

# Dahej PCPIR – Opportunity Analysis for Social Infrastructure

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## Abstract

The Department of Chemicals & Petrochemicals (DOC&PC), Government of India (GoI) has approved the Gujarat Petroleum, Chemical & Petrochemical Investment Region (PCPIR) at Dahej (District: Bharuch) in the year 2009. MOA is signed between DOC&PC and the Government of Gujarat (GoG) in the year 2010 for developing the Special Investment Region (SIR) under the provisions of the state legislature of the year 2009. Dahej is a Village in Vagra Taluka in Bharuch District of Gujarat State, India. The District of Bharuch witnessed a surge in investments in chemicals & petrochemicals, drugs & pharmaceuticals, engineering and textiles as well as allied services. The district is an inherent part of the popularly referred golden corridor for chemical and petrochemical industries which extends from Ahmedabad to Vapi. The presence of existing industrial estates at Dahej, Vilayat and Panoli have enhanced the location attractiveness of the Region. Current research proposed a population projection considering diverse aspects concerning industrial needs. In the census of India (2011), the reported population in the region was about 69,000 which will grow to 85,400 in a natural course of time and trend. The Govt. of Gujarat (GoG) is committed to undertaking speedy implementation of all the active projects like freight corridor, National Express Highway No. 1, Airport and such. The effect of industrial migration will have a significant effect on the settlement and will be developed as an urban centre, and it will house a more substantial population yet. These citizens will need not only housing but social infrastructure facilities as well. Based on the analysis, the needs in housing sector under various categories and classes are projected. Besides, the needs for social infrastructure, addressing the education, health, socio-cultural, open spaces, recreational spaces, sports facilities, distribution services, safety and security services, and safety management are identified and envisaged for need-based development that generates an opportunity at different levels.

**Keyword- Dahej PCPIR, Gujarat, Industrialization, Social Infrastructure, Urbanization**

## I. INTRODUCTION

The Department of Chemicals & Petrochemicals (DOC&PC), Government of India (GoI) has approved the Gujarat Petroleum, Chemical & Petrochemical Investment Region (PCPIR) at Dahej (District: Bharuch). The Government of Gujarat has notified PCPIR as 'Special Investment Region' under Gujarat Special Investment Region Act, 2009 (the SIR Act).

A Regional Development Authority (RDA) for the PCPIR constituted under the SIR Act vide GOG Notification dated 18th September 2010. The RDA will do the ground level planning and execution and will perform all regulatory functions relating to the PCPIR. The first meeting of the RDA held, and the Detailed Development Plan of the Special Economic Zone (SEZ) was approved. The PCPIR is envisaged to leverage manifold advantages. It will allow for the concentration of Petroleum, Chemical and Petrochemical estates around PCPIR. The area of the SEZ is rich with natural resources and feedstock. The possibility to provide all infrastructure - road, rail, port, power, gas, water - in place, with planned up-gradation, is high. The proposed development has the potential to act as a chemical port and storage facility along with the establishment of Liquefied natural gas (LNG) terminal. The PCPIR also will be equipped with specific infrastructure - effluent disposal pipelines, solid waste disposal sites. It also is expected to engage the quality workforce and peaceful labour settlements in the townships with an adequate number of amenities, effective and efficient services.

## II. AIM AND OBJECTIVES OF THE STUDY

Present paper highlights the development extent and potential in the study region of Dahej PCPIR that is upcoming as an important Special Investment Region in the Gujarat State of India. The paper aims to evaluate the necessity for social infrastructure based on projected population scenario looking it as a potential for future investment in contributing to increase the quality of life for the workers as well as families thereof who choose to reside in the region. Major objectives of the study include understanding of the region from different perspectives, project the population of future based on logical framework and, predict for the need of diverse social infrastructure facilities.

### III. DAHEJ – HISTORY AND LOCATION

Dahej is a Village in Vagra Taluka in Bharuch District of Gujarat State, India. It is about 46 KM away to the west from Bharuch, the district headquarter, 20 KM from Vagra and 193 KM from State capital Gandhinagar. Dahej is a brownfield area with significant players including Reliance (former IPCL), GACL existing since 1993. The District of Bharuch witnessed a surge in investments in chemicals & petrochemicals, drugs & pharmaceuticals, engineering and textiles etc. The district is an inherent part of the popularly referred golden corridor for chemical and petrochemical industries which extends from Ahmedabad to Vapi. The presence of existing industrial estates at Dahej, Vilayat and Panoli have enhanced the location attractiveness of the Region. Below is a timeline showing essential and benchmarking events in a time frame for Dahej PCPIR development till date.

