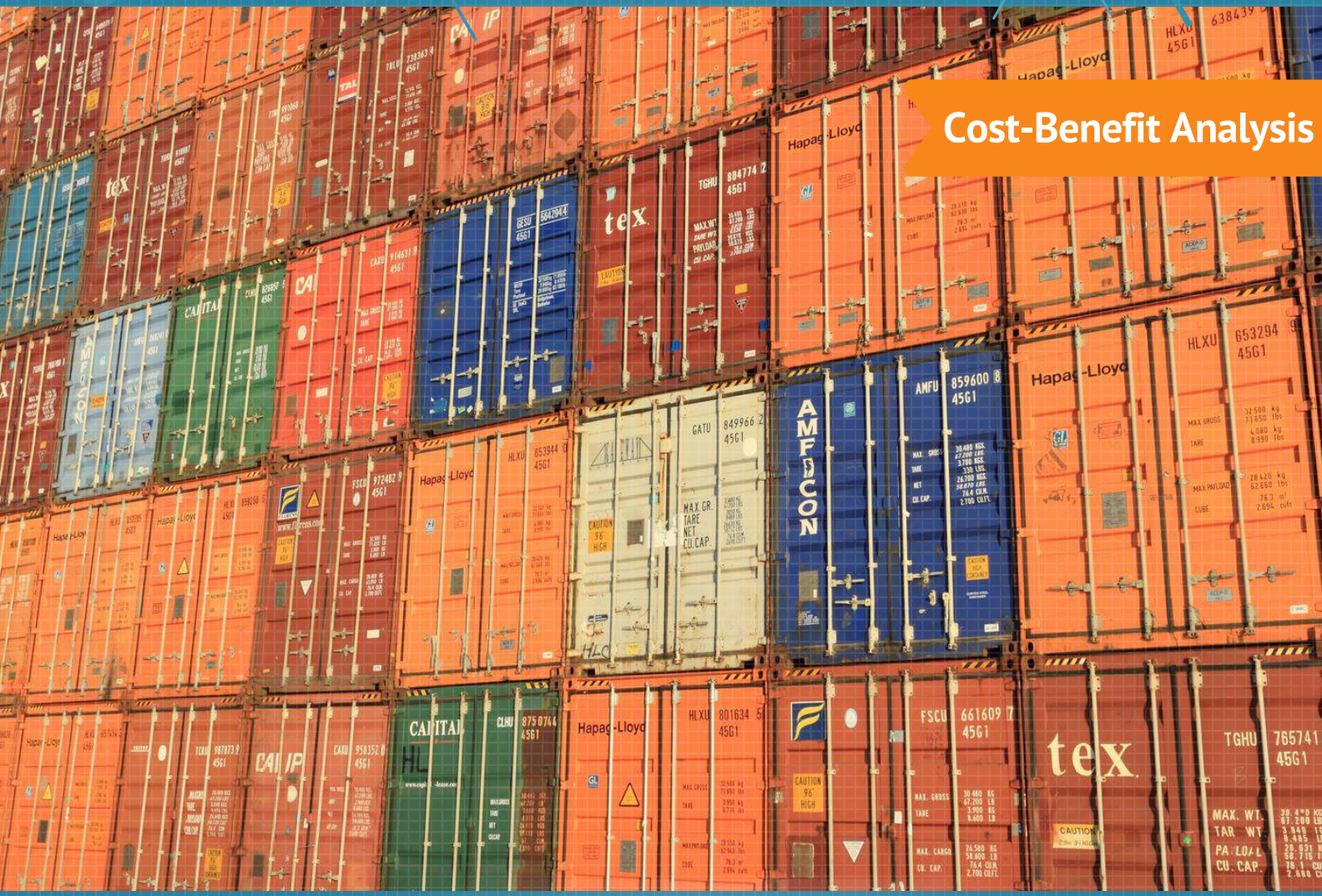
TRADE

Cost-benefit analysis of trade interventions in Andhra Pradesh



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ANDHRA PRADESH PRIORITIES
AN INDIA CONSENSUS PRIORITIZATION PROJECT

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Enhancing Exports and Trade

Andhra Pradesh Priorities
An India Consensus Prioritization Project

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Academic Abstract

It is imperative for India to capture larger shares of global markets for growing at sustained high rates. This would require Indian exports to become globally competitive backed by suitable policies. This paper examines the feasibility of three policy interventions for implementation in India's eastern coastal state of Andhra Pradesh for enhancing the competitiveness of its exports. Connecting to the ongoing coastal economic development strategy of the 'Sagarmala' project of Government of India, the interventions include development of an export-oriented apparel park; modernizing an existing port and linking it deeper to hinterland; and establishing facilities for certifying quality standards of seafood exports. While the first and third interventions yield high Benefit Cost Ratios, the second produces much lower estimates. Based on the computations and available evidence, the paper recommends all three interventions including the second one given the latter's fundamental utility.

Policy Abstract

The Problem

Enhancing exports and increasing participation in global production networks is an important prerequisite for the Indian economy to grow at sustained high rates. Unless exports increase, and Indian producers become major actors in global and regional value chains, India would not be able to capture major shares of global markets. Obtaining larger shares of global markets requires Indian exports to be more competitive. Enhancing such competitiveness requires expansion of trade and export-enhancing infrastructure in Indian states.

Andhra Pradesh (AP) is one of the top five exporting states of India[1]. It occupies a leading position among Indian states in production and export of marine products, agricultural commodities and textiles. The state has several operational Special Economic Zones (SEZs) specializing in textiles and apparel, food processing, leather and footwear, pharmaceuticals and IT[2]. Following the bifurcation of the old state of Andhra Pradesh into two new states – Telengana and the 'new' Andhra Pradesh– the latter has embarked on a fresh new long-term growth and development strategy with strong emphasis on 'globally competitive exports'. The emphasis connects to the state's overall strategy of coast-led industrial development by utilizing its natural endowment of the longest coastline in India. Success of the emphasis and the strategy requires the state encouraging exports through focused measures and upgrading the existing trade infrastructure for enhancing competitiveness of exports. The required measures include constructing geographical enclaves dedicated to exports, increasing port connectivity with hinterland for reducing logistic costs and establishing institutional facilities for certifying quality standards of exports.

Intervention 1: Development of an export-oriented apparel park in a Coastal Economic Zone (CEZ)

Overview

The intervention visualizes construction of an apparel park over an area of 2000 acres with the facility dedicated primarily to exports. The main objective of the park would be to enhance exports from Andhra by taking advantage of the rapid development of the state's port and maritime facilities. The park will be located in an upcoming CEZ in Andhra under the Sagarmala initiative of the Ministry of Shipping, Government of India.

The two proposed CEZs in Andhra are the Visakhapatnam Chennai Industrial Corridor (VCIC) – Central and North, respectively. Out of these, the apparel park is being conceived as part of the VCIC North, which would be linked to the Vizag port, and would have apparels as one of

[1] 'Maharashtra, Gujarat corner 46% of India's exports: study', The Hindu, 30 March 2016; http://www.thehindu.com/news/cities/mumbai/business/maharashtra-gujarat-corner-46-of-indias-exports-study/article8411933.ece

[2] 'About Andhra Pradesh – Industries, Economy, Infrastructure, Exports, GSDP', India Brand Equity Foundation (IBEF), February 2018; https://www.ibef.org/states/andhra-pradesh.aspx

its core industries[3]. The CEZ would include the districts of Guntur, Krishna, West Godavari, East Godavari, Visakhapatnam, Vizianagaram and Srikakulam. The facility is expected to be developed by private developers in collaboration with state government agencies. It will complement Andhra's existing SEZs, but will exploit the benefits of the new maritime infrastructure and hinterland connectivity improvements being fashioned by Sagarmala initiative.

Implementation Considerations

Implementation of the apparel park would begin from 2019 with purchase of land by developer. Purchase of land is a lengthy process and is expected to be finished over a period of 5 years. Development of purchased land would begin from the 2nd year, i.e. 2020, as soon as the first chunk of land becomes available. Facilities for use by exporters are expected to be completed by the 6th year i.e. 2024. Faster land purchase would hasten implementation. The project is expected to become operational by 2025 and start generating revenues. At the pre-operational stage, there are risks of the project getting delayed due to difficulties in purchasing land. Such delays might increase fixed costs.

The success of the initiative will be judged by exports generated, as well as the new economic activity created through positive spillover in terms of new livelihoods, growth of ancillary industries, and urban and retail development in the surrounding areas. The available evidence on SEZs in this regard is mixed. India's SEZs have not been particularly successful in producing large economic spillovers. This is largely because they were part of an integrated maritime and coastal development strategy like the Sagarmala. Being part of such an initiative can greatly enhance their benefits as they are able to overcome connectivity handicaps with the domestic tariff areas and also enjoy better port facilities. Indeed, the evidence on SEZs in other parts of Asia, such as China, Korea and Southeast Asia, point to the significant contributions they have made in exports, foreign exchange and overall economic activity.

Costs and Benefits[4]

While the costs for developing an apparel park can be estimated upfront through of fixed and variable costs, the estimation of benefits would depend on evidence-specific assumptions employed. We use three sets of assumptions for calculating the benefits. These are based on evidence of India's existing SEZs, those used in Sagarmala Perspective Plan and performance of SEZs elsewhere, including China.

