

SOME PERSPECTIVES ON SEAPORT CITIES

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ABSTRACT: Seaport cities are artifacts of seaports. Its growth depends on seaports. Unless the growth is regulated cost-benefit ratio will be a minimum. Seaport cities are either evolutionary and/ or creations. Seaport cities develop based on long term perspective plans. Seaport cities are discussed under perspectives of geology and geomorphology, environment, demography, human resources, infrastructure, polity, economics, international aspects, etc. Growth dynamics of seaport cities is dependent on all stake holders' viz., citizens, rulers, and port users. In this paper conceptual ingredients of a seaport city and necessary components of its management are discussed.

Keywords: Seaport, seaport city, Seaport city concept, Seaport city management, seaport city dynamics

INTRODUCTION

Seaport city is defined as a sea waterfront city serving the seaport. Seaport cities are artifacts of seaports; they are designed, structured and made functional by both business and businessmen of nearby ports. The concept of seaport is a naturally evolved one from time immemorial as and when man wanted to explore sea, seeking seafood and other material. As activities rise in seaport, cumulative growth is seen in the growth of adjoining locality into a seaport city. Seaport cities owe its genesis to several factors which are operating the seaport. Seaport and seaport city, as per modern concept, are considered as a pair. Planners give due weightage to seaport city while seaport is being planned. This is because seaport city is the hub that governs the hustle and bustle of seaport. UNESCO recognized Valparaiso port as heritage site due to its age-old existence. In this paper are given the seaport city concept and seaport city management. Fisher (2013) compares a portcity to a human heart as it imports and exports. So development of the country depends on the functionality of the seaport city.

SEAPORT CITIES OF THE WORLD

Internet resources reveal that at least 4951 port cities might be serving equal number of seaports as of 2017 (World port sources, 2017). Nineteen geographic regions covering 196 countries share these ports and port cities. Table 1 presents the number of countries and ports regionwise. Necessity and natural justice has taken care of 44 landlocked countries to get linked to neighbouring countries' ports by rail and road. UN has also provided legal support through its UNCTAD (1990). Mostly seaport-city pair occurs with one to one correspondence.

1 SEAPORT CITY CONCEPT

SEAPORT CITY – BY EVOLUTION OR CREATION?

As man's needs grow gradually seaports and seaport cities grow by evolution. When his needs grow unbound exponentially seaports and seaport cities are created to match the demand. It is certain that seaport upcoming in a remote coastal village will also experience labour pain in developing that village for a rebirth into an urban city or metro.

Historical seaports and corresponding cities were developing in stages whereas modern day seaport cities are being developed in short durations of time with the help of technology. Technology enhanced growth of seaport cities is never comparable with any in the past. In the historic times natural (geomorphological) indentations of coasts viz., rivers' mouths and bays served as harbours. But now sea water enclosures are created by building piers and wharfs to develop harbours. Similarly naturally developed harbours, too, are extended by artificial compartments into very large ones.

Table 1 Number of countries and number of seaports in different geographic regions of the world

S. No.	Geographic region	No. of countries	No. of seaports
1	North America Northern	4	814
2	Africa	5	84
3	Eastern Africa Southern	8	30
4	Africa	9	51
5	Western Africa Central	20	72
6	America	8	83

7	South America	15	316
8	Eastern Asia	7	498
9	Southeast Asia	10	290
10	Southern Asia	6	93
11	Western Asia/ Middle east	19	146
12	Caribbean	25	170
13	Eastern Europe Northern	9	160
14	Europe Southern	12	931
15	Europe Western	11	594
16	Europe	7	409
17	Micronesia	7	15
18	Oceania	14	195
Total		196	4951

After World port sources 2017.

Naturally originated seaports and adjoining natural seaport cities as time passes will wear a complex look and are to bear congestion whereas in artificial seaport-city pair transport networks and other structures will be systematic enabling faster transfer of men and material and promoting convenient living. AIVP (2012) kept its motto as “transforming ports changing cities” for its conference; so as to accommodate or to meet the needs of a port people transform it and either they change or the city itself gets changed to adapt to its transformed port. Necessity of dialogue between city and port has been reiterated even in AIVP 15th conference (2016).

Majority of large cities of the world do have supporting seaports. And the rate of its growth can also be attributed to the seaport merchandize. Ports are fed by hinterland and port cities are served by ports.

HUMAN TENDENCY

Any concept, for that matter, including seaport and seaport city development and management, needs to include human behavioural component to become concrete and successful and further to be time-tested. By doing so the concept certainly would have incorporated the human tendency in all activities that govern both self and public. It is sure if man's money, energy, and time are taken care of. Man is greedy for money; he wants to spend less energy; he wants to do things quickly. Basically he wants to maximize his income while minimizing energy and time expenditure. This attitude makes man to choose short cuts both at his office and at home. So he will not prefer low revenue – high effort – long term projects and activities.

LOCATION AND SPACE

Irrespective of whether the port is natural or artificial the hinterland is to develop as a city. City bordering the waterfront is the most favoured location of the world. People of all sorts would like to live on the shore or close to the shore. A shore based city offers people a wide variety of residence, employment and recreation.

