THE CHUNNEL AS AN EXAMPLE OF INCORRECT EVALUATION OF PUBLIC MEGAPROJECTS

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ABSTRACT: Public service megaprojects analysed with financial tools can give erroneous decisions as proved by the European Tunnel (Chunnel) which academics use as an example of megaproject failures. Financial analysis before its construction, comparisons with reference class megaprojects and its construction delays, cost overruns and performance below expectation in the first few years was shows as the Chunnel being a failure. However, 25 years later, the Chunnel is considered indispensable to the United Kingdom. This study analyses three common good megaprojects (CGMs) that have proven their benefits over decades to centuries to demonstrate that extant methods of evaluating megaprojects based on their financial cost and returns cannot capture their appropriate worth and long-term benefits. The research method is a qualitative approach in the interpretive paradigm, within the realist and pragmatist philosophies to get a holistic picture aided by a facility of discovery. When comparing the Chunnel with other megaprojects, it is revealed that the Chunnel, a public good, was treated as a business megaproject using market-based financial metrics. The study allows for new discussion to take place on an alternative model to select and evaluate CGMs in the future.

Keywords: Megaprojects, Iron Trap, Iron Triangle, Common Good Megaprojects, Channel Tunnel.

1. Introduction

In the fairy tale 'The Ugly Duckling' by Hans Andersen (1843), a duckling on a farm was scorned as ugly because, unlike the other animals in the farm—the dog, cat and hen—the duckling could not bark, meow or lay eggs. Dejected, one day she flies out of the farm and runs into a bevy of swans in a lake; she then realises that she is a swan. Similarly, the Chunnel was pronounced a failure, or an 'ugly duckling', by academia based on economic evaluation criteria and a reference class of projects. Twenty-five years later, it has turned out to be a swan—indispensable to the United Kingdom (UK) and creating economic value to all European nations involved (Shenhar & Holzmann, 2017) and worth every penny that was spent on it (Dennis, 2020). It is considered a crucial part of UK infrastructure (Channel tunnel turns 20, 2014) which the UK could not have done without (Dennis, 2020). This study contributes to the current literature by showing that development and common good megaprojects (CGMs) evaluated with financial criteria and the iron triangle may give erroneous results, possibly leading to a 'thriving of the unfit'.

The objective of a CGM is to serve the society. Historically, given the public nature of infrastructure and the positive externalities generated by them, CGMs are financed by governments (Croce, Paula, & Laboul, 2015; Priemus, Flyvbjerg, & van Wee, 2008). Currently, megaprojects are selected using market-based methods such as financial viability, payback, return on equity, and cost-benefit analysis (CBA). They are pronounced successes or failures from the iron triangle of budget, schedule and benefit (The Economist, 2012, p. 55). In this paper, these two methods are referred to as the 'financial and iron triangle model' (FIT); further, it is posited that these methods do not differentiate between the types of projects. This study shows that the FIT criteria, while valid, cannot be used for CGMs, as CGMs are, by definition, built for the benefit of the people for their consumption, or 'self-consumption'. The investment cannot be considered a cost, and the benefits cannot be quantified for the CBA as evidenced in the case of the Chunnel. Hence the project analysis with CBA and evaluation by the FIT leads to unfit projects being selected, a kind of survival of the unfittest (Flyvbjerg, 2009).

Mahalingam (2021) shows that there are three types of megaprojects, depending on their purpose, the altruism, business, and common good (ABC) model of megaproject motives. Each type is significantly different in its needs, selection criteria, management, personnel, and evaluation. Common goods, public goods, and public development projects are all referred to as one, as they have common characteristics. Public goods are non-excludable and non-rival; everyone can use them, and their usage by one person does not reduce the availability to another. Common goods are non-excludable but rival; everyone can use them, but use

by one reduces the availability to others (Deneulin & Townsend, 2007; Sabzalieva & Quinteiro, 2022). Development projects may be public or common goods. Therefore, the research question posed is: Is the FIT model sufficient and optimal for selecting and evaluating CGMs?