Costs

Fixed costs comprise cost of purchasing land and its development and variable costs include operational expenses. Total costs during the first six years of implementation are aggregate of land purchase and development costs and comprise operational costs thereafter (Figures 1a and 1b).

[3] Lok Sabha, Unstarred Question No 4620, 30 March 2017, Government of India, Ministry of Shipping
[4] (All estimates are in Rs crore and at 5% discount rate).

Figure 1a

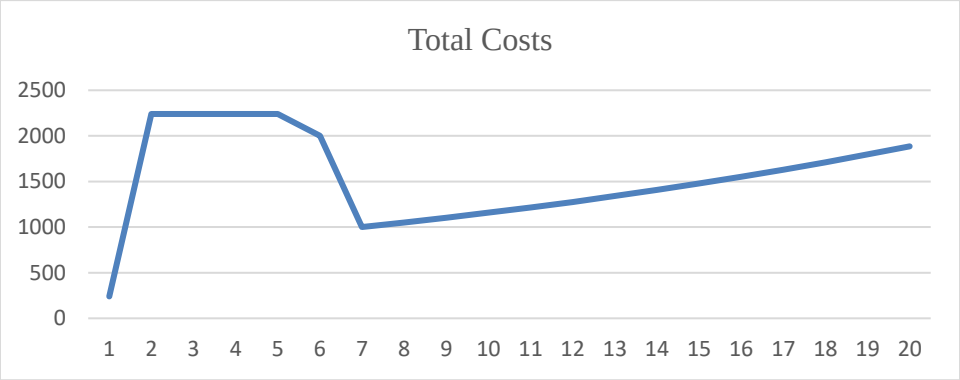
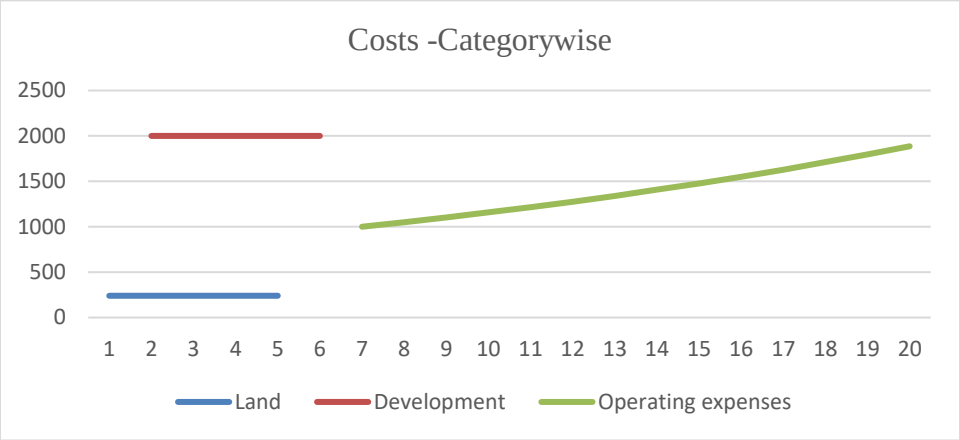


Figure 1b



Purchase price of land is computed on the basis market prices in Nellore district (part of VCIC North) and adjoining coastal areas[5]. The computation notes the variation in market prices between different categories land i.e. land which is more developed, and that is which is hardly so adjusts per capita purchase price accordingly. With land purchase expected to be phased over five years, costs get distributed likewise (Figure 1b). Development expenses commence from the 2nd year and continue till the 6th (Figure 1b)[6]. Total costs from the 7th year onward reduce significantly (Figure 1a). Operating expenses are assumed as proportion of fixed costs with an annual fixed increase. Based on this calculation, the total cost for the intervention is estimated to be INR 19,235 crores.

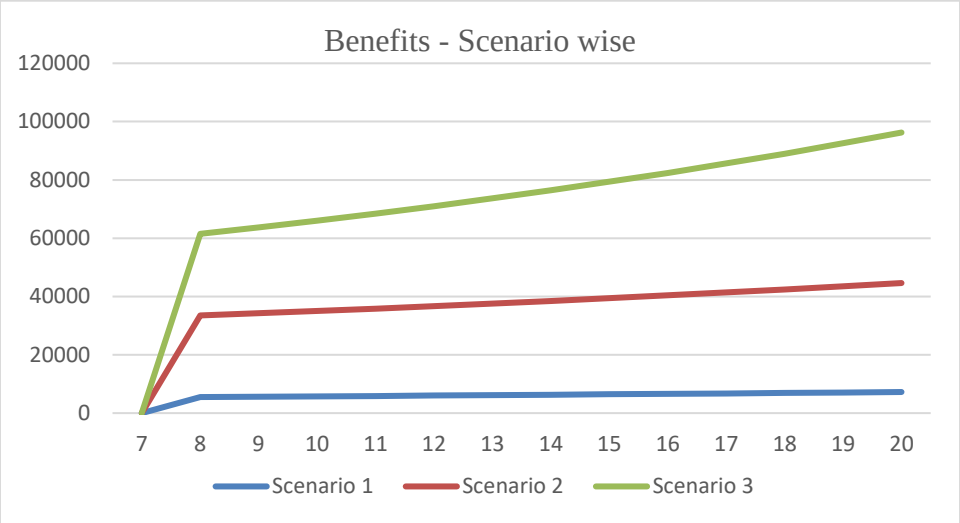
Benefits

The Sagarmala Perspective Plan provides ballpark estimates of export and spillover economic activities from export-oriented apparel clusters[7]. We describe these benefits as the baseline scenario (Scenario 2). From this scenario, we further compute two others, one a more conservative scenario, and another more robust (Figure 1c). The conservative scenario – described as Scenario 1 - assumes benefits on the basis of evidence of India's current SEZs. The academic literature points to much modest performance of these SEZs compared with

[5] Interviews with government officers and agencies.
[6] Development costs are extrapolated from those of a 1000 acres apparel park as reflected in Sagarmala Perspective Plan, Vol II, Ministry of Shipping, Government of India. Further scale economies are assumed leading to some moderation of costs.
[7] Sagarmala Perspective Plan, Vol II, Ministry of Shipping, Government of India.

Scenario 2. Accordingly, for scenario 1, We estimate exports at half of those for Scenario 2. For economic activity, which measures the spillover benefits, we employ a much more conservative proportion of just under 20 per cent of the economic benefits projected in Scenario 2, in the first year of operation. On the other hand, for scenario 3, which computes benefits on the basis of performance of SEZs in China and rest of Asia, we employ more robust assumptions, by projecting spillover benefits to increase by 5 per cent annually, compared with 2 per cent in Scenarios 1 and 2.

Figure 1c



Export revenues are estimated from the 7th year onward with the initial revenue extrapolated by an annual increase each year. The greater impact of the park though, is experienced through its substantive 'economic impact' in Scenarios 2 and 3.

Having employed above three scenarios based on estimates of export benefit and spillover economic activities. The benefit calculated for first scenario is equivalent to INR 46,461 crores with BCR of 2.4, which is a conservative calculation of benefits on the basis of evidence of India's current SEZs. Under second scenario the benefits are equivalent to INR 237,726 crores with BCR of 12.4. However, third scenario with robust benefits calculation indicating benefits equivalent to INR 282,338 with BCR of 14.7.

Intervention 2: Modernizing port facilities and improving hinterland connectivity

Overview

The closely inter-related aspects of the intervention relate to improvement of existing port facilities and enhancing its connectivity with the hinterland. These are envisaged for a non-major port on the Andhra coast and as part of the broader developments under Sagarmala Initiative. The key objective is delivering a port equipped with modern state-of-art facilities that significantly enhance its maritime traffic handling capacity. At the same time, backward linkage of the port with the hinterland is developed for enabling fast movement of cargo and overall reduction in logistics costs – a key factor inhibiting competitiveness of Indian exports.

Usually, port-led development, including hinterland connectivity in India, has relied on public investments. But this project can be a collaborative venture between state and private agencies. Private investments could well be forthcoming given the revenue potential of the policy.

Modernisation of port facilities is an ongoing initiative across ports located in both coasts of India. Sagarmala has been emphasizing modernization. It also notes the importance of linking ports to hinterland as an essential condition for improving their competitiveness. The intervention is expected to complement both ongoing and upcoming efforts.

Implementation Considerations

Beginning from 2019, the project visualizes acquisition of 1000 acres of land, for modernizing and upgrading the port's core facilities such as expanding berths and building a container freight terminal. Given the implementation experience of similar projects elsewhere in India, work on obtaining land, modernization and building connectivity is expected to last for at least seven years from the date of beginning of the project.

Risks to implementation include delays in acquiring land as well as delays in progress on connectivity leading to time and cost overruns. These unavoidable costs, often due to 'red tape' are in addition to the difficulties that developers might encounter in raising resources for long-gestation projects, particularly at a time when Indian banks are struggling with large non-performing loans. The benefits from the project are to be judged from the revenues it will generate, which are expected to be steady and increasing over time. Social benefits are difficult to quantify and evaluate.