When a seaport starts to shape up all directly or indirectly linked activities and fulfillment also gears up. On one side men and material move; on the other side attendant problems stem up. The transformation of a rural hamlet located on a sandy coast into sprawling and skyscraping metropolitan city will not be smooth and steady. Its roadmap will be bumpy and full of pit-falls.

While shore and offshore areas are required for ship operations adjoining onshore areas are very much needed for port facilities and stocking yards. After the advent of container concept and tower cranes large open space became essential. Similarly, warehousing of various import export items and handling systems like coal conveyors and oil tankers necessitated vast land space. Paved ways for transport of oversized vehicles, parking lots, lumbering areas, transitory storing places for cars, granites and grains alike also require space.

HERITAGE BUILDING

Man is always interested to learn history of his surroundings; he wants to upkeep remains of the past also. Such heritage boasting museums will inspire young and old alike to be proud of their port-city and they will feel a “ownership” of the city in which they live. Such feelings will make them take part in the port-city activities. AIVP (2012) set out the concept behind the ‘Port Center’. The concept represents a programme of social integration that encourages the main stakeholders of port cities to devise more educational initiatives to raise awareness of the port, its activities and its tasks. The establishments of centres such as port centre provide means to make people aware of port activities and their role as citizens.

DEMOGRAPHIC DYNAMICS

Seaport city will experience hardships due to implications of population dynamics. Population includes native, migratory and floating categories. Further, socioeconomic conditions of local populace and migrated people shall naturally match with the development of big projects like seaport. Both poor and rich would live in harmony because of the mutual dependency. Rich spends money; poor discharges services.

It is not only population in a port-city is going to increase but also several attendant issues along with the development of a port. Native population is the most sufferers because they are dislocated due to the land acquisitions. Space occupying projects such as wagon and container terminals, fuel tanks and stock-yards are further driving away the local settlers, equally raising the land value. Also it is true that people with sentiment and want to live in the same area (now turned prime area) are by hook or crook and sometimes with muscle power are thrown out of the land.

Employment, trade and other infrastructural facilities will attract populations from far off places to settle in and around ports leading to the multidimensional growth of seaport cities. They are threat and competitors to native populace on many aspects. 'Squared city' will treat the works previously done by local people as illegal and the same act will also become punishable. Natives face rising land cost, rent, prices of commodities, competition in employment and other opportunities for example, education. Number of schools will never match the need of both native and migratory populations especially in populous countries like India.

HUMAN RESOURCE

The operation of a seaport depends on human resources. It involves information and material flow. By the unfaltering effort of humans the transfer of cargo from consignor to consignee properly takes place.

Manpower includes a variety of skilled (and expert) and unskilled hierarchically varying personnel. AIVP's (2016) 15th conference concluded with a note on social innovation's 75% contribution and human capital agenda for the growth and development of port and its cities. A port's management involves a host of process elements viz., ministerial and judicial activities, customs and clearance, lading and unloading, transport, safety and security, cargo handling, vessels management, berthing and parking, meteorological, oceanographical, geological, geomorphological, engineering and environmental activities, labour management, fishing, natural disaster preparedness and mitigation, warehousing, and other hundreds of activities.

All these process elements require manpower to be operational. Labour management governs all spheres of manpower starting from recruiting to retirement through staff welfare and legal proceedings.

Peripheral activities such as insurance bring in additional people.

It follows that such huge force of men (and women) require welfare measures like food, healthcare, sanitation, etc. within the premises of the port-cargo-containers-vessels.

At this juncture, due attention is to be given to handle mass psychology of employees of the port residing in the seaport cities. Frequent strikes and agitations crop up frequently spontaneously and also under instigation. As these are sure to affect the function of the port and normal activities of the port cities, such protests need to be avoided either through conciliatory talks and/or through legal proceedings.

POLITICS AND GOVERNANCE

Generally the very siting of a seaport commences from congressman hailing from coastal areas rather geologists and economists involvement. He or she may insist a seaport in his or her location to improve the economic and living conditions of local people. The same pull locates a seaport in an unsuitable area compared to a more suitable area in adjacent areas. Such wrong location of the port is inevitable as politicians are final deciding authorities in any public projects. In most of the world coastal zones are declared as federal property. In such cases, allocation of land for seaport will not be a problem; whereas if lands from private owners are to be acquired elaborate procedures including acquisitions become inevitable.

National and international issues generally crop up which require careful tackling. Larger the extent of sea lesser is the problems. Within the limits of territory seaport might have been established.

Seaport duties, taxes and other costs are under the politicians' nose.

Single window systems are most preferable for both payment of taxes and other clearances as well.

EMPLOYMENT

A ship is made to sail means provision of employment at all levels: literate-illiterate; skilled-unskilled and brokers. Direct and indirect employments are generated. Just road connectivity to port would trigger the self-employment. (A case study: Tuticorin city bypass connecting port and hinterlands of Madurai and Trichy when laid it was a barren and dull length. But as of now, the road stretch is bustling with hundreds of shops, automobile workshops, tube vulcanizers, eateries and other amenity providers; mostly of self-employed stalls. In this development there is no hand of government and port. It is the result of provision of just road. Local and nearby populace have ventured into starting small but own businesses of their might and meeting the commuters' need.) Tei (2012) concluded on the correlation of port throughput to the regional employment potential.

