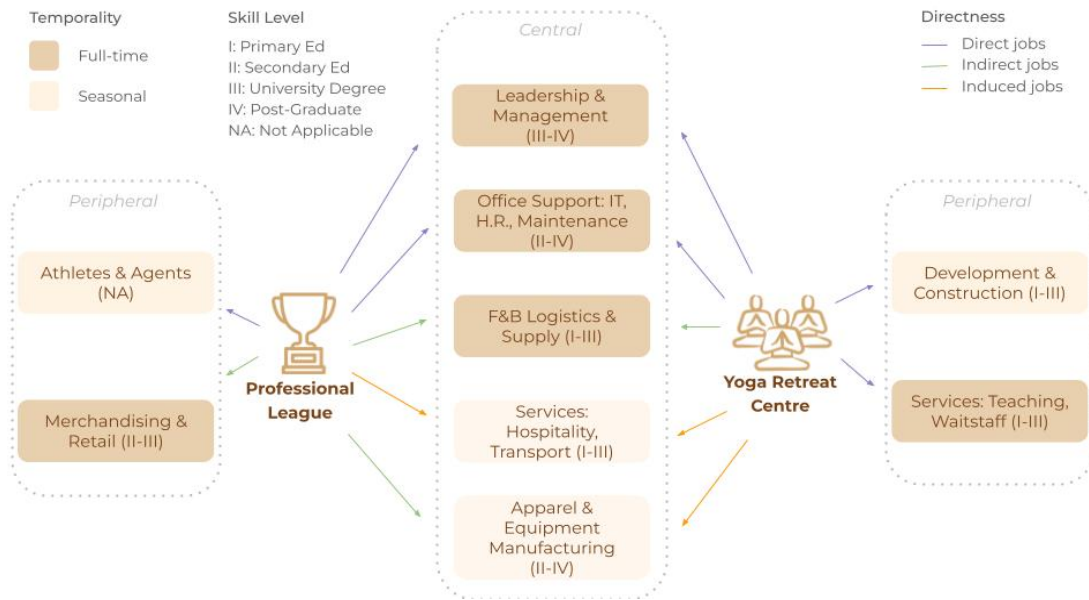
⁹⁵ Tommaso Venturini et al., "What Do We See When We Look at Networks: Visual Network Analysis, Relational Ambiguity, and Force-Directed Layouts," *Big Data & Society* 8, no. 1 (2021): 20539517211018488, <https://doi.org/10.1177/20539517211018488>.

⁹⁶ See: <https://gitlab.com/ouestware/retina>

An additional field was added, consisting of a URL (i.e., hyperlink) that conducts a Google search for Indian training programs related to the occupation. This basic feature can be

refined in future versions of the tool to link to specific training/skilling resources as available.

Figure 8: Diagram demonstrating how the SAPA ecosystem network is constructed by linking cases (e.g., Professional League and Yoga Retreat Centre) to related occupations⁹⁷



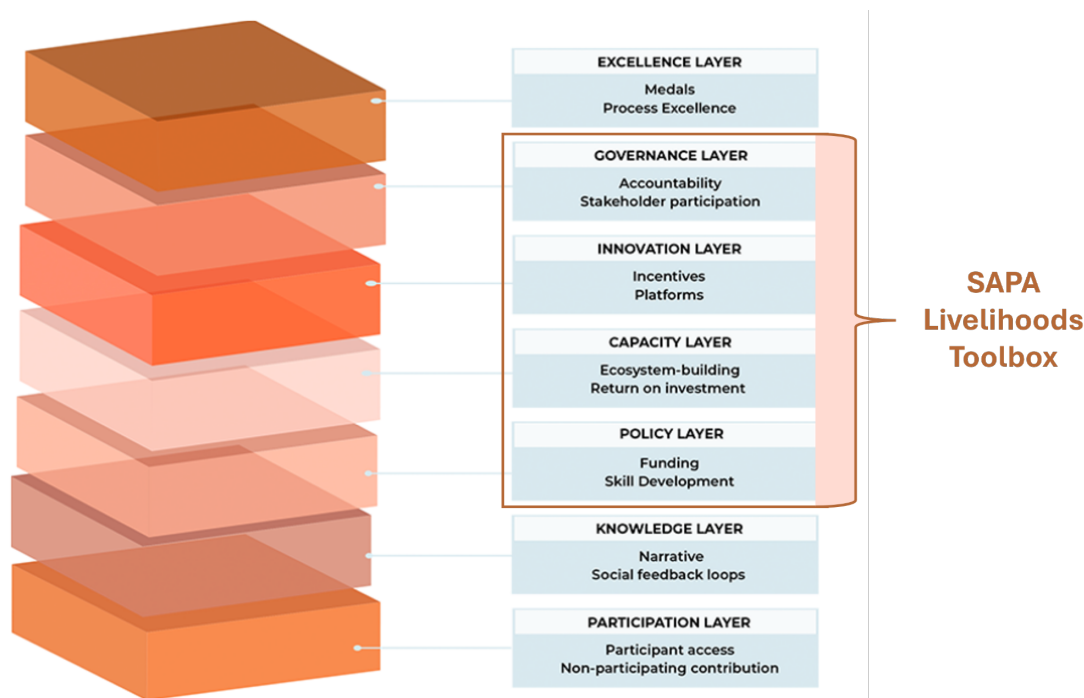
⁹⁷ Each occupation has various attributes, including Temporality, Skill Level (based on NCO 2015), and Directness. Note that the same occupation can be linked to multiple cases, with different types of Directness.

Insights from Phase 1

The “whole-of-system” approach developed by the SAPA Centre at SSA emphasises governance, capacity, and policy as critical levers for accelerating the SAPA ecosystem. Employment creation occurs across every layer of the SAPA stack, from grassroots participation and education to training, infrastructure, science, and allied industries (Figure 9). A full-stack lens connects these layers through policy, capacity, and industry to turn SAPA into a sustainable engine of employment and economic growth.