Costs & Benefits

Costs

Fixed costs comprise cost of acquiring 1000 acres of land for developing new facilities at the port and upgrading current ones. Price of acquiring land has been based on market value of such land in coastal AP and – as in the earlier intervention – after noting the variation in the nature of land. Modernisation costs are considered separately, while connectivity improvement costs, again part of the overall fixed costs, also include costs of additional land that might be required for expanding highways.

All fixed costs for modernization - dredging, building a new container freight station and expanding berths – are based on costs of similar modernisation at Visakhapatnam port in recent years[8] and extrapolated with a 'built-up' multiplier, which also factors costs from time overrun. All activities are assumed to be completed within seven years with a gradual reduction in fixed costs as activities progress (Figures 2a and 2b).

[8] Rajya Sabha Un-starred Question no 1736 on 31 July2017; Port Development Project, Ministry of Shipping, Government of India.

Figure 2a

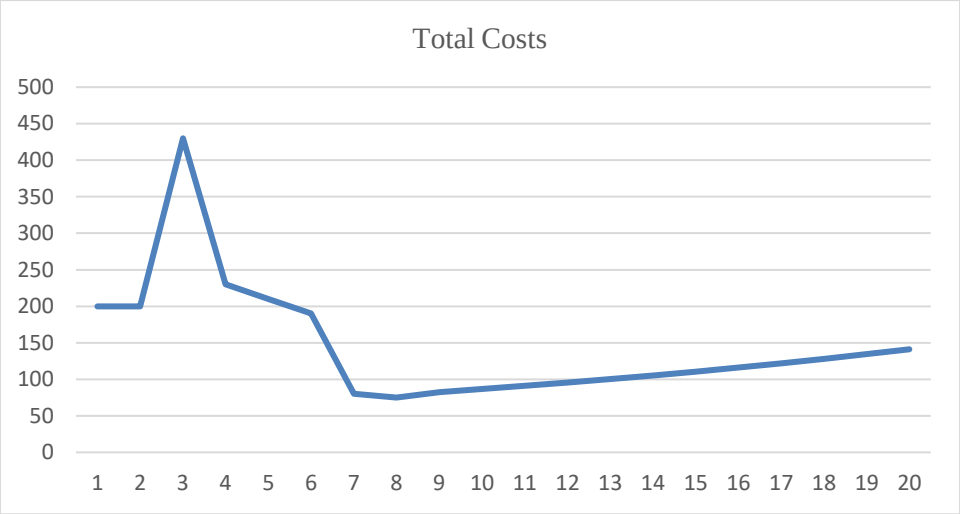
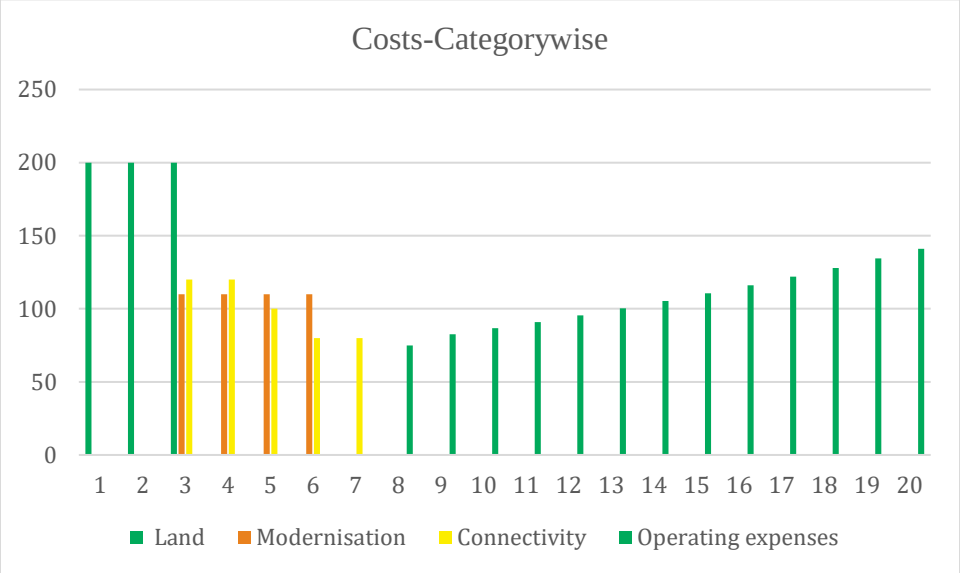


Figure 2b



Road connectivity costs are benchmarked on budgetary allocation and expenses for similar work at the JNPT in Maharashtra[9]. Again, costs are extrapolated with a built-up multiplier after factoring in enhanced costs for acquisition. Aggregate costs are assumed distributed over five years, beginning from the 3rd year, with gradual reduction given that initial costs are higher due to acquisition (Figure 2b). Operating expenses are computed as proportion of additional revenue generated from the port post-modernisation with Visakhapatnam port statistics acting as benchmark. We, however, assume a lower operating expense on efficiency grounds. Therefor the total cost calculated for this intervention is INR 1,985 crores.

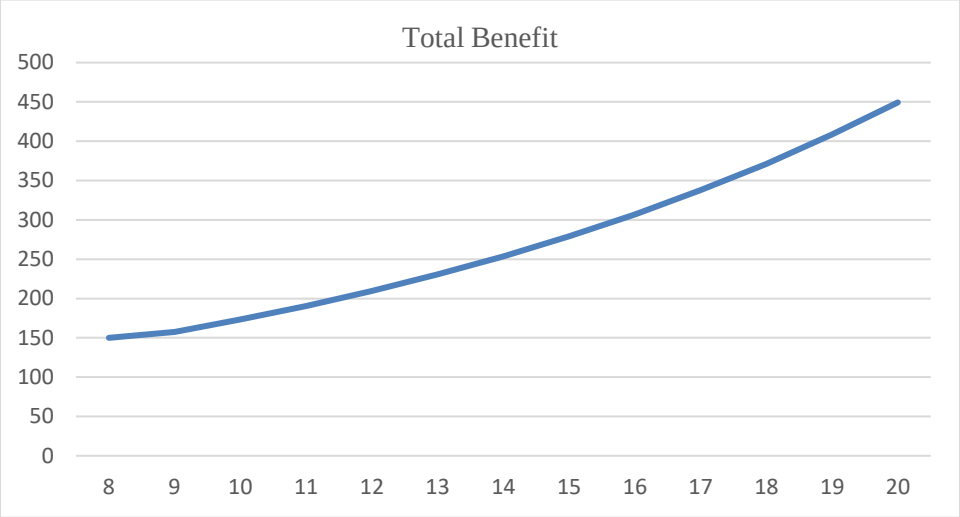
Benefits

Benefits are computed on assumed increase in port capacity, which in the current instance is by 20 million tonnes per annum, based on similar capacity increase target for facilities

[9] Same as above; Annexure projects for 2016-17

implemented at Visakhapatnam port[10]. Further computations look at a non-major port in the state like Gangavaram in Visakhapatnam, its installed capacity, volume of cargo handled and the capacity utilization rate, which is below 50% for 2015-16, the latest year for which statistics were available. We expect capacity utilization for our port to improve following modernization and connectivity improvement and are optimistic of reaching 75%.

Figure 2c



Revenue collections are based on statistics for Gangavaram port in 2015-16[11], with the estimate being extrapolated on the basis of assumed traffic increase from higher capacity and its better utilization. As a result, we are able to assume an initial increase of 20% in revenues from their current levels. In addition, we expect revenues to progressively increase due to flexibility of non-major ports in fixing tariffs (Figure 2c). Therefore, the total benefits calculated are expected to be equivalent of INR 1,695 crores, projecting a BCR of 0.9.

Intervention 3: Scientific testing and certification facilities for marine product exports

Overview

The intervention comprises establishing a laboratory equipped with latest scientific testing facilities for certifying quality standard of seafood exports from AP to the US, EU, Northeast Asia, Southeast Asia and Middle East. The laboratory will greatly enhance prospects of seafood exports because in absence of certification ensuring compliance with global quality standards, exports won't be able to access major global markets. The new certification facility would encourage a part of seafood production currently targeted at the domestic market to divert to global markets as exports.

[10] Rajya Sabha Un-starred Question no 1736 on 31 July2017; Port Development Project, Ministry of Shipping, Government of India

[11] Gangavaram port figures are from Socioeconomic Survey 2016-17 of AP; p.140 http://www.ap.gov.in/wp-content/uploads/2017/03/SOCIO-ECONOMIC-SURVEY-2016-17.pdf

The facility will be in addition to similar seafood certification facility at Vizag[12]. The proposed location is in the coastal stretch within the VCIC North CEZ for catering to the large demand for seafood exports that AP would experience from global markets as it grows into an 'aqua hub' and expands production of specific items like Vannamei shrimps. As of now, the Vizag port handles the largest volume of marine exports among all Indian ports. The facility will contribute to certification of outbound exports from Vizag port, as well as from Krishnapatnam and other ports in the state. The investment for the laboratory can be either from the government – in connection with similar efforts being undertaken by the Food Safety and Standards Association of India (FSSAI) – or from the private sector.

