Chapter 5
Spatial Distribution of Startup Cities of India

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Abstract Cities are centers of very high density of population, mainly engaged in non-agricultural activities. The population is usually well educated, trained, highly technical and innovative. Cities with such population are vibrant and energetic and lead the country in different sectors of socio-cultural-economy of the country. Historically cities led the society in trade and commerce, administration, education and industrial activities. In economic development planning, cities acted as the Growth Pole or Growth foci through which the development trickle down to smaller settlements. The information and communication technology brought a new entity named startups in highly technical cities. Initially startups were heard in the Silicon Valley of United States of America, concentration of technology-based companies. Later on with the dispersion of technology, outsourcing of processing component of these big companies and economic compulsions, these big companies start operating from different parts of the world. This led to emergence of startups even in developing countries like India. Startups, technology and innovation are seen as exciting and effective instrument for India's transformation. Indian Government is considering startups as new engine of employment generation and growth. Startups are making news nowadays and are gaining popularity in India. Their number is increasing day by day. Some of the successful startups are financed or take over by big companies. These startups are highly concentrated in cities. Startup is a new dimension added to the characteristics of cities. The economists are writing number of articles on number, type, investment and different aspects of startups. We geographers are not able to take note of these. It is necessary to analyse the geographical dimensions of startups. Therefore, this paper attempts to trace out the spatial distribution and types of these startup cities in India using secondary data extracted from angel list of startups up to March 2016.

Keywords Startup cities · Innovation · ICT · GIS · QGIS · Techies · Open source software

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Acronyms

CEO Chief executive officer
GIS Geographical information system
ICT Information and communication technology
IIM Indian Institute of Management
IIT Indian Institute of Technology
IIIT Indian Institute of Information Technology
IISc. Indian Institute of Science
NIIT National Institute of Information Technology
QGIS Quantum geographical information system
U.S. United States

5.1 Introduction

There is a noise of the word "startup" nowadays. Everyone is talking about this word. The print media especially economic ones are full of articles related to startups. The new generation of students passing out of IIT's, IIIT's, IIM's and other technological and management institutes loves to associate themselves with this word. These management and technical students working on their project work sometimes hit some idea of doing something in a different manner using technology and management skills. These new ideas or innovation brought a revolutionary change in the manner business or commerce is done, or payment is made or products and services are supplied to customers using information and communication technology (ICT). New companies are formed to use these innovative ideas and earned millions. Facebook, Google, Amazon.com, etc. and present day big companies were started as startups. The term gains popularity during the dot.com bubble when number of dot.com companies were formed. Those who provided these innovative ideas also become partners in these companies and become millioners over the night. Big companies, big banks and venture capitalists run after these newly formed companies either to take over or to finance these. The students are encouraged to develop more and more such innovative ideas by financial and other support. These newly established entities, now termed as startups are now hot cakes of the day in India. The startups are coming up in metropolitan cities of India. Cities are centers of very high density of population, mainly engaged in non-agricultural activities. The population is usually well educated, trained, highly technical and innovative. Cities with such population are vibrant and energetic and lead the country in different sectors of socio-cultural-economy of the country. Historically, cities led the society in trade and commerce, administration, education and industrial activities. In economic development planning, cities acted as the Growth Pole or Growth foci through which the development trickle down to smaller settlements. The history of economic development indicates that the Growth pole

model resulted into concentration of development at these cities only. So the focus shifted to the development of rural areas and smaller towns. Now the ICT again brought the cities into centre of development by introducing a new entity named startups in highly technical cities. The present paper attempts to analyse the spatial distribution of startup cities of India to find out locational factors and try to develop a typology of these startups to classify the startup cities into different groups. QGIS open-source Geographical Information System (GIS) software has been used to present the data on map.

The word startup as a noun means the action or process of setting something in motion or a newly established business. As per Cambridge dictionary, startup means a small business that has just been started. Startup is defined as "A Startup is a company that is in the first stage of its operations. These companies are often initially bank rolled by their entrepreneurial founders as they attempt to capitalize on developing a product or service for which they believe there is a demand" as per investopedia.com. "Early stage in the life cycle of an enterprise where the entrepreneur moves from the idea stage to securing financing, laying down the basis structure of the business, and initiating operations or trading" defined by business dictionary. "A startup is a company working to solve a problem where the solution is not obvious and success is not guaranteed," says Neil Blumenthal, cofounder and co-CEO of Warby Parker. "Startup is a state of mind," says Adora Cheung, cofounder and CEO of Homejoy, one of the Hottest U.S. Startups of 2013. It can be concluded that startup is a new company just started by founder entrepreneur to provide a product or service to meet the demand of the market.