Thus, our objective in developing the SAPA Livelihoods Toolbox was to create an approach that encompasses the entire SAPA ecosystem by identifying and illustrating the number and variety of occupations likely to be associated with each case. Note that these are preliminary insights designed to demonstrate the capabilities of the Toolbox and will require future phases of research and development to validate and expand insights, as well as make predictions about the future of employment in the Indian SAPA ecosystem.

Figure 9: Layers of the SAPA Stack that the SAPA Livelihoods Toolbox addresses



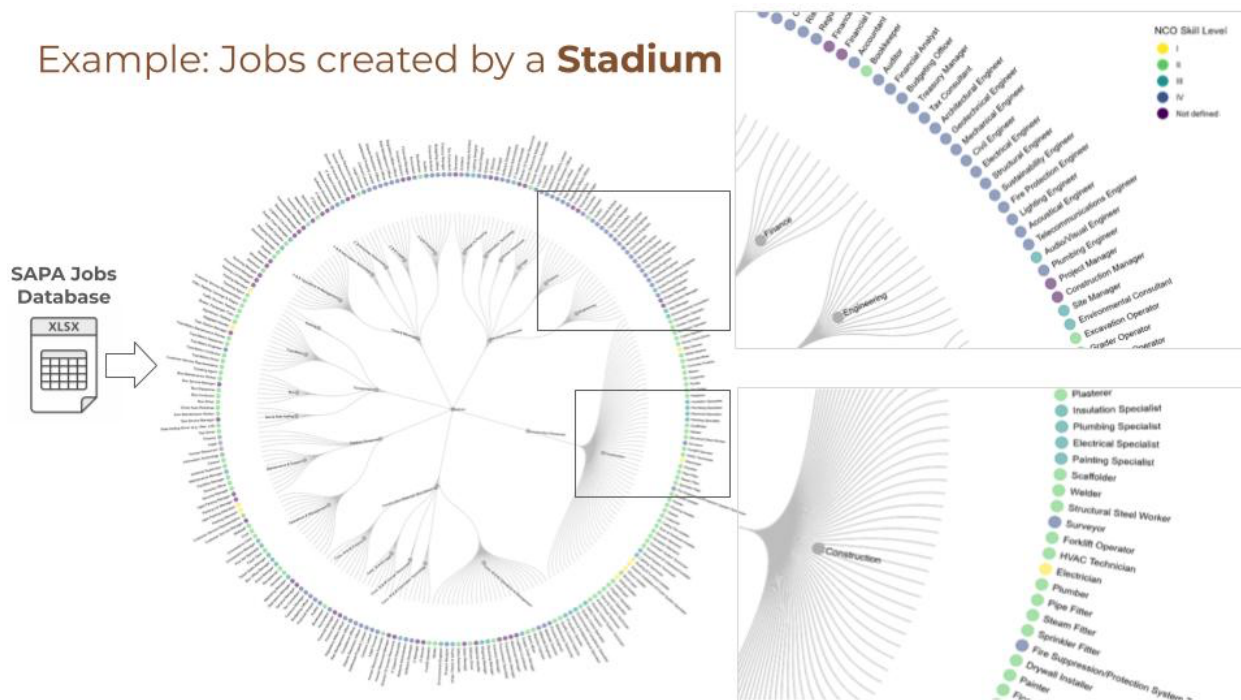
As discussed previously, we developed a hierarchical structure for classifying each occupation in the SAPA database (see simplified box and arrow representation in Figure 7). To visualize this hierarchy for each case in its entirety, we created circular dendrograms from the database. Dendrograms are commonly used in the

biological sciences for representing the taxonomic entities related to a group (e.g., in a phylogenetic tree). Circular dendrograms visualize the structure of hierarchical clustering radially around a center point, arrange branches and sub-branches to radiate from the center, adjust branch length to indicate the level of similarity between points

or clusters, and include labels to provide additional information about clusters or data points. A circular dendrogram for each case is available as supplementary material. Figure 10 shows the circular dendrogram created for the case of the stadium. The case (stadium) is plotted as the central node, while themes and then sub-themes radiate out from the center, and occupations are plotted on the outer edge of the circle. To the right are zoom-ins of different sub-themes and related occupations. The occupations are colored by their classified NCO Skill Level, showing that occupations of a

wide range of skill levels are created through investing in the development of a stadium. This spans sub-sectors as well: for instance, construction alone contains informal unskilled workers like bricklayers and cement mixers, to tradespersons like welders, forklift operators, and highly skilled professionals in development and landscape architecture. A circular dendrogram thus provides a comprehensive view of the range of archetypal occupations and subsectors associated with a single SAPA project.

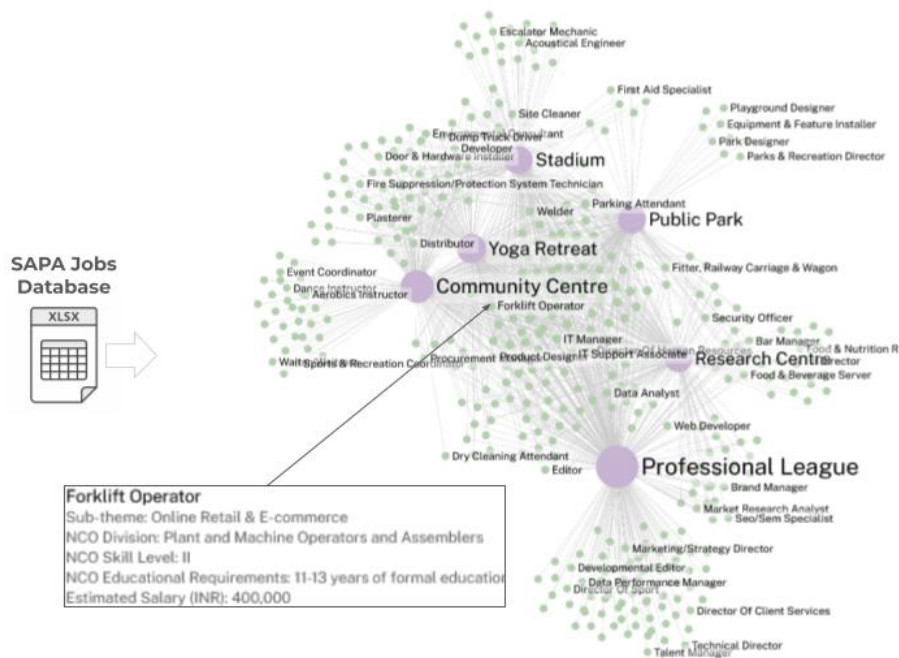
Figure 10: Dendrogram of the occupations created by a stadium. Occupations are colored by skill level as defined by the NCO 2015