Day	Month	Year	What Happened
		2001	Establishment of first Chemical Terminal at Dahej by GCPTCL
		2004	Establishment of first LNG Terminal at Dahej by PLL
20 <sup>th</sup>	December	2006	Notified and operational in area of 1718-93-87 hectares vide notification No: 2131(E) dated 20/12/2006 (44 villages in PCPIR)
31 <sup>st</sup>	March	2009	DOC&PC has approved the Gujarat PCPIR at Dahej,
		2009	Vibrant Gujarat Summit 2009, 69 MoUs were signed
18 <sup>th</sup>	September	2010	Regional Development Authority for the PCPIR constituted under the SIR Act vide GOG Notification
7 <sup>th</sup>	January	2010	Memorandum of Agreement signed between DOC&PC and GOG
		2011	151 MoUs were signed during Vibrant Gujarat Summit 2011
			Socio-economic survey done by TERI
		2013	79 IIFs were submitted in the Vibrant Gujarat Summit 2013
		2014	EIA completed and approved by MoEF, GoI
		2015	61 IIFs were submitted in the Vibrant Gujarat Summit 2015
		2017	Developmental activities in progress

Table 1: Dahej in timeline

For Dahej SEZ of Vagra Taluka administered by the Bharuch District, the surrounding area is located on the East bank of Gulf of Cambay. The coastline of the district in the North-West is of 286 km length. The terrain is smooth in most of the area with a very mild slope towards the West. The average elevation of the Dahej locality is 16.0 Mt above the Mean Sea Level. The average temperature in Bharuch is 27.9 °C. The warmest month is May during a year. The temperature in May averages 33.1 °C. At 21.9 °C on average, January is the coldest month of the year. The annual temperature varies at 11.2 °C. The average annual rainfall is 873 mm. The July showers maximum of the precipitation, with an average of 299 mm. The wind speeds are averagely below 4 m/s, and the windward direction is usually the South-west.

The district Bharuch is rich in surface water resource. Five perennial rivers namely Mahi, Dhadar, Narmada, Kin and Tapi flow through the district. The river Narmada on entering a low level of Gujarat plains near Markai flows in the west to the Gulf of Cambay. The first 40 km stretch of river separates the Vadodara territory on its right and Nandod taluka on the left. The remaining stretch of 112 km passes through the Bharuch district. All through this stretch, the river flows through rich flat plain with highly rough banks of hard clay and sand. Near Bharuch town, it widens into an estuary and finally meeting the Gulf of Cambay. The average annual flow observed of Narmada river near Rajpipla is 38.2 billion cubic meters. The availability of water from the Narmada river would further increase on completion of a proposed dam near Rajpipla.

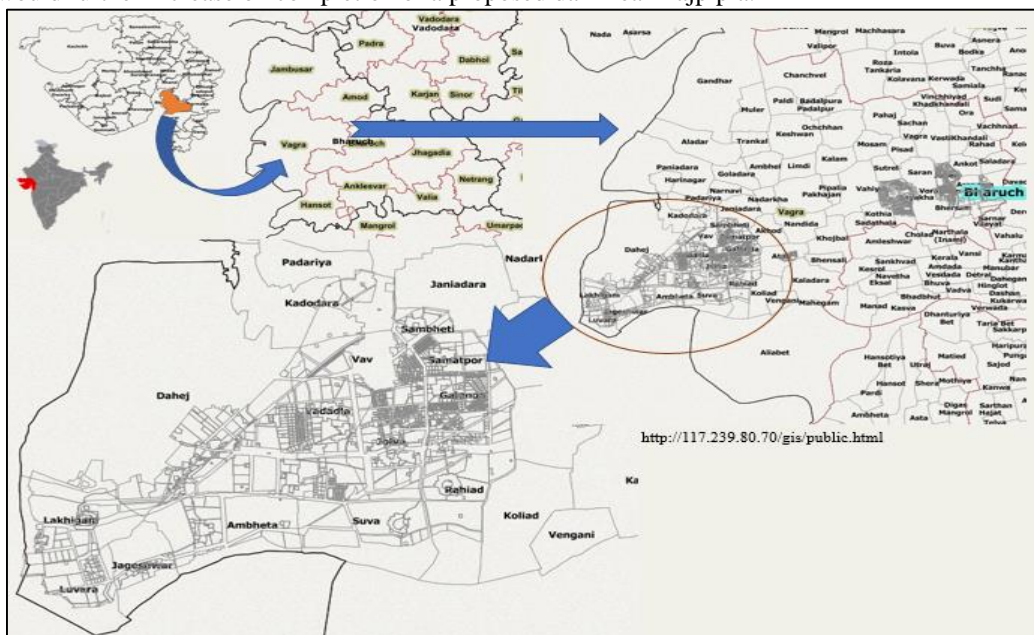


Fig. 1: Location of Dahej PCPIR

#### IV. DAHEJ – PCPIR CONCEPT

The central Government introduced the Petroleum, Chemicals and Petrochemical Investment Regions (PCPIR) policy in 2007 to develop global-scale industrial clusters in the Petroleum, Chemical and Petrochemical sectors with world-class infrastructure.