5.2 Distribution of Startup Cities at Global Level

The present paper is based on Angel list of startups located in different countries. There is no other source to verify this list. The list may not be complete but it gives an estimate of startups in different countries and cities of world. The number of startups is highest in North American continent followed by Europe and Asia. The number is very small in South America, Oceania and Africa. This clearly indicates that the number of startups is closely related with the level of technological development and technology friendly population. It is higher in the developed regions while very low in underdeveloped or developing regions of world. Although the two largest populated countries are located in Asia, the number of startups is comparatively very low (Table 5.1). At city level, Silicon Valley and the San Francisco Bay Area of California of United States of America have long been the world leaders in high-tech startups, giving rise to cutting-edge companies from Apple and Intel to Google, Facebook, and Twitter. But recent years have seen the rise of an increasingly potent group of cities around the world that are generating new startups in creative and unique ways (Florida 2015). It is followed by New York, Los Angeles and Boston. Most of the leading cities are from United States of America. The only Indian city appeared in Richard's list of 20 leading city is

Table 5.1 Number of startups in world (as on 30th March 2016)

Region	Number of startups
North America	109,674
Europe	35,257
Asia	30,017
South America	4719
Oceania	3722
Africa	2880
Total	186,269

Source https://angel.co/locations

Bangalore at 15th place. Bangalore is also placed as the third fastest growing startup cities in world.

5.3 Startups in India

Till recently, the uses of ICT were limited in commerce, business and services sector of India. With the expansion of management and technological education institutes like IIT's, IIIT's, NIIT's and IIM's, etc. a large number of young graduates are coming out into the market equipped with ICT. On the other hand, an increase in ICT literacy of population and its application by customers created a demand for ICT-enabled business, commerce and services. The young technocrat's new ideas of application of ICT in business, commerce and services sectors of the economy brought a revolution in India. There are new ways of doing business, new ways of doing commerce and new ways of providing services and products to the customers. As a result, number of startups came up in the last five years. Their number increased almost 40%, the amount invested increased 125%, and the use of technology, the number of persons employed reached to 85 thousands in last years. These are only some rough estimates reported in various newspapers or magazines and going to shoot in the near future. The interest shown and capital invested by foreign banks and companies made startups in India a hot cake. The fresh graduates coming out of management and technological institutes become employer over the night. Every year, startups start appearing in new cities and in sectors. Present Government of India realized the importance of startups in application of ICT in different sectors of economy, in attraction of foreign investment, and especially in diverting the students towards starting their own companies. The students passing out of these institutes are now employer and not employee. They are now employing others rather than searching for jobs.

The economy of any country depends on economic activities carried out by the workforce. Larger the number of employed or working people better be the

economy. After independence, first agriculture sector and then industrial sector was developed to produce food grains and jobs. With the changing technology, globalization, and privatization the role of the government was focused on policy making. This led to the growth of private sector in India. Startups are also totally promoted by private financers. The Indian government realized that Indian people have the potential to work hard, all they need is, a promising startup. Many people dream of starting up their own business, but due to financial or other similar issues are unable to do so. So, Indian Government in the leadership of honourable Prime Minister has decided to offer a gift as a nation wise program—"Start up India". "Start up India" is a revolutionary scheme that has been started to help the people who wish to start their own business. These people have ideas and capability, so the government will give them support to make sure they can implement their ideas and grow. Success of this scheme will eventually make India, a better economy and a strong nation. On April 17, 2015, the Ministry of Commerce and Industry released a notification to define "startups". An entity will be identified as a startup

(i) Till up to five years from the date of incorporation.
(ii) If its turnover does not exceed 25 crores in the last five financial years.
(iii) It is working towards innovation, development, deployment, and commercialisation of new products, processes, or services driven by technology or intellectual property.

Another observation leads to the fact that an entity shall be considered a startup only if it aims to develop and commercialize—a new product or a service or a process—or significantly improves on a product or service or process which will add significant value for customers or workflow. You are not liable to get the tax benefits as you will not be defined as a startup unless there is some innovation in your product or process or services. The technical institutes are also promoting their students to work for a startup for a year or two and then again may appear for placement if not successful. As a result a large number of students are trying their hand on startups in India. Housing.com, Flipkart, Snapdeal, etc. are some of the successful one.

