D 3.2 – Preparatory Briefing on India

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Abstract: The preparatory briefing on India is the result of the collection of relevant cluster information in the country, including business and sector trends, cluster policies and programmes, as well as cluster mapping. This document is intended to provide a good overview of the country's opportunities for European cluster organisations and SMEs.

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1. Objective of the report

The aim of this "preparatory briefing" is to provide up to date information on the cluster landscape in India in order to support European cluster organisations and their (SME) members to familiarise themselves with the country and explore its potential for collaboration and market opportunities. More specifically, this briefing paper provides an overview of the country's economy and sectoral trends and strengths and highlights the role of clusters. In addition, it aims at giving an idea of the existing cluster community, the cluster policies, local support to clusters and the cluster programmes - including their historical development and internationalisation activity where relevant.

A complementary report, "discussion paper", provides an overview on the existing EU-India cluster cooperation, presents related good practices / success stories and opportunities for future exchanges.

The information of this report is provided through desk research and as well as contributions from local representatives based on information collected through interviews.

2. India Economy: focus on sectoral trends

2.1. Overview

India is the seventh-largest country by area and the second-most populous country in the world with over 1.365 billion people.[1] India GDP was € 2320,37 billion, in 2017, accounting for 4.19% of the world's economy[2] and the economy is continuing to grow [3]. There is an unemployment rate of 6.1%.[4] After a decrease in 2012 India's economy increased during the last years again. Its growth rate is up to 8.1% in 2015, but dipped to 7.1% in 2016 and 6.6% in 2017.[5]

Figure 1 – World Bank: GDP Growth: India[6]

Even though India is one of the fastest growing economies in the world, the country still faces considerable challenges. It is an emerging economy that still reflects the characteristics of a developing economy. A high percentage of the population works and lives in rural areas and is

[1] Wolrdometer, 2019 (Live). http://www.worldometers.info/world-population/india-population/ consulted on 02/04/2019

[2] Trading economics, 2018, https://tradingeconomics.com/india/gdp , consulted on 02/04/2019

[3] World Bank Data, https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=IN, consulted on 02/04/2019

[4] Trading Economics, 2018. http://www.tradingeconomics.com/india/indicators , consulted on 02/04/2019

[5] World Bank Data, https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=IN, consulted on 02/04/2019

[6] Asian Development Bank, 2016. http://www.adb.org/countries/india/economy

economically disadvantaged. The population still lacks education and most women do not work.[7] In India, 21.9 % of the population lives below the national poverty line.[8] The gap between the poor and the rich people has increased with India's growth. New initiatives are expected to help to increase economic growth and close the gap.[9]

India is part of the BRICS (Brazil, Russia, India, China, South Africa), the association of five major emerging national economies, which becomes more and more influential in international negotiations and diplomacy.

In 2017 the political stability index for India was very low at -0.83 on a scale from +2.5 to -2.5. India is within the last quartile of the world ranking in this regard. [10]

Trade and Investments in and with India

The EU and India launched negotiations in 2007 for a Free Trade Agreement (FTA) and suspended negotiations in 2013.[11] Nevertheless, the EU is still committed to working towards an FTA with India. Substantial progress has been achieved and further key areas have to be discussed including improved market access for some goods and services, government procurement, geographical indications, sound investment protection rules and sustainable development. Both authorities adopted a joint communication on November 20, 2018.[12]

EU is India largest trading partner (13.1% of India's global trade), whilst India is EU 9th largest trading partner (2.3% of EU's trade in goods). India's total export value in 2015 was € 365.2 billion. Trade in goods between the EU and India have almost doubled in the last decade. The EU exports from India in 2017, were worth € 41.7 billion, whereas EU imports from India represented € 44.2 billion, hence generating a trade balance of € 2.5 billion in favour of India.[13]

India still maintains substantial tariff and non-tariff barriers that hinder trade with the EU. In addition to tariff barriers to imports, India also imposes a number of non-tariff barriers in the form of quantitative restrictions, import licensing, mandatory testing and certification for a large number of products, as well as complicated and lengthy customs procedures.

EU-India trade negotiations cover:[14]

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[7] World Bank, India Overview, 2019 http://www.worldbank.org/en/country/india/overview, consulted on 02/04/2019

[8] Asian Development Bank, 2016 http://www.adb.org/countries/india/poverty , consulted on 02/04/2019

[9] European Commission, 2018, http://ec.europa.eu/trade/policy/countries-and-regions/countries/india/, consulted on 02/04/2019

[10] The Global Economy, 2017. http://www.theglobaleconomy.com/rankings/wb_political_stability/ , consulted on 02/04/2019

[11] European Commission, Directorate General for Trade, 2017. http://ec.europa.eu/trade/policy/countries-and-regions/countries/india/ , consulted on 02/04/2019

[12] European Commission, Press Release, http://europa.eu/rapid/press-release_IP-18-6481_en.htm, consulted on 02/04/2019

[13] European Commission, Directorate General for Trade, 2017. http://ec.europa.eu/trade/policy/countries-and-regions/countries/india/ , consulted on 02/04/2019

[14] European Commission, Directorate General for Trade, 2016 https://eeas.europa.eu/sites/eeas/files/eu_india_trade_and_investment_2016.pdf , consulted on 02/04/2019

- Access to each other's markets, for goods, services and to public procurement contracts;
- The framework for investment;
- The rules that typically structure trade arrangements, such as intellectual property and competition;
- Sustainable development, growth in trade needs to be seen in tandem with the environment, social and labour rights.

The *Atlas economic complexity* is an interactive online tool that enables users to visualise a country's total trade, track how these dynamics change over time and explore growth opportunities for more than a hundred countries worldwide. An analysis of India shows the following results:[15]

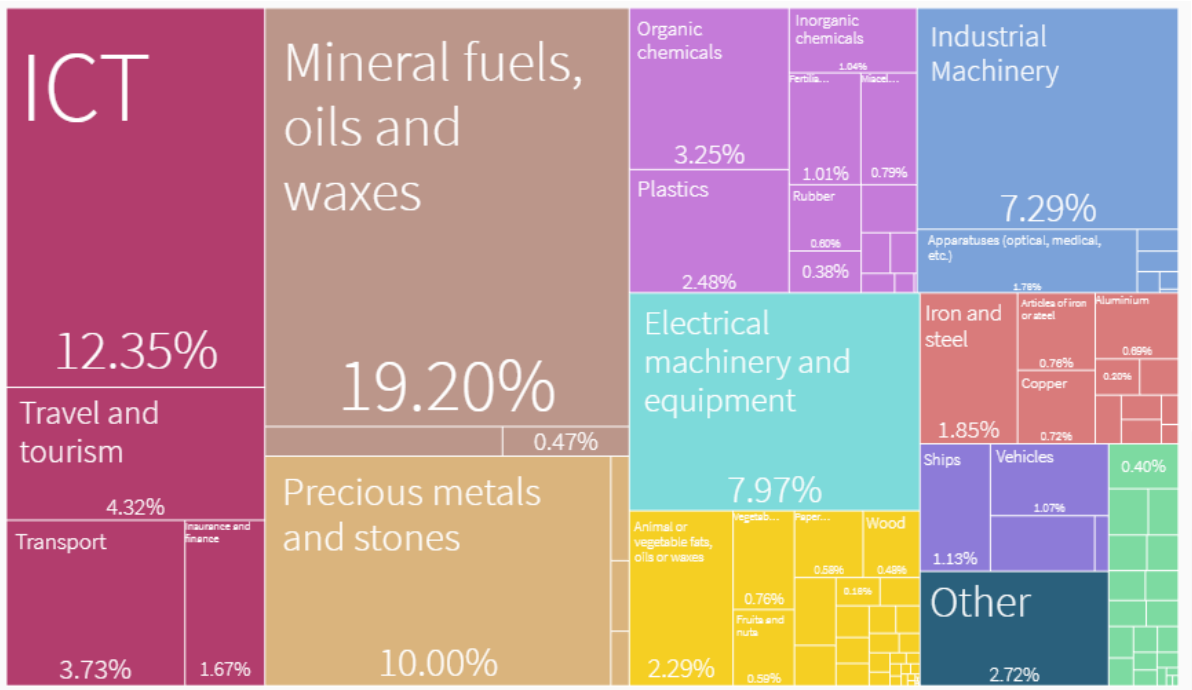

Figure 2 - India's imports in 2016 in the Atlas of Economic Complexity[16]