While the circular dendrograms focus on visualizing the hierarchy and structure of occupations associated with a single case, the network structure in Figure 11 depicts the structure of occupations across all six cases, offering a visualization of an interconnected

SAPA ecosystem. The larger nodes (circles) represent the case studies, with smaller occupation nodes connected to them. The box to the left of the network shows a selection of attributes pertaining to each occupation, including NCO Skill Level and estimated salary.

Figure 11: Network visualization of the SAPA ecosystem. Nodes colored by type (purple = case; green = occupation) and sized by degree (e.g., number of connections)



A wide range of archetypal occupations appear in domains like construction, manufacturing, tourism, hospitality, services, office management, and support. Occupations which are cross-cutting (i.e., occur in multiple cases) are pulled to the centre of the network, making it easy to identify 'keystone' occupations which may be strategically targeted for policy action.⁹⁸ Given that India has a vast blue-collar workforce — nearly 292 million individuals (~70% of the total workforce in 2025), which faces a pressing need for upskilling due to automation and process innovation, specific attention may be paid to develop or draw on existing national programs supporting semi-skilled and trades-based occupations.⁹⁹

For example, the top 10 most influential

occupations included Welder, Forklift Operator, IT Manager, Accountant, Software Developer, and Logistics Manager (Figure 12). Their location at the center of all of the cases indicates that they occur across a wide range of SAPA contexts, either as direct, indirect, or induced occupations, depending on the case. While on-field occupations like athletes, coaches, and related supporting roles are often seen as central to the SAPA economy, behind-the-scenes roles across skill levels and domains (e.g., office, maintenance, construction) repeatedly emerge across cases.¹⁰⁰ As additional cases and real-world data is plugged into this model, the types of occupations with a high centrality score will change. However, through assigning eigenvector scores, the Toolbox will enable the

⁹⁸ In ecology, a keystone species is a species that has a disproportionately large effect on its environment relative to its abundance. These species play a critical role in maintaining the structure and stability of an ecosystem.

⁹⁹ See: <https://www.praxisga.com/insights/education-and-employability/harnessing-india-s-skilling-revolution-trends-in-vocational-training>

¹⁰⁰ For more, see: <https://sports.ndtv.com/othersports/sports-and-physical-activity-a-rs-50-lakh-crore-opportunity-for-india-9195758>

identification of important SAPA-related occupations that may require greater government policy attention and resources. This is especially true of occupations essential



to multiple sectors of the SAPA ecosystem, since impacts on them would disproportionately disrupt the employment network and economic stability.

Figure 12: Network visualization of the SAPA ecosystem with the top 10 most influential occupations highlighted

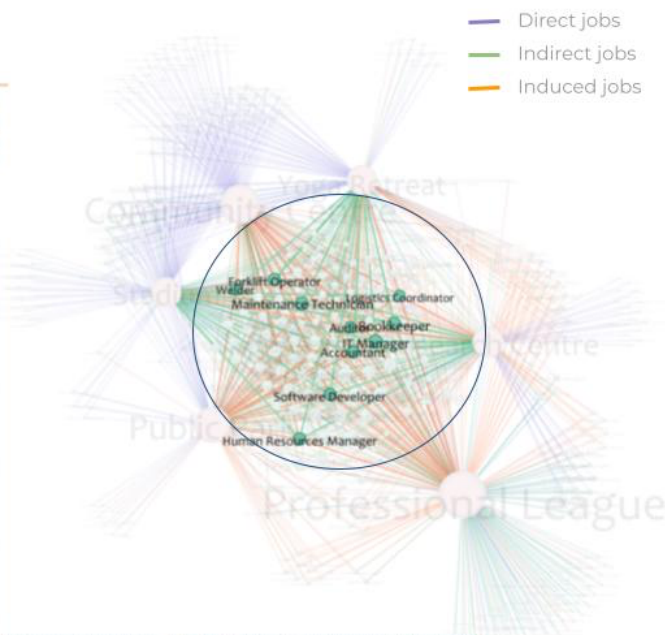
Identifying Keystone Jobs

The network reveals that some jobs appear more frequently across case studies than others. These "keystone" jobs may require greater government and policy resources and focus.

Top 10 Keystone Jobs (Eigenvector* Score)

 Bookkeeper	 Software Developer
 I.T. Manager	 Forklift Operator
 Maintenance Technician	 Auditor
 Accountant	 Welder
 H.R. Manager	 Logistics Coordinator

*Eigenvector centrality: measure of a node's influence in a connected network. A high eigenvector score means that a node is connected to many nodes who themselves have high scores.



Summarizing the data by directness shows the large proportion of indirect and induced occupations likely to be created by the development of India's SAPA ecosystem (making up about 69% of the occupations identified across the cases). Indirect and induced employment reflect local economic linkages (suppliers, transporters, retailers, service providers) and household income effects (additional local spending). Accounting for them highlights SAPA's potential for widespread, durable employment and stronger community-level resilience: for example, steady contracts for suppliers and

service providers, or livelihood diversification via manufacturing hubs. It is worth noting that the number of both indirect and induced occupations will significantly increase when real-world data is plugged in and multipliers are accounted for in Phase 2.

Over half of the occupations in our database were able to be matched with the NCO 2015 list with only a medium or low confidence (Figure 14). Future iterations of the Toolbox, incorporating real-world data, may be used to expand and refine the list of SAPA-related occupations in the next version of the NCO.