WITHIN THE GLOBAL FRAMEWORK

In the days of GATT and globalization many people have been forced to choose a new profession for living. Several are able to sustain this test of time. Failed ones end up as menial servants in the houses of new bosses. Global patents and IPR swindle native's several practices and products before they realize. Similarly in today's market driven economy poor are made to live in "concentration camps" of mega cities.

SCIENCE AND TECHNOLOGY

Natural seafloor geomorphology is an output of slow and steady long term balance of erosion and deposition of sediments influenced by sea waves and currents. Such delicate equilibrium is collapsed due to rapid deepening in port building. This will have a reflective effect along the beach in the near port area or in a far off place. It warrants a thorough geological consultation to predict coastal geomorphologic changes.

Import-export component of seaport is to be evaluated from both economic and geologic points of view. Economics look at it from fiscal framework whereas geological appraisal looks at it from the land use and stability points of view.

Until land is under cultivation, it recharges groundwater. When cultivation yields to real estate the ground gets destabilized. Removal of groundwater compacts the ground resulting in sinking and/ or downwarping. Landslides and earthquakes are imminent dangers as loading on the ground increases due to urbanization and seaport import-export loads. (It is a case of isostatic adjustment of earth parts.)

Unless there is a land regulatory authority because of migratory population's large land requirements modify land use pattern itself. It is common even in growing urban and suburban areas. Paddy fields give way to concrete jungles. For a country land is small and dear it cannot be unconcerned over the conversion of fertile lands into urban areas as it will affect its food security in the long run. Urbanization influences the food reduction and groundwater potential. Paved areas prevent water percolation which leads the dwindling recharge of groundwater. Over exploitation of groundwater is also an inevitable situation in a growing urban city.

In cities developing in tune with the upcoming seaports sea-view tall buildings mushroomingly rise. Line-up of such tall buildings modifies wind patterns acting barrier to wind. Systems of land breeze and sea breeze are disturbed by these wind barriers.

Seismic proof designed and deep rooted buildings ensure stability of the buildings at the same stability of the patch of ground, over which such tall buildings stand, is lost or at least partially affected. It continues to modify nearby plate boundaries. Apparently and in comparison with the lithospheric plates dimension it may be insignificant. But balance is upset by small and long duration effect on local pressure regimes.

Increasing number of floating objects such as ships and other platforms raise the sea levels as sea water is to be distributed when the basin volume is constant. These floating objects including war ships bring in minute inequilibrium condition to the sea level which is further modified by local instability of slopes of coastal tracts over which seaport cities stand. Apparently, this may seem trivial; the "butterfly effect" could be referred to realize this fact (www.fractalfoundation.org).

Plate tectonics, city mass, floating vessels' volume, cargo mass on shore, all interact and originate a complex pressure and adjustment force regimes.

2 SEAPORT CITY MANAGEMENT

INTRODUCTION

World Bank has published a port reform toolkit for the benefit of seaport administrators who design, plan, budget and erect port (World Bank, 2007). It is a good reference, though it is meant for seaport, for those who want to administer seaport city as seaport and the seaport city are mutually dependent entities. It is high time that managers of port-city take stock of dwindling benefits and interdependence of port and port-cities (Ducruet, 2011). The transformation of a city port to portcity and further to megalopolis is by the growth of the port in the beginning. Later maritime city blossoms into metropolitan with its own functional entities.

The success of a port depends on the capacity of generating cargo and transshipment traffic of that port's hinterland (World Bank, 2007).

TOOLS OF THE TRADE

Management of the inseparable pair of port-city shall be optimized by applying systems analysis, econometrics, fuzzy logic and such other models based on Geographic Information Systems. However, these models require a strong data base on port and portcity activities. It is not enough if data is generated but data warehousing and data mining would be of immense use in the governance of port-cities. Several solutions and ways will emerge and help managers to maintain port-cities in a more efficient manner saving time and resources.

HOLISTIC SYSTEMS ANALYSIS

A new "urban science" is to be contemplated "to build a better city future" as it involves complex challenges that can be resolved by means of transdisciplinary and systems approach.

Systems analysis views the port and the port-city as a whole with holistic approach. It analyses the port-city pair's states, links and processes in terms of input – throughput – output components within the domains of time and space. Econometrics provides the behaviour pattern of above system components in a given situation. By carrying out sensitivity analysis of port-city parameters improvements in efficiency may be attained. Fuzzy logic is yet another mathematical model to solve problems which arise due rolling plans and spilling compartments. That is designated compartments may have fluid boundaries wherein rigidity is lacking. A continuous and gradational change is envisaged. Under this vision port-city's demand and supply may be dealt with.

Higher the port efficiency higher is the regional development; to improve port efficiency the following are suggested: enhance technical efficiency; increasing the size of the port; and quantum of throughput.

