Volume - 5, Issue- 7, July 2017 IC Value : 56.46 e-ISSN : 2347 - 9671| p- ISSN : 2349 - 0187
EPRA International Journal of Economic and Business Review SJIF Impact Factor(2016) : 6.484
ISI Impact Factor (2013): 1.259(Dubai)
UGC-Approved Journal No: 47335
Research Paper
www.eprawisdom.com

EVALUATION OF PATNA AS A SMART ECONOMY IN SMART CITY

Vivek Kumar Saurabh[1]

[1]*Doctoral Candidate at Political Geography Division, Centre for International Politics, Organisation and Disarmament, School of International Studies, Jawaharlal Nehru University, New Delhi.*

ABSTRACT

Economy is the major driver of Smart City initiatives, and a city with a high degree of economic competitiveness is thought to have one of properties of a Smart City. As well, one of the key indicators to measure growing city competition is the capacity of the city as an economic engine. Giffinger et al. (2007) suggest a Smart City framework consisting of six main components (Smart Economy, Smart People, Smart Governance, Smart Mobility, Smart Environment and Smart Living). Their operational definition of a Smart Economy includes factors all around economic competitiveness as innovation, entrepreneurship, trademarks, productivity and flexibility of the labor market as well as the integration in the national and global market. In this paper, Patna has evaluated as a Smart Economy by an adopted methodology, the methodology and indicators developed by Centre of Regional Science (SRF), Vienna University of Technology, Vienna, Austria on Smart City has been adopted with some modification according to the study area. The analysis of this study is based on secondary data. The secondary data will also be analysed with the help of various useful statistical methods and techniques, different cartographic techniques.

KEY WORDS: *Smart Economy, Smart City, Patna.*

INTRODUCTION

Economy is the major driver of smart city initiatives, and a city with a high degree of economic competitiveness is thought to have one of properties of a smart city. As well, one of the key indicators to measure growing city competition is the capacity of the city as an economic engine (Giffinger *et al.*, 2008). Giffinger et al. (2007) suggest a smart city framework consisting of six main components (smart economy, smart people, smart governance, smart mobility, smart environment, and smart living). Their operational definition of a smart economy includes factors all around economic competitiveness as innovation, entrepreneurship, trademarks, productivity and flexibility of the labor market as well as the integration in the national and global market.

A series of studies released by the IBM Institute for Business Value identify business as one of core systems of smarter cities, which comprise city services system, citizens system, business system, transport system, communication system, water system, and energy system. Capacities for smart business systems include ICT use by firms, new smart business processes, and smart technology sectors. The smart city initiatives are designed to develop information technology capacities and establish an agenda for change by industry actions and business development. Creating an environment for industrial development is pivotal to a smart city. The economic outcomes of the smart city initiatives are business creation, job creation, workforce development, and improvement in the productivity (Kumar 2016).

RESEARCH OBJECTIVES

- To evaluate whether Patna qualifies as a Smart Economy.
- To evaluate limitations and potentials of Patna as a Smart Economy.

STUDY AREA

Patna, the capital city of Bihar is situated at a crossroad of 25 036' 0" N latitudes and 85 07' 0" E longitudes. It is the largest city of the state spreading over an area of 99.45 sq. km. Patna Municipal Corporation Area has been divided in 72 wards, which have been further re-arranged into 4 Circles, namely- New Capital, Bankipur, Kankarbagh and Patna City respectively (District Gazette 2007).

The modern city of Patna is situated on the southern bank of the Ganges. The city also straddles the rivers Sone, Gandak and Punpun. The city is approximately 35 km long and 16-18 km wide. Patna has a humid subtropical climate with hot summers from late March to early June, the monsoon season from late June to late September and a mild winter from November to February. The population of the municipal area of Patna is 1.683 million as of the 2011 census of India. The sex ratio (females per 1000 male) is 882. The overall literacy rate is 84.71%, with the male literacy rate being 87.71% and the female literacy rate being 81.33%. Patna has recorded most decadal growth rate (43.5) of urbanization.

As of 2011, the economy of Patna has seen sustained economic growth. In particular, the economy has been spurred by growth in the Fast Moving Consumer Goods (FMCG) industry, the service sector, along with Green revolution businesses. In 2009, the World Bank stated Patna as the second best city in India to start up a business.

Data availability also plays an important role in the selection of the cities if resources are limited. The collection of data is mainly a question of available project resources. In the present scenario, Patna is the only city of Bihar where smart city related data can be easily collected.