The major import categories:

- 19.2 % Mineral products, majorly petroleum oils, crude;
- 12.35% of ICT services
- 10.0 % Stone / glass, mainly diamonds (4.6 %);

[15] "The Atlas of Economic Complexity," Center for International Development at Harvard University, http://www.atlas.cid.harvard.edu

[16] "The Atlas of Economic Complexity," Center for International Development at Harvard University, http://www.atlas.cid.harvard.edu

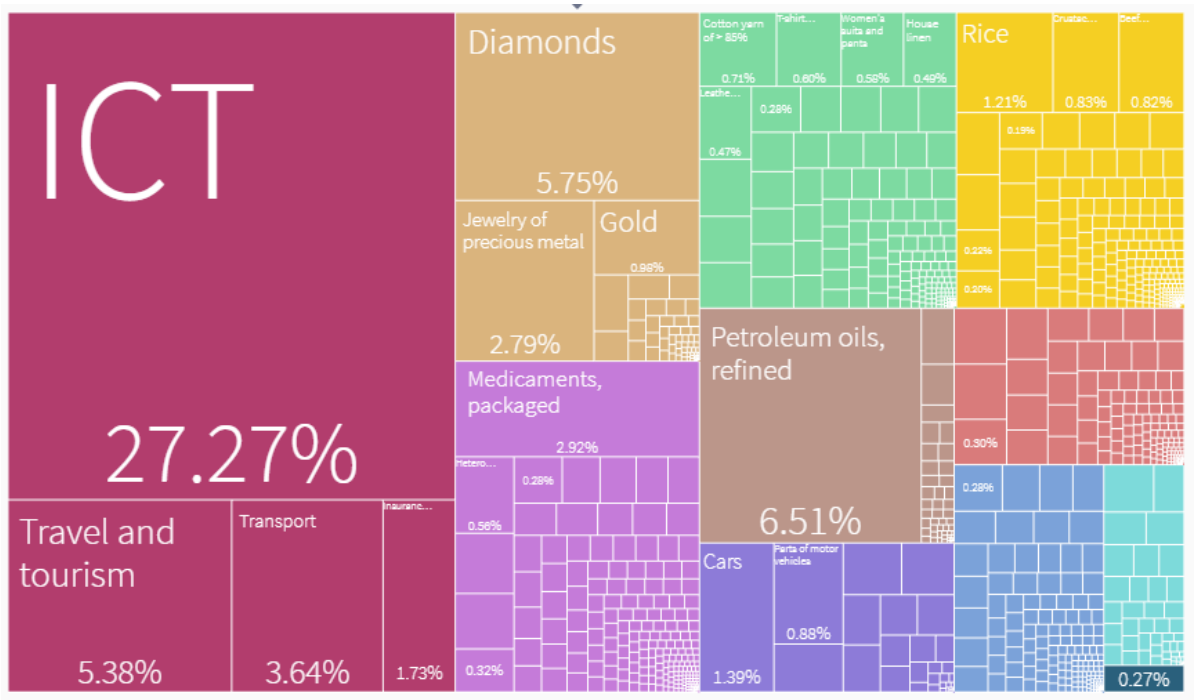

Figure 3 - India's exports in 2016 in The Atlas of economic complexity[17]

The major export categories:

- 27.27% of ICT services
- 10.65 % Stone / glass, mainly diamonds (5.75 %), second jewellery of precious metal (2.79 %);
- 10.11 % Chemicals & allied industries, with majorly medicaments, packaged (2.9 %).
- 9.51 % Textiles;

The atlas shows that ICT services account for a major element of India's exports. Also, India's **oil industry** has a major impact on trade. India imports petroleum oils, crude and export it refined, which implies a high competence in processing the products. The same applies to **stone / glass** where there is a high import of production materials, like gold and diamonds and high exports of diamonds and jewellery. Also, **textiles** are an important export product, but here the major part of the value chain remains in India. These categories offer an interesting potential for European buyers. On the import side, there is a potential for sellers in **mineral products and stone** / **glass**, **machinery / electrical** and **chemical & allied industries** that are brought into India. The category is very fragmented and different subcategories present a wide range of opportunities for these kinds of products.[18]

[17] Ibid.

[18] Ibid.

The **most important sectors by export from the EU** to India are "machinery and appliances" (30.1 %), "pearls, precious metals and articles thereof" (20.5 %), "products of the chemical or allied industries" (10.0 %), "base metals and articles thereof" (8.9 %), and "transport equipment" (7.7 %).[19]

The cumulative Foreign Direct Investment (FDI) Equity Inflows into India were US$ 409.15 billion (April 2000 to December 2018). The share of top investing countries FDI equity inflows were Mauritius (32%), Singapore (19%), Japan (7%), UK (6%), USA (6%), as of December 2018. The major sectors attracting the highest FDI equity inflows were the services sector (17.%), computer software and hardware (9%), telecommunications (8%), construction development (6%), Trading (5%), automobile (5%), drugs and pharmaceuticals (4%) and chemicals (4%), as of December 2018.[20]

India's economy and innovation

The Indian economy is going through a change, from a closed economy with public-owned companies at the end of the last century, to a more open and liberal market economy in the beginning of the 21th century. Still today, there are many public-owned companies. Private companies have to challenge governmental regulations; especially big companies which are called the "organised" sector, and they have many strict regulations.

Two thirds of all enterprises belong to the so called "informal sector" and are not counted in governmental control and regulation.

The *Economy Rankings of the World Bank* is an indicator that helps ranking countries according the ease of doing business. A high "ease of doing business"-ranking means the regulatory environment is more conducive to the starting and operation of a local firm. India is ranked 77 (out of 189) and is moving up the list (130/189 in 2015). Compared to the first (Denmark place 3) and the last European country (Greece place 72) on the list, India is not far behind[21]. Another interesting indicator is the Global Competitiveness Report providing insights into the country's drivers of productivity and prosperity. The report ranks India in the 58th place out of 140.[22]

[19] European Commision, Directorate-General for Trade, 2016. https://eeas.europa.eu/sites/eeas/files/eu_india_trade_and_investment_2016.pdf , consulted on 02/04/2019

[20] IBEF, 2018. http://www.ibef.org/economy/indiasnapshot/about-india-at-a-glance , consulted on 02/04/2019

[21] World Bank Group, 2019. http://www.doingbusiness.org/rankings , consulted on 02/04/2019

[22] World Economic Forum, 2018. http://reports.weforum.org/global-competitiveness-report-2018/competitiveness-rankings/, consulted on 02/04/2019