RESOURCE MOBILIZATION

The growth of port-cities is founded on resource mobilization. Resource dimensions are fiscal, infrastructure, manpower, and supplies. Optimized spending of money, well balanced full utilization of infrastructure, proper delegation of manpower and rational distribution of supplies and all these at timed delivery would result in peace and prosperity of both the port and the portcity.

FINANCE

Sizeable capital investment is required for the establishment of connectivity from port to portcity and hinterlands. Although it is portcity managers' concern to provide connectivities unless port itself makes a contribution the growth will not be as expected and in turn it will affect port efficiency, even. Private hands may be encouraged to invest for development of portcity through different operation and functional modes like PPP and BOT. World Bank realizing the need to support port and port-city

in a global context has devised suitable programmes of funding. Market analysis will further strengthen the finance portfolio of port and port-cities. A due weightage is to be given to upkeep of schedules as delays draw more funds and financial setbacks.

REVENUE ANALYSIS

Periodical review of throughput of port and its impact on its hinterland would reveal the health of the portcity. Joint resolutions of administrators of both port and portcity would bring in the desired results and the economic growth. Optimal use of resources could sustain the port and portcity.

ROLLING PLANS

Rolling plans give a shelter to underutilization of funds. However, in such instances caution is to be exercised against excessive spilling of time frame.

FLEXIBILITY

When national ports are to follow acts and rules of the port and the central and state governments, flexibility, in resolving ties and issues, does not have a place. At the same time, flexibility attracts clientele and passengers towards ports. For example, port funds, strictly speaking, shall be used for the development of port's premises. But, as port's traffic is linked with hinterland's infrastructure and other supports, port is to consider for investing its money on the infrastructure of the feeder areas.

ENVIRONMENTAL AUDIT

It is of great importance to alleviate the fear of portcity citizens from the environmental angle. Environmentalists and public with environmental concern raise voice against polluting developmental activities. Well planned and balanced actions through emerging concepts of green city will save the authorities. It is true that no developmental activity is possible without environmental implication. However, environmental mitigation measures provide a cushion. It is not enough if environmental care is taken it will be complete in real world terms when environmental awareness is created and disseminated among common man.

Environmental conservation is a way out of emerging pollution troubles. The concept of three R's i.e., *reuse, recycle, reduce* shall be built in the design of the port-city pair itself which is sure to bring in environmental cleanliness. Land reclamation within port limits and portcity limits through dumping of dredge soil benefits both port and portcity, as in the case of V.O. Chidambaranar Port, (New Tuticorin Port) Tamil Nadu, India where dredged material is dumped along the coast and new land is created for harbor use (Natural shoreline is modified and shifted towards offshore).

SEAPORT CITY ARCHITECTURE

Seaport city may grow meeting the demands of seaport. If so, later, the city will suffer from non-cost effective situation and haphazardly grown posing traffic and other problems. One such instance is, people will erect their housing at a place where no streets, no power, no drainage are available. Village administration will spend large public resources to provide above facilities to such a disorientedly grown city.

Seaport authorities and/ or people at governance of the region may take initiative and develop hinterland of the upcoming seaport in a planned and architecturally designed manner to optimize the use of resources for the present and the future. So, the seaport city will have necessary infrastructure and enable faster movement which is a prime factor in seaport development and sustenance.

INFRASTRUCTURE

Following the land acquisition port managers turn their attention towards rail and road networks as they are the arteries of harbours; bypassing populous locations, broad and all weather and heavy weight roads need to be laid enabling faster mobility of oversized vehicles with high (tall) dimensional loads. Ports shall be made capable of receiving Triple E class of vessels and port cities shall be able to carry contents of such giant vessels. Rail networks take care of movement of wagons. Air terminals and sea terminals connectivity by rail and road serve better for international trade. Long and High cube containers need special road clearance for being transported.

BUILDER-MODES

Developments of large projects like seaport and seaport cities are possible through public only or public private partnership (PPP) or private only. Nowadays people realize PPP is a better option for projects involving huge investments and early completion. Since decisions are made by committees under distributed risk factor public domain involves wastage of time. In private, decisions are faster as decision making power and risk rest with one man – the boss. Many-a-times, taking risk, he ventures out to decide on oral acceptance which ensures faster growth. That is why private party involvement is encouraged though Build Operate Transfer (BOT) policy. A port may be built and revenue may be collected up to certain pre-agreed term period and after that the port will be transferred to public administration. This removes impediments arising due to obvious procedural delays by public administration.

TRAFFIC ANALYSIS

Regional economy is found to be associated with the port traffic in developed countries (Ducruet, 2013). Urban size plays a role in variety of port traffic. For a better understanding managers of port cities shall undertake data mining and analysis of available traffic data. Data analyses need to be integrated for a holistic view. Relative concentration indices are used to designate a city as general, maritime, city port, gateway and hub based on the ratio of container traffic to population; the boundary values for the same are as 0.33, 0.75, 1.25, and 3.00 correspondingly.