To investigate whether the FIT model is appropriate for CGMs, I review three historic megaproject cases that have proven their beneficence over decades and centuries: a 2000-year-old functioning dam, a 100-year-old hydroelectric dam, and a 50-year-old sea port, all of which have transformed the regions around them. I then apply the results of this analysis to the Chunnel to verify whether it may have been maligned by vested interests acting too quickly. The remainder of this paper is organised as follows. Section 2 presents a literature review, Section 3 presents the research methodology, Sections 4–6 comprise the case studies, analysis, and discussion, respectively. Finally, Section 7 concludes the paper and addresses the limitations of the study and avenues for further study.

2. Literature Review

CGMs are a separate class of projects, with the purpose of serving a need of the public. Apart from their direct and developmental benefits, their very presence may spawn unimagined novel uses and benefits in the future. In other words, CGMs may have delayed and long-term benefits.

The economic development of a nation requires very large infrastructure and public development projects. It is predicted that many developing nations will spend an excess of $6.3 trillion USD annually over the next decade, much of it on CGMs (Garemo, Matzinger, & Palter, 2015). CGMs, such as transportation infrastructure, public utilities, and public service projects, increase productivity of the workforce, improve standards of living (Bivens, 2012) and bring comfort to the members of the community. For example, transportation infrastructure megaprojects change the land use of a country, transforming the economy or the region. Such CGMs influence many aspects of peoples' lives, including where they choose to work, live, and where their children go to school. CGMs change the utility of marketing, which in turn, changes the range of available goods and prices in areas where factories are built, or locations that become holiday destinations, among others (Laird, Nash, & Mackie, 2014). Investments in CGMs are usually very high, and therefore, are realised by a community collectively (Dupré, 1993) over decades or centuries.

With so many programmes and megaprojects to fund, governments select CGMs based on financial parameters, including the robust and popular CBA (Laird et al., 2014), which has an equally poor reputation among academics (Adler & Posner, 1999). A CBA compares the costs of a proposed action based on market principles; thus, introducing the normative role of economics, making the government work more like a business (Posner, 2000). The CBA originated in the 1920s with the United States (U.S.) Corps of Engineers, who used it as a strategy for limiting political involvement in the selection proposals of public works (Porter, 1995).

Economists measure the impact of a project by the economic multiplier from base theory, although the theory is not without criticism (Hicks, 2016). Bivens (2012) points out that the benefits of public investment cannot be measured as a means to accrue a wide range of people and businesses. Tay, Chan and Diener (2014) discuss subjective well-being, and its components of ecological momentary assessment and day reconstruction method, as additional tools to assess the impact of change and development. Vickerman (2017) argues against using wider economic benefits in megaprojects, which he says are marginal and not certain as they are assumed to be. However, all alternatives suffer from the same limitation of the CBA, which requires predicting a future activity, measuring its effects, pricing it in the future and using it for analysis in the present.

Aiding the CBA is the internal rate of return (IRR), a method of comparing multiple investment opportunities with their known unknowns. Evaluating a project by IRR neither reveals its absolute benefits, nor does it work particularly well with CGMs that have long utility of decades or centuries. A study by the Omega Centre of The Bartlett School of Planning, University College of London (Dimitriou, Ward, & Wright, 2012) observes that the changing demands and unplanned outcomes in infrastructure and utilities, both beneficial and otherwise, can make it difficult to model the requirements over two or three decades.

Laird et al. (2014) report that the CBA methods are inadequate in truly transformational projects, those for which land use changes as CBA only considers the difference between inward cash flows within-the-project and counterfactual scenarios. At present, different methods can give, or can be made to give, very different results, which may engender potential confusion and misinterpretation. Adler and Posner (1999) find that the CBA does not resolve the philosophical problems in the decision-making process and is just a tool of evaluation and decision-making for social and economic policy. There is no alternative to CBA, says Sunstein (2005), and CBA is 'best taken as [a] pragmatic instrument, agnostic on the deep issues and designed to assist people in making complex judgements where multiple goods are involved' (p. 1157). As for the practical side, Posner (2000) has a relatively humorous take: 'If the taxpayer and the voter all know—thanks to CBA—that a project under consideration will save 16 sea otters at a cost of $1 million apiece, and the government goes ahead, I would have no basis for criticism' (p. 1157).