Figure 13: Occupations in the SAPA database summarized by Directness

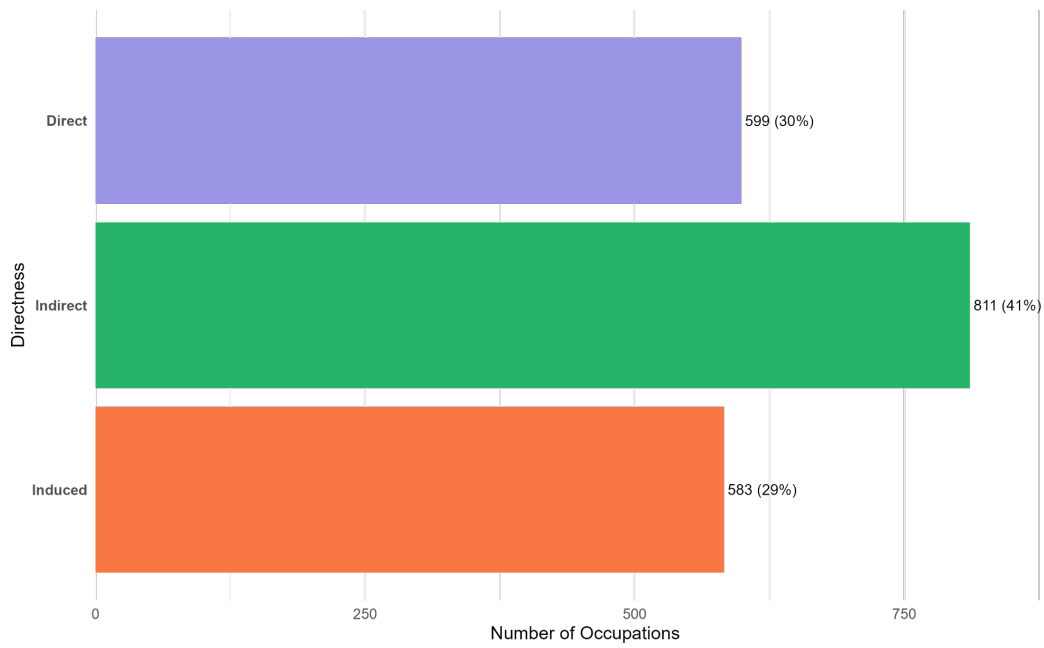
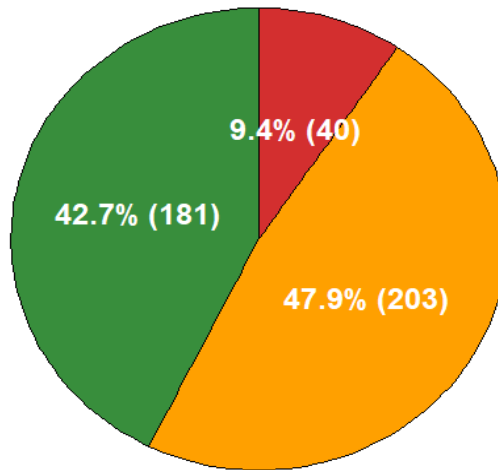


Figure 14: Occupations in the SAPA database summarized by match confidence with NCO 2015

Unique SAPA-related Occupations

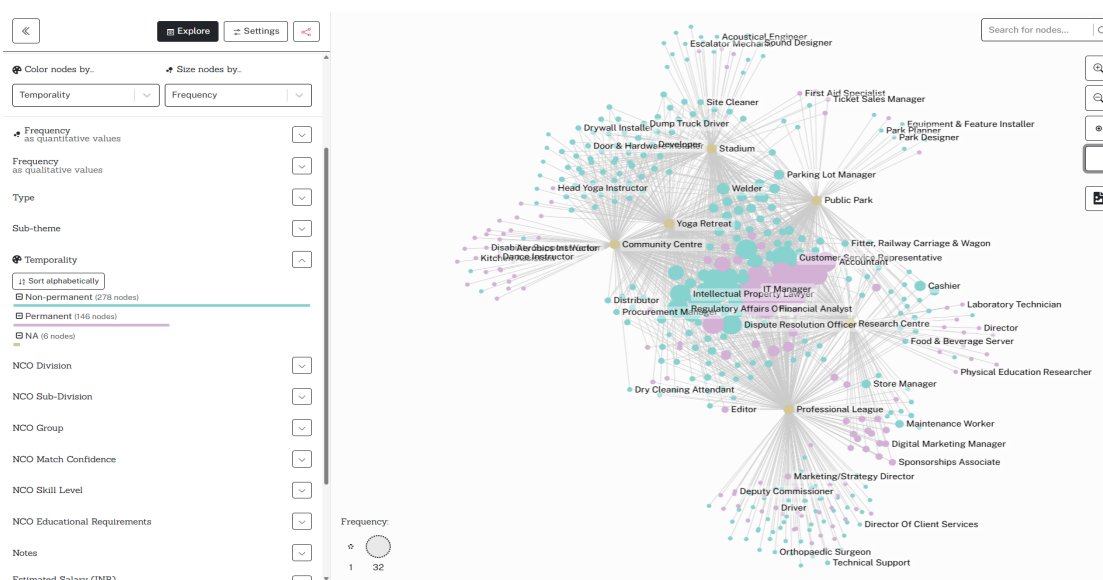


Match Confidence with NCO 2015 ■ High ■ Medium ■ Low

Network visualizations in *Retina* enable users to interactively explore the SAPA database (you can use [this link](#) to access the interactive tool).¹⁰¹ The user interface provides a filterable legend indicating the colour and number of nodes associated with each category. With this, users can easily search, filter, resize, and recolour nodes by various attributes. For example, Figure 15 below shows nodes coloured by temporality and sized by frequency (the number of times an occupation occurs in the database), so that

more frequently occurring occupations appear larger than less frequently occurring ones.¹⁰² *Retina* also enables users to filter and highlight specific node categories. For example, Figure 16 below shows occupations coloured by Sub-theme, with ‘Operations & Management’ highlighted.¹⁰³ Since the nodes are once again sized by frequency, we can see that ‘Customer Service Representative’ is relatively large compared to other highlighted nodes, indicating there are relatively more customer service representatives across all cases.¹⁰⁴