TAKING THE PEOPLE IN PORT'S STRIDE

In managing seaport cities, the importance of obtaining and acting upon feedback is of great significance. Unless people are made to trust that their opinion will receive due weightage, they will be reluctant to provide a feedback. So feedbacks must be made public and also the actions taken there upon the suggestions made in the feedbacks. This will further promote the habit of providing opinions and constructive criticisms over an issue or an activity.

It should be viewed that press and media and other nongovernmental organizations as feedback providers. In fact better ideas would come from such expressed opinions, if followed; they can bring in best solutions towards betterment of the functioning of the ports and port cities.

TURNAROUND TIME

Another important aspect of attraction to port users and portcity dwellers is the minimal turnaround time one has to spend in obtaining clearances, connectivity (power, communication, water and fuel), logistic support and licenses and including subsidies, if anything announced. Implementation of e-governance could help minimize turnaround time.

COMPETITIVE SPIRIT

Competitions do bring in functionality in a system. Competitions are obvious among ports of different countries. Ports of single nation also need to competitively function to improve upon their efficiency and economic growth.

Outdated management practices are cited as one of the reasons for the deteriorating health of a port (World Bank, 2007). It also warrants a participatory approach in the context of labour problems. Kerr (2008) reiterates the revision of maritime legislative agenda to suit the present needs of a port or portcity or both.

INFORMATION AND COMMUNICATION TECHNOLOGY

Application of information and communication technology is a must in today's parlance. People are carried away by the internet deluge. Everyone wants a pass by pressing a single button or key. Especially ICT saves money, energy and time. Correctness of data is also ensured. Anywhere anytime looking back and verification became possible. Except for vital aspects creation and production of physical documents can be given up.

Above all ICT demands elaborate arrangements for cyber security. If suitable mechanisms are devised and deployed, the system can escape from hackers.

In traffic monitoring and movement and instant communication ICT role is appreciable. It is always true that a proper communication and transport facilities bring in flourishing economy.

Even where a hard copy of physical document is necessary for certain clearance a fool-proof softcopy transfer or exhibit (with a conditional release against later production of the same) can be made acceptable to ensure faster processing.

In India railway tickets booked through online will be confirmed as mobile SMS and it is also made acceptable by ticket examiners to minimize the printing of tickets by passengers and thereby use of papers.

WAN and intranet would serve the port and save money, energy and time of stake holders.

TREND-CONSCIOUS

The port-city needs always be sensitive to changing trends in business and environment. Concepts of climate adept city, blue economy, industrial ecology, competitiveness, Innovation and other strategies usually drive cities to a new trend setting.

NATURE-COPING

Nicholls et al. (2008) reported that, after a study of 136 port cities, East and South Asian cities are vulnerable to coastal flooding. It was justified by the floods of 2005 experienced by populous cities viz., Mumbai, Guangzhou, Shanghai, Ho Chi Minh City, and Kolkata. Asian Development Bank, Japan International Cooperation Agency and the World Bank took stock of the situation in these cities (World Bank, 2010).

BLUE GROWTH

Although problems are the same for port cities across the world, cultural and institutional backdrops are different which require the transfer of experiences and equal efforts. At such circumstances blue economy models could be tried and tested. *"Respond to basic needs with what you have, introducing innovations inspired by nature, generating multiple benefits, including jobs and social capital, offering more with less: This is the Blue Economy®."*

As stated in the www.blueeconomy.eu for a sustainable growth of the seaport city we should hold resource audit of the city. Locally available material shall be used to produce a product; further by products are still resources for yet another product. This attempts to bring in a paradigm change from supply chain to manufacture chain. Local resource – product – by product – waste – product from waste - employment and establishments – minimized transportation – local economy – lower cost – distributed income are the links of blue growth which can be suggested to the youth of port-cities.

Maritime Innovative International Territories Network (MITIN) of France, America, Europe and Asia advocated the blue growth concept of sustainable economic growth of coastal and marine resources, through effective collaboration and exchanges. While port activities influence marine biodiversity people influence marine pollution (www.thenatureofcities.com, 2013 in www.sustainablecitiescollective.com, 2013).

Marine spatial planning, similar to land-use planning, as guided by UNESCO, can be exercised to accomplish our ecological, economic and social objectives through rationalizing the spatial and temporal distribution of human activities in marine areas.

Zero Emissions Research and Initiative (ZERI) draws public attention towards blue economy through its activities and portal.

GREEN CITY

Having experienced the dust, congestion, and no-time attitude people started resorting to green city concept. Green roofs, parks, and walk-ways sprawl in busy port cities. Become more concerned with the climate change threat plans like climate adept plans emerge. The action plan of City of Port Phillip identified the following five key themes to develop a resilient city: climate-proofing buildings, flood management, beach protection, city climate and access and safety.