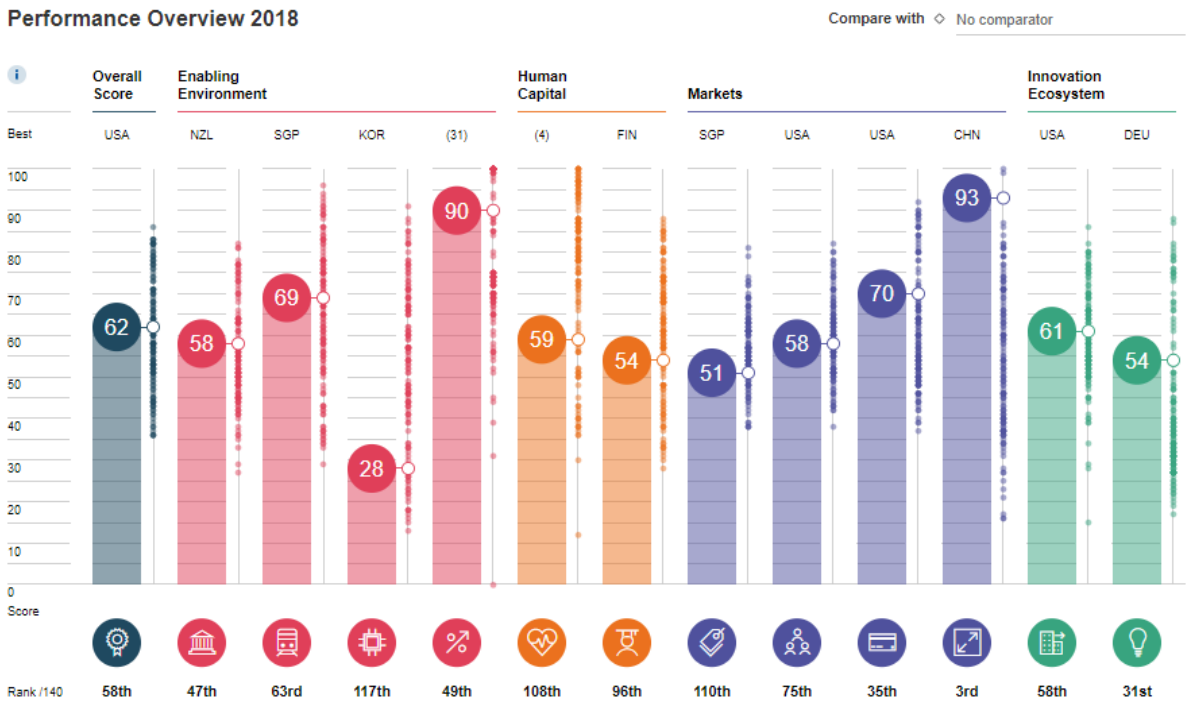

Figure 4 - Global Competitiveness Report: India[23]

India's main asset is its huge market (rank 3).[24] Nevertheless, the ranking shows problems in many areas, especially in the category "ICT adoption" where India underperforms and is situated on rank 117. This is also the case for the areas "Product market", and "Health". If European companies want to enter the Indian market, they have to be aware of these kinds of issues, whereas once companies have successfully entered the market, the market size is a valuable compensation.

Regarding innovation, the Global Innovation Index ranks India 57 (on 126), an improvement since 2017, when India was ranked 60. India's gross expenditure on R&D represent 0.6% of the GDP. India's strengths can be found in the percentage of graduates in science and engineering, where India ranks 6th, as well as in the ICT services exports where India ranks first. On the other hand, weaknesses are found on the ease of starting a business where India ranks 114th, the use of ICT (rank 110th) and the environmental performance (rank 123th).

Current political initiatives to support the economy

To keep the growth rate and reduce poverty and underdevelopment, India is supporting its workforce intensive industries, like leather or electronics, and invests in its people and infrastructure.[25] The

[23] World Economic Forum, 2018, http://reports.weforum.org/global-competitiveness-report-2018/country-economy-profiles/#economy=IND, consulted on 02/04/2019

[24] Ibid.

[25] German Ministry for Foreign Affairs, 2016. http://www.auswaertiges-amt.de/DE/Aussenpolitik/Laender/Laenderinfos/Indien/Wirtschaft_node.html , consulted on 08/04/2019

Indian government has established national programmes such as "Make in India", "Skill India", or "Start Up India" to support manufacturing, education and companies in India.

Launched in 2014, the programme "**Make in India**" supports 25 manufacturing sectors of the economy: for instance, Automotive, automobile components, aviation, biotechnology, chemicals, defence manufacturing and so on. It aims to make bureaucratic affairs easier, allow more FDIs, support the protection of intellectual property and strengthen national manufacturing industry.[26] As the programme supports FDIs, it should also increase the investments and production capacities in India. The programme's overall objective is to create new jobs. This is an important step in order to make India a free market economy and increase market competition within the country. At the same time, it also means that Indian companies and especially SME have to be better prepared for foreign competitors.[27]

"**Skill India**" is an initiative launched in 2015, to train 400 million people in India in different skills by 2022. Under the initiative several programmes with international and national partners were started. The "Skill India Portal" was conceptualised to provide a collaboration platform to help all stakeholders to freely connect with each other, and disseminate reliable information by providing an interface to enquire, explore, and access as well as engage with various affiliated and accredited training partners and infrastructure providers. The overall focus of this initiative is to help to provide an engaging ecosystem to cater to skills and qualification needs of citizens by publishing and sharing relevant information. The outcome of this collaboration should ideally lead to inclusive growth especially for those at the bottom of the pyramid (approximately 800 million citizens).[28]

"**Start-up India**" is an initiative of the Government of India, intended to build a strong eco-system to nurture innovation and start-ups in the country to drive sustainable economic growth and generate large scale employment opportunities. With this initiative the government aims to empower start-ups to grow through innovation and design. The action plan addresses all aspects of the start-up ecosystem: from digital / technology sector to a wide array of sectors including agriculture, manufacturing, social sector, healthcare, education, etc.; and from existing tier one cities to tier two cities and tier three cities including semi-urban and rural areas. The action plan is divided across the following areas: simplification and handholding, funding support and incentive and industry-academia partnership and incubation. Since 2014, 17 589 start-up received recognition and 182 were funded.[29]

[26] Make in India, 2016. http://www.makeinindia.com/policy/national-manufacturing , consulted on 08/04/2019

[27] Ibid.

[28] Skill India Portal, 2015. http://skillindia.gov.in/about-us , consulted on 08/04/2019

[29] Government of India, 2016. http://startupindia.gov.in , consulted on 08/04/2019

2.2. Opportunities for Europe

With regards to cluster cooperation, two types of cooperation between India and the EU can be identified: scientific cooperation, which has been taking place for a number of years, and a more recent bilateral agreement, signed under "Make in India" which is intended to boost companies' entry in the Indian market.

Scientific Cooperation between India and the EU

India is a contrasted country for research and innovation characterised, on the one hand by world class-research institutes, and on the other hand, rather few researchers (200,000 FTE for the whole country, in 2016) and low levels of patent applications, (17 patent applications for 1 million inhabitants, in 2016). R&D intensity in India is 0.85% of the GDP: 55% of the expenditures comes from the private sector and focuses on the fields of automotive, machinery and IT industry. The other 45% are spent by the public sector on defence, space and the nuclear sectors.[30]

The **joint Declaration on research and innovation cooperation** signed in February 2012 calls for building an Indo-European research and innovation partnership with larger scale, scope and impact, focused on common societal challenges, and enhancing synergies between India, the EU and its member States.[31]

An **Agreement for scientific and technological cooperation** from 2002 exists between the European Union and the Government of India to encourage and facilitate cooperative research and development activities in science and technology fields of common interests.[32] A review from 2012 shows, that in 2011 the EU-India cooperative activity included 166 research projects. The largest number of projects was in health (34), in information and communication technologies (19), in environment (including climate change) (19), and in food, agriculture and fisheries (14). Twenty-two projects were carried out as part of the Marie Curie International Research Staff Exchange Scheme. The review also points out the weaknesses of the agreement. The agreement has been renewed in 2016. The EU-India Joint Steering Committee has decided to extend cooperation, notably in the field of renewable and smart-grid capacity.

There is also an **Agreement for cooperation in the field of fusion energy research** (2009) in place and currently an agreement for R&D cooperation in the peaceful use of nuclear energy is under negotiation. In 2016, it has been decided to pursue cooperation notably by allowing a partnership with India to collaborate in the JET programme.

[30] Roadmap for EU – India S&T cooperation, http://ec.europa.eu/research/iscp/pdf/policy/in_roadmap_2017.pdf#view=fit&pagemode=none , consulted on 08/04/2019

[31] The Delegation of the European Union to India Research & Innovation Section, 2016. http://eeas.europa.eu/delegations/india/documents/snt_update_26_oct_12/overview_of_research_and_innovation_coop_july_2012.pdf

[32] European Commission, 2002. http://ec.europa.eu/research/iscp/pdf/policy/india_agreement.pdf#view=fit&pagemode=none

In 2018, EU and India released a joint call of € 30 million on research and innovation to develop next generation influenza vaccines. In 2019, EU and India funded jointly seven projects on water quality for a budget of € 40 million.