Flyvbjerg (2009) argues that not using the CBA would result in inapt projects being selected, leading to the phenomenon of 'survival of the unfit'. Sunstein (2005) reveals that the CBA is not required in independent agencies, such as the Federal Communications Commission, the Securities and Exchange Commission, and the Nuclear Regulatory Commission, showing the limited use of the method.

The sheer size and complexity of these projects will lead many to an 'iron trap' (Mahalingam, 2021), exceed the budget, delay in completion, and not deliver the expected benefit in the short term. Terrill (2016) states that the largest cause for failure in megaprojects is the pre-election promises of politicians, while Flyvbjerg (2007) posits four factors as causes of failure which he calls the 'four sublimes', a political sublime as a rapture of immortality for the leaders who initiate or dedicate these monuments; an economic sublime of the delight businesses and other professionals get imagining the profit from these projects; a technological sublime of the excitement of technologists at pushing new frontiers of technology; and an aesthetic sublime of the pleasure designers get from creating iconic objects.

The ABC model of megaprojects classifies them into three types: Altruism megaprojects are those driven by altruism and compassion, such as the Exxon Valdez clean-up following the oil tanker running aground in Alaska, killing millions of marine lives. Business or commercial megaprojects have profit motives, such as the Boeing 787 project (Mahalingam, 2021). Mahalingam (2021) has presented that the four sublimes are just vested interests present in any project, and none of them are sublimes: A sublime inspires awe, extreme fear, great excellence, or beauty unparalleled (Kant, 2011) and universal, enduring and across time (Nye, 1994). The ABC model separates CGMs from business megaprojects that require different management skills, personnel, and yardsticks to measure their success.

A research gap exists in the selection and evaluation of megaprojects with very long useful life: Financial methods are applicable in business megaprojects that can have a measurable output and lend themselves to evaluation through their performance in the budget, schedule and benefits. Some categories of megaprojects are built with the aim of serving a public need. They typically transform society. Public and common good megaprojects yield benefits that may be delayed or benefit over a longer period of time. This leads us to a research question if the FIT model can be used to select public megaprojects. This includes the evaluation of such megaprojects by the triple cause of budget, schedule and direct benefit over a few years.

3. Research Methodology

The research question is if the FIT model sufficient for selecting and evaluating CGMs? A null hypothesis would be that the FIT model identifies any public megaprojects correctly. As this question might raise a new theory, I used a qualitative inductive approach, followed by an abductive application-- a pragmatist philosophy with a mono qualitative method (Vizcarguenaga-Aguirre & López-Robles, 2020) on the basis of a realist ethnographic strategy with a holistic view of the field of megaproject management. A research design should identify megaprojects from different sectors, periods, and geographies from a holistic view of the field of megaproject management through a qualitative approach to provide the facility of discovery (Williams, 2007). The case approach offers such a facility of discovery and facilitate understanding of little known and poorly understood situations (Leedy & Ormrod, 2001; Williams, 2007). Availability and access to the information required for this research question steered the samples to recent projects from open societies over the past few decades. I collected over 200 CGMs cases, ranging from fighter aircraft and infrastructure to scientific megaprojects and selected cases with a purposive method (Patton, 2002). The CGMs considered have survived for centuries and decades, continued their original objective, and grown to support new developments not conceived of during the original proposal. The key criteria used to select the cases were as follows:

3.1. Is it a public or common good that has existed for over 50 years, which is the period used to calculate financial rates of return and viability?
3.2. Is the project continuing to benefit society after this period?
3.3. Has the project or its existence nurtured

opportunities not considered in the original plan of the CGM?
3.4. Are the benefits of the CGM evident and accepted by all?
3.5. Can the information on the project be conveyed briefly and convincingly?