By definition, a PCPIR is a specific investment region having a 250 square kilometres planned area for the establishments of manufacturing units through domestic and export-led production in Petroleum, Chemicals & Petrochemicals, along with the associated services and infrastructure [1]. The PCPIRs comprise capital and technology intensive projects and are likely to be operational within 10 to 15 years.

Resulting PCPIR is aimed to be a comprehension of production units, public utilities, logistics, environmental protection mechanisms, residential areas and administrative services. It would have a processing area, where the manufacturing facilities, along with associated logistics and other services, and required infrastructure will be located, and a non- processing area, to include residential, commercial and other social and institutional infrastructure. Each PCPIR would have a refinery or petrochemical feedstock company as an anchor tenant. The external infrastructure linkages will be provided by the Government of India and the concerned State government. This infrastructure will be created or upgraded through Public-Private Partnerships (PPPs) to the extent possible. Central Government provides the necessary Viability Gap Funding (VGF) through existing schemes.

The PCPIR at Dahej is spread over 453 Sq. Km. of the area in the Gulf of Khambhat (Cambay), in Bharuch District in South Gujarat in close vicinity of other chemical estates and onsite chemical port terminal & LNG terminal. Thus, along with its robust business environment, policy support by government, strong talent pool and entrepreneurial culture, the state is poised to further build on its leadership position in the chemical industry in the way ahead. The influenced area of 150 km on either side of DFC is being developed as “Delhi Mumbai Industrial Corridor” (DMIC). Bharuch- Dahej industrial area lies within 50 km of the Dedicated Freight Corridor in southern Gujarat. State government identified 82 links in the DMIC (which includes Bharuch also) Influenced area to upgrade them into Four lane carriageway offering connectivity between ports, industrial estates, hinterlands, markets and points of agricultural produce. The emergence of PCPIR (Petroleum, Chemicals & Petrochemicals Investment Region), Dahej SEZ and passing of DMIC are expected to further fuel the industrial and economic growth of the district [2].