Smart cities to be functional require uninterrupted power supply. In almost cities in Bihar, for instance, scheduled power cut is imposed for even eight to ten hours which makes computers and mobile phones mere showpieces. Only Patna has above twenty hours uninterrupted power supply.

DATABASE AND RESEARCH METHODOLOGY

Data for this research would be collected primarily from secondary sources. The secondary data would be obtained from state and central government ministerial reports, Bihar Statistical Hand Book 2012, Economic survey of India 2013, Economic Survey of Bihar 2013, District Statistical Hand Book of Patna, Censes 2001, 2011.

For methodology concerns, the methodology and indicators developed by *Centre of Regional Science* (SRF), Vienna University of Technology, Vienna, Austria on Smart city has been adopted with some modification according to the study area.

Table: 1 Smart Economy Factors and Indicators

Factor	Indicator	Level
Innovative spirit	1. R&D expenditure in % of GDP 2. Patent applications per inhabitant	National Regional
Entrepreneurship	3. Self-employment rate 4. New businesses registered	Local Local
Economic image & trademark	5. Importance as decision-making centre (HQ etc.)	
Productivity	6. GDDP per capita income on 2004-05 price	Local
Flexibility of Labour market	7. Unemployment rate	Regional
International Embeddedness	8. Companies with HQ in the city quoted on national stock market 9. Air transport of passengers 10. Air transport of freight	Local Regional Regional

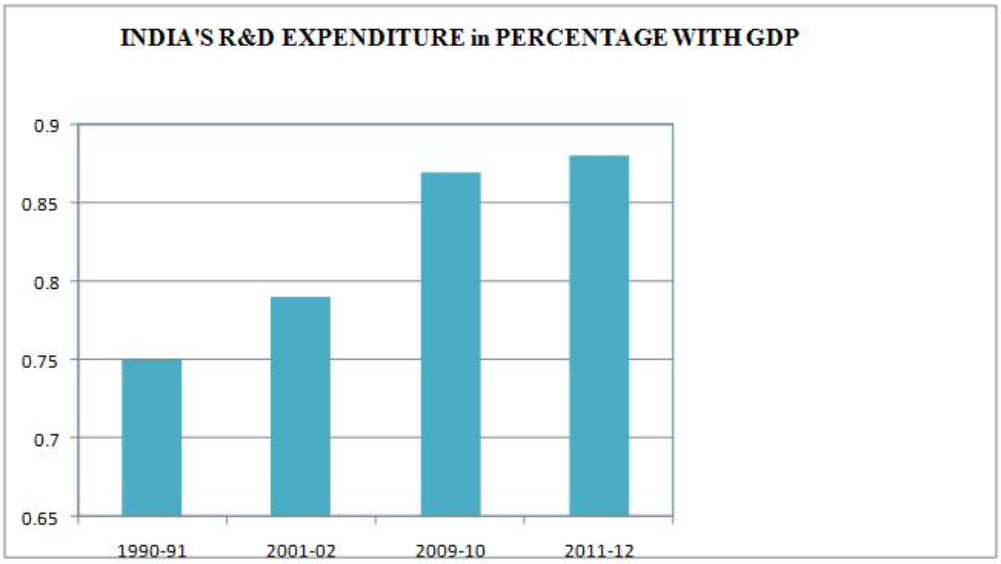
Source: Giffinger et al. 2007, Centre of Regional Science (SRF), Vienna University of Technology, Austria

Evaluation of Smart economy has been done on the basis of above factors and Indicators

Factor1. : Innovative Spirit

Indicator:

1. R&D expenditure in % of GDP (National)
2. Number of filed Patent applications (Regional)



Source: Department of Science & Technology, Government of India.

According to Department of Science & Technology (India), India spent 0.87% of its GDP on R&D in 2009-10, while the same among other developing BRICS countries was Brazil 1.17%, Russian Federation 1.25%, China 1.70% and South Africa 0.93%. This ratio was less than 0.5% for countries like Pakistan, Sri Lanka and Mexico. Most of the developed countries spent more than 2% of their Gross Domestic Product (GDP) on R&D. In 2005-06, Bihar contributed only 1.78% in the term of total R&D expenditure of India.