Based on the criteria listed, I selected three cases with the information required of the research question. Although a single case is sufficient for such a study (Flyvbjerg, 2006), the consideration is between the depth of the study from fewer cases and the ability to generalise from several cases. The three case studies cover a span of centuries, which validates the findings over a long period of time. The three CGMs selected are:

1. Kallanai Dam, 2000 years old, now the lifeline of the region.
2. Krishna Raja Sagar (KRS) Dam, 90 years old, irrigation and power project.
3. V O Chidambaranar (VOC) Port, 50 years old, deep-sea port.

4. The Case Studies

4.1. The Kallanai Dam

The Kallanai Dam in South India, built by King Karikalan between 100 BCE and 100 AD across the Kaveri river, is one of the oldest irrigation systems in the world still in use (Agoramoorthy & Hsu, 2008). Arthasastra, the ancient Indian political treatise written by Chanakya in the fourth century BCE, extorted kings to build water-works and share their provisions with the people or entrust the kingdom to another king. Indian rulers have constructed dams, canals, wells and embankments (Jean, 1991) to provide sustenance to the people. The Kaveri is the third largest river in India at 800 km long, and the Kallanai Dam was built to irrigate about 30,000 hectares in the Chola Kingdom in South India.

Figure 1: The Kallanai Dam.
Source: Wikipedia- Ashwin Kumar.

The dam now irrigates nearly 400,000 hectares (Arulmani & Latha, 2014) and provides water to 73 million people (Bhuvaneswari et al., 2013). What started as an irrigation project has, over 2000 years, turned into a lifeline for the region; further, this outcome was likely not imagined by the king at the time of construction. For those who wonder how the dam has not clogged by silt from the water, the builders of the time reshaped water currents and sedimentation sophisticatedly such that the silt was carried away. The Kallanai Dam shows that dams can have a useful lifespan of centuries and help the development of society with their utility and benefits.

4.2. The KRS Dam

The KRS Dam in South India was built between 1911 and 1931 on the Kaveri river, upstream of the Kallanai Dam, and was the second largest dam in the world at the time. The dam was built to shelter the population from the vagaries of the monsoon in the Kingdom of Mysore, South India. The region had historically been dry, and crop failures were common due to lack of water for irrigation. Heavy rain had destroyed the crops in 1873, and a severe drought in 1875–76 wiped out one-fifth of the population (Prasad, 2014). Scant rainfall in the following year caused lakes to dry up and affected food stock and cattle, especially milch animals.

Figure 2: The KRS Dam.
Source: Central Water Commission, Government of India.

In the 19th century, the British considered the Kingdom a ‘Model State’ in their realm, the best administered one, and a jewel in the crown (Ushadevi, 2000). In 1915, the Chief Engineer of Mysore proposed constructing the dam with a two-fold objective: (i) to generate hydroelectric power for the State and (ii) to supply water to irrigate about 50,000 hectares of land. The proposal mentions the ‘vista of possibilities of ever-increasing value in the state by adding to the productive power with the increase in agricultural produce and development of industries and manufacture’ (KRS Operating Manual, 2019). The detractors argued that the project would ‘serve no purpose’ and that there was no demand for electricity. In addition, the colonial British Government would not fund the dam and the Kingdom did not have the money (Sukumar, 2019).

To finance the dam, the Queen Mother of Mysore pledged her jewels to the neighbouring King of Kashi and borrowed money for the construction. Then, 20 years into the construction and six months from completion, the project ran out of money due to mounting labour and construction costs (Sharma, 2019). The King appealed to his people to contribute their efforts by working for free for four weeks, and they completed the project—an interesting example of financing a CGM.

The objective of the dam was to protect residents from the periodic and constant threat of famine and flood while a plentiful river Kaveri was flowing through the state. The dam was funded by the King’s treasury and his personal wealth. While the original proposal was to irrigate 50,000 hectares (KRS Operating Manual, 2019), today it irrigates more than 160,000 hectares in Karnataka. Additionally, it irrigates 500,000 hectares in the neighbouring states and is the only source of drinking water for 16.5 million people (Johnson, 2016).

4.3. The VOC Port

The VOC port resulted in the transformation of the town, economy, and community over the years. The town expanded, affluence and standards of living increased, and the community became a city with anonymity. It was a deep-sea port where large ships could land bulk material and huge plants and machinery for large-scale industries.