#### V. DEVELOPMENT PLAN AND LAND USE

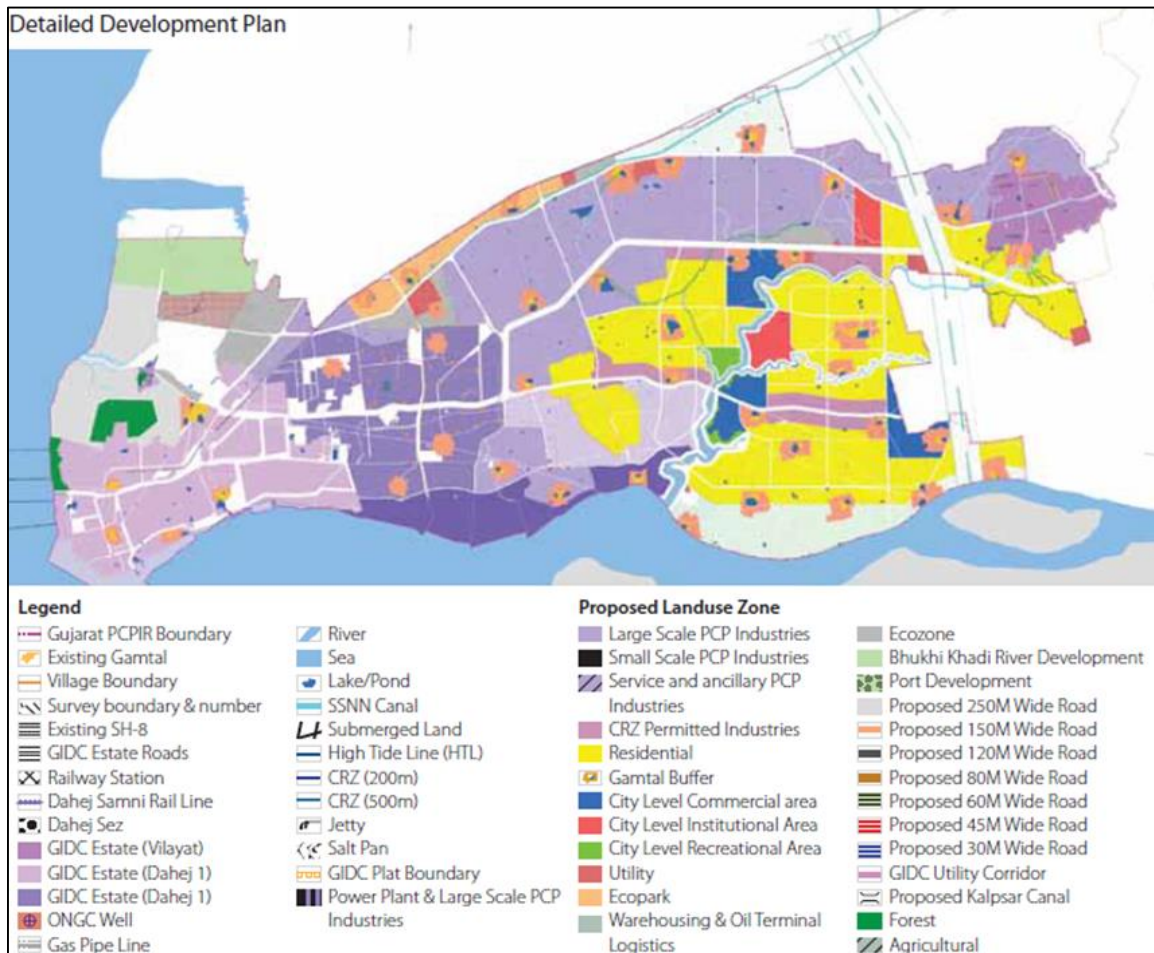


Fig. 2: Dahej PCPIR Land use

The rest of the land covers the non-processing area. It includes for residential areas in individual nodes, commercial spaces, institutional areas, spaces for recreation and mixed land use. It also covers the spaces of eco-park and ecozones, river development proposals, forest and agriculture reserves, utility pockets, roads and Gamtal areas. About 4.4% area of land is comprising the natural water bodies which will be preserved. About 13% of the total earmarked land is available for development of projects related to housing and commercial, recreational and institutional activities. Below image shows the proposed land use in the PCPIR area. Followed by a table illustrating the break-up of the proposed land use.

## VI. INDUSTRIES AT DAHEJ

The Dahej PCPIR has attracted an investment of around of about USD 25 billion so far. When asked to make a list of the visible results and benefits arising from the above-mentioned programmes of the Departments in support of PCPIRs, the Department furnished its response in writing as: "It is difficult to apportion event wise outcome in terms of investment etc, however, as per the information received from State Governments the total investment made in the four PCPIRs as of March 2014 was around Rs. 1.48 Lakh crore which has reached to around Rs. 1.60 Lakh crore by end of March 2015. The employment generated has reached from 2.22 Lakh to 2.23 Lakh during the same period. In case of Dahej PCPIR 360 MoUs have been signed during Vibrant Gujarat events 2009 to 2015 and investment of around Rs. 41,000 crores has been made in PCPIRs as follows. MoUs/Investment Intention Forms (IIFs) were signed for development in Dahej PCPIR during various Vibrant Gujarat Summits:

- In Vibrant Gujarat Summit 2009, 69 MoUs were signed
- In Vibrant Gujarat Summit 2011, 151 MoUs were signed
- In Vibrant Gujarat Summit 2013, 79 IIFs were submitted
- In Vibrant Gujarat Summit 2015, 61 IIFs were submitted"

The Bharuch district is famous for industrial units and allied establishments. So far, in the district, there are 17 locations where GIDC has planned and facilitating various industrial establishments.

The proposed PCPIR at Dahej will comprise of a large number of process plants. Other infrastructure will be including water supply, effluent disposal arrangements and other social infrastructure facilities. Predominance will be of the chemical industries that are existing in the area as major industries, and there are 21 others medium and large-scale industries existing in the PCPIR region.

## VII. DEMOGRAPHICS AND POPULATION PROJECTIONS

To understand the demographics of the PCPIR Dahej region, the population of all 44 included villages was obtained and studied for the decades of 1961 till 2011. Growth rate (natural) of the population was found to be about 17% per decade. A summary of population analysis is presented herewith. The declining rate of household (family) size indicates that the presence of a single person (mostly male) is increasing. However, the fact is well reflected in the share of male persons in the decades of 2001 and 2011 in the total population. The latest Census record has reported the sex ratio to be 835 which is comparatively low to the sex ratio of 919 (Gujarat state) and 940 (India). The society in PCPIR Dahej is dominated by male, apparently, skilled and non-skilled workers. Based on the observations on the past decadal populations, a projection with a moderate growth rate of 17.17% per decade was considered. It helped in deriving the natural population forecast in the PCPIR villages. Below graph shows the population trend in the region.