Bilateral Agreements under "Make in India"

As discussed in section 2.1.3, "Make in India" was launched by the Prime Minister in 2014, to encourage foreign companies to manufacture their products in India. Part of the "Make in India" programme are bilateral agreements that aim to establish international partnerships between companies and to facilitate foreign direct investments in India.

An example is the Indo-German initiative "Make in India Mittelstand" (MIIM). Following Prime Minister Narendra Modi's visit to Germany in 2015, many German companies had shown interest in participating in the "Make in India" programme. With the support of the Indian Embassy in Berlin and the relevant ministries of Government of India, a strategic investment support programme, "Make in India Mittelstand"(MIIM), was announced in September 2015 to help German small and medium enterprises (SMEs)—commonly referred to as "Mittelstand companies"—enter the Indian market. The focus of MIIM is on:

1. Industrial: machine tools, textiles, electric/electronics, glass manufacturers;
2. Environment: water, solid and waste water management solutions providers, fuel cells, renewable energy;
3. Infrastructure: building material, construction technology;
4. Mobility: automotive components;
5. Consumer goods: white goods (large electrical goods, typically white in colour);
6. Others: aerospace, security and surveillance, pharma, and packaging.

Under the MIIM programme, companies are also supported through regular workshops on topics like "Economics of localisation and sourcing in India", "Logistics and supply chain challenges", "Location assessment and investment zone options". These workshops prepare the companies well in advance before their market entry into India. Apart from workshops, MIIM offers webinars and round tables to generate further comfort and ease for the German Mittelstand companies intending to localise in India. As of early 2017, the programme has supported 72 German SMEs with an investment of about € 650 million, providing about 4,000 jobs in India.[33]

[33] For further details on this programme see http://www.makeinindiamittelstand.de/

2.3. Sectoral view

India has a strong **agriculture sector** employing half of the population and contributing to 15.5% of the GDP. The industry sector accounts for 26.3%. The **service sector** is the biggest sector by GDP representing 58,2%.[34] The sectors that are the most important for exports in India were described in section 2.1.

This section presents three other sectors in the Indian economy, that are traditional or emerging sectors in India, and present an interest and potential for EU-India cooperation in terms of R&D and innovation, market access, and investments. They are: automotive and automotive components, biotechnology and renewable energy. All three sectors are promoted by the "Make In India" initiative (see sections 2.1.3 and 2.2.2) and energy is one of the four target sectors and activities of the Indian Foundation for MSME Clusters[35] (FMC – see section 4)

Automotive and automotive components

With an average annual production of 25 million vehicles in four[36] large auto manufacturing clusters, India's **automotive industry** contributed 7.1%[37] of the country's GDP, in 2016-17. It is the third largest producer in the world; the fifth largest commercial vehicle manufacturer; the first two-wheel manufacturer; and motorcycle manufacturer.[38] India's **automotive market** is the third largest in the world in 2016/17 and will account for more than 5% of global vehicle sales: 80% are two-wheelers; 14% are passenger vehicles. All areas are expected to grow and opportunities are seen in rural markets. For example, tractor sales are expected to grow by 8-9 % p.a. during the next five years.[39] Major drivers for this development mentioned by the government of India are: growing population with increased GDP per capita, an expanding middle-class, a large pool of skilled and semi-skilled workers, and governmental support programmes[40]. Indian government sees investment opportunities for all types of vehicles, including electric vehicles: *"Huge demands for low-cost electric vehicles that are suited for safe short-distance urban commutes (averaging 50-100 km/trip) that are rugged enough to perform reliably through India's summers and monsoon. It is estimated that total electric vehicles sales would amount to 6-7 million units by 2020."*[41]

Indian government expects to sell six million-plus hybrid and electric vehicles annually, by 2020. Therefore, they set a special focus on electro mobility and R&D-activities. To support its efforts, India offers R&D-incentives as well as additional area-based and state incentives. Examples of existing

[34] World bank data, https://databank.worldbank.org/data/reports.aspx?source=2&country=IND#, consulted on 08/04/2019

[35] Foundation for MSME Clusters website and brochure: http://fmc.org.in/productdemo?q=46 , consulted on 08/04/2019

[36] Delhi-Gurgaon-Faridabad in the north, Mumbai-Pune-Nashik-Aurangabad in the west, Chennai- Bengaluru-Hosur in the south and Jamshedpur-Kolkata in the east

[37] and additional 2.3 % from the automobile component industry

[38] Make in India, Government of India, 2014. http://www.makeinindia.com/sector/automobiles , consulted on 08/04/2019

[39] Ibid.

[40] Make in India, Government of India, 2014. http://www.makeinindia.com/sector/automobile-components , consulted on 08/04/2019

[41] Make in India, Government of India, 2014. http://www.makeinindia.com/sector/automobiles, consulted on 08/04/2019

European investors are Piaggio, Volkswagen, and Renault from the automobile industry[42] or from automobile components industry, like ZF, Bosch, or Delphi.[43]

A cluster example is the Automotive Cluster Pune (http://www.autoclusterpune.org/).

Biotechnology

India's biotechnology sector accounts for 2% of the global biotech sector. [44] The country is among the top 12 biotech industry markets in the world and the third most important in the Asia Pacific region. India is the largest Hepatitis B vaccine producer and has the second highest number of U.S. Food and Drug Administration (USFDA)-approved plants, after the USA. The biotechnology industry in India has grown from US$ 1.1 billion in 2005 to US$ 7 billion in 2017. It has also emerged as a leading destination for **clinical trials**, contract research and manufacturing activities. The biotechnology sector is separated in biopharma (62%), bioservices (18%), bioagri (15%), bioindustry (4%), and bioinformatics (1%). [45]

India also holds a large consumer base with 17 % of the global population. In 2005 India adopted the product patent regime, which aimed at extending patent protection to products, in addition to processes, in the field of life science and health the country has facilitated 100 intellectual property agreements.[46]

To promote increased R&D-investments and intellectual property-development, India offers incentives for investors and funded innovation and start-up programmes. BIRAC, a public sector unit of Government of India, has supported 104 start-ups, 346 companies, and 509 projects including 115 collaborative projects. India has five university innovation clusters, one regional innovation centre, three industrial facilities, and two contract service facilities. European investors include Limagrain, Sanofi Aventis and Bosch.[47]

A cluster example is the Bangalore Life Sciences Cluster composed of research actors (http://www.ccamp.res.in). The Bengaluru Tech Summit is a regular business fair dedicated to biotechnologies in India (http://www.bengalurutechsummit.com).

Textile

Textile is a major industry in India, accounting for 9.5% of the exports of the country.[48] The textile industry is labour intensive and is the first employer in India. The sector is divided in two broad categories: the informal sector gathers the making of handloom, handicraft and sericulture products,

[42] Ibid.

[43] Make in India, Government of India, 2014. http://www.makeinindia.com/sector/automobile-components consulted on 08/04/2019

[44] Indian Brand Equity Foundation (IBEF), 2016. http://www.ibef.org/industry/biotechnology-india.aspx , consulted on 08/04/2019

[45] Make in India, Government of India, 2014. http://www.makeinindia.com/sector/biotechnology, consulted on 08/04/2019

[46] Make in India, Government of India, 2014. http://www.makeinindia.com/sector/biotechnologyIbid.

[47] Ibid.