Figure 15: Network visualization of the SAPA ecosystem. Nodes colored by temporality (blue = Non-permanent; pink = Permanent) and sized by frequency



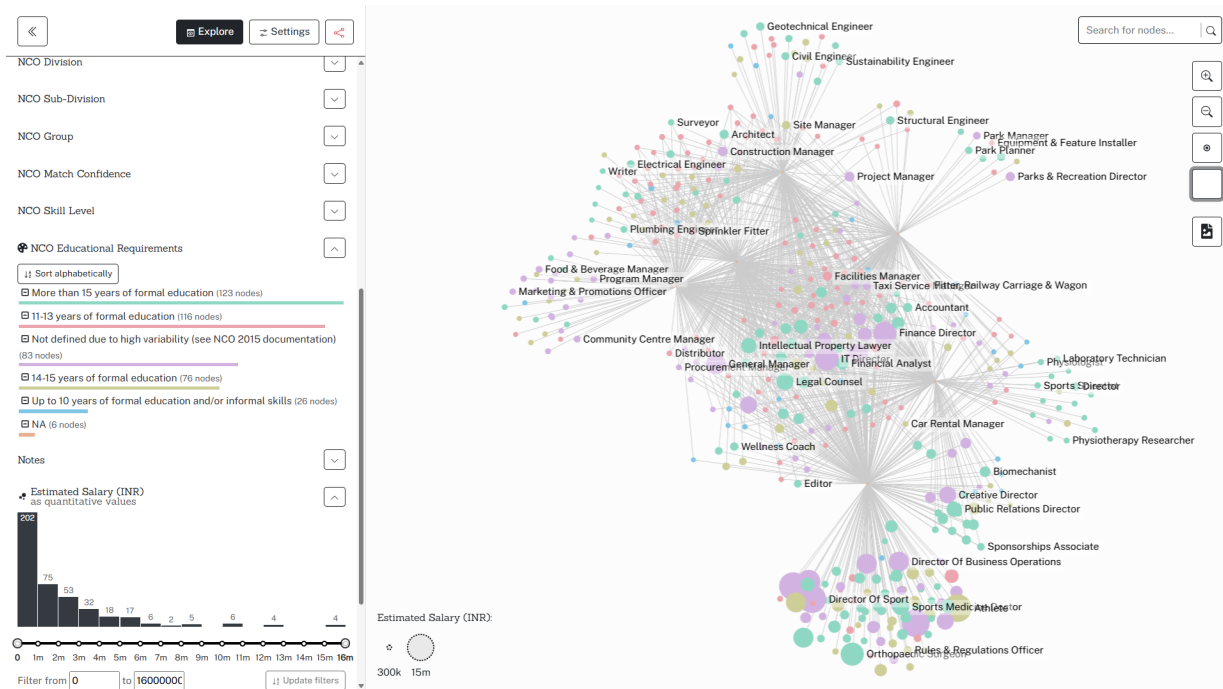
¹⁰¹ The interactive visualisations on Retina can be explored using the following link: <https://tinyurl.com/mrdwbysa>

¹⁰² Although temporality can be further disaggregated into seasonal, temporary, or project-based occupations, this is highly dependent on the context the occupation is associated with. Thus, as previously noted, all indirect and induced occupations have been classified as Permanent and Non-permanent in Phase 1 (see further explanation in Annex). Given the large proportion of indirect and induced jobs in the current database, it is unsurprising that there is a vast overrepresentation of non-permanent occupations (~82%) in the network. Plugging in real-world data in Phase 2 will enable users to visualize the number of permanent, seasonal/cyclical, and temporary jobs associated with a specific case.

¹⁰³ Note: Because multipliers have not yet been incorporated into the database, there is an overrepresentation of sectors such as Operations & Management, though this category is likely to be overshadowed by occupations from Manufacturing and/or Construction in future iterations of the tool.

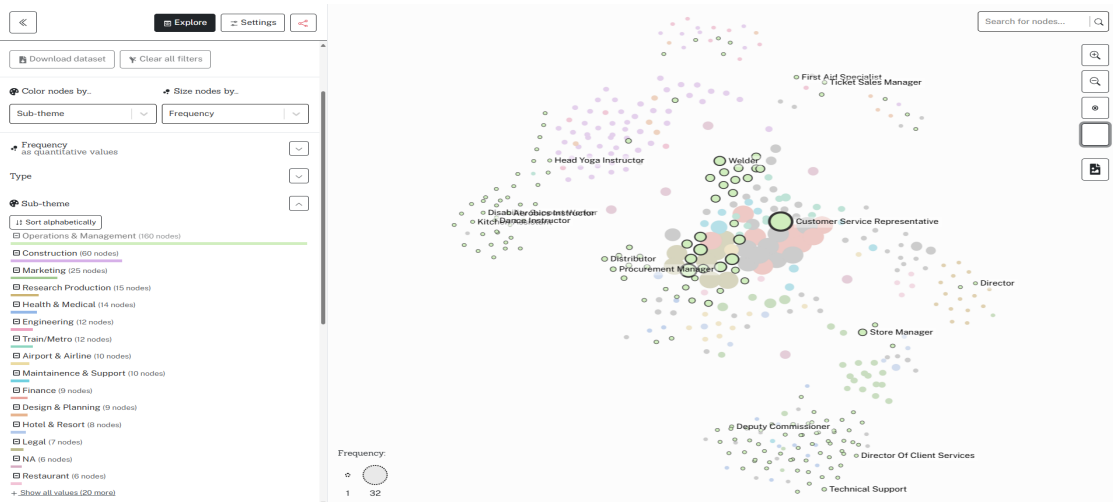
¹⁰⁴ Again, this will change with the inclusion of multipliers in Phase 2.