Implementation Considerations

The intervention is visualized over a shorter period than the two earlier ones. Beginning from 2019, it is expected to commence operations in four years and is to come up over 5 acres. Even though land requirements are not large, there could be delays involved in acquisition and construction. There might also be delays in getting accreditations, such as from the Export Inspection Council (EIC) of India. These delays, however, can be overcome by proactive steps on part of the state government as well as key product councils like the Marine Product Export Development Authority (MPEDA).

The main indicator for the success of the intervention is the increase in seafood exports it is able to achieve. Quality certification is a necessary condition for Indian exports in gaining wider and deeper global market access. Without such certification, it is not possible for Indian exports, particularly seafood exports, to penetrate deeper in global markets and increase the national and state shares in global seafood exports. The 'new' exports generated by the facility through substitution from domestic market are its primary benefits. As the evidence in this respect shows, the role of quality certification for facilitating market access for developing country exports is strong, particularly in today's context where advanced country domestic quality standards are continually evolving and upgrading.

Costs & Benefits

Costs

Fixed costs comprise land and building and laboratory & equipment. The costs are to be rolled out over the first three years. The assumptions for land and building are based on market prices for industrial land in reasonable proximity to Vizag port and state highway[13]. The FSSAI's cost assessments for upgrading state food laboratories[14] are benchmarked for computing costs of laboratory and equipment with the estimates upgraded by a multiplier of 25 per cent. The testing equipment is expected to be put in place within one year after obtaining land and building, and are therefore, expected to be done by the 3rd year. From the 4th year onward, project costs reduce to operational costs assumed as a proportion of total fixed costs for first 3 years and progressive increase annually thereafter (Figures 3a and 3b).

[12] 'Experts stress importance of seafood safety', HANS India, 11 May 2017; http://www.thehansindia.com/posts/index/Food/2017-05-11/Experts-stress-importance-of--Seafood-safety-/299088

[13] Market intelligence reports on property prices

[14] SoFTel - Strengthening of Food Testing Laboratories; Food Safety and Standards Association of India (FSSAI).

Based on these assumptions, the cost for this intervention is estimated to be equivalent of Rs. 44 crores.

Figure 3a

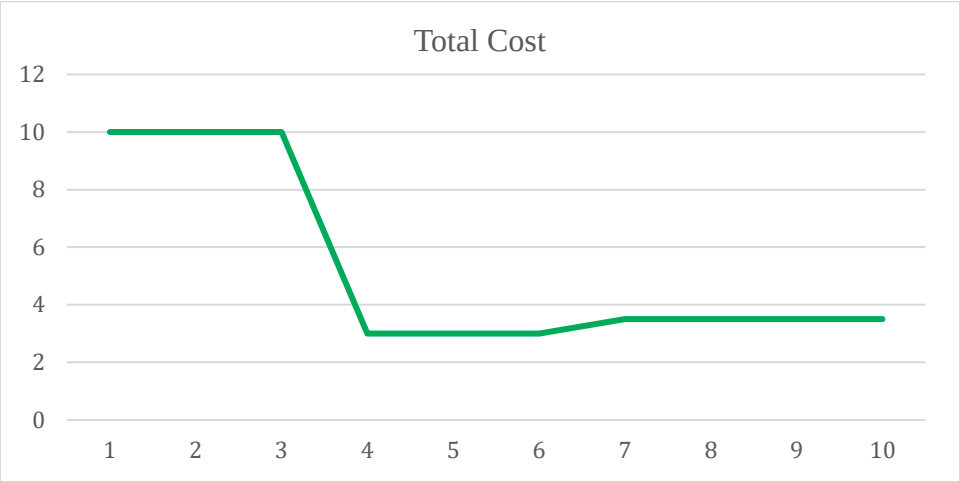
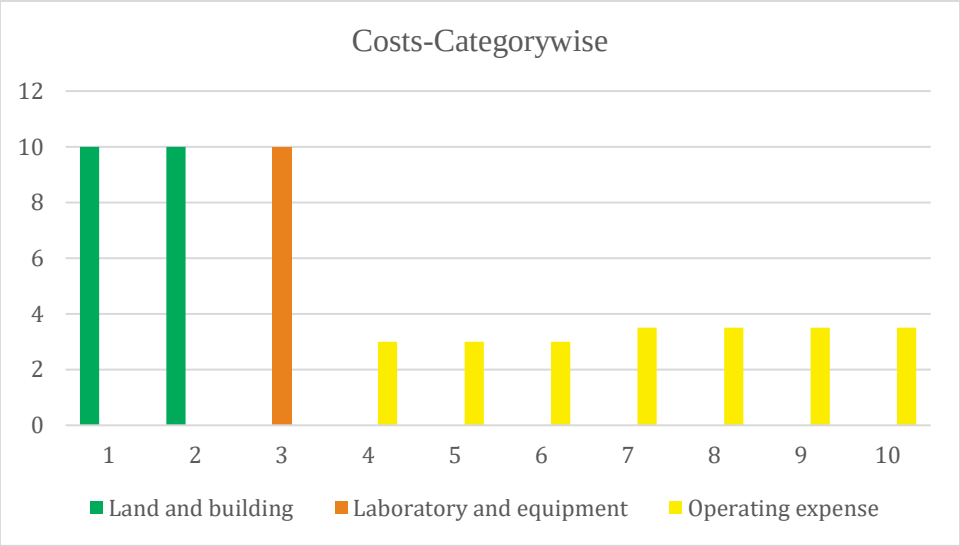


Figure 3b

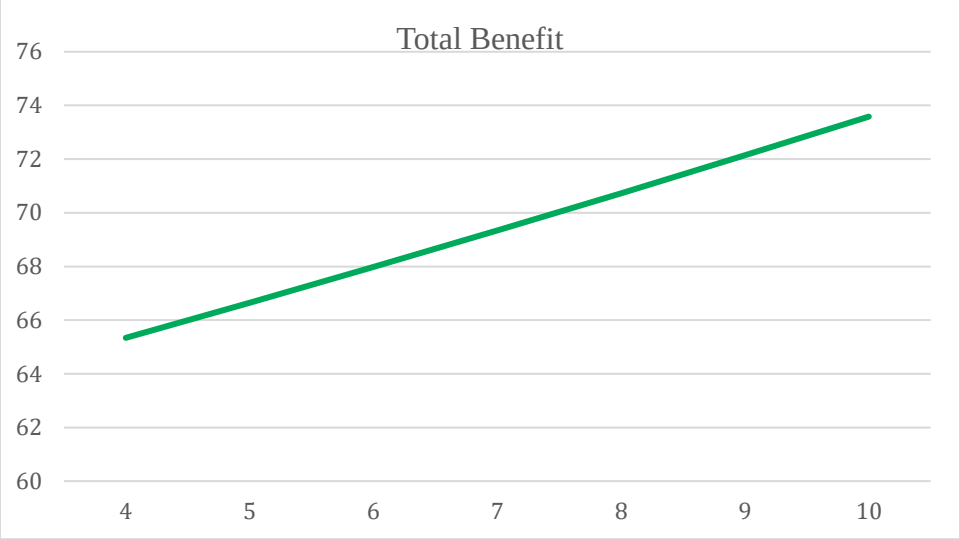


Benefits

Additional exports generated by the facility, and the revenue fetched therefrom, are based on the benchmark of current estimates of seafood exports from Vizag and Krishnapatnam ports for the year 2017[15]. An initial increase of 2% by volume, following substitution from domestic markets to exports, would fetch additional export revenues from higher price of seafood in international market. These exports would be triggered by a price differential of 25% between domestic market price and international price. Driven by large share of frozen shrimps in the export basket, export revenues are expected to increase annually by 2%, since shrimps enjoy the highest price premium in global markets among all seafood exports. Therefore, the intervention is estimated to bring the benefit of INR 346 crore with BCR of 7.9.

Figure 3c

[15] As in 11 earlier.



BCR Table

Interventions	Cost (INR crore)	Benefit (INR crore)	BCR	Quality of Evidence
Intervention 1: Development of an export-oriented apparel park in a Coastal Economic Zone*				
Intervention 1: *Scenario 1*- conservative benefits	19,235	46,461	2.4	Medium
Intervention 1: *Scenario 2- baseline benefits*	19,235	237,726	12.4	Medium
Intervention 1: *Scenario 3*- robust *benefits*	19,235	282,338	14.7	Medium
Intervention 2: Modernizing port facilities and improving hinterland connectivity	1,985	1,695	0.9	Strong
Intervention 3: Scientific testing and certification facilities for marine product exports	44	346	7.9	Strong

Notes: All figures assume a 5% discount rate

*For the first intervention; Development of an export-oriented apparel park in a Coastal Economic Zone, we have assumed three scenarios based on estimates of export benefit and spillover economic activities. The first scenario assumes conservative benefits on the basis of evidence of India's current SEZs. However, second scenario is a baseline scenario for benefit calculation based on evidence from GoI's reports. As academic literature points to much modest performance of these SEZs compared with spillover benefits, therefore for first scenario we employ a much more conservative proportion of just under 20 per cent of the economic benefits against second scenario. The third scenario employ robust assumption for benefits mainly on the basis of performance of SEZs in China and rest of Asia.