[48] "The Atlas of Economic Complexity," Center for International Development at Harvard University, http://www.atlas.cid.harvard.edu, consulted on 08/04/2019

whereas, the "organised" sector consists of spinning, apparel and clothing segments, realised with modern techniques and machinery.[49]

The close relations between the agricultural sector (India is amongst the world's most important producers) and the textile industry, as well as its traditional importance makes it a strong industry within the informal sector. The textile industry employs 45 million people directly, of which many are women in villages, producing "khadi" a handwoven fabric made of cotton, silk or wool intended to both national and international markets.[50]

The textile industry in India represented US$ 120 billion in 2016 and is expected to reach US$ 230 billion in 2020, accounting for 2% of Indian GDP. The Indian sector has attracted an increasing FDI over the past years: between 2000 and 2018, US$ 2.9755 billion were invested in the sector. [51]

In terms of public policy, the government of India aims at fostering the development of the textile sector in five ways:

- The Government wants to provide 50 million village women with "Charkha" (traditional spinning wheel) to foster the production of "Khadi", in addition to opening 60 Khadi outlets;
- The Government will organise a pan-India camp for 421 handloom and handicraft clusters to reinforce the weavers' capacity on the provision of credit facilities and technological upgrade, distribute modern toolkits, promote courses, grant them access to services and organise buyer-seller meetings.[52]
- The Government has initiated a social reform in the power loom sector to grant its workers with social welfare, including insurance cover, cluster development, improvement of equipement, tax benefits and marketing support;
- The Government has, in addition, signed a MoU with 20 e-commerce companies to encourage direct sales for the handloom and handicraft sector;
- The government has passed a labour-friendly reform, in order to increase employment in the apparel and make-up sector and aims to create another 11.1 million jobs.[53]

The textile sector is characterised by many clusters gathering informal handloom and handicraft factories, which function more like cooperatives of means and products than clusters as defined in Europe (cf. section 3.1). The OGCT "Gateway to Apparel Manufacturer in India" cluster is more similar to the type of clusters that can be found in Europe and has received an ESCA label (http://www.ogtc.in/about-us/mission.html).

[49] India Brand Equity Foundation (IBEF), Textile Industry & Market growth in India, 2017 https://www.ibef.org/industry/textiles.aspx

[50] Ibid.

[51] Ibid.

[52] Press Information Bureau, Government of India, Ministry of Textile, Government to hold Pan India Handloom and Handicraft Camps, http://pib.nic.in/newsite/PrintRelease.aspx?relid=170288

[53] India Brand Equity Foundation (IBEF), Textile Industry & Market growth in India, 2017 https://www.ibef.org/industry/textiles.aspx

Renewable Energy

India is the fifth largest producer and consumer of energy in the world and the demand for energy is growing. Indian urban population represents more than 30% of its total population and increased by 32% between 2001 and 2011. It is expected, that by 2050, 50% of India's population will live in urban areas. This has already resulted in increased transport and energy needs.[54]

The India renewable energy sector is developing at a fast pace, with a Compound Annual Growth Rate (CAGR) of 19,8% between 2014 and 2018. The Indian government aims to take the total renewable capacity to almost 175 GW[55] by March 2022, including 100 GW of solar power, 60 GW of wind power, 10 GW from biomass and 5 GW from small hydro power[56] Therefore, government and states support renewable investments: investment in clean energy reached US$ 11 billion in 2017 Examples of European investors are Enercon, Vestas, or Micon.[57]

A very new cluster and the first cluster in this industry is the India Clean Energy Cluster.[58]

[54] European Cluster Collaboration Platform (2013) An Overview of Strategic Markets to Develop Cooperation Brazil, Mexico, India, Japan, South Korea, Morocco and Tunisia

[55] IBEF, Renewable Energy presentation, https://www.ibef.org/industry/renewable-energy-presentation, consulted on 08/04/2019

[56] Make in India, Government of India, 2014. http://www.makeinindia.com/sector/thermal-power

[57] Ibid.

[58] Business.un.org, 2015. https://business.un.org/en/commitments/3944

3. Cluster community in India

3.1. Characteristics of clusters in India

The Abid Hussain Committee Report (1997) first drew attention of Indian policy makers to issues concerning industrial clusters. Soon after an "Integrated Technology Up-gradation and Management Programme" (UPTECH) was launched in 1998. It was replaced by a more comprehensive "Small Industry Cluster Development Programme" in 2006. The scheme was further renamed as **"Micro and Small Enterprise Cluster Development Programme**" following the promotional package for Micro and Small Enterprises (MSEs) in 2007. The scheme, based on the concept of cluster development principles aims at enhancing the productivity and competitiveness of small enterprises situated in clusters.[59]

The **Cluster Observatory** is a non-government, not-for-profit registered trust, conceived at the suggestion of the now defunct Ministry of Small Scale Industry (SSI) . It is run by the Foundation for MSME Clusters (FMC) and was established in 2005.[60] The Cluster Observatory lists more than 5,000 clusters on their website. Clusters here are understood as concentrations of SMEs running similar activities on a given-territory. A filter function enables users to search for specific industry, products, states or districts. Some clusters also offer special cluster profiles, which gives an overview about name, location, sector, number of firms (and types) and workers, turnover, major products, associations in the cluster, relevant institutions, major markets, major problems / prospects, and the date of the last update.[61]

The categories provided by the Cluster Observatory are:[62]

- Industrial cluster (1,196);
- Handicraft clusters / handloom (3,672)
- Micro enterprises clusters (154);
- Service (47).

The Observatory however is still in "work in progress", according to the founders themselves, who point out the difficulties they have in collecting the data. Unfortunately, the available data is of relative low quality, the provided information may not always be correct and many cluster profiles detailed are missing. Also, there is no proper search function and sometimes the existing information is not up-to-date or important details are missing.[63] More details can be seen in Annexe, figure 1 showing an example of a cluster profile.

[59] Deputy Director, Office of Development Commissioner (MSME), "Feasible Cluster Development Model– a Perspective for Development of Micro and Small Enterprises", 2011. http://www.pib.nic.in/newsite/feacontent.aspx?relid=72044, consulted on 08/04/2019

[60] Cluster Observatory, 2016. http://www.clusterobservatory.in/about.php, consulted on 08/04/2019

[61] Cluster Observatory, 2016. http://www.clusterobservatory.in/view_cluster.php?cluster_id=36576 consulted on 08/04/2019

[62] Ibid.

[63] Cluster Observatory, 2016. http://www.clusterobservatory.in/clustermap.php consulted on 08/04/2019

Only a few clusters in India do have a formal structure following the European model of a cluster initiative and/or cluster organisation. There has been one Indian cluster organisation who received an ESCA Bronze label (the OGTC, see below) which demonstrated the excellence of its management. Other clusters have a good online promotion and have a formal structure: such as the Cybersecurity Cluster Pune which details on its website its governance and team, as well as its members (https://cyberclusterpune.org/), or the Engineering Cluster Pune (http://enggclusterpune.com/about-us.html). In addition, a total of 29 Indian cluster profiles were available on the previous ECCP – which was rather high in comparison to other third countries.

There are numerous so-called Business Membership Organisations (BMO) that claim to manage a cluster. However, almost all of them are rather industry associations that cater to the needs of SMEs of which are the vast majority micro enterprises. Research institutions or universities are not involved in these initiatives. German Development Cooperation (GIZ) has been working for the last few years on the further development of BMOs towards cluster organisations following the "European model".[64] See Chapter 4.2.2 Accreditation Standard for Business Membership Organisations for further details.

[64] Oral input from Thomas Lämmer-Gamp, European Secretariat for Cluster Analysis (ESCA), who has advised GIZ in India.

3.2. Mapping of clusters

The Cluster Observatory has created an interactive map to locate the Indian clusters they refer to on their website. As explained before, the nature of the Indian clusters, characterised with a wide amount of small/ family owned companies collaborating together, is fundamentally different from the European conception of clusters. The map allows to differentiate the different types of clusters by sorting them in three different types: "industrial, handloom and handicraft". Nevertheless, the lack of qualitative descriptions for each of the clusters makes it difficult to assess whether collaboration with European clusters would be possible or pertinent.