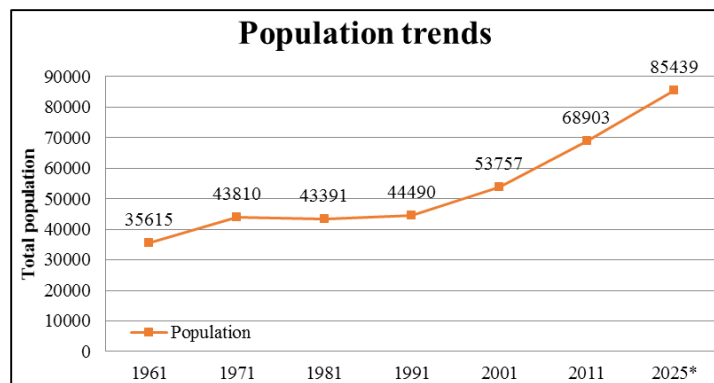


Fig. 3: Dahej population trend

After obtaining the natural growth rate-based population for the region, the horizon year 2025 will populate about 85,439 persons. As per trend in the nation, about 30% of persons if are engaged in economic activities, it will work out to be 25,632 persons. Further, if this population is subtracted from the projected employment of 8.00 Lakh, it derives that 7,74,368 persons will be immigrants in the region. By the year 2025, if about 40% of these workers establish their family living in the region, considering an average family size of 4.358 persons per household, the projected population reaches to about 13,50,500 persons. In addition to

it, the workforce of 4,64,620 will populate a scenario of accommodating 19,00,558 persons (including projected village populations and the effect of immigrants) in the Dahej PCPIR region.

### VIII. SOCIAL INFRASTRUCTURE - EXISTING SITUATION AND OPPORTUNITIES

Developmental activities in the industrial sector are required for economic development as well as the creation of employment opportunities (direct & indirect) and to meet the basic/modern needs of the society, which ultimately results in overall improvement of the quality of life through upliftment of social, economic, health, education nutrition status. However, at the same time, the industrial activities are also expected to generate/discharge different types of pollutants in the surrounding environment. In this manner, they may also lead to natural resource degradation, implemented in an environmentally sustainable manner through the implementation of pollution prevention mitigation and control measures and thus, all developmental projects have a direct as well as the indirect relationship with socio-economic aspects and public acceptability for new developmental projects.

All villages of PCPIR Dahej have primary schools. However, higher secondary school is there only in Dahej. Also, Adult literacy class/ centre is active in Keshrol and Eksal villages. Educational facilities are available up to high school. For higher studies, people avail the facility from the nearest town and district. There are 7 ITIs set up in the PCPIR and surrounding 30 km radial area. Also, a few Skill up-gradation centres set up by GIDC and private companies such as Essar, ABG Shipyard, L&T and so on concerning the development of specific need-based skills. Most of the villages having Child welfare centre, Medical facilities concerning community health workers are available in some of the villages, primary health centre and health sub-centres are adding the medical facility in the villages. Drinking water source is water taps, tank water, tube well, and hand pump. For the industrial establishments in the SEZ, the GIDC supplies 33 MGD raw water drawn from the Narmada river, and GWSSB provides drinking water through the Narmada Canal. The proposals include a 100 MGD new water supply network along with a separate water supply network of 20 MLD in SEZ. The O&M of water infrastructure will be carried out through an SPV - Gujarat PCPIR Services Ltd. (JV of GIDC and Multi ManTech).

Communication facility is excellent in the study area. A network of BSNL and private companies including the WLL - BTS available at Dahej and Vagra. The proposals include for the Broadband (Tier II) and Broadband (DSLAM) along with Wi-Max facility to be provided by BSNL. Transportation facility in these villages are run by G.S.R.T.C which is regular and reasonably good. Some of the villages have tar (Pucca) roads and unpaved (Kuchha) roads. All villagers have electricity, but there is constant load shading. However, the Power available from Gujarat Urja Vikas Nigam Ltd. from 220 KV sub-station, linked with the state grid by 220 KV circuit line is made available. The proposals include a 1500 MW gas-based by Torrent Power, co-developer of Dahej SEZ (construction started) and a 2640 MW coal-based by Adani Power (construction started).