Figure 16: Network visualization of the SAPA ecosystem and interactive filtering options of Retina software. Nodes colored by Sub-theme with 'Operations & Management' highlighted



In Figure 17 below, the nodes are coloured by NCO Educational Requirement and sized by estimated salary, allowing a cross-comparison of education and income. Moreover, for quantitative attributes like salary, *Retina* creates a histogram that, when filtered, filters the network visualization on the right. In this case, the histogram is right-skewed, reflecting a large number of occupations with smaller salaries (e.g., Brick Layer; Cleaner) and a small number of occupations with very large salaries (e.g., Director of Sport; Finance Director).

Figure 17: Network visualization of the SAPA ecosystem and interactive filtering options of Retina software. Nodes colored by NCO Educational Requirements and sized by estimated salary



Conclusion

Building a strong SAPA ecosystem in India requires moving beyond a narrow understanding of sport as either elite competition or leisure. SAPA should instead be understood as a whole-of-system domain in which participation, education, health, skilling, governance, infrastructure, science, technology, tourism, manufacturing, events, media, and community life are deeply interconnected. This broader view is important because value in SAPA is not generated by any one actor in isolation. It is co-created by a wide range of institutions and individuals, including athletes, coaches, teachers, schools, clubs, federations, state agencies, private academies, universities, health professionals, event managers, manufacturers, technology providers, volunteers, and local communities.

The work undertaken by the SAPA Centre incubated at the Sports and Society Accelerator reinforces this perspective. The SAPA Livelihoods Toolbox has been developed precisely to make visible the full spectrum of sectors, occupations, and relationships that constitute the Indian SAPA ecosystem. Its purpose is not only to identify direct employment in sport, but also to illuminate indirect and induced livelihoods, reveal how occupations connect across cases, and support future policy planning, implementation, and forecasting. In this sense, the ecosystem lens is both conceptual and practical. It provides a way of understanding SAPA as a dynamic network of interdependent activities rather

than as a collection of disconnected programmes or institutions.

In this regard, the Australia-India collaboration report offers a useful complementary frame for thinking about ecosystem building.¹⁰⁵ A recurring insight in that report is that sporting success rests on institutional depth and systems coherence. Australia's experience suggests that high performance is sustained when it sits on top of a broad and inclusive base of participation, supported by strong governance, modern coaching and officiating, sports science, volunteering, physical literacy, infrastructure planning, and long-term advisory and coordination mechanisms. Its Play Well and Win Well approaches are especially instructive because they treat participation and excellence not as separate policy silos, but as connected parts of a single sporting system.

For India, this implies that ecosystem building must begin with participation. School sport, club sport, amateur sport, recreational sport, and sports-for-development programmes need to be seen as foundational infrastructure rather than peripheral activity. A fragmented model, in which grassroots engagement, talent identification, coaching, education, and competition structures are designed in isolation, is unlikely to generate either mass participation or sustained sporting excellence. By contrast, a coherent ecosystem approach can create lifelong engagement with physical activity while also improving pathways into performance, employment, and entrepreneurship.

¹⁰⁵ Molina Asthana, *Strategy for Sports Collaboration between India and Australia: A Comprehensive Partnership from Grassroots to Podium*, 2025.

An ecosystem approach also expands how livelihoods in and through SAPA are understood. Employment in SAPA is not limited to athletes, coaches, and managers. It extends to a much wider set of roles across tourism, construction, manufacturing, retail, sports goods, food and beverage, transport, hospitality, broadcasting, event management, education, sports science, health, data, and information technology. This is one of the central contributions of the SAPA Livelihoods Toolbox. By mapping these relationships, the Toolbox helps demonstrate that SAPA is not a marginal social sector, but a labour-intensive and economically significant field with the potential to generate meaningful work across skill levels and geographies.

A robust ecosystem must therefore connect five broad layers broadly in line with the SAPA Centre's Sports Stack. First, it must create a wide base of access and participation. Second, it must establish clear pathways from participation to progression through coaching, competitions, institutions, and athlete support. Third, it must build enabling systems of governance, integrity, and professionalisation. Fourth, it must strengthen the knowledge backbone through education, physical literacy, research, sports science, and skilling. Fifth, it must cultivate allied industries and supporting sectors that expand the economic footprint of SAPA. The whole-of-system approach developed by the SAPA Centre is valuable precisely because it connects these layers through policy, capacity, and industry, thereby positioning SAPA as a sustainable engine of employment and economic growth.

This perspective is especially relevant for India in the present moment. National policy developments already point in this direction. The NSP 2025 recognises sports as a driver of social and economic development. At the same

time, related policy frameworks in education, labour, and skilling open pathways for modular learning, reskilling, upskilling, recognition of prior learning, and new career routes in sports and sports-related sectors. The long-term value of the SAPA ecosystem will depend on how well these policy streams are brought into convergence. In this regard, the Toolbox can serve not merely as an analytical device, but as a coordination instrument that helps identify where capacity gaps lie, where new livelihood pathways can be created, and where cross-ministerial alignment is needed.

The next stage of ecosystem building will require grounding this framework in real cases, data, and institutional arrangements. As envisaged in the phased development of the Toolbox, this includes plugging in data from existing SAPA cases, refining occupational mappings, identifying short- and long-term employment effects, and building forecasting capabilities that can inform policy and investment choices. Over time, this can support workforce planning, job transition pathways, resilience analysis during economic shocks, and the eventual development of a more robust Indian approach to Sport Satellite Accounting. In that sense, ecosystem building is not only about strengthening present structures. It is also about creating the knowledge architecture required to shape the future of SAPA in India.

Finally, ecosystem building in India should be understood as both a development agenda and a legacy agenda. Positioned within the broader ambitions of *Viksit Bharat*, Commonwealth Games 2030, and a potential Olympics 2036, the SAPA ecosystem can help expand meaningful employment, improve participation, deepen inclusion, and create credible lifelong career pathways. A strong SAPA ecosystem is therefore not simply a

support structure for sport. It is an institutional and economic framework through which sport and physical activity can

contribute more fully to national development.