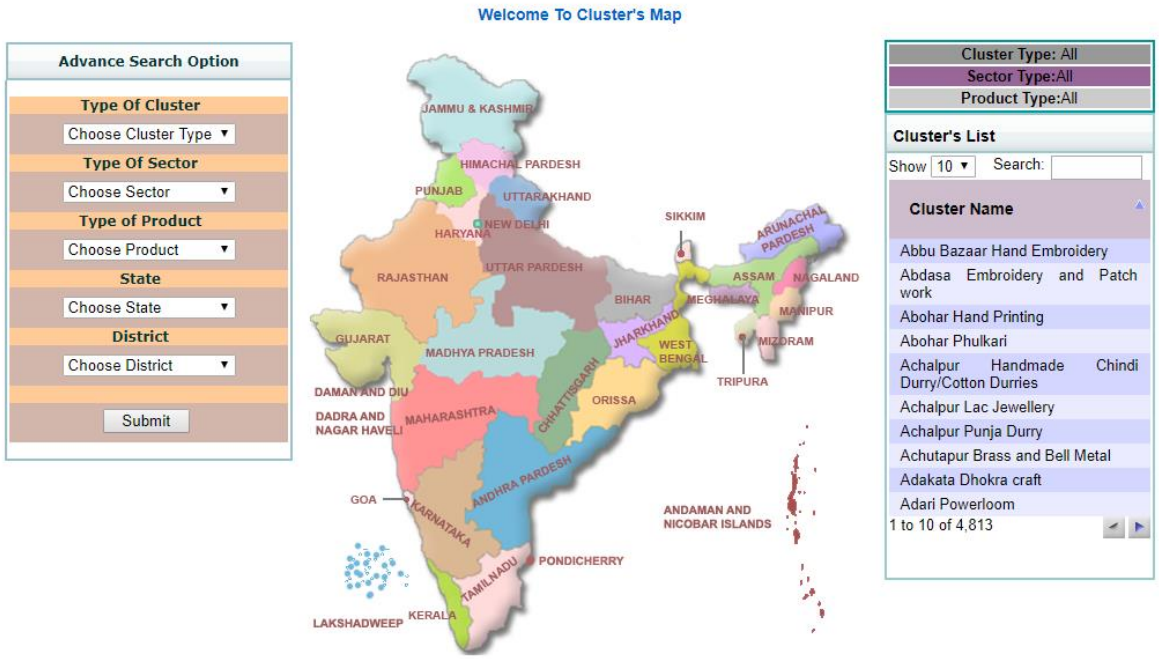

Figure 5 Interactive map of clusters in India[65]

[65] Cluster Observatory, 2017 http://www.clusterobservatory.in/clustermap/m1.php

3.3. Clusters in the four sectors

The preparatory briefing has identified one or two clusters per strategic sectors as illustrations with which European clusters could collaborate. Overall, and given the nature of the information there are few clusters with the potential to partner with, in comparison to the actual number of clusters that are indicated on the Indian Cluster Observatory. This situation is principally explained by the structural differences observed between Indian and European clusters. The clusters mentioned below are clusters whose structure, goals and functioning is similar to European clusters, hence who could become potential partners.

Automotive and automotive components

The **Pune Auto Cluster** was created in 2004 and calls itself the first Indian auto cluster, in the region. The creation of the cluster was supported heavily by the authorities under the Industrial Infrastructure Upgradation Scheme by the Department of Industrial policy and Promotion of the Ministry of Commerce and Industry. The cluster is governed by five public and private stakeholders: PCMC, MCIA and ARAI for the private entities and the Ministry of the Commerce of Industry and the Government of Maharashtra for the public bodies.[66]

The goal of the cluster is to promote collaborative research between the automotive industry of the Pimpri-Chinchwad industrial areas, and to provide their collaborative initiatives with adequate research facilities. The cluster has 10 facilities: a business centre, an exhibition centre, a design centre, a rapid prototyping centre, a laser cutting centre, a prototype production facility centre, a rubber testing lab, a polymer testing lab, an environmental lab and an endurance testing lab.[67]

It is hard to assess the activities and the relevancy of the cluster, as, apart from its website, little information is available online and the latest website update seems to date back to 2006.

Biotechnology

As far as biotechnologies are concerned, the territory of the Government of Karnataka stands out in India and has implemented three initiatives which aim at gathering the companies of the biotech industries, to foster research and development. Karnataka has a large pool of R&D institutions, is home to 50% of Indian biotechnologies companies, contributes to a third of India's biotech exports and is hence recognised as the India Biotech capital.[68]

The **Bangalore Life Science Cluster** is a technological platform gathering three research centres: the National Centre for Biological Science, the Institute for Stem Cell Biology and Regenerative Medicine, the Centre for Cellular and Molecular Platforms. The cluster was created by the Department of Biotechnology of the Ministry of Science and Technology. If the purpose of the cluster is "to have an integrated multi-disciplinary and interactive bioscience and technology research enterprise" is

[66] Auto Cluster Pune, http://www.autoclusterpune.org

[67] Auto Cluster Pune, http://www.autoclusterpune.org/facilities.html

[68] Bengaluru Biotech Summit, http://www.bengalurutechsummit.com/index.php/about-event/

straightforward, there is no easily available information regarding how it works and what are the private companies benefitting from the research infrastructures.[69]

The **Bangalore Bioinnovation Centre** is also a public-led incubator, created by the Karnataka Biotechnology and Information Technology Services (KBITS), Government of Karnataka with national funds from the Department of Biotechnology. If the centre is not a cluster as such, it is part of the Bangalore biotech ecosystem. The Bangalore Innovation Centre provides start-ups with access to state-of-the-art facilities.[70]

In addition, the Government of Karnataka organises each year a fair, the **Bengaluru Tech Summit**, dedicated to biotechnologies. The event aims at presenting the local companies, the latest innovations and facilitates match-making between Indian and international companies.[71]

Textile

One cluster stands out in the textile industry in India, as it differs widely from the large variety of handloom and handicraft clusters that can be found in the textile sector: the OGTC cluster - Gateway to apparel manufacturers in India.

The establishment of the OGTC cluster was facilitated by the MSME. It is the first of its kind in India. It was developed based on the understanding, that joining together improves the strength of all participants and will support their businesses. Some key facts about the cluster show its success:[72]

- 110 manufacturing units;
- 41,000 stitching machines;
- 70,000 employees;
- US$ 500 million total exports;
- Capacity for 110 million pcs / annum.

The aims of the cluster are to have a collective approach for being more competitive in the world market and secure the government's attention in more authoritative manner:[73]

- To develop linkages between the local industrial units, technological and research institutes, as well as to bodies like Apparel Export Promotion Council, Federation of India Chamber of Commerce & Industry, and Textile Association;
- To support members with developing training, common sourcing of critical inputs whenever required, and capacity building to achieve economies of scale for the SME's;
- Work as a think tank for the apparel export industries.

[69] Bangalore Life Sciences Cluster (BLiSC), http://www.ccamp.res.in/blisc

[70] Bangalore Bioinnovation Centre, www.bioinnovationcentre.com/

[71] Bengaluru Tech Summit, http://www.bengalurutechsummit.com/index.php/about-event/

[72] OGTC, 2016. http://www.ogtc.in/about-us/mission.html

[73] Ibid.

Results of the cluster activities are:[74]

- Work on Clean Development Mechanism (CDM);
- Start of Lean Manufacturing Practices – Productivity gains from 23 % to 91 %;
- Sharing of Resources – Varied Savings;
- Quality – Defect Rate Reduction by 50 %;
- Cutting Room – Fabric Saving 2 %;
- Productivity Increase – 15 % to 60 %;
- LED lights on Sewing machines.

Renewable energies

The India Clean Energy Cluster was created in 2015 in the State of Kerala. It aims at establishing across Kerala a green network of clean energy clusters in the region who engage in Clean Development Mechanisms (CDM) and are only powered by clean energies. More specifically, it aims at connecting research institutes and local companies to develop tailored CDMs in the energy sector and beyond.[75]

Unlike the other sector's cluster that are strong public-driven initiatives, the cluster is the result of a collaboration between private companies and research institution. The cluster is a non-profit organisation, which gathers private and public partners. The cluster is already linked to international organisations. Parts of its activities involve the support to start-ups and entrepreneurship in the clean energy sector and the promotion of education, research and exchange programmes. The cluster helps enterprises in their product and processes innovation processes as well as helping them grow thanks to networking and marketing support.[76]

[74] Ibid.