Introduction

India's current shares in global merchandise trade, and exports, are only 1.9% and 1.6% respectively[16]. Its current rate of GDP growth of 7% plus makes it the fastest growing among the major economies of the world. Maintaining the current rate of GDP growth, or shifting to a higher trajectory, requires India to expand its share in global trade and exports, as economic activity generated by the domestic market would be insufficient for maintaining the growth momentum in the long-run.

Enhancing India's share in global trade is contingent on its exports becoming more competitive. Domestic factors have been major determinants of India's export competitiveness. These comprise factors influencing competitiveness at borders as well as beyond borders. The former includes efficiencies of ports, particularly their abilities to expedite movement of container cargo, while the latter include linkages between ports and their hinterland that impact transport costs of inward and outbound cargo. Export prospects can significantly improve from upgradation of operational facilities at ports and strengthening their backward linkages with the domestic transport networks. It is equally important to encourage exports by creating dedicated export hubs equipped with best facilities. These imply state-of-art industrial clusters focusing primarily on exports as opposed to the domestic market. Furthermore, access of exports in foreign markets is often constrained by their inability to meet quality standards of these markets. The problem can be addressed by creating adequate facilities for certifying quality standards.

Andhra Pradesh, which is among the top five exporting states of the country, can experience significant acceleration in its exports, following implementation of the above initiatives. Higher exports from the state would increase India's overall exports, its share in global trade and the role of Indian producers in global value chains. The combined long-term impact should witness virtuous outcomes for India's GDP. This paper examines the economic feasibilities of the suggested policy interventions for Andhra.

Three specific premises govern the context and importance of accelerating exports from Andhra. The first is bifurcation of the old state of Andhra Pradesh into the current parts of Telengana and Andhra. The division was a result of the Andhra Pradesh Reorganization Act of 2014. It necessitated the crafting of a new strategic vision for economic development of 'new' Andhra Pradesh given the redistribution of assets and liabilities of the old state. The vision is articulated in 'Sunrise Andhra Pradesh' – a Vision Statement of the state for the year 2029. According to the vision 'globally competitive exports' are a priority for long-term growth and development of Andhra Pradesh[17].

The second premise pertains to the focus of the state's strategic vision on coast-led industrial development. In this respect, AP is an excellent example of the economic development strategy of an Indian state dovetailing neatly with an identical overarching vision of the Central Government. The latter's vision manifests through the 'Sagarmala' maritime economic initiative of the Ministry of Shipping of the Government of India. Andhra's

[16] WTO, Trade Profile, India.

[17] Chapter 1, Page 1-36; 'Sunrise Andhra Pradesh Vision 2029; Draft for Review and Discussion June 2016, Government of Andhra Pradesh; http://apvision.ap.gov.in/PDFs/Vision-report.pdf

geography, particularly its long coastline of more than 900 km, makes it a prominent part of 'Sagarmala' with the state well positioned to develop as a global maritime hub.

The final premise grows out of the centrality of exports in the objective of coast-led economic development and Andhra's prominence as a major exporting state. Andhra already has a proven track record on exports, particularly marine products, agricultural commodities, textiles and garments. Its thrust on exports is also evident from the multiple special economic zones (SEZs) in the state. Andhra Pradesh's strategy of utilizing its coast as a gateway for integrating into global production systems and developing as a maritime hub is contingent on its success in accelerating exports. This gels well with India's larger goal of achieving and maintaining high growth rate of its GDP, which requires stronger contribution from exports.

1. Development of an export-oriented apparel park in a Coastal Economic Zone

1.1 Background and Evidence

India is developing coastal economic zones (CEZs) under the 'Sagarmala' project. The initiative aims to improve national export competitiveness by developing ports close to manufacturing hubs, reduce cost of transporting domestic cargo by enhancing transport connectivity, bring down logistics cost of bulk commodities by developing capacities close to coast and reduce time for container movements. For achieving these objectives, the initiatives focuses on four goals: modernization of existing ports and developing new ones; improving connectivity of ports to hinterland; develop industrial clusters and coastal economic zones close to ports and promote sustainable development of coastal communities[18].

AP is a key state in the long-term perspective vision of Sagarmala. This is natural given the port's long coastline, good export performance and further potential for high export growth. Out of the fourteen CEZs planned under Sagarmala, two are being developed in AP. The CEZs would comprise multiple industrial sectors and come up around a few coastal districts.

Development of 'fenced-in' zones and enclaves dedicated exclusively to exports are not new and have been implemented by several countries. India itself has been implementing export promotion zones that were later classified as SEZs. The world's third export promotion zone, and Asia's first, came up at Kandla in India in 1965. Many more zones have since come up in India. Till the beginning of the last decade, such zones were mostly developed by the Central and state governments. Since the introduction of the SEZ Act of 2005, several privately developed zones have been built. But notwithstanding their growth, the research on performance of these zones point to the relatively little impact they have had on the Indian economy[19]. Non-availability of disaggregated data is a problem in judging the performances of individual SEZs[20]. Nonetheless, there is no doubt that Indian SEZs have hardly made as

[18] Sagarmala initiative, Concept & Objectives; Ministry of Shipping, Government of India; http://sagarmala.gov.in/about-sagarmala/vision-objectives

[19] See, for example, Aggarwal (2012) on the empirical assessment of socio-economic impact of SEZs, Palit and Bhattacahrjee (2008) and Alkon (2016).

[20] Aggarwal (2012)

much impact on the domestic economy as, for example, the Chinese zones have. The major reasons for the limited impact are their underdeveloped linkages with the rest of the economy, particularly connectivity with domestic tariff areas, as well as their relatively small sizes, preventing exploitation of agglomeration benefits[21].

It is important to bear in mind that coast-led industrial development under Sagarmala initiative envisages integrated infrastructure and industrial development of a size and scale that does not have existing examples in India. In this respect, the limitations of existing Indian SEZs in terms of their limited forward and backward linkages with the rest of the economy, as well as size, can be overcome through Sagarmala. Sagarmala and its planned CEZs, and the industrial hubs visualised within these CEZs, are part of a well-structured policy vision involving both the Centre and Indian maritime states. The existing SEZs in India, till now, have unfortunately not been part of such an overarching vision and have suffered as a result.

Industrial cluster development within Sagarmala CEZs have to be looked at in this new perspective. The new industrial clusters within these CEZs would benefit Earlier from 'linkage' developments, particularly hinterland connectivity. This can put the new zones, such as a large apparel park dedicated to exports, in a far better positon to generate new exports and positive spillover effects for the domestic economy. Indeed, Asian experience of such spillover effects from zones is quite robust. The most notable gains are noticed in additional employment generated, not only from SEZs in China, but also export zones in Philippines, Indonesia, Bangladesh and Sri Lanka[22]. The evidence of employment generation is also positive in some of India's early state-developed SEZs as well as more recent private zones[23]. The cross-country employment benefits of SEZs and the supporting economic activities they generate constitute strong evidence of positive spillover.

1.2 Description

Development of CEZs is consistent with the long-term economic growth strategy of the AP government. The 'Strategies' and 'Initiatives' mentioned in the AP Vision Strategy 2029 include 'infrastructure upgradation' as a specific strategy, and 'logistics and coast-led growth' as one of the key engines[24].

Table 1: CEZs proposed for AP[25]

Name	Districts	Link Port	Industries
VCIC Central	Chittoor, Nellore	Krishnapatnam	Electronics
VCIC North	Guntur, Krishna, West Godavari, East Godavari, Visakhapatnam, Vizianagram, Srikakulam	Vizag, Kakinada	Food processing, petrochemicals, cement, apparel

Note: VCIC: Visakhapatnam Chennai Industrial Corridor being developed with technical assistance from ADB

[21] Palit and Bhattacharjee (2008)
[22] Palit and Bhattacharjee (2008), Aggarwal (2006a), Wang (2013)
[23] Palit and Bhattacharjee (2008)
[24] Page 0-3, As in 2.
[25] '14 Coastal Economic Zones being developed under Sagarmala', Press Information Bureau, Ministry of Shipping, Government of India; http://pib.nic.in/newsite/PrintRelease.aspx?relid=176381

The proposed CEZs are being conceptualized as large industrial zones around coasts with multiple industrial clusters and well-developed backward and forward linkages between the clusters, the coast and the hinterland. In this respect, the CEZs are structurally more expansive and exhaustive than most of India's extant SEZs that are stand-alone fenced-in enclaves. AP itself has many of these zones. From the perspective of an upcoming CEZ like the VCIC Central, there are existing SEZs like Apache SEZ (footwear), Mas Fabric park (textile, apparel), Bhartiya International SEZ (leather), IFFCO Kisan multi-product SEZ and AP Industrial Infrastructural Corporation (APIIC) multi-product SEZ. All these SEZs are located in Nellore district. All these SEZs are subsequently to be dovetailed into the upcoming CEZs. Their performances should definitely improve as a result of the improvement in surrounding business conditions.