In the first decade of the new port, the region bustled with new industries; India’s largest fertilizer manufacturer, Southern Petrochemical Industries Corporation was commissioned in 1972. In 1979, a coal fired thermal power plant was opened. In 1979, a ‘Heavy water – Deuterium’ plant was constructed. The largest manufacturer of soda ash and allied chemicals, Tuticorin Alkali Chemicals & Fertilisers Ltd (TFL), followed in 1980. Other factories, such as Tamil Nadu Petro Products, Pharmaceuticals, and Sterlite, the largest copper smelter plant in India, all came up within 30 years. The originally single small

gauge railway in the 1960s expanded to multiple broad gauge (wide and stronger rails) rails to carry heavier loads, at higher speeds, and greater throughput. Fifty years later, the roads around the town have grown manifold, connecting it to the rest of the country. A new airport has been built, and a rocket launch station is planned for this decade. The population has grown from 130,000 to 600,000, and the one-college town has grown into a district headquarters with colleges of medicine, engineering, sciences, and arts. A cruise terminal has recently been added.

Figure 3: VOC Port (Source: VOC Port).
Photograph by Dhanasekaran Muthu

4.4. The Eurotunnel or Chunnel

The Eurotunnel, more commonly called the Chunnel, is an undersea tunnel connecting Britain and Europe, funded through a private company with capital subscribed by the public. British Prime Minister Margaret Thatcher had insisted that the project shall not have recourse to any public money, or even a sovereign guarantee. Therefore, although being a public good, the Chunnel was made with private money. It was promoted to private investors and relied on user charges and market-based revenues to reward equity and repay debt (Goldsmith & Boeuf, 2019). Construction of the tunnel began in 1988 and it was opened to service in 1994 (Minihane, 2019).

Figure 4: The European Tunnel (Chunnel).
Photograph by Daniel Terdiman, CNET, Source CNET.

The construction and financing costs exceeded the original estimates by 80% and 140%, respectively, due to challenges in technology. Further, the forecasted traffic did not materialise, partly because of the lack of last mile connectivity.

The Channel tunnel was declared a complete failure by academia, applying the criteria and comparing it with a basket of megaprojects. Anguera (2006) says that the British economy would have been better off had the Channel tunnel never been built, and Flyvbjerg (2017) adds that it diminished the value of the economy instead of adding to it. However, Shenhar and Holzmann (2017) say, “from the public good’s perspective the channel is clearly a successful project . . . it continues to create economic value to all involved European nations” (p. 35). Dennis (2020, p. 1) finds that the tunnel was considered worth every penny, and the UK could not function without it: ‘Countless vital products too time-critical to ship and too numerous to fly, arrive onto our little island every day via this portal to the continent’.

The American Society of Civil Engineers named it as one of the seven modern Wonders of the World, and this miracle of modern engineering remains one of the great testaments to tunnel engineering and the railway’s ability to connect people. Before the Chunnel was built, ferries could not make the crossing in uncertain weather, affecting the supply of goods across the UK (ibid). Even when the ferry was running on time, the London to Paris journey required a full working day. The 1980s had made business and industry an increasingly global affair, and such an unreliable connection to the continent was becoming a problem for the UK economy. With the opening of the Chunnel, 21 million passengers and 23.1 million tonnes of freight cross the strait annually. Economic Footprint of the Channel Tunnel, a report by Ernst & Young (E&Y, 2018), mentions that approximately 4.5 million UK tourists use the Channel tunnel every year, with 1.6 million trucks transporting goods between the UK and the continent, making it worth around €140 billion per year for the UK and European economies. Twenty-five years after its opening, the Chunnel does not appear to be the curse that academia had been projecting to be (Minihane, 2019). The Chunnel is an ideal example of a CGM not meeting the FIT projections or short-term goals but thriving in the long-term with benefits to both the community and economy.

5. Analysis

The first three cases show that the CGMs became increasingly beneficial over their lifespan, and their utility was not restricted to three or four decades. These CGMs had to be built with large capacities, which continued to provide benefits for decades or centuries; they were all financed by the governments of the day. The fourth case of the Chunnel is added to aid the following discussion. Table 1 presents a comparison of the cases.