Sanitation facilities are inferior in these villages. No gutter and garbage disposal facilities are available in the villages. Gram Panchayat have not taken any initiative to improve the sanitary conditions of the villages. People generally dump the waste outside their houses because of which several health problems have developed in the regions. For food preparations and other needs, mainly the wood is used as fuel since the availability of LPG is a constraint. It has been indicated that the general prevailing diseases in the PCPIR Dahej villages are malaria, diarrhoea, dysentery and viral fever, which could be attributed to improper sanitation. People do not have access to appropriate hygiene and sanitation facilities nor do they take care of improving the surrounding. Health status of the region will deteriorate to some extent due to increased pollution in the region during the construction phase.

Opportunities are identified for different social infrastructure facilities based on the ideal requirement derived through the use of URDPFI guidelines, 2014. A derivation of existing facility and difference of matching the URDPFI guidelines (Gaps) for the year 2011 and projected population of the year 2025 is obtained. The education facility only considers for a population without the effect of the workforce. Various tables below show the derivations of social infrastructure potentiality for development. Based on population projection scenario for the horizon year 2025, the gap (or projected population-based requirement) in the social infrastructure are identified that is reflected in the scenario-2 (S1). The Scenario-1 (S2) and Scenario-3 (S3) show the differences for 25% conservative (S2 - lower by 25% of the population) and superlative (S3 - higher by 25% of the population) projected requirements.

<i>Social Infrastructure – Educational Facilities</i>										
<i>Categories</i>	<i>Sub categories</i>	<i>Population served per Unit</i>	<i>Area requirement</i>	<i>census 2011</i>	<i>Required</i>	<i>GAP as per 2011</i>	<i>assume for 2025</i>	<i>GAP as per 2025-S1</i>	<i>GAP as per 2025-S2</i>	<i>GAP as per 2025-S3</i>
<i>Pre-Primary to Secondary</i>	<i>Pre-Primary</i>	2500	0.08 ha	0	28	28	575	575	570	950
	<i>Primary School</i>	5000	0.40 ha	55	14	-41	287	232	285	475
	<i>Senior Secondary</i>	7500	1.80 ha	11	10	-1	253	242	190	316
	<i>Integrated School (without hostel facility)</i>	90000 - 1 Lakh	3.50 ha	0	n		15	15	15	23

	integrated School with hostel facility	90000 - 1 Lakh	3.90 ha	0	n		15	15	15	23
	Schools for Physically challenged	45000	0.70 ha	0	2	2	32	32	32	52
	Schools for Mentally challenged	10 Lakh	0.20 ha	0	n		2	2	1	2
Higher Education	College	1.25 Lakh	5.00 ha	0	n		12	12	11	19
	University Campus		10.00 - 60.00 ha	0	n			0	0	0
	ITI-A	10 Lakh	4.00 ha	1	n		2	1	1	2
	ITI-B	10 Lakh	4.00 ha	0	n		2	2	1	2
	Engineering College	10 Lakh	6.00 ha	0	n		2	2	1	2
	Medical College	10 Lakh	15.00 ha	0	n		2	2	1	2
	Other Professional colleges	10 Lakh	2.00-6.00 ha	0	n		2	2	1	2
	Nursing and Paramedical Institute	10 Lakh	2000 Sq. Mts.	0	n		2	2	1	2
	Veterinary Institute		availability of land	0	n			0	0	0

Social Infrastructure – Health Facilities										
Categories	Sub categories	Population served per Unit	Area requirement	census 2011	Required	GAP as per 2011	assume for 2025	GAP as per 2025-S1	GAP as per 2025-S2	GAP as per 2025-S3
Health	Dispensary	15000	0.08 - 0.12 ha	21	5	-16	127	106	95	158
	Nursing home, child welfare and maternity centre	45000 - 1 Lakh	0.20 -0.30 ha	0	2	2	19	19	14	23
	Polyclinic	1 Lakh	0.20 -0.30 ha	0	n	-	19	19	14	23
	Intermediate Hospital category-B	1 Lakh	1.00 ha	0	n	-	19	19	14	23
	Intermediate Hospital category-A	1 Lakh	3.70 ha	0	n	-	19	19	14	23
	Multi-Specialty Hospital (NBC)	1 Lakh	9.00 ha	0	n	-	19	19	14	23
	Specialty Hospital (NBC)	1 Lakh	3.70 ha	0	n	-	19	19	14	23
	General Hospital (NBC)	2.5 Lakh	6.00 ha	0	n	-	8	8	6	9
	Family Welfare Centre	50000	500-800 Sq. Mts.	0	2	2	38	38	28	47
	Diagnostic centre	50000	500-800 Sq. Mts.	0	2	2	38	38	28	47
	Veterinary Hospital for pets and animals	5 Lakh	2000 Sq. Mts.	1	n	-	4	3	2	4
	Dispensary for pet animals and birds	1 Lakh	300 Sq. Mts.	0	n	-	19	19	14	23
	Rehabilitation centres	-	as per requirement	0	n	-		0	0	0