The proposed intervention does not envisage creation of another SEZ similar to those existing. It visualizes the growth of an *export-oriented apparel park* that would be an organic component of the upcoming CEZs in AP. The APIIC is already developing several industrial complexes in the Nellore district. The suggested intervention is consistent with its efforts as well as with the larger perspective objective(s) of the CEZs. The intervention accordingly is conceptualized as an apparel park with focus on exports and for greater integration of local producers into global value chains. It is specifically visualized as an industrial cluster with a size of 2000 acres for enabling it to be well positioned for triggering agglomeration benefits.

1.3. Costs and Benefits

The fixed costs for the intervention are estimated by computing costs of purchasing land in coastal districts of Andhra and developing it over a period of five years. We further estimate operating expenses for running the project. The key benefits of the project are estimated as new exports that the apparel park generate, as well as the new economic activity that it is expected to produce from positive spillovers. The benefits are estimated under three distinct scenarios, based on the evidence from performance of India's current SEZs, those envisaged in the Sagarmala perspective plan, as well as more robust anticipation of export and spillover benefits from international evidence.

Purchase price of land is computed on the basis of market prices in Nellore district (part of VCIC North) and adjoining coastal areas[26]. The computation considers variation in market prices between different categories land depending on whether they are more, or less developed. With land purchase expected to be phased over five years, costs are distributed likewise. Development expenses commence from the 2nd year and continue till the 6th (Figure 1b)[27]. Total costs from the 7th year onward reduce significantly and comprise only operating expenses assumed as proportion of fixed costs with an annual fixed increase.

The Sagarmala Perspective Plan provides ballpark estimates of export and spillover economic activities from export-oriented apparel clusters[28]. We describe these benefits as the baseline scenario (Scenario 2). Two further scenarios are computed: one a more conservative

[26] Interviews with government officers and agencies.
[27] Development costs are extrapolated from those of a 1000 acre apparel park as reflected in Sagarmala Perspective Plan, Vol II, Ministry of Shipping, Government of India. Further scale economies are assumed leading to some moderation of costs.
[28] Sagarmala Perspective Plan, Vol II, Ministry of Shipping, Government of India.

scenario, and another more robust. The conservative Scenario 1 assumes benefits on the basis of evidence of India's current SEZs. The academic literature points to much modest performance of these SEZs compared with Scenario 2. Accordingly, we estimate exports to be lower than in Scenario 2. We particularly reduce our expectations of spillover benefits, given that this has been noted by academic literature to be rather low for Indian SEZs. On the other hand, for scenario 3, which computes benefits on the basis of performance of SEZs in China and rest of Asia, we employ more robust assumptions, by projecting spillover benefits to increase at a higher annual rate, compared with Scenarios 1 and 2. Details of the assumptions used for costs and benefits can be seen in Appendix.

2. Modernizing port facilities and improving hinterland connectivity

2.1. Background and evidence

Our earlier analysis of the development of an export-oriented apparel park in coastal Andhra – and as a part of an upcoming CEZ – alluded to the positive spillover effects of such a facility given its integration with a holistic approach to coast-led industrial development. Unless backed by modern port infrastructure with sound capacities and good connectivity with hinterland, export initiatives would fail to take off, and Indian exports would remain globally uncompetitive due to high logistic costs.

The competitiveness of ports is fundamentally dependent on their connections with the hinterland[29]. Seamless connectivity helps in faster movement of cargo between the hinterland and ports leading to lower logistics costs for exporters and all other actors involved in maritime trade. The lack of good connectivity with hinterland affecting competitiveness of Indian exports through high logistics costs has been variously indicated in academic literature[30]. Indeed, a comparative evaluation with globally best performing ports from Asia and Europe – China, Singapore, Netherlands, for example – reflect strong multi-modal connectivity with the hinterland. Such connectivity not only facilitates quick movement of cargo, but also encourages more containers to use the well-connected ports, and increases the flow of maritime traffic.

Building new ports and improving existing ones, while developing strong linkages between the ports and the hinterland, is integral to Sagarmala Initiative. The idea arises from the well-noted point that competitiveness of Indian exports is a function of transport costs, which include inland costs of transporting cargo to ports and the efficiency with which ports clear outgoing cargo. As reported, the evidence in favour of this policy intervention is strong. The intervention that we visualize aims to integrate both objectives. It is obvious that a port cannot enhance competitiveness of exports unless it has modern state-of-art facilities and is linked well with the hinterland for enabling exports seamless passage from land to sea. This is also an imperative in the light of a traditional weakness of India's maritime infrastructure and the fact that Sagarmala's goal of coast-led development, and Andhra's prominent role as an exporting state, would remain unfulfilled without such capacities.

[29] Accicaro and Mckinnon (2013), Merk and Notteboom (2015)
[30] Singh and Kathuria (2016), Planning Commission (2013).

2.2 Description

We note three aspects of modernization of port facilities – dredging, building a new container freight station and expansion in berth size. All three are activities that have been carried out in recent years in Visakhapatnam port – the largest port in AP – as well as the port central to the offtake of the upcoming CEZs. These modernization programmes are also being implemented in various phases in different major and minor ports of the country.

Along with modernization and upgrading of existing facilities, we note the importance of establishing good and strong connectivity linkages between the port and hinterland. Such developments have been noted specifically for the Jawaharlal Nehru Port Trust (JNPT) in India's western state of Maharashtra. In this specific instance, our focus on connectivity improvement entails stronger road connections to the port with the hinterland through expansion of the existing road network by increasing the number of lanes of the existing highway network.

2.3. Costs and Benefits

The fixed cost component of the initiative is substantive and includes costs for purchase of 1000 acres of land, which would be used for greater capacity expansion. We estimate land costs on the basis of market value of such land in coastal AP and – as in the earlier intervention – after noting the variation in the nature of land. Modernization costs for each activity - dredging, building a new container freight station and expanding berth sizes – are benchmarked to similar modernization costs at Visakhapatnam port in recent years[31] and extrapolated with a 'built-up' multiplier, for factoring costs from time overrun. All activities are assumed to be completed within seven years with a gradual reduction in fixed costs as activities progress.

Road connectivity costs are benchmarked on budgetary allocation and expenses for similar work at the JNPT in Maharashtra[32].We estimate land requirement for hinterland connectivity and road connections separately and employ an escalation factor here as well. Operating expenses for the new facilities are computed on the basis of similar expenses for existing operations at Visakhapatnam, as proportion of additional revenue post-modernisation with assumptions being on the lower side on efficiency grounds. Aggregate costs are distributed over five years, beginning from the 3rd year, with gradual reduction given that initial costs are higher due to acquisition.

Revenue is used as the primary measure of benefit. The revenues are obtained from greater increase in both inbound and outbound maritime traffic. Computations assume increase in port capacity by 20 million tonnes per annum based increase target for on similar facilities implemented at Visakhapatnam port[33]. Further computations look at a non-major port in the state like Gangavaram, its installed capacity, volume of cargo handled and the capacity

[31] Rajya Sabha Un-starred Question no 1736 on 31 July2017; Port Development Project, Ministry of Shipping, Government of India.
[32] Same as above; Annexure projects for 2016-17
[33] Rajya Sabha Un-starred Question no 1736 on 31 July2017; Port Development Project, Ministry of Shipping, Government of India

utilization rate, which is below 50% for 2015-16[34], the latest year for which statistics were available. We expect capacity utilization for our port to improve significantly following modernization and connectivity improvement and are optimistic of reaching 75%. The initial revenue increase is expected to be by around 20% to be followed by 5% each year. Computation assumption details are in Appendix.

Apart from higher traffic produced by higher capacity and its better utilization, we expect revenues to progressively increase due to flexibility of non-major ports in fixing tariffs. It is difficult to estimate the social benefits for this exercise given the difficulty of pinpointing such benefits and the problems of both over and under-estimation involved.

3. Scientific testing and certification facilities for marine product exports

3.1. Background and evidence

Fisheries and marine products are among the most significant export resources of AP. The state is the largest fish producer in the country and is aiming to be the fish processing and export hub of the country. The objective – as outlined in the state's Vision Document – highlights the intention of boosting revenues from fishery exports and establish mechanized processing, packing and quality control measures for enhancing exports[35].

The great importance of the fisheries sector in the state economy is evident from it providing employment to more than a million people. The total production of fish and prawns in the state has been exhibiting impressive annual growth of more than 10 per cent during the first half of the current decade[36]. As the state moves forward on its goal of becoming an 'aqua hub' for the world, marine product exports, particularly prawns and shrimps, are expected to contribute significantly. Vannamei shrimps - an exotic species and a major seafood delicacy - are further expected to be crucial in enhancing AP and India's seafood exports. AP is the largest producer of these shrimps and accounts for more than 40 per cent of India's total seafood exports[37].

It is therefore imperative that AP invests in the establishment of scientific testing facilities that certify quality standards for marine and seafood exports from the state. Quality control and standard certification are essential for enabling seafood exports to meet the food quality standards in the US, EU, Japan, China, Southeast Asia and Middle East, which are the major export markets for Indian seafood exports[38].

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[34] Gangavaram port figures are from Socioeconomic Survey 2016-17 of AP; p.140 http://www.ap.gov.in/wp-content/uploads/2017/03/SOCIO-ECONOMIC-SURVEY-2016-17.pdf

[35] Page 11, as in 2.

[36] Socio-Economic Survey 2016-17, Page 74, Table 5.18.