Table: 2 Application for Patent filed in the year 2011-12

State/Union Territory	Filed patent	Per cent
Maharashtra	2643	30.45
Tamilnadu	1149	13.24
Delhi	1040	11.98
Karnataka	869	10.01
Andhra Pradesh	610	7.02
West Bengal	443	5.10
Uttar Pradesh	389	4.48
Gujarat	376	4.33
Kerala	337	3.88
Haryana	201	2.31
Jharkhand	102	1.17
Bihar	**27**	**0.31**
Other states	856	9.86
Total	8678	

Source: Annual Report 2012, Intellectual Property India, Department of Industrial Policy and Promotion Ministry of Commerce & Industry, Government of India.

The table shows number of patent application filed by Indian states and Union Territory. Maharashtra, Tamilnadu, Delhi, Karnataka, Andhra Pradesh and West Bengal filed 76% patent application, while Bihar contributed only 0.31%. Its show there is need to more investment in Intellectual Property sector in Bihar.

Factor 2: Entrepreneurship

Indicator:

1. Self-Employment Rate (Local)
2. New Businesses Registered (Local)

Self-Employment Rate: Persons who operated their own farm or non-farm enterprises or were engaged independently in a profession or trade on own-account or with one or a few partners were treated as self-employed in household enterprises. The essential feature of the self-employed is that they have autonomy (decide how, where and when to produce) and economic independence (in respect of choice of market, scale of operation and finance) for carrying out their operation (NSSO).

Regular wage/ salaried employee: These were persons who worked in others' farm or non- farm enterprises (both household and non-household) and, in return, received salary or wages on a regular basis (i.e. not on the basis of daily or periodic renewal of work contract). This category included not only persons getting time wage but also persons receiving piece wage or salary and paid apprentices, both full time and part-time.

Casual wage labour: A person who was casually engaged in others' farm or non-farm enterprises (both household and non-household) and, in return, received wages according to the terms of the daily or periodic renewal of work contract, was a casual wage labour.

Table: 3

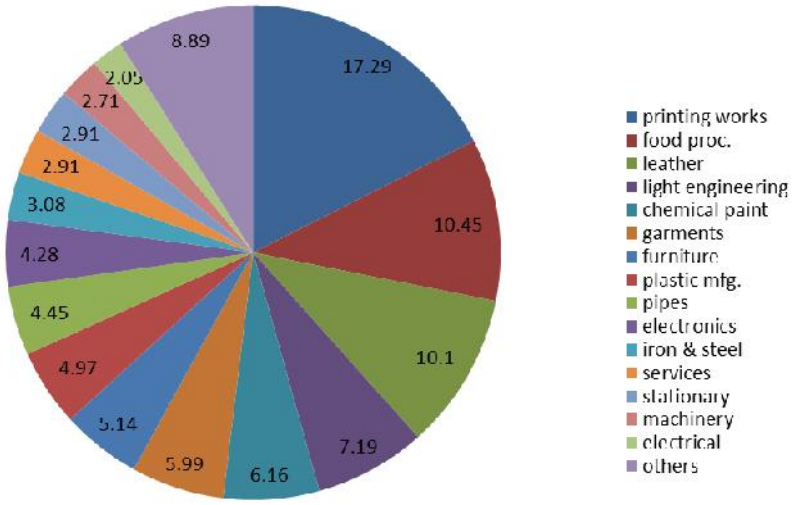
Urban	Self-Employment Rate in per cent	Regular Wage/ Salaried	Casual Labour
Patna	48	50	1.95
Greater Mumbai	26.8	70.15	3.1
Delhi M.C (Urban)	32.55	66.3	1.15
Kolkata	37.4	50.45	12.15
Bangalore	38.65	49.75	11.65
Chennai	22.25	56.45	21.35
Kanpur	37.85	34.65	27.45
Urban India	40.4	40.85	18.3

Source: NSS0 66th round, 2009-10

The table shows regular wage, casual labour and self-employment rate in selected cities of india. Patna self-employment rate is higher than urban India. Given this growing significance of self-employment, it is important to consider in more depth the precise nature of self-employment, and to what extent it is a positive move of workers away from domination and control by employers, or a "refuge" form of employment forced upon workers by the inadequacy of generation of paid employment.

What is the picture of self-employment that emerges? The rosy image of new productive opportunities emerging from self-employment because of a vibrant fast-growing economy is unfortunately far from the truth for most self-employed workers, even in the urban areas which are currently seen as more economically dynamic. Of course it is true that in the highly-skilled professional categories new forms of highly remunerative self- employment are emerging. But this is only a minuscule drop in the ocean of self-employment. Instead, the evidence suggests that most self-employed workers are engaged in continuous, intensive but low productivity work that provides little remuneration and is also prey to tremendous uncertainty because of the unpredictability of income (Chandrasekhar and Ghosh, 2009).