Social Infrastructure – Socio-Cultural Facilities										
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Categories	Sub categories	Population served per Unit	Area requirement	census 2011	Required	GAP as per 2011	assume for 2025	GAP as per 2025-S1	GAP as per 2025-S2	GAP as per 2025-S3
Anganwadi - Housing area/cluster	-	5000	200-300 Sq. Mts.	44	14	-30	380	336	285	475
Community Room	-	5000	750 Sq. Mts.	31	14	-17	380	349	285	475
Community hall, mangal karyayala, barat ghar/library	-	15000	2000 Sq. Mts.	6	5	-1	127	121	95	158
Music, dance and drama centre	-	1 Lakh	1000 Sq. Mts.	1	n	-	19	18	14	23
Meditation and spiritual Centre	-	1 Lakh	5000 Sq. Mts.	0	n	-	19	19	14	23
Recreational Club	-	1 Lakh	10000 Sq. Mts.	0	n	-	19	19	14	23
Old age home	-	5 Lakh	subject to availability of land	0	n	-	4	4	2	4
Religious Facilities	At neighborhood / housing cluster level	5000	400 Sq. Mts.		14	14	380	380	285	475
	At sub city level in urban extension	10 Lakh	4.00 ha	0	n	-	2	2	1	2
Other Facilities	Orphanage/ Children's Centre	10 Lakh	subject to availability of land	0	n	-	2	2	1	2
	Care centre for physically /mentally challenged	10 Lakh		0	n	-	2	2	1	2
	Working women – men hostel	10 Lakh		0	n	-	2	2	1	2
	Adult education centre	10 Lakh		0	n	-	2	2	1	2
	Night Shelter	10 Lakh		0	n	-	2	2	1	2
	Socio – Cultural centre/ Exhibition cum fair ground	10 Lakh	15 ha	0	n	-	2	2	1	2
	Science Centre	10 Lakh	as per requirement	0	n	-	2	2	1	2
	International Convention Centre	city level		0	n	-	1	1	1	1

Social Infrastructure – Open Spaces/ Recreational Facilities										
Categories	Sub categories	Population served per Unit	Area requirement	census 2011	Required	GAP as per 2011	assume for 2025	GAP as per 2025-S1	GAP as per 2025-S2	GAP as per 2025-S3
Organized Green	Housing Area Park	5000	0.50 ha	-	14	14	380	380	285	475
	Neighborhood park	15000	1.00 ha	-	5	5	127	127	95	158
	Community park	1 Lakh	5.00 ha	0	n	-	19	19	14	23
	District park	5 Lakh	25.00 ha	0	n	-	4	4	2	4
	Sub city park	10 Lakh	100.00 ha	0	n	-	2	2	1	2

Multipurpose Grounds	Sub-city level multipurpose	10 Lakh	8.00 ha	0	n	-	2	2	1	2
	District level multipurpose	5 Lakh	4.00 ha	0	n	-	4	4	2	4
	Community level Multipurpose	1 Lakh	2.00 ha	0	n	-	19	19	14	23

Social Infrastructure – Sports Facilities										
Categories	Sub categories	Population served per Unit	Area requirement	census 2011	Required	GAP as per 2011	assume for 2025	GAP as per 2025-S1	GAP as per 2025-S2	GAP as per 2025-S3
Residential unit play area	-	5000	5000 Sq. Mts.	14	14	0	380	366	285	475
Neighborhood Play area	-	15000	1.50 ha	0	5	5	127	127	95	158
District Sports Centre	-	1 Lakh	8.00 ha	0	n	-	19	19	14	23
Divisional Sports Centre	-	10 Lakh	20.00 ha	0	n	-	2	2	1	2