[37] 'Vannamei future of Indian seafood exports' , The Hindu, 25 September 2016; http://www.thehindu.com/todays-paper/tp-national/tp-andhrapradesh/Vannamei-future-of-Indian-seafood-exports/article14998793.ece

[38] 'India's seafood export at all-time high in 2016-17: MPEDA', Press Information Bureau, Government of India, Ministry of Commerce & Industry; 7 June 2017; http://pib.nic.in/newsite/PrintRelease.aspx?relid=164454

Empirical research on the relationship between quality standards and trade broadly points to adoption of standards leading to an increase in host country exports[39]. The evidence needs to be looked at in view of more specific results suggesting non-tariff measures (NTMs) - popularly described as SPS and TBT measures – often acting as market access barriers for developing country exports to developed country markets[40].

Specific studies on seafood exports from India point to the difficulties encountered by these exports from progressive tightening of safety and quality standards in various industrialized country markets, particularly from differences in conformity assessment procedures in domestic markets and abroad[41]. Studies also point to the seafood value chain in India restructuring following adoption of stringent quality standards at home and overseas, and high-value seafood exporters complying to growing private and voluntary standards for obtaining long-term comparative advantages[42].

On the whole, empirical evidence suggests the necessity of developing country exports – and in the present instance Indian seafood exports – complying with quality standards, both upcoming domestic standards (e.g National Good Aquaculture Practice)[43] and international standards. The significant role of more capacities in this regard can hardly be overstated, particularly for a state like Andhra that has great seafood export prospects.

Our expectation is the development of new capacities for certifying seafood exports would have the positive 'substitution' effect of encouraging a part of seafood produce, currently aimed for the domestic market, to be diverted to exports. These exports would also fetch a premium over and above domestic price. We expect the premium to generate considerable export revenue over time, since seafood exports from Andhra primarily comprise shrimps, for which international prices are around 40 per cent more than domestic prices[44]. Though other seafood exports do not command as high premiums, Andhra's large production and decided comparative advantage in shrimp exports, places it in a unique position to earn more revenues from seafood exports.

3.2 Description

The intervention is visualized as a laboratory with state-of-art testing and certification facilities. To be built over 5 acres, the emphasis of the laboratory will be on providing exports headed outbound through Vizag and other ports of Andhra, such as Krishnapatnam, necessary certification for getting access in the US, EU and major markets in Northeast Asia, Southeast Asia and Middle East. The facility will add to existing testing and certification facilities in the state and will be seafood-specific given the great importance that these exports can play in Andhra's future economic growth. While the basic functional parameters, including the machinery and equipment to be installed, would proceed in line with norms set out by the FSSAI, we expect private sector and industry views to be important in shaping the

[39] Swann, G.P.(2010)
[40] WTO (2012)
[41] Henson et al (2004)
[42] Raymond and Ramachandran (2017)
[43] NAAS.(2015).

[44] Salim, Safeena and Athira (2015)

final facilities of the laboratory. This is necessary given the industry's regular interaction with the process of obtaining standards and certifications.

While Vizag is the key gateway for marine product exports, Krishnapatnam has also been playing a major role. The facility needs to be located within reasonable proximity of both ports and as a part of the upcoming CEZs to enable its maximum utilization by seafood producers.

3.3. Costs and Benefits

Land and building costs for construction of the laboratory are estimated on the basis of market prices for industrial land in reasonable proximity to the Vizag port and state highway. Such locational characteristics are important for ensuring maximum accessibility to the laboratory from surrounding aquaculture hubs. The land and building costs are assumed split over two years. In computing the laboratory and equipment costs, we go by the FSSAI's benchmark estimates for upgrading existing food testing laboratories in various Indian states. However, these estimates are extrapolated upward for factoring the costs of the most modern equipment required for testing products that need to meet highest global standards. Operating expenses are computed on the basis of a proportion of fixed costs, to be progressively scaled up over time.

Benefits are computed on the basis of current volumes and values of seafood exports from Vizag and Krishnapatnam ports. As explained earlier, we expect the positive substitution effect of the new facilities to result in a 2% increase in exports by volume in the first year. The price incentive for these exports – the differential between their current domestic market price and international price - is assumed of 25% of current international price for seafood exports. Given the dominance of frozen shrimps in AP's export basket, which as it is command a higher price differential, this is a reasonable assumption. More details are in Appendix.

4. Conclusion

The BCRs are summarized in Table 2.

Table 2: BCR Summary Table (INR Crore)

Interventions	Discount Rate	Cost	Benefit	BCR	Evidence
1. Development of an export-oriented apparel park in a Coastal Economic Zone a. Scenario 1	3	22,930	59,929	2.6	Medium
	5	19,235	46,461	2.4	
	8	15,198	32,346	2.1	
b. Scenario 2	3	22,930	306,759	13.4	Medium
	5	19,235	237,726	12.4	
	8	15,198	165,414	10.9	
c. Scenario 3	3	22,930	367,393	16.0	Medium
	5	19,235	282,338	14.7	
	8	15,198	194,070	12.8	
2. Modernizing port facilities and improving hinterland connectivity	3	2,290	2,252	1.0	Strong
	5	1,985	1,695	0.9	
	8	1,643	1,129	0.7	
3. Scientific testing and certification facilities for marine product exports	3	47	395	8.4	Strong
	5	44	346	7.9	
	8	39	285	7.3	

Apart from intervention 2, which is seen to yield BCR of 1 only under a 3% discount rate, the remaining interventions produce high BCRs for all discount rates and scenarios. By its very character, modernization of existing port facilities and deepening its linkages with the hinterland – as visualized by intervention 2 – is a policy development that is expected to take significantly long to yield substantive benefits. Success in obtaining land and pushing modernization might alter the BCR computations for this intervention over all discount rates.

Quicker benefits are expected from intervention 3, which could be the 'low hanging fruit' for accelerating exports. Intervention 1, is also expected to be significantly benefit enhancing over the longer term, particularly in terms of its positive spillover effects, even under the most conservative of the three scenarios.

The larger point to be noted from the results is that policy benefits need to be distinguished between those would yield returns over a longer term vis-à-vis those in much nearer term. The Sagarmala Vision Plan and AP Vision 2029 are steps in the right direction. As parts of these visions, there are policies those, while being correct choices, would take time to fructify. Quicker implementation, needless to say, would lower costs and expedite benefits from all the interventions.

5. References

Acciaro, M. and A.C. McKinnon (2013), Efficient hinterland transport infrastructure and services for large container ports, Position paper for the OECD/ITF Roundtable, Port Investment and Container Shipping Markets, Santiago de Chile, Chile, 7-8 November.

Aggarwal, Aradhana (2012), *Social and Economic impact of SEZs in India*. Oxford University Press.

Aggarwal, Aradhana (2006), 'Performance of Export Processing Zones: A Comparative Analysis of India, Sri Lanka and Bangladesh', Journal of Instaflag Institute, Vol.30, No. 1, World SEZ Association, Arizona, USA, 2006

Alkon, Meir (2016), 'The Developmental Effects of Special Economic Zones: Evidence from India's States'; https://ncggnew.princeton.edu/file/366/download?token=fsHpqSXd

Merk, Olaf and Notteboom, Theo (2015), 'Port Hinterland Connectivity' Discussion Paper No. 2015-13, OECD, May; https://www.itfoecd.org/sites/default/files/docs/dp201513.pdf

NAAS.(2015). Aquaculture Certification in India: Criteria and Implementation Plan. Policy Paper No. 77, National Academy of Agricultural Sciences, New Delhi:16p

Henson, Spencer, Saqib, Mohammed, Rajasenan, D (2004), 'Impact of Sanitary Measures on Exports of Fishery Products from India', Agriculture and Rural Development Discussion Paper 17, The World Bank, Washington DC; http://siteresources.worldbank.org/INTARD/Resources/India_Fish_final.pdf

Palit, Amitendu and Bhattacharjee, Subhomoy (2008), *Special Economic Zones in India* , Anthem Press

Planning Commission (2013), 'Ports and Shipping', National Transport Development Policy Committee; http://planningcommission.nic.in/sectors/NTDPC/voulme3_p2/ports_v3_p2.pdf

Raymond, Asha and Ramachandran, Alappat (2017), 'Food Safety Management Systems in Indian seafood export industry – the case of Kerala', I*nternational Journal of Management*, Volume 8, Issue 2, March – April 2017, pp. 199–208, Article ID: IJM_08_02_021 http://www.iaeme.com/MasterAdmin/UploadFolder/IJM_08_02_021/IJM_08_02_021.pdf

Salim, S Shyam, Safeena, P.K. and Athira, N.R. (2015), 'Does India Really Need to Export Fish: Reflections and Upshots', *Agricultural Economics Research Review,* Vol. 28 (Conference Number) 2015 pp 117-126
DOI: 10.5958/0974-0279.2015.00027.0

Singh, Purva and Kathuria, Rajat (2016), Infrastructure and Connectivity in India: Getting the Basics Right, Asian Economic Policy Review, July; https://doi.org/10.1111/aepr.12144

Swann, G.P. (2010). International Standards and Trade: A review of the empirical literature. OECD Trade Policy Working Papers, No 97. OECD Publishing. https://www.oecd.org/tad/45500791.pdf