5.3.1 Spatial Distribution of Startup Cities in India

The locations of primary activities are normally found in villages, the locations of industries are according to either the sources of raw material or market. These startups need innovative entrepreneurs, high-speed Internet, advanced computers, uninterrupted supply of electricity and motivated technical workforce. Though there is also a requirement of capital, capital will flow if other requirements are met. Another important requirement is demand of ICT-based services and concentration

of population who can pay a small amount for these services. The urban population of India is well educated, smartphone users, single families and most importantly both husband and wife working during the day. Due to late working hours in private sector, this new generation has no time to visit market to purchase or to visit billing centers to deposit bill amount, etc. They prefer only portals to do all their odd jobs. Hence, large urban centers like Delhi, Bangalore, Mumbai, Chennai, etc. are the most favourable location for these startups.

A quick glance at the map (Fig. 5.1) reveals that the startup cities are clustered in India, strictly following the pattern of distribution of metropolitan cities. Most of the startup cities are either metropolitan city or city located near these. The biggest cluster is in North India, including the cities of Delhi, Gurgaon, Noida and Ghaziabad. This cluster branches into two directions, first towards Kolkata through the northern plains along river Ganges. The second branch passes through startup cities located along Rajasthan and Madhya Pradesh border, Gujarat and Maharashtra border, right up to Mumbai. The second cluster of startup cities is in South India including Bangalore, Chennai, Hyderabad and other major south India cities. This seems to follow the golden quadrangle of national highways. Another factor which played important role in the spatial distribution of startup cities is the location of IIT's, IIIT's, and other technological and management institutes. All the major startup cities are centre of IIT's, IIIT's, IIM's or NIIT or some regional institute.

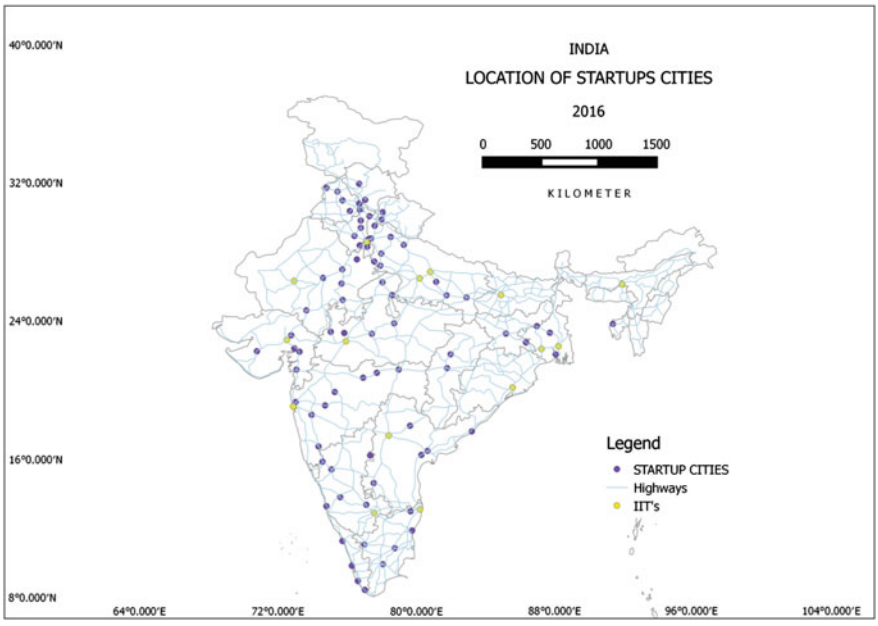

Fig. 5.1 Spatial distribution of startups in Indian cities. *Source* Author

5.3.2 Regional Distribution of Startup Cities in India

If we divide India into five regions and clubbed the startup cities in these five regions, it is observed that the South India leads in the number of startup cities closely followed by North Region (Fig. 5.2). South Indian region includes the metropolitan and capital cities of Bangalore, Chennai and Hyderabad. Bangalore is the hub of electronic and ICT companies similar to Silicon Valley. Chennai is offering an alternative location to ICT companies near Bangalore. In north region, the capital city of New Delhi is the main hub. Alternative locations are offered by Gurgaon and Noida. The third place is of western region. In the western region, only two important cities of Bombay and Pune are the centers of startups. The number of startup cities was very small in eastern region and smallest in central region. Eastern region is more industrial and the size of population is smaller in central region cities.