[75] India Clean Energy, https://business.un.org/en/commitments/3944, consulted on 08/04/2019

[76] India Clean Energy (ICE) cluster, file:///C:/Users/cg/Downloads/14719796-212247049-14719796_india_clean_energy_cluster_-_india.pdf consulted on 08/04/2019

4. Cluster policies and programmes in India

4.1. General overview

In addition, to the Cluster Observatory there are a number of different operational national institutions, supporting the development of clusters in India. The main institutions involved with cluster development initiatives in India include the following:[77]

- The Development Commissioner of the Ministry of Micro, Small & Medium Enterprises (MSME);
- MSME Foundation (an EDI – Entrepreneurship Development Institute- initiative with support of UNIDO) whose role is to support institutions in undertaking cluster based local economic development;
- The National Innovation Council (NInC) of India;
- Small Industries Development Bank of India (SIDBI);
- Entrepreneurship Development Institute of India;
- Textiles Committee;
- Technology Information, Forecasting and Assessment Council (TIFAC);
- Khadi and Village Industries Commission (KVIC);
- National Institute for Small Industry Extension Training (NISIET).

Cluster Development is seen as a strategic tool in support of the development of India's economy. Nevertheless, there is currently no recognisable, holistic approach for cluster policy in India.

Probably, the most holistic approach can be found within policy domain of the Indian Government Development Commissioner **Ministry of Micro, Small & Medium Enterprises** (MSME). The MSME has[78]

> *… adopted the cluster development approach as a key strategy for enhancing the productivity and competitiveness as well as capacity building of Micro and Small Enterprises (MSEs) and their collectives in the country. Clustering of units also enables providers of various services to them, including banks and credit agencies, to provide their services more economically, thus reducing costs and improving the availability of services for these enterprises.*[79]

[77] Smallb.in, 2016. http://smallb.sidbi.in/%20/manage-your-business%20/production%20/improve-productivity%20/bds-cluster-initiatives consulted on 08/04/2019

[78] Government of India, 2016. http://dcmsme.gov.in/MSE-CDProg.htm consulted on 08/04/2019

[79] Ibid.

The objectives of the programme are:[80]

1. *To support the sustainability and growth of MSEs by addressing common issues such as improvement of technology, skills and quality, market access, access to capital, etc.;*
2. *To build capacity of MSEs for common supportive action through formation of self-help groups, consortia, upgradation of associations, etc.*
3. *To create / upgrade infrastructural facilities in the new / existing industrial areas / clusters of MSEs;*
4. *To set up common facility centres (for testing, training centre, raw material depot, effluent treatment, complementing production processes, etc.).*

Supported interventions are (figures in brackets indicate how much of the costs can be covered by the initiative): diagnostic studies (100 %), soft intervention (up to 75-90 %), setting up Common Facility Centres (CFCs) (up to 70-90 %) and infrastructure development (Upgradation / New) (up to 60-80 %). Until today, 1018 clusters have been supported with one or more of these activities. The investment of the government in this support programme in 2015 / 2016 is around 81.36 Crore rupees (approximately 10.76€ million). The MSME maintains a webpage that presents further information.[81]

The **National Innovation Council** (NInC) of India also acts to catalyse and facilitate the creation of innovative clusters through Cluster Innovation Centres (CICs). These centres will act as a networking hub of the cluster, forge linkages between various stakeholders, and initiate and assist innovation activities acting as catalysts and facilitators. These bodies will aid the cluster and its ecosystem in connecting with each other, provide guidance to various stakeholders when needed, organise initiatives to promote growth.[82] The figures below describe this process.

[80] Ibid.

[81] UNIDO, 2016. http://www.dcmsme.gov.in/clusters/clus/clusorgmpng.htm#clusorg, consulted on 08/04/209

[82] National Innovation Council, Government of India, 2016. http://innovationcouncilarchive.nic.in/index.php?option=com_content&view=article&id=51&Itemid=33 consulted on 08/04/209

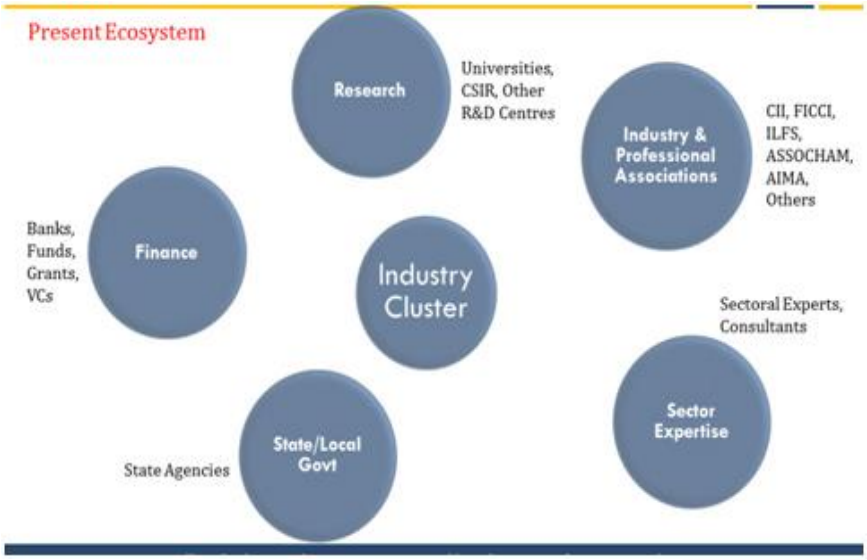

Figure 6 Current situation in India [83]

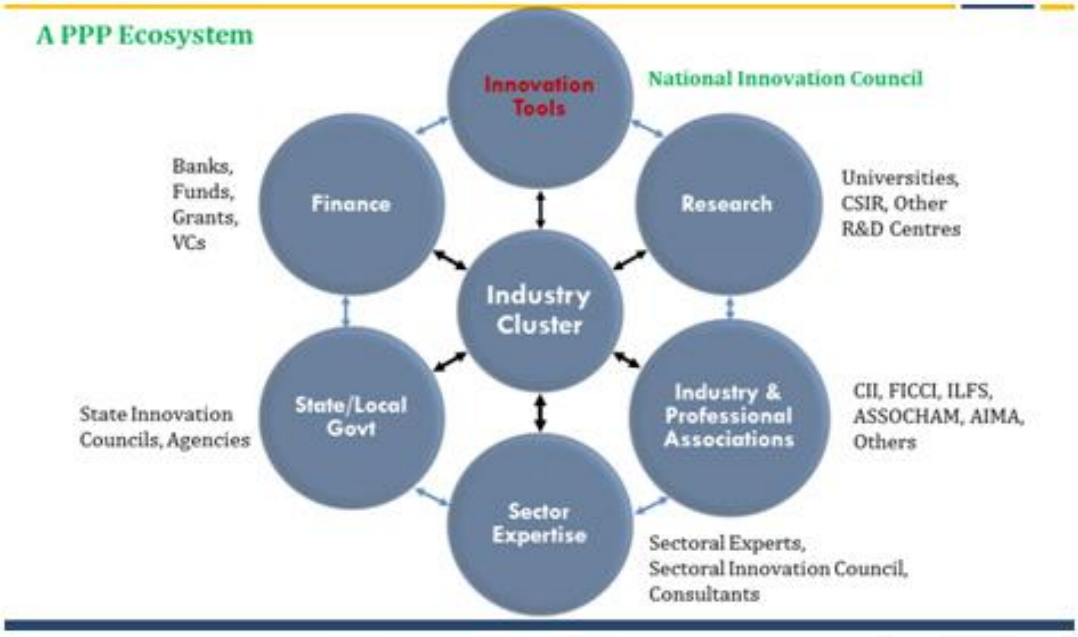

Figure 7 Planned change in the cluster structure

[83] Ibid.

4.2. Interesting cluster initiatives

MSE Cluster Development Programme

The Ministry of Micro, Small and Medium Enterprises (MoMSME) has introduced a "MSE Cluster Development Programme" to support in particular the development of micro and small enterprises (MSE) through active participation in a cluster.[84] The objectives of the programme are:

- To support the sustainability and growth of MSEs by addressing common issues such as improvement of technology, skills and quality, market access, access to capital, etc.;
- To build capacity of MSEs for common supportive action through formation of self-help groups, consortia, upgradation of associations, etc.;
- To create/upgrade infrastructural facilities in the new/existing industrial areas/ clusters of MSEs;
- To set up common facility centres (for testing, training centre, raw material depot, effluent treatment, complementing production processes, etc).