Social Infrastructure – Distribution Services Facilities										
Categories	Sub categories	Population served per Unit	Area requirement	census 2011	Required	GAP as per 2011	assume for 2025	GAP as per 2025-S1	GAP as per 2025-S2	GAP as per 2025-S3
Petrol/ Diesel filling and Service Centre	-	As required	270-1620 Sq. Mts.	0	n	5	-	25	-	-
Compressed Natural Gas filling station	-		1080 Sq. Mts.	0	n	2	-	10	-	-
LPG station	-	40000 - 50000	520 Sq. Mts.	0	2	2	38	38	28	47
Milk Distribution	-	5000	150 Sq. Mts.	0	14	14	380	380	285	475

Social Infrastructure – Police, Civil Defense & Home Guards (Safety & Security services)										
Categories	Sub categories	Population served per Unit	Area requirement	census 2011	Required	GAP as per 2011	assume for 2025	GAP as per 2025-S1	GAP as per 2025-S2	GAP as per 2025-S3
Police Post	-	40,000 – 50,000	0.16 ha	-	2	2	38	38	28	475
Police Station	-	90,000	1.50 ha	-	n	-	22	22	15	25
Traffic and Police Control Room	-		as required	-	n	-	1	1	1	1
District office and battalion	-	10 Lakh	4.80 ha	-	n	-	2	2	1	1
Police line	-	20 Lakh	4.00 - 6.00 ha	-	n	-	1	1	0	1
District Jail	-	10 Lakh	10.00 ha	-	n	-	2	2	1	2
Civil defence and home guards	-	10 Lakh	2.00 ha	-	n	-	2	2	1	2
Police Training Institute	-	city level	5.00 ha	-	n	-	1	1	1	1
Police Firing Range	-	city level	up to 10.00 ha	-	n	-	1	1	1	1
Police camp including Central Police Organization/ Security Forces	-	-	up to 10.00 ha	-	n	-		0	0	0



Police Booth	-	-	10-12 Sq. Mts.	-	n	-		0	0	0
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Social Infrastructure – Safety Management Facilities										
Categories	Sub categories	Population served per Unit	Area requirement	census 2011	Required	GAP as per 2011	assume for 2025	GAP as per 2025-S1	GAP as per 2025-S2	GAP as per 2025-S3
Sub fire station/ Fire Post	-	within 3-4 km radius	0.6 ha	-	10	10	10	10	10	10
Fire Station	-	2 Lakh population or 5-7 km radius	1 ha	-	n	-	10	10	10	10
Disaster Management Centre	-	one in Each Admin Zone	1 or 2 ha	-	1	1	1	1	1	1
Fire Training Institute/ College	-	city level	3 ha	-	1	1	1	1	1	1

Table 2: Social infrastructure gap identifications

## IX. CONCLUDING REMARKS AND DISCUSSION

The area will become a business centre because of the proposed action which would stimulate the growth of market and trading with more shopping centres leading to regional development. There would be assured growth in the revenue generation and economy at local, regional, state and national levels. Due to the proposed project, there would be overall development of the area, which will improve the quality of life of the people in the region. There is an expected Increase in the competitiveness of products and services. The proposed PCPIR project would enhance the export activity & would bring in improvement in the national economy. It is likely that during the construction period, there will be some short-term socio-economic impacts, mainly due to floating population (contractual labour), producing marginal strain on civic amenities like drinking, sanitation, road transport and other associated infrastructure. Also, post-construction, there will be migrated workers settled in the PCPIR Dahej residential townships and generate pressure for natural resources and seek for social infrastructure.

Of the total worker, if it is assumed that about 40% are residing with their families, the total projected population will be 19,00,558 persons by the year 2025. Employment in the tertiary sector is expected to be improved in the region. There would be an increase in the commercial, business and shopping centres due to an influx of population in the region to cater to the needs of the existing population as well as the immigrants. It shall result in indirect benefit to the local people by providing opportunities for starting small/medium scale business in trade and commerce. It shall also create an opportunity in the education sector. Augmentation in the health facilities will be required. Also, improvement in the Banking and postal sector of operations will also be needed. Increase in infrastructural activities concerning the development of the region will undoubtedly increase the livelihood of people and thereby the region. Also, to confront the unemployment problem, encouragement for cottage industries, handicrafts and small-scale industries by way of giving interest-free loans or low-interest loans to rural people could be a kind gesture. In the name of entertainment, at present, there exists no facility, and hence, there lies a tremendous opportunity for future sectoral potential through various projects such as theatre, malls, multiplexes, clubhouse, religious complexes, recreational space and so on.

## ACKNOWLEDGEMENTS

The authors appreciate for the support of the Principal, BCHS- APIED, The Principal, BBIT Polytechnic, Vallabh Vidyanagar. The authors are thankful to Shri Nilesh Gajera, My Real Estate for extending supporting documents about the Dahej PCPIR.

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