5.3.3 Number of Startups in Indian Cities

As per the list available on Angel list website, the total number of startups is around 15,000 in India. The largest number of estimated startups was reported in Bangalore, the Silicon Valley of India. Bangalore is the only city in the top 20 startup cities of world ranking 15th and the third fastest growing city with respect to number of startups. Bangalore was found outstanding due to its technological advantage (large sizes of circle in Fig. 5.3). Bangalore is the heart of computer technology and ICT for a long period. Though there is no IIT in Bangalore, there are large number of ICT-based and electronic companies along with engineering and management institutes. These ICT-based companies are the hub of innovative

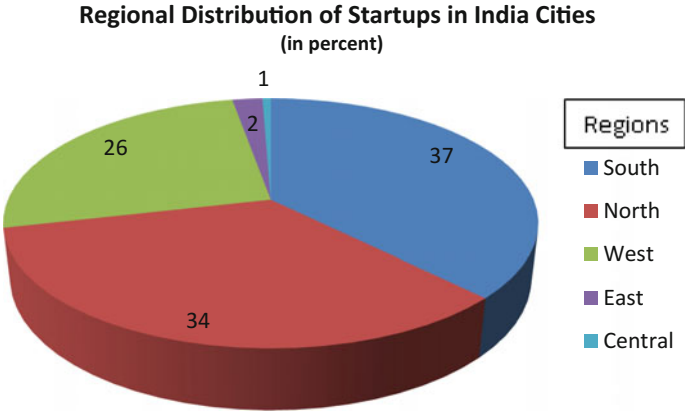

Fig. 5.2 Regional distributions of startup cities in India (as on 30th March 2016). *Source* Author

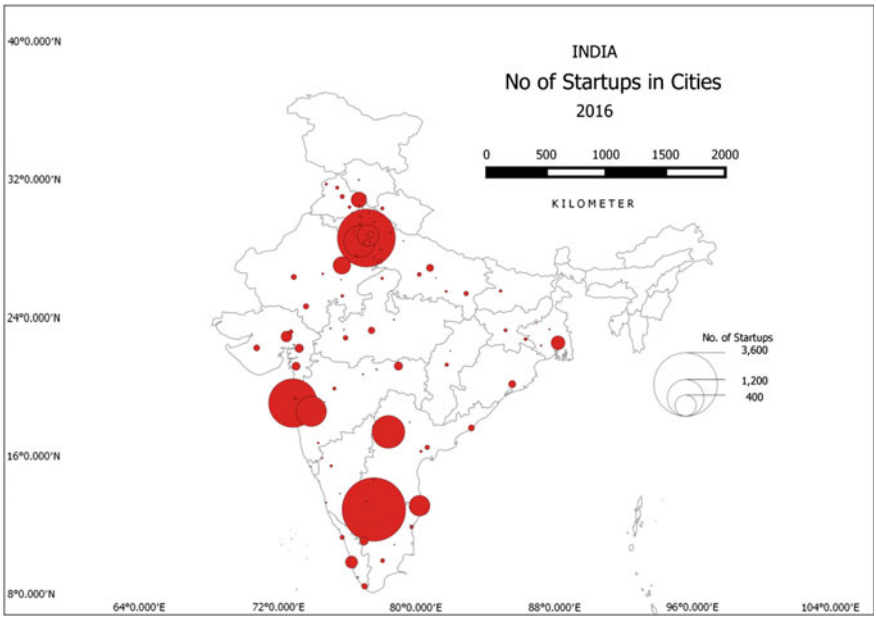

Fig. 5.3 Number of startups in Indian cities. *Source* Author

activities. Bangalore (almost one-fourth of Indian startups) is followed by two close cities of New Delhi (one-fifth of startups) and Mumbai where a demand is found for such services due to mobile-friendly large metropolitan population (Table 5.2). Location of IIT's in both the cities is one of the important factors, and there are other institutes leading students in various innovative activities. At the third level, are the startup cities of Hyderabad, Gurgaon and Pune. Hyderabad, the capital city of Andhra Pradesh is an independent centre of startups, where number of management institutes are located. Gurgaon and Pune are developing as independent hub of technology near the metropolitan cities of Delhi and Mumbai. These two cities offered alternative locations near Delhi and Mumbai.