CITIZEN-CENTRIC

Initial initiative for a port itself entwine citizen-centric elements in the process for sustained development of port and thereby portcity. Ultimately it is human beings for whose welfare only all activities on this globe take place. Understanding this tenet our plans shall be perfected. First thing is to make a citizen feel that he is taken care of in the new venture. Growth of port is certainly intertwined with the growth of port-city. So port itself can lay roads and rails in the portcity and construct schools and hospitals. It is also important to allow port-city authorities to collect revenue from these establishments for the port-city's growth. Development of parks and sports establishments, museums, swimming pools and port centres will further make citizens feel they are taken care of by the upcoming port. Likewise ports shall be open to public to have knowledge and experience the port setup. Especially, the children would enjoy the men and machines and their operations. Even they may be prompted for a career in the port related activities.

SUPPLIES

Regarding supplies to ships (water, fuel, and food supply) it is a herculean task. Maritime operators require supplies in large quantities to meet their requirements during their voyage. While stevedoring supplies man power ship chandling takes care of ship-stocks. Ship stocks are managed through supply chain management (adopting multilevel routing). While farm owners are at the bottom agents are at the top.

Supplies to port and port cities need special attention as to its procurement and distribution. Generally it happens through chains. So, supply chain management deserves a special mention as it is the backbone of running the show. Supplies are of a few categories, viz., food, energy, fuel and service. Lapses in meeting these supplies will lead to the functional deficiency of seaport and seaport cities. It attains paramount importance during the times of crisis. Natural disasters, storms and floods, and wars severely modify the demand and supply regimes.

BENCH MARKING

Portcity bench marking elements are: port – city – state – federal governments; logistics elements; and economic impact – commercial performance and equipment productivity. An audit of these elements would reveal the state of a portcity in terms of functional success.

VALUE ADDITION

In order to dissolve the tyranny due to monopoly several distributary laws came into existence. But, now, in the name of value addition, giants of the trade handle themselves nearly 100% of their products and services. Though it is good as it ensures standard and quality it erodes several other's jobs and services. However, clients of sea ports will prefer value addition in their line of trade for example provision of guest accommodation in the seaport city to the clients' representatives. Value addition may be in any form, tangible or intangible.

SECURITY

Sea piracy is a threat on open seas. In the days of terrorism security concern is of prime importance in both seaport and seaport city. Terrorism spans from bombing of critical establishments to software hacking. Hence, counteracting such threats require elaborate and technologically advanced systems of surveillance.

Surveillance is being done with the help of land, sea and air borne systems. Such systems include from TWIC (Transportation Worker Identification Credential), for biometric identification of people, to ROV (Remotely Operable Vehicle) for underwater inspection. Container scanners, High-infrared systems and real-time 3D sonars are also deployed to ensure security.

However, the terrorists use any available breach in the security system to reach their targets. So, the authorities are not expected to take any chance in security management and deployment. Coasts need layered protection.

As automation and operations have been entrusted to computers the authorities need to be doubly sure of elimination of hackers to save data, process and clientele.

Cargoes carrying dangerous goods and their handling require direct control of central government; in such circumstances privatization is not advisable (World Bank, 2007).

PREPAREDNESS

Keeping people alert and ready to face any natural and man-made disasters is of great significance while addressing the people's safety. Preparedness starts from educating school children to periodical exercises of protective measures required at times of blasts and fire. In the seaport cities, unless conveyance and hardware backup are provided, training of people to meet such eventualities will not serve the purpose.

OUTREACH

Port-cities can express itself to external world by extending educational, technical, economical and other conceptual expertise and showcases. At times, this may work as bait for port and portcity's growth.

FUTURE PERSPECTIVES

Growing population including transit population requires space to settle or to temporarily stay. Education and health care then come into picture. Markets and other public amenities need space and air, road and rail networks. Supplies of all kinds; electricity, telecommunication, food supply, gas water, oil and metals, and what-not's are to be arranged or people who come forward to operate on these lines need to be encouraged.

Migratory population's needs are to be satisfied. It is: housing – huts to multistory apartments; education – nurseries to universities; health – clinics to multispeciality hospitals; eateries – platform vendors to luxury restaurants; markets – roadside traders to shopping malls; transport – cycles to elevated trains (mass rapid transit systems). Here, this is spoken in particular because of alarming growth rate of migratory population. So, matchingly, seaport city managers shall give weightage to these requirements. In an industrial ecological perspective, the carrying capacity concept is proposed or modeled for migratory population (Wissen, 2004). But, in the present context, migrations occur in a reversible reaction analogy. Huge potential of all sorts of city centre welcome people from rural and semi urban areas are forced to return to distant places from the city centre. This is not because of lack of supply but because of lower affordability due to rising costs.

Facilities such as road and transport, eateries, public amenities, communication etc are of dire necessity in a locality where floating population turns unmanageable. Peak hour management becomes critical.

Considering the pros and cons of seaport and seaport city development a delicate trade off is to be exercised. An equilibrium need to be managed to avoid disasters due to natural and man-made causes as these are resultant activities of development of seaport and seaport cities.