Next Steps

The SAPA Livelihoods Toolbox represents a timely and strategic opportunity to advance India's long-term development goals, particularly those articulated under *Viksit Bharat*, which envisions a fully skilled workforce, meaningful employment opportunities, and increased participation of women in economic activity. Positioned within the broader context of legacy planning for the Commonwealth Games 2030 and a potential Olympics 2036, the Toolbox can play a transformative role in shaping SAPA as a significant contributor to national economic growth and a viable lifelong career pathway.

Building on this national vision, this section outlines the development, evolution, and implementation pathways of the Toolbox.

The purpose of this report was to discuss the envisioning and development of a SAPA Livelihoods Toolbox to analyse current and future employment scenarios in Indian SAPA. While the framework developed in Phase 1 provides a foundation and flexible structure to build from, it is still at a preliminary stage and requires comprehensive corroboration with real-world data in future phases. The strengths of the Toolbox lie in its attempts to capture the full spectrum of livelihood creation (i.e., direct, indirect, and induced employment within a limited set of SAPA cases) and modularity, making for easier future refinement and augmentation. The development of the Toolbox closely aligns with initiatives envisioned in the Draft National Skill Development and Entrepreneurship Policy 2025, which recognises sports as a priority sector for skilling and underscores the need for careers in sports and sports-related sectors.

Phase 2 will focus on plugging in data from real cases (for example, from existing sports leagues such as the Indian Premier League). These will allow us to realistically estimate the number of jobs created across different industries, identify employment gaps (e.g., subsectors where India relies on imports, seasonal work), and capture short- and long-term employment impacts in each case. Phase 2 will also include verifying the temporality and estimated salaries for each occupation, assessing and refining each occupation's match with the NCO, and adding additional cases identified through expert consultations. These steps will ensure the final Toolbox captures the Indian SAPA ecosystem as accurately as possible. This phase will provide a strong institutional foundation for implementation scenarios, lay the groundwork for engagement, and ground the toolbox in the social, political, and economic needs of the SAPA ecosystem.

Phase 3 will focus on forecasting future scenarios by collaborating with economists, policymakers, and researchers to build and test predictive capabilities of the Toolbox. Network analysis and graph theory provide a powerful framework for doing this and are commonly used for understanding the resilience of complex systems. For example, consider an ecological network where nodes represent species and edges reflect predator-prey relationships. By simulating the removal of certain species (nodes) and observing how this affects overall network connectivity and function, researchers can identify which species are essential for maintaining ecosystem resilience.

In a similar way, our Toolbox could be used to simulate the impact of economic shocks (e.g., tariffs, wars, sector closures/downturns) by removing nodes (occupations) and examining how the network responds in terms of connectedness and functionality. Similar vulnerability analyses at the case level could be used to understand how the closure or downturn of a sector might affect its related occupations. Path analysis could be used to assess how easily occupations can transition from one sector to another, reflecting the flexibility of the labor market. Understanding these interdependencies will provide valuable insights for workforce planning and policy-making.

This phase unlocks a pathway for many use cases. It can be used to guide economic policy decisions on workforce development, training programmes, and sector support during economic downturns. It may also help design job transition programmes by identifying pathways for workers to move between sectors based on the connectivity of occupations, thereby aiding job retraining initiatives. It could also help to understand which occupations are more vulnerable during crises (e.g., pandemic-induced economic shutdowns) and develop strategies to enhance workforce adaptability. The toolbox also presents itself as an essential resource for guiding the future development of a Sport Satellite Account for India. As the Toolbox is developed to highlight the diverse livelihood opportunities in and through SAPA, adopting a pillared approach can further strengthen efforts to showcase SAPA's potential for economic growth. Such an approach may capture three key pathways: direct employment within sports, careers in allied

and related sectors, and job readiness through SAPA, particularly for uniformed services, where sports participation has long supported recruitment.

The way ahead must be situated firmly within India's existing policy and governance architecture. The policy implementation of the tool can be led by MSDE, which can serve as the nodal ministry. With a total allocation of INR 9885.80 crore in 2026-27, the MSDE is well-positioned to anchor cross-ministerial coordination and initiatives for SAPA-based livelihoods.¹⁰⁶ Supported by the MYAS, MoE, and MoLE functioning as key line ministries, the long-term implementation of the tool can be across skilling, education, labour, and employment systems. Aligned with the NSP strategic framework, policies and initiatives at the state level can be developed to identify opportunities and create frameworks that strengthen inter-sectoral convergence, promote collaborative approaches, and expand opportunities for skill development while supporting sustainable livelihoods in and through sports at the local level. The Integrated Scheme in Skilling Architecture (allocated INR 600 crore), initiating State Skills Transformation Pilots in Andhra Pradesh, Odisha, Uttar Pradesh, and Assam, presents an immediate entry point for state-level convergence.

Strengthening linkages with MSDE's Skill India Digital Hub (SIDH)¹⁰⁷ and Sports & Fitness Sector Skills Council (SPEFL-SC)¹⁰⁸ programmes may enable structured SAPA skilling and certification pathways, including opportunities for foundational learning, vocational training, and modular upskilling. Further, the INR 2,800 crore Skill India

¹⁰⁶ The details of the budget are available here: <https://www.indiabudget.gov.in/doc/eb/she92.pdf>

¹⁰⁷ For more, see here: skillindiadigital.gov.in

¹⁰⁸ The SPEFL-SC's programmes can be found here: <https://www.sportsskills.in/>

Programme and the newly launched PM SETU scheme (allocated INR 6,140.50 crore for the upgradation of 1,000 Industrial Training Institutes [ITIs and setting up five National Centres of Excellence for Skilling) provide a concrete foundation for embedding SAPA-related vocational pathways within existing national skilling infrastructure. This integration can include competency frameworks with micro-credentials for SAPA educators, practitioners, and coordinators with qualification packs and badges co-developed with national skill councils.