The fourth level startup cities are Jaipur, Chandigarh, Calcutta, Kochi and Ahmedabad where the number of startups varies from 275 to 105. In addition to these major startup cities, there are other 100 more cities where startups are less than 100 spread over the country (small size of proportional circles in Fig. 5.3). The number of startups is comparatively lesser in these cities because of the size of population and their distant location from the four metropolitan cities of India. An attempt is made to analyse the relationship between size of population and number of startups in a city (Fig. 5.4). It seems there is some relationship between population and number of startup in a city, but closeness to larger metropolis disrupts this relationship. This may need to be further tested taking all the nearby cities together as an agglomeration.

Table 5.2 Number of startups in Indian cities (as on 30th March 2016)

Name of city	Number of startups	Percent startups
Bangalore	3599	23.56
New Delhi	2992	19.59
Mumbai	2106	13.79
Hyderabad	960	6.29
Gurgaon	883	5.78
Pune	821	5.38
Noida	414	2.71
Chennai	384	2.51
Jaipur	375	1.80
Chandigarh	213	1.39
Calcutta	171	1.12
Kochi	131	0.86
Ahmedabad	105	0.69
Others	2219	14.53
Total	15,273	100

Source Author

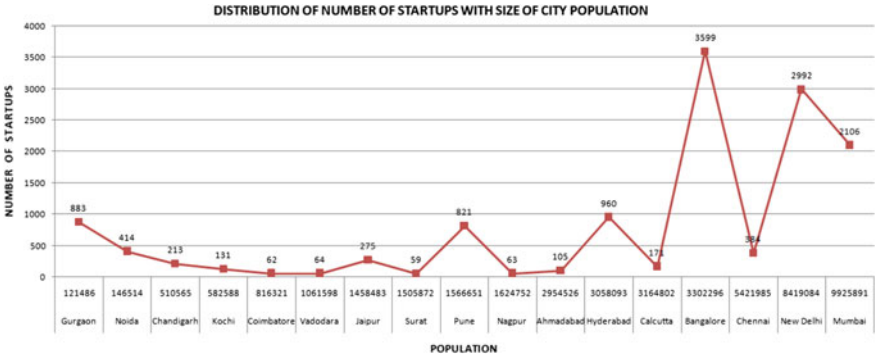

Fig. 5.4 Distribution of number of startups with size of city of population. *Source* Author

5.3.4 Types of Startups in Indian Cities

An attempt is made to classify the startups in 10 categories on the basis of type of main activities of the entity. The categories include Mobile App, Education, e-Commerce, Social, Health Care, Hyper local, Online, Travel, Food and others. The most important type of startups is Mobile App and related activities (Fig. 5.5). Educational, Web-based and e-commerce startups are at second place in proportion of the total types of entities. A significant proportion of social, health care, hyperlocal (consolidates the orders and handles the delivery), online, travel, and

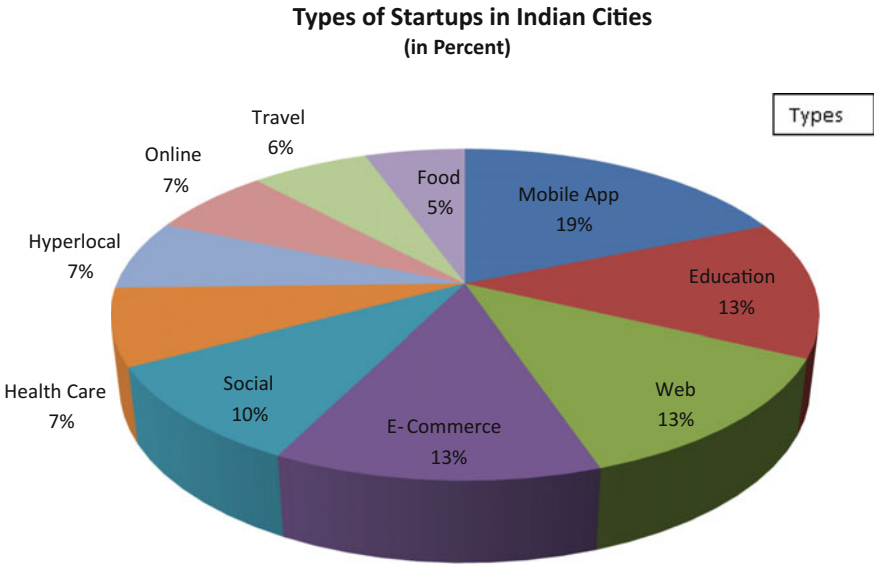

Fig. 5.5 Types of startups in Indian cities (as on 30th March 2016). *Source* Author

food-based activities are also reported in Indian cities. The proportion of different types of startups in Indian cities is almost same across the country and the share of Mobile App based startups is highest in all the cities.