3 **PORT-CITY CONTINUUM**

The term “continuum” is generally used to denote a system where principles and practices continue to undergo modification as needed by the growing system. In this context, port-city pair is an excellent example for the concept of continuum. It is a holistic concept of port and city including their management. Figure 1 displays interactions and balances between seaport and seaport city in portcity continuum. In fact, it can be thought of a handshaking process; it can be a give and take policy. In continuum of port and portcity from creation to yield, various fluid themes prevail, viz., creation, innovation, formulation, monitoring, servicing, implementing, sustaining, transferring, benefits and feedback. Success of a port-city depends on healthy and constructive feedbacks. So, it is the responsibility of city governors to peek feedbacks from people of all stages and stocks. Follow-up is respecting feedbacks with due attention. Society needs to be informed about the action on feedbacks. Otherwise feedbacks dwindle and start lacking luster.

While needs for international logistics chain are being attended needs of cities for social development are also to be taken care of. It is a balancing act. Growth of a port and portcity, in time and space domains, is continuous and calling for resources of all sorts. Port authorities are to take care of portcity's needs because wherefrom major chunk of port needs come. It is the best practice to have special allocations on for e.g. education and healthcare of portcity in the agenda of ports. It is a way of making

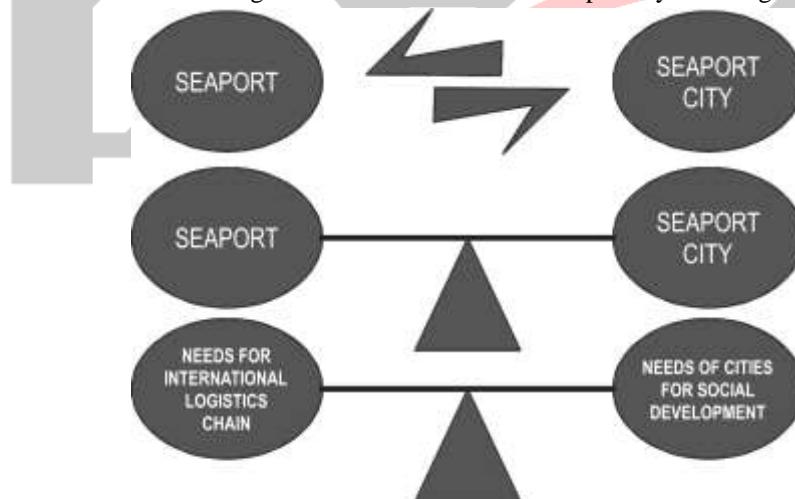


Fig. 1 Migration mechanism of people and functional change in the growth of port cities

people look back on ports with due concern.

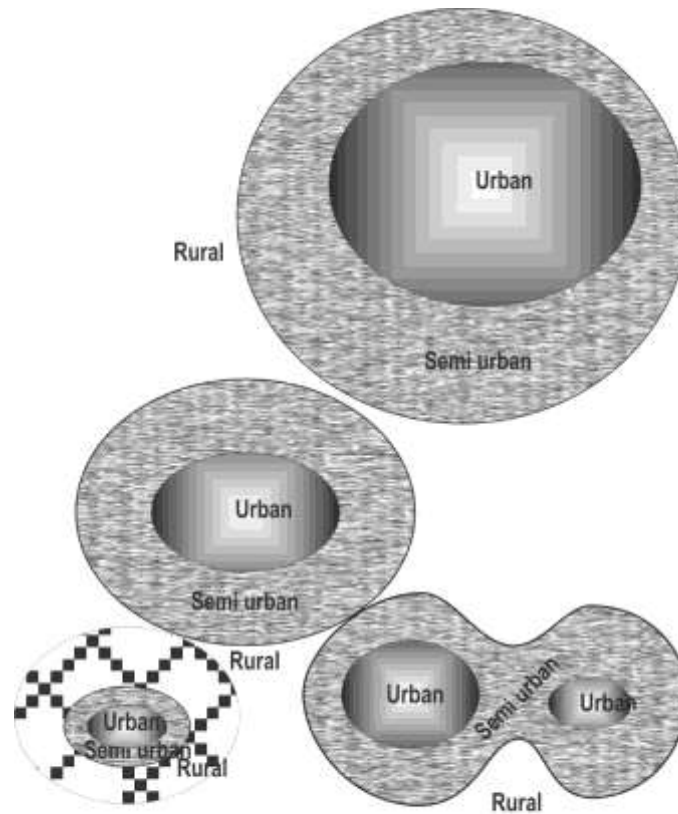


Fig. 2 Expanding purpose-oriented land-use (Or Centripetal shifting of activity levels)

The continuum of port-city manifests in the form as depicted in the Fig. 2. In the figure is projected the scenario of rural, semiurban and urban areas in an ever expanding milieu of economy. This continues forever until some *force majeure* hampers the system. However, the rate of development of port cities may differ according to the influences from outside (port) and/ or within the city itself.