Table 1: Comparison of the Cases.

	Megaproject	Existence	Original Objective	Current Benefit	Scope of Future Benefit
1	Kallanai (Agoramoorthy and Hsu, 2008)	2,000 years	Irrigation of 300 km^2	Irrigation of 4,000 km^2, water for two states	Growing
2	KRS Dam (Johnson, 2016) (‘KRS Operating Manual’, 2019)	90 years	Famine alleviation, irrigation of 500 km^2, incidental hydro electricity	Irrigation of 7,000 km^2, manifold needs of electricity, water needs of 17 million people	Growing
3	VOC Port (Johnson, 2016)	50 years	Export salt, spices Some import trade	Export of salt, spices, import coal, machinery, container port, growth in hinterland	Growing
4	The Chunnel (Goldsmith and Boeuf, 2019)	25 years	Connect Great Britain and the European continent	Benefits are substantial and increasing	

The 2,000-year old Kallanai Dam continues to function and benefit the region, and its benefits have increased manifold, keeping up with the growth in population and the consequent needs. Based on the inscriptions of the period, it is assumed that the King paid for it with contributions and possibly with debt raised from rich merchants and landowners. Further, it is safe to assume that the project was not considered a business project to recover the investment or earn from it: This region in India is known for the philanthropy of the kings and merchants as evidenced by the number of charitable activities and temples, small and huge with magnificent and intricate carvings. The King of Mysore built the KRS dam to solve the need for irrigation and protect his subjects from periodic floods and famine. The money was provided by the king, and the dam was completed with the help of the labour of his subjects, all with no plan of recovering the investment in the dam. Now, 90 years later, the dam and hydroelectric station are the drivers of industrialization in the now much enlarged state of Karnataka and neighbouring states. It benefits the larger population by fulfilling their needs for irrigation, drinking water, and electricity. The VOC Port is a recent example of a megaproject fully paid for by the government without expectation of payback of the investment. It has been in service for 50 years, and its benefits have increased over time. Originally, it was meant to facilitate the exportation of materials and produce from the surrounding region, but it opened up possibilities of unloading entire manufacturing plants, which brought many factories and projects of national importance to its hinterland. The ease of bringing coal by sea and the need for power for the major factories created the conditions for building the thermal power station. The electricity supply and the port helped open up other industries, such as copper smelting and a spate of ancillary, allied, and new industries. This further led to new activities and entities such as ship repair and maintenance, maritime institutions, and engineering colleges. None of these activities were envisaged in the original plan of the port. Forty years after its inauguration, the port has grown into a major deep-sea port of the country.

If the Chunnel is not considered a business project, it has the same pattern of the three cases mentioned above. The cases are spread over 2000 years, while the Chunnel is just 25 years old. It is this difference in time that establishes the veracity of the theory. The Chunnel has a very long lifespan by design, is technology intensive, and is a one-of-a-kind tunnel with 38 km under the sea. The major portion of the investment was used to design a capacity high enough to be useful for many decades; after 25 years in existence, the Chunnel is now seen as something the UK could not function without.

6. Discussion

In the three cases analysed, the Kallanai and KRS dams began as irrigation projects, which grew to meet the demands of rising populations, including water for irrigation and living purposes and the growing demand for electricity in the case of the KRS dam. The very presence of a CGM opens up new opportunities, as is the case in the KRS dam and VOC Port. The Chunnel is more than just a rail link to the European continent and is indispensable today. Given this nature of CGMs, selecting and judging them within a narrow slice of time, as is done for business megaprojects, can lead to incorrect decisions and projects being taken up or abandoned.