5.4 Results and Discussions

On the basis of analysis of number of startups, their types, number of startups in Indian cities, spatial distribution of startup cities and their typology, the following points may be highlighted:

Startups normally appear in the cities having a large population base, diversified in nature, higher proportion of employed population, and high level of use of computer and mobile technology. The distribution of startup cities in India strictly follows the distribution pattern of large cities. Startups are almost absent in villages or primarily rural area. Startup cities are found more around cities, in general, and metro cities, in particular. The distribution pattern of startup cities seems to follow the golden quadrangle of national highways. This indicates that there is some relationship between the location of startup cities and highways. It needs to be further statistically tested.

The number of startups is more in metropolis and surrounding cities and less in smaller cities. Highly urbanized, diverse, technically literate and employed population is base for startup entities. Metropolitan cities are concentration of this type of population. Another characteristics, which is necessary for startups and found in

metropolitan cities is the use of smart phones. In metropolitan cities, the level of use of smartphones is very high; here, even a kid is found using mobile phone to order his pizza or his toys online. The use of mobile phone is going to increase further not only in metropolitan cities but also in the small towns and after some time even in villages. This increase in use of mobiles will further increase the number of startups and a day will come when the startups may be found located in rural areas.

The startups can be classified on the basis of type of activities performed. Startups are trying to help the customers in reducing their time and energy spent in day-to-day work by providing solutions at the press of a key of their mobile phone or click of a mouse. At present, Mobile App, web, education and e-commerce are the four important types of startups activities reported in Indian cities. The number of startups in each type is going to further increase with the increase in number of smartphone users in metropolitan cities, smaller cities and villages. The reduction in the prices of smartphones, when made in India, phones will be launched that will further increase users in India. It is pertinent to mention here that the type of activities found in startups will also increase in future to extend startups in new sectors of the economy. It has been observed that the types of activities are almost similar in nature and magnitude across the startups cities in the country. These activities may be different but the mode of provision of services is based on ICT. The classification exercise needs more data, time and deliberation.

The startups are considered as new engine of economic development and attraction of foreign investment in the country. The startups are the only way to realize the slogan of Employer not Employee, slogan highlighted by the present prime minister of the country. There is an increase in revenue to the local government. The startups may again bring the Growth Pole Theory in focus as these are located in the larger regional cities of the area. Time will come when these startups will be based in the surrounding rural areas to take benefits of economy. There is a need to have startups to help the farmers of the country, so that their products may be purchased directly or processed at village level and then supplied to the consumers. This will not only help the farmers in getting a reasonable price of their crop, but the consumers will also get these products at lower rates. A larger section of our society, farmer is not able to benefit by the economic models adopted till date. Such startups, even if, located in urban areas, but dealing directly with the farmers will definitely improve the conditions of the farmers.

The startups will encourage young generation to learn skills than general education. The startups have scope of job generation for educated and skilled young generation for coming years. The young generation will start generating jobs rather than looking for jobs. This will lead to expansion of jobs in private sector, and reduce the burden on government.

The startups may again lead to disparities between urban skilled and rural non-skilled youth. The involvement of skilled workforce is more in startups. The urban youth responds to the current situation quickly and start taking skill education, on the other hand the rural youth still opt for general education. The growth of startups will further lead to fresh migration stream from rural areas and small towns

to Metro Cities. The startups will be highly concentrated in metro cities, so skilled youth will migrate from small cities and rural areas to these startup cities.

It is observed that the workforce employed in the startups is mostly from other urban centers. This new workforce earning high salary contributes to income tax, tax to the local government and infuses energy in the slowdown of reality sector. On the other hand, it is a cause for the tension between the new techies from other cities, local residents and local government. There is a need to look into these issues by the administrative set up of the concerned city.

To conclude, it can be said that the number and type of startups are going to increase further in near future. The concentration of these startups needs to be diverted towards rural areas to have a better spatial distribution. There is a need of regulations regarding online activities and generation of awareness among the population. Further analyses of data are required to develop a typology of the startup entities and relationship between size and number of startups in cities.

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The list of startups is extracted from the **angel.co/india** website. This is the only source of such data. The author is highly indebted to the website for publication of such data on their site for public use

The notification of Indian Government on startups is taken from the official website of the government of India

Track.in, website for list of startups funded till March 2016