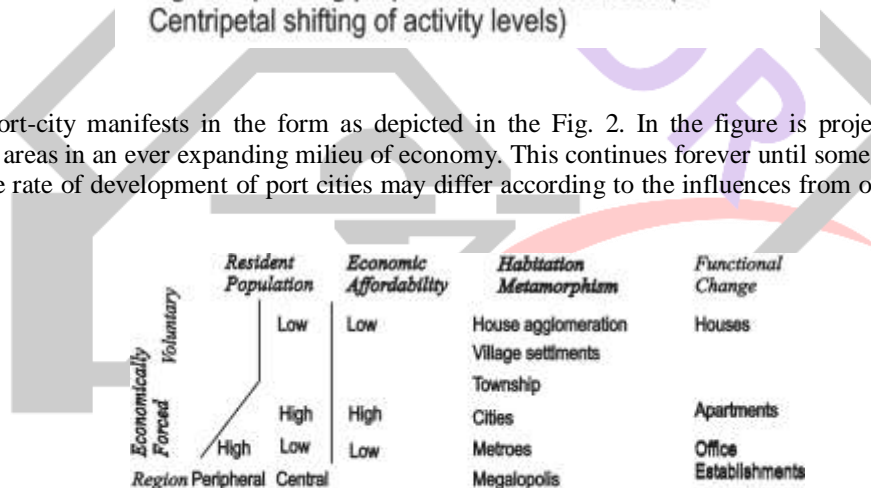


Fig. 3 Migration mechanism of people and functional change in the growth of port cities

Figure 3 portrays people’s migratory pattern in tune with the metamorphosis of rural, semiurban and urban areas. Space and cost factors in metros drive people back to peripheral regions. Built-up structures also get its function transformed. For example residential complexes manifest into office establishments driving away the residents peripherally. Given the time, rich residencies yield to centres of trade, commerce and business (Figs. 2 and 3). Once dominated by residences, these areas are now over saturated with office conglomerations. In the past “rich” has been driving away “poor” to the peripheral regions. Overwhelming demand, for space in the city centre, drive even the “rich” to distances.

This functional metamorphosis and migration mechanism of people may be understood from Fig.4 wherein a few important variables’ trends are conceptualized.

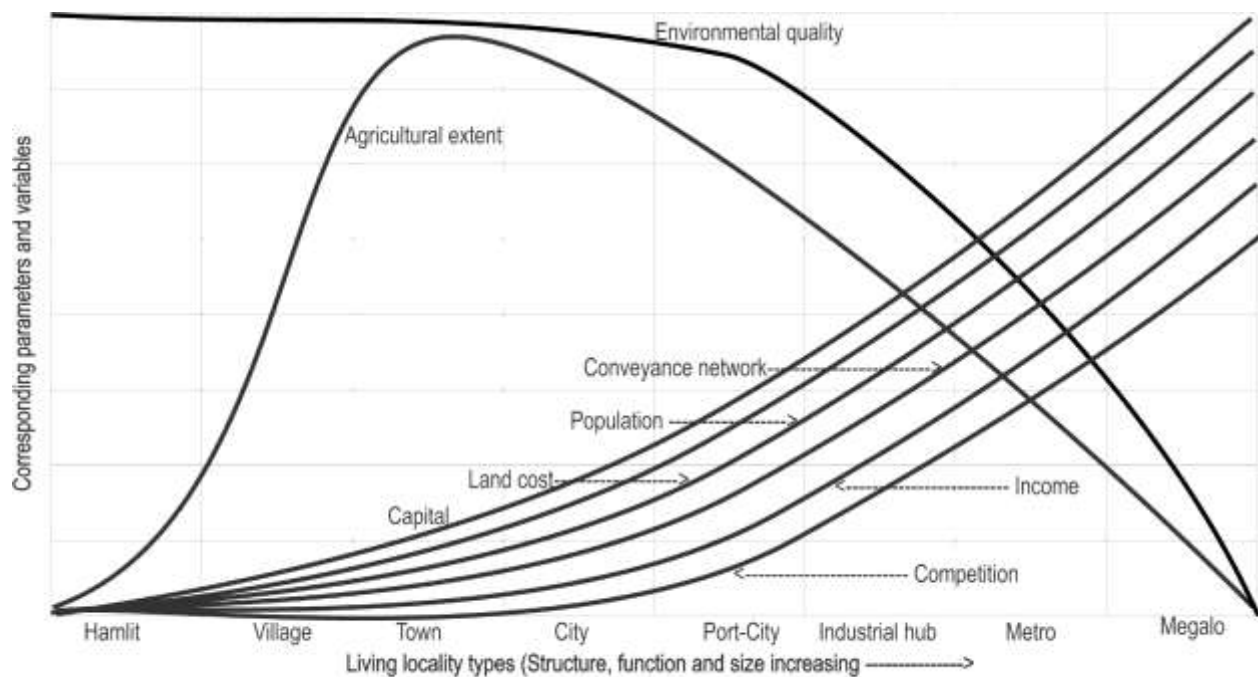


Fig. 4 Conceptual trends of important factors in various stages of cadastral transformation

In conclusion, the management of seaport cities relies on this port-city continuum. An integrated approach by the authorities of both port and port cities would be necessary to upkeep the balance of these two regimes. Suppose if seaport is becoming less functional it is to be balanced by pumping in of resources and expertise of seaport cities. And the case may be vice versa also. As modeled by Mizuno (2003), several seaport cities join together to form a megalopolis provided there occur time-space convergence. In all, self organization plays a dominant role.

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