When a CGM is paid for by the government, people have 100% equity in it. In contrast, the Chunnel gave 0% equity to the people, as the UK Government refused any investment, subsidy, or risk protection. Goldsmith and Boeuf (2019) point out that a public sector investment subsidy of around 50% of the capital costs would have made the Chunnel financially attractive to private investors, while generating an economic rate of return estimated between 3% and 6% over the life of the concession. Therefore, underlying the rhetoric of the failure of the Chunnel is the people being let down by a government on a whim of political posturing. This developed a deep bias against the Chunnel, as is evident in a recent statement when the Chunnel was already seen as being useful: ‘Revenues have been half of those forecasted, with even lower numbers after the COVID-19 pandemic’ (Flyvbjerg, 2021). COVID-19 spared very few, and the Chunnel is no exception. The Chunnel has delivered real economic benefits and has been an important agent of change despite being criticised as a waste of money for over two decades (Goldsmith & Boeuf, 2019).

6.1. Cost-Benefit Analysis

The CBA is least suitable for CGMs as it simply hides the deeper qualitative issues. The CBA becomes ‘cost-benefit-abuse’ when used to give a dollar value to future activities that cannot be predicted. Hirschman did not trust the CBA because of the deceptive ‘scientific’ number of the many aspects of the project (Hirschman, 1967). A CBA can be applied if there are simple outcomes, which are both measurable and predictable, but not to questions such as what the presence of a dam can do or what transformation the Chunnel can engender. The critical pundits of the Chunnel appear to have missed this aspect. A relevant example is the CBA practised by families in poverty, wherein more babies mean more income at the marginal cost of a mouth to feed. Many academics believe that CBA does not produce morally relevant information, and hence, should not be used in project evaluation (Adler & Posner, 1999). Megaprojects must be selected based on their long-term benefits to the society. Dimitriou et al. (2012) point out that these tools devalue the holistic long-term approach and deprive civil society of the opportunity of transformation that comes with CGMs.

The CBA is supported by the payback period and the IRR, which is, in effect, the present value of the cash inflows of the megaprojects due to the benefits. A business project has an investment that is returned in the form of revenues from the project, savings in operational features, or new opportunities that the project might open up. The primary objective of the business megaproject is profit; service to society isseccodar.

Adding to the selection method, the present art of megaproject management uses the iron triangle of time, budget, and benefit to pronounce the megaproject as a success or failure. Dimitriou et al. (2012) point out that ‘such practices can also hide the broader and long-term damage created by these megaprojects by excluding parameters not considered within the scope of “Iron Triangle” concerns’ (p. 36), which is another way of disregarding the better projects.

Although the case studies analysed are of a different time and location as compared to the Chunnel, as CGMs, they share common characteristics. They were built for the benefit of the people. CGMs are usually very capital intensive, have long lead times, and very long useful lives, and the benefits are more often rear ended; hence, financial models will distort their benefits to society. Further, these megaprojects usually spawn additional and extended uses, which are not visible at the time of the CBA. The take away is that CGMs cannot be analysed with the market-oriented methods in any aspect and must have separate metrics.

7. Conclusion

Public and common good projects are built to solve a society’s needs. They could be human needs or other needs, such as wildlife corridors, conservatories, and reforestation. These projects are for self-consumption of the society, and hence, they are built by governments with public money. They are long-run drivers of growth and benefit, and their useful life is better measured in decades and centuries. Therefore, they should not be viewed through the lens of financial viability and return on investment as is done for business projects. Private investment cannot accept the long wait for a return, as the time value of money falls to less than 1% in 40 years. CGMs selected with financial methods or evaluated by a simplistic delay, budget, and benefit triangle, within a period dictated by finance, lead to ‘thriving of the unfit’. The CBA has an inherent shortcoming with respect to CGMs as it cannot predict how the world will be after 30 years, how the CGM will be used, or what benefits will spawn to form the basis for the CBA. Some CGMs may not generate cash flows at all, and some might be natural monopolies that spawn other activities that benefit the economy as a whole and cannot be predicted or measured. In the case of the Chunnel, it is unfortunate that the swan was called an ugly duckling.

7.1. Implications

This topic is extremely relevant in today’s scenario where countries globally are shifting towards making more sustainable and economic investments which will be beneficial in the long run. It opens up research avenues regarding defining the purpose of CGMs and the parameters to analyse new megaprojects based on their primary objective. Identifying CGMs as a separate category of megaprojects using the ABC model of megaproject motives will prevent a market-oriented spin on their selection and evaluation