New Businesses Registered in Patna(2007-2012)



Source: District Industries Centre (DIC), Patna

Industry registration data from April 2007 to April 2012 has been analysed as provided by the DIC Patna. The analysed data show that there are prominent new registered industries are printing works, food processing industries, leather, light engineering and chemical paint industries. The data also shows absence of large scale industries. There are mainly SMSE (small and medium scale industries) are growing. Major cause of development of these type industries are government scheme and incentive. There are highly needed a large scale industries. Information Technology; Energy Generation, Transmission & Distribution; Bio Technology; Export Industries producing Pollution Control Equipment and Non-Conventional Energy Generators; Rice Mills; Tea; Sugar are the thrust industries for Patna which is suggested in city development plan for Patna under JNNURM.

Factor: Economic image & trademark

1. Importance as decision-making Centre (HQ etc.):

Patna is the capital of Bihar. So, major decision making bodies of state level are present here. All ministries, all state department headquarters are located here.

Factor: Productivity

Indicator:

1. GDDP per capita on 2004-05 price (Local)

Table: 4

Year	GDDP In Rupees
2006-07	39702
2007-08	43542
2008-09	48683
2009-10	53434
2010-11	57843

Source: Directorate of Economics and Statistics 2013, Government of Bihar

The table shows trend of Patna's increasing income in term of Gross District Domestic product. The given data also shows Income of Patna is increasing swiftly in recent years. It's highest in Bihar. In 2011, Bihar GDDP is RS 13404 which is lower than India national average.

Factor: Flexibility of Labour market

1. Unemployment rate (local)

Unemployment Rate (UR) is the ratio of number of unemployed persons/person-days to the number of persons/person-days in labour force. Employed and unemployed taken together constitute labour force (LF). UR gives the unutilized portion of the labour force. According to NSS, the unemployment rates of persons aged 15 years and above according to usual status (adjusted), current weekly status and current daily status for each class 1 city/size-class of towns separately for males and females.

Unemployment Rate for male and female of age 15 years and above according to **usual status** in 2009-10

Table: 5

Urban Area	Unemployment Rate of age 15 years and above in per cent	Unemployment Rate for Males of age 15 years and above in per cent	Unemployment Rate for Female of age 15 years and above in per cent
Patna	19	13.2	23.9
Delhi M.C. (Urban)	2.55	3.1	2.0
Greater Mumbai	5.5	4.2	6.8
Bangalore	3.55	3.5	3.6
Chennai	2.89	3.9	1.88
Kanpur	4.25	7.7	8
Kolkata	5.85	3.1	8.6
Urban India	4.21	2.8	5.7

Source: NSS 66th round survey, 2009-10

According to NSS 66th survey on unemployment during 2009-10, among the class 1 cities, chronic unemployment rate for males was the highest for Patna (13.2 per cent), followed by Kanpur (8 per cent). During 2009-10, among the class 1 cities, chronic unemployment rate for females was the highest for Patna (23.9 per cent), followed by Chennai and Pimprichinchwad (19 per cent each). Above table also shows unemployment rate of Patna is higher than urban India.

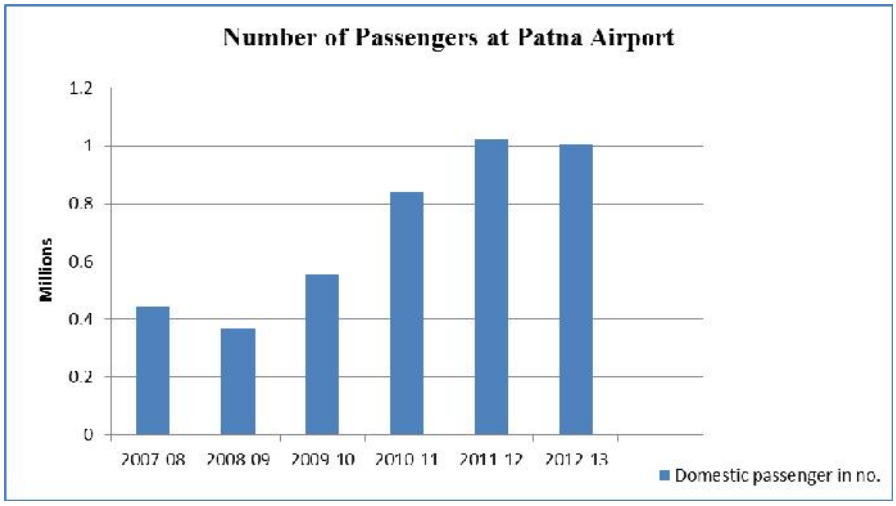
Higher Unemployment rate is a major threat for economy of any city. Here, need to be more employment schemes from central and state government.