Supported activities include:

- Diagnosis study reports: to map the business processes in the cluster and propose remedial measures, with a validated action plan;
- Soft interventions: technical assistance, capacity building, exposure visits, market development, trust building, etc for the cluster units;
- Detailed project reports: to prepare a technical feasible and financially viable project report for setting up of a common facility centre for cluster of MSE units and/or infrastructure development project for new industrial estate/ area or for upgrading of infrastructure in existing industrial estates/ area/ clusters;
- Hard intervention/Common Facility Centres (CFCs): creation of tangible "assets" like testing facilities, design centres, production centres, effluent treatment plants, training centre, R&D centre, raw material bank/sales depot, product display centre, information centre, any other need based facility;
- Infrastructure development: development of land, provision of water supply, drainage, power distribution, non-conventional sources of energy for common captive use, construction of roads, common facilities such as first-aid centres, canteens, other need based infrastructural facilities in new industrial (multiproduct) areas/estates or existing industrial areas/estates/clusters.

[84] For further details see Ministry of Micro, Small and Medium Enterprises, http://msme.gov.in/sites/default/files/ModifiedGuidelinesofMSE_0.pdf consulted on 08/04/209

As of July 2017, 41 Common Facility Centres (CFCs) have been already implemented while a further 67 are still in the implementation phase. In terms of infrastructure development projects 148 have been already implemented and a further 37 are still on-going. Business Membership Organisations are encouraged by the Ministry of Micro, Small and Medium Enterprises to take advantage of this scheme to further develop themselves towards cluster organisations following the European model.[85]

Accreditation Standard for Business Membership Organisations

Based on the European Cluster Excellence Label the Quality Council of India has introduced an accreditation scheme for Business Membership Organisations.[86] This initiative forms part of the overall policy approach of the Ministry of Micro, Small and Medium Enterprises (MoMSME) to develop capacity among Business Membership Organisations to develop a cluster. By providing a quality standard it also support the initiatives "Make in India", "Start-up India", "Digital India" and "Stand-up India".

The standard is supported also by other ministries and was developed by the Quality Council of India in collaboration with the MoMSME, the Small Industries Development Bank of India (SIDBI) and German Development Cooperation (GIZ). The purpose of the scheme is to provide Business Membership Organisations with a framework to plan, establish, monitor and improve services. The accreditation scheme is based on the quality parameters of governance, operations, services and performance measurement and review (Figure 8). There are three levels of the accreditation scheme including Silver, Gold and Diamond. To date some 40 organisations have successfully participated in the scheme. The number was expected to reach 200 by the end of 2017.[87]

[85] Presentation by R. K. Rai, Director Cluster Division at Ministry of Micro, Small and Medium Enterprises, International Training Workshop for Business Membership Organization Leaders and Managers, 20th-21st July 2017, New Delhi

[86] See https://economictimes.indiatimes.com/news/economy/policy/quality-council-of-india-launches-accreditation-for-business-membership-organisations/articleshow/40858062.cms for further details. consulted on 08/04/2019

[87] Oral information by Dr. Indrajit Bhattacharya, Director NABET National Accreditation Board for Education and Training/Quality Council of India, New Delhi, July 21st, 2017

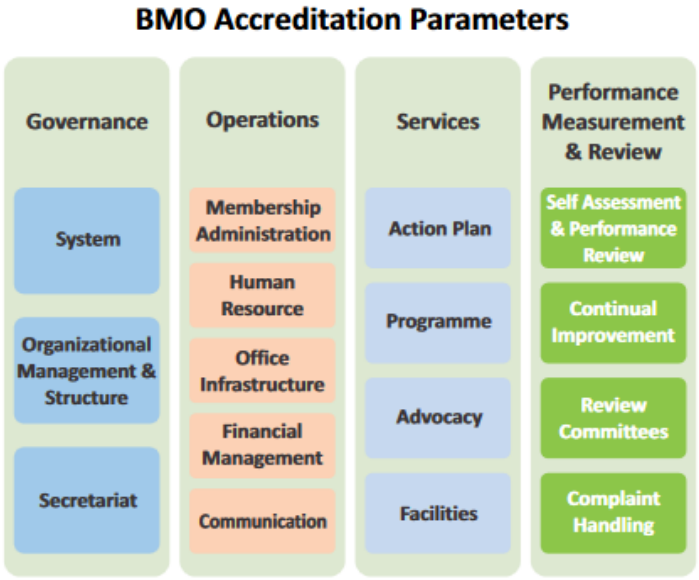

Figure 8: BMO Accreditation Parameters

5. Conclusion

India has many aspects that make cooperation and investment interesting for industry and cluster organisations and their members from the EU. Increased governmental support and social development of the people is helping the country to become a major economic player in the world and many of the main economic indicators are positive. India is well aware of the advantages and the positive impact of clusters. The Indian government supports the development of clusters across many industries and across the country. Focused investment in science and R&D will also enhance the economic performance of businesses and increase the intellectual capabilities of the people.

Four industry sectors are of particular interest for developing cooperation actions as they represent major growth sectors in India, are driven by innovative and supported by strong public policies. They include: Automotive and automotive components, biotechnologies, textile and renewable energy.

Despite strong the strong interest in developing cooperation actions, cluster to cluster cooperation is hindered by the lack of structuration in most of India clusters, which come in various shapes and structures.

To date India is not amongst the most cited or targeted countries by the European Strategic Cluster Partnerships – Going International. It was targeted by 5 of them (out of 24) for the first ESCP-4i generation - the European Circular Construction Alliance (ECCA), SmartCityTech, DElivering Cluster International Strategies Into Overseas Networks (DEICISON), PERES-Promoting European Rail Excellence outSide EU, and Wiitech 2020. Currently, another three second generation ESCP4i target India: European Digital Industry Alliance (DIA), Foodnet, FoodPackLab - which overall shows an interest from European industries from various sectors.[88]

[88] ECCP; ESCP4i, https://www.clustercollaboration.eu/eu-cluster-partnerships/escp-4i/profiles, consulted on 08/04/2019

Annex: Example of cluster profile on the Indian cluster observatory

Cluster Details

Name of the Cluster :	Malout Agriculture Implements
Location :	Malout
District :	Muktsar
State :	Punjab
Sector :	Metal Products and Parts except Machinery &
No. of Firms :	75
Turnover :	Rs. 620 Millions
No. of Workers :	NA
Products :	Agricultural Implements

About the Cluster

1	Name of the Cluster	Malout Agriculture Implements
2	Place	Malout
3	District	Mukatsar
4	State	Punjab
5	No of firms (by type)	75 units (SME ◆ 56)
6	No. of workers	Not available.
7	Turnover	Rs. 620 Million
8	Associations in cluster	M/s Taran Industry, Ludhiana
9	Major products	Agricultural Implements.
10	Specific and relevant technical institutions (R&D, Testing Lab accredited)	DIC, Muktasar
11	Major markets	Within India ◆ Export - Not available.
12	Major problems/prospects	• The speed at which the world is changing, more so the developing economy, call for sophistication & efficiency. It calls for new models. As such, there is a dire need for adoption of modern technology to enhance efficiency and productivity. • For reaping the benefits of global marketing, reducing inventory costs and improving maintenance cost will meet the needs of the market in the current business scenario. Thus finding ways & means to develop low cost strategy is the need of hour, cost competitiveness is the buzz word today. • Energy saving is another problem being faced by this cluster which requires adoption of measures to reduce consumption and to identify key opportunities for saving by focusing of energy intensive systems such as process heating, steam, pumps, fans and compressed air. • There is need for adoption of stricter emission & safety norms

Figure 9 - Example – Malout Agriculture Implements[89]

[89] Cluster Observatory, 2016. http://www.clusterobservatory.in/view_cluster.php?cluster_id=36576, consulted on 04/08/2019