WTO (2012). World Trade Report 2012. Trade and public policies: A closer look at non- tariff measures in the 21st century. https://www.wto.org/english/res_e/booksp_e/anrep_e/world_trade_report12_e.pdf

Wang, Jin (2013), 'The Economic Impact of Special Economic Zones: Evidence from Chinese Municipalities', Journal of Development Economics 101 (2013) 133–147

6. Appendix

Assumptions for Costs and Benefits

Intervention 1: Development of an export-oriented apparel park in a coastal economic zone	
Costs	Benefits
Land: Size of 2000 acre for apparel park/food park/electronics hub[45] of 2000 acre. Acquisition rate for developed land is around 1 crore/acre in Nellore and other coastal areas of AP[46]. We assume land acquisition at mean price of Rs 0.6 crore/acre as it will be a parcel of developed/partly developed/hardly developed land. Based on the average experience of time taken in acquiring land, we expect it to be distributed evenly over five years at 400 acre each with a cost of 240 crore (400*0.6 crore per year).	Exports: Sagarmala Perspective Plan for SEZs apparel export cluster export potential of Rs 25,000-30,000 crore[47]. We assume cluster to generate Rs 26,000 crore exports over a period of 10 years. We further assume Rs 1000 crore exports from first year of operation to increase by 10% each year. (Baseline Scenario – Scenario 2) For Scenario 1, we expect 1st year exports at much lower Rs 500 crore. For Scenario 3, we retain same assumption as baseline scenario.
Development: Development costs of around US$1 billion or Rs 6400 crore for a 1000 acre apparel park[48] are extrapolated to Rs 10000 crore for a 2000 acre park. We assume there will be some scale economies leading to moderation of costs. We assume costs to be spread out at 2000 crore for 5 years beginning from 2nd year.	Economic Impact: Sagarmala Perspective Plan estimates economic impact to at Rs 30,000-35,000 crore for an apparel park[49]. This is 4.5-5.0 per cent of AP GSDP (2017, current prices) of INR 670000 crore. We assume economic impact from new jobs and greater economic activity to be at around 4% of AP GSDP 2017 i.e. Rs 27000 crore with an increase of 2% each year. (Baseline Scenario- Scenario 2) For Scenario 1, we expect economic impact at Rs 5000 crore. For Scenario 3, we assume Rs 27000 crore – same as Scenario 2 – but employ a higher annual increase of 5%.
Operating costs: We assume these to be 10% of development costs with an increase of 5% each year[50].	
Intervention 2: Modernising port facilities and improving hinterland connectivity	
Land: We assume 1000 acres of land will be required for upgrading existing facilities and connectivity and employ the same assumption for cost of land and	Revenue: Modernisation measures are expected to increase port capacity by 20 million

[45] Rajya Sabha Unstarred Question 2862, 27 Mar 2017; Coastal Economic Zones under Sagarmala Project; Ministry of Shipping, Government of India

[46] Interviews with government officers and agencies.

[47] Sagarmala Perspective Plan, Vol II, Page 49, Exhibit 1.49; another estimate indicates US$4 billion in 10 years (Vol II, Page 44); Ministry of Shipping, Government of India.

[48] Ibid

[49] Same as in 14.

[50] Ibid.

its eventual cost based on the land mix between developed and partly developed as in Proposition 1. We estimate total land prices for 1000 acres at Rs 600 crore.	tonnes per annum. This is on the basis of similar modernization capacity increase target for facilities implemented at Visakhapatnam port[51]. Since we have a non-major port in mind for the exercise, we assume Gangavaram port capacity as an example. The port has 45 million tonnes capacity in 2015-16 and generated a cargo of 20 million tonnes. This indicates a capacity utilization rate of just under 45%. We expect capacity utilization to improve following modernization and connectivity improvement. We assume capacity to improve to 75% utilization. Thus with a new capacity of 65 million tonnes (45 + 20 now added), 75 per cent capacity utilization should generate cargo of roughly 50 million tonnes. In 2015-16, GV port fetched revenue of INR 750 crore from cargo traffic of 20 MT. As traffic more than doubles to 50 MT, revenue should increase correspondingly[52]. But we expect this to happen over a period of time. In the first year, we expect a 20 per cent increase in revenues (Rs 150 crore) and subsequently a 5% increase in revenues each year. This increase is feasible given the higher capacity utilization, greater demand and flexibility of non-major ports in fixing tariffs.
Modernisation/upgrading of existing facilities: Based on the cost estimates of dredging, building a new container freight station and expanding the size of berths at Visakhapatnam port[53] and a 20% escalation in costs (particularly time overrun and implication of costs), we arrive at following costs: dredging - Rs 45+Rs 9=Rs 54 crore; new container freight station Rs 100+Rs 20=Rs 120 crore and expanding berth size Rs 200+Rs 40=Rs 240 crore. The total costs are estimated at 414 crore, which we further increase to 440 crore and assume them to be completed over a period of 4 year with annual cost of 110 crore.	
Connectivity: We assume road connectivity of the port to hinterland to be expanded by increasing number of lanes of existing highway network. Similar national highway expansion project in Maharashtra for JNPT has been allotted 335 crore[54]. We assume 500 crore after factoring in enhanced costs for acquisition and assume costs to be spread like Rs 120 crore, Rs 120 crore, Rs 100 crore, Rs 80 crore and Rs 80 crore with costs higher in the beginning due to acquisition.	
Operating Expenses: We assume operating expenses at 50% of additional revenue. Shipping statistics point to such expenses being 60% for a major port like Visakhapatnam, but we assume 50% on efficiency grounds.	
Intervention 3: Scientific testing and certification facilities for marine product exports	
Land and Building: We expect the laboratory to be in a major coastal city of AP, such as probably Visakhapatnam. Vizag port handles the largest volume of marine exports in 2016-17 among all Indian ports. Along with Vizag port, the laboratory is also expected to facilitate marine product exports from Krishnapatnam port and other ports in the state. Industrial land in reasonable proximity to Vizag port and state highway is currently priced at roughly Rs 2.2 crore per acre[55]. We propose the lab to come up in an	Revenue: The quantity and value of marine exports from Vizag and Krishnapatnam ports are 159973 tons and Rs 9295 crore and 62049 tons and Rs 3700 crore for 2017[56]. The combined total of both ports is 222022 tons at Rs 12995 crore. This produces a unit estimate of 1 ton seafood export at Rs 0.058 crore from both ports. Our assumption is the substitution effect would produce a 2% increase in exports in volume in the first year. These exports would be triggered by a price

[51] Rajya Sabha Unstarred Question no 1736 on 31 July2017; Port Development Project, Ministry of Shipping, Government of India

[52] Gangavaram port figures are from Socioeconomic Survey 2016-17 of AP; p.140 http://www.ap.gov.in/wp-content/uploads/2017/03/SOCIO-ECONOMIC-SURVEY-2016-17.pdf

[53] Rajya Sabha Unstarred Question no 1736 on 31 July2017; Port Development Project, Ministry of Shipping, Government of India.

[54] Same as above; Annexure projects for 2016-17

[55] Market intelligence reports on property prices

area of around 5 acre entailing a cost of Rs12 crore. We expect the construction and development of the land to cost another Rs 8 crore. The land and building costs are assumed split over two years.	differential of 25% between domestic market price and international price. We assume 25% as bulk of seafood exports from AP are frozen shrimps, which command price differential of around 40%. The assumptions yield initial export of 4440 ton, fetching revenues of Rs 65.34 crore at a per capita price of Rs 0.14 crore. We further expect the value of exports to increase by 2% each year.
Laboratory and equipment: We follow the Food Safety and Standards Association of India (FSSAI)'s cost assessment for upgrading state food laboratories. These assessments point to total upgradation cost of Rs 8 crore for state food laboratories[57]. We upgrade the cost by 25 per cent. We expect the establishment of the lab along with equipment to take place in the 3rd year.	
Operating Expenses: Annual operating costs are assumed at 10% of total fixed costs (land and building, laboratory & equipment) for first 3 years with further assumption of increase by Rs 0.5 crore each year.	

[56] As in 11 earlier.

[57] SoFTel - Strengthening of Food Testing Laboratories; Food Safety and Standards Association of India (FSSAI).

As a new state, Andhra Pradesh faces a bright future, but it is still experiencing many acute social and economic development challenges. It has made great strides in creating a positive environment for business, and was recently ranked 2nd in India for ease of doing business. Yet, progress needs to be much faster if it is to achieve its ambitions of becoming the leading state in India in terms of social development and economic growth. With limited resources and time, it is crucial that focus is informed by what will do the most good for each rupee spent. The Andhra Pradesh Priorities project as part of the larger India Consensus – a partnership between Tata Trusts and the Copenhagen Consensus Center, will work with stakeholders across the state to identify, analyze, rank and disseminate the best solutions for the state. We will engage people and institutions from all parts of society, through newspapers, radio and TV, along with NGOs, decision makers, sector experts and businesses to propose the most relevant solutions to these challenges. We will commission some of the best economists in India, Andhra Pradesh, and the world to calculate the social, environmental and economic costs and benefits of these proposals

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