Alignment with MoE initiatives such as academic bank credits and vocational learning frameworks can further support flexible progression routes for learners entering or transitioning within SAPA careers. In parallel, integrating the Toolbox with the priority areas of MoLE, including the provisions of the Draft National Labour & Employment Policy (*Shram Shakti Niti 2025*), such as the ISCS, can enhance recognition, portability, and crediting of SAPA skills across the labour market. Connecting with the National Career Services Portal (as also envisioned in the draft labour and employment policy) can improve the visibility of SAPA occupations, expand outreach, and support data-driven workforce planning. This can contribute to toolkits and transition pathways for those currently in work, or those looking to return to work, such as former athletes.

Leveraging key MYAS initiatives, such as Khelo India (with an increased allocation of INR 224.35 crore), which supports community coach development, talent identification, and grassroots capacity building; the newly

announced Khelo India Mission in the 2026-27 budget; the allocation of INR 500 crore to sports goods manufacturing; which marks a major shift to a long-term, outcome-driven framework to transform India's sports ecosystem;¹⁰⁹ and the Scheme of Human Resource Development in Sports (allocated INR 5 crore),¹¹⁰ which focuses on training, research, and professional development, can provide structured pathways, expanded opportunities, and sustained field-level engagement to strengthen livelihoods and career development within the SAPA sector.

Further, the National Youth Policy (Draft) 2025¹¹¹, with its priority focus areas in education, skilling, employment, entrepreneurship, and sports and recreation, can provide a framework to enhance the SAPA toolbox. The Mera Yuva Bharat (MY Bharat)¹¹² portal (allocated INR 90 crore in 2026-27), envisioned as a “phygital” initiative with a dedicated portal and resource centres, can be leveraged to expand livelihoods in the SAPA ecosystem by supporting experiential learning, mentorship, volunteer opportunities, and youth–employer linkages, ultimately scaling actionable initiatives nationwide.

Collaboration with the Ministry of Social Justice and Empowerment and the Ministry of Women and Child Development can ensure inclusive access, enabling participation of vulnerable groups, individuals re-entering the workforce, and former athletes seeking sustainable livelihood pathways.

Developed through a phased, comprehensive approach, the Toolbox can be helpful across a range of applications. Taken together, it can be

¹⁰⁹ For the exact budget breakdown, refer to the MYAS Notes on Demands for Grants, 2026-2027:

<https://www.indiabudget.gov.in/doc/eb/sbe102.pdf>

¹¹⁰ *Ibid*

¹¹¹ https://yas.gov.in/sites/default/files/Draft%20NYP-2025_0.pdf

¹¹² <https://mybharat.gov.in/> - MY Bharat portal is a portal designed for youth leadership and social engagement

designed as a nationally aligned digital instrument capable of strengthening SAPA-linked livelihoods, improving access to skilling opportunities, enhancing workforce

adaptability, and contributing meaningfully to the aspirations of *Viksit Bharat* and the NSP 2025.

Annexure: Caveats and Assumptions

Overall, our classification process is subjective and adaptable to the context and structure of each case. This means that occupations associated with a particular theme or sub-theme may change depending on their relationship to the case. For example, an occupation may be classified as indirect in one sub-theme and induced in another. The same occupation occurring in another case might only be classified as direct.

The inclusion of indirect and particularly induced occupations greatly increased the number of occupations needing to be considered in each case, and it quickly became clear that cutoff rules were needed in order to keep the list to a manageable size. To delimit the analysis, indirect and induced occupations were only included if they were within 1 degree of separation from the case. The following examples demonstrate this rule:

1. A cafe at a Community Centre would require cafe staff (e.g., manager, barista, cook, etc.), all of which would be considered direct occupations because they are employed by the Community Centre and are core to its operations. However, the food and beverage companies that supply ingredients to the cafe (e.g., coffee, flour, napkins) would be considered indirect occupations, because they are 1 degree of separation from the direct occupations they support.
2. The creation of a league would result in athletes, league office workers, and fans spending money on taxi drivers (Athletes/League Office/Fans → Taxi Driver), and so a taxi driver would be considered an induced occupation (1 degree of separation). However, the taxi

company would also have an office staff (e.g., phone operators, clerks, etc.), but these would be 2 degrees of separation from the case (Athlete → Taxi Driver → Taxi Office Worker), and therefore not included in the analysis. While this is a somewhat arbitrary cutoff to keep the work within manageable bounds for Phase I, this can be easily expanded in Phase II.

Many SAPA and SAPA-related occupations occur in multiple contexts. For example, in the case of a Professional League, the League Office would include a set of occupations related to Information Technology, as would each Team Office and each Media & Broadcasting Office. To capture these in a consistent manner, a set of archetypal occupations was created for each sub-theme. These occupation sets served as a template and repeated as necessary, reduced or augmented based on the specifics of each Theme and/or Case.

As the database developed, several caveats and assumptions were made:

1. Although different themes and occupations were standardized across cases (i.e., standardized occupation titles), occupation type (i.e., direct/indirect/induced) was not standardized, since this will change depending on the case.
2. Direct occupations were repeated for different sub-themes (e.g., League and Team offices will both employ financial experts), but indirect and induced occupations were not repeated (e.g., League and Team offices, as well as some fans, would hire travel agents on occasion).

3. Sports Research Centre, League (and League teams) were assumed to use facilities that already exist, and therefore do not include any construction occupations.
4. The Sports Research Centre is assumed to be located in a larger institute like a university. Thus, those occupations directly employed by the Centre were considered direct, while those hired by the university were considered indirect.
5. In all instances, tax consultants were considered indirect, even when other finance team members may be direct. This is because they are often self-employed or consultants, not hired as full-time employees.
6. In all instances, auditors were considered induced, as they are not paid by companies, but would have business as a result of the creation of a new company.
7. Temporality was classified as Non-permanent for all indirect and induced occupations, as the economic activity created by each of the cases would not entail the creation of a full-time indirect or induced occupation. For example, a Food & Beverage supplier would receive a one-off or yearly contract from the creation of a stadium or league, but this would not comprise the entirety of their employment throughout the year. This classification could be refined in Phase 2 to reflect the context of a given case study and add further detail about the nature of the temporality (e.g., seasonal vs. one-off employment) for a given occupation and case.