Factor: International Embeddedness

1. Companies with HQ in the city quoted on national stock market (Local)
2. Air transport of passengers (Regional)
3. Air transport of freight(Regional)

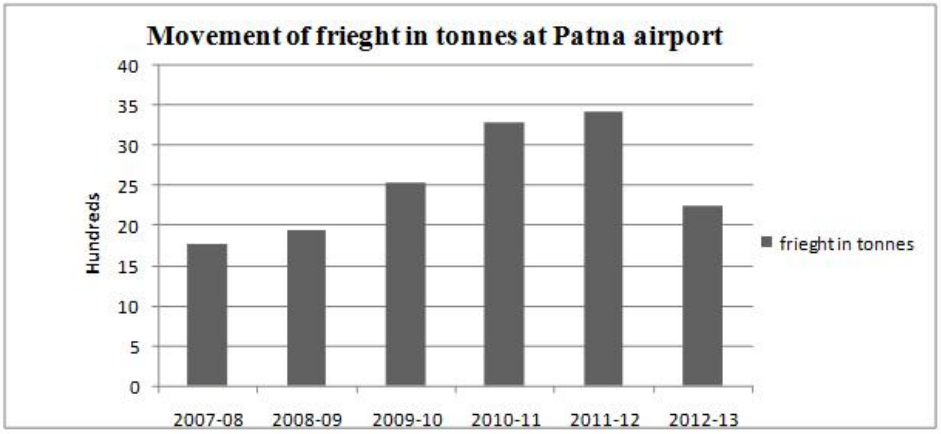
Companies with HQ in the city quoted on national stock market: In Patna, there is not any company located in Patna, which is listed on national stock market.

Air transport of passengers: After witnessing the constant fall in the last three years, the Indians have resumed the domestic air travel. In September, 2013, there were 45.50 lakh domestic fliers, which is 13.4 percent more than 40.2 lakh fliers in September a year before. Bihar too witnessed the all-India trend and, during 2013-14 (up to September), there have been 17 flights per day at Patna airport which included 6 flights of Indigo and 5 flights of Air-India. There has not been any international flight at Patna airport in recent years.



Source: Airport Authority of India, Patna

Air Transport of Freight:



Source: Airport Authority of India, Patna

In 2012-13, there was also a small drop in the number of passengers. As may be observed from Table 4.17, the freight also dropped from 3425 tonnes in 2011-12 to 2251 tonnes in 2012-13.

CONCLUSION

Smart Economy is acknowledges as key driver of Smart City. Giffinger *et al* suggested total twelve indicators and six Factors for development of Smart Economy. In this study, out of twelve indicators, we found ten is useful for evaluation of Patna as a Smart Economy. Entrepreneurship, Economic image and Trademark, Productivity and International Embeddedness factors showing a hope for development of Patna as a Smart Economy but Innovative Spirit and Flexibility of labour market shows dull picture of Patna as a Smart Economy.

BIBLIOGRAPHY

1. *Giffinger et al, (2007) 'Smart Cities: Ranking of European Medium-Sized Cities' Centre of Regional Science(SRF), Vienna University of Technology, Vienna, Austria.*
2. *Giffinger, R and H. Gudrun (2010), 'Smart cities ranking: an effective instrument for the positioning of cities?' ACE: Architecture, City & Environ, 7–25.*

3. *Caragliu et al., (2011), 'Smart cities in Europe', Journal of UrbanTechnology, vol. 18(2), 65–82.*
4. *Dameri, Paola R., and Camill Sabroux (2014), Smart City: How to Create Public and Economic Value with High Technology and Uraban Space, Springer: London.*
5. *Kumar, Vinod (2016), Smart Economy in Smart City, Springer: Singapore.*
6. *Chowdhury, Subhanil. 2011. "Employment in India: What Does the Latest Data Show?" Economic & Political Weekly, Vol. XLVI, No. 32 (August 6), pp. 23-26.*
7. *Chandrasekhar, C. P. and Jayati Ghosh. 2007. "Recent employment trends in India and China: An Unfortunate Convergence?" Paper presented at ICSSR-IHD-CASS seminar on "Labour Markets in India and China: Experiences and Emerging Perspectives," 28-30 March 2007, New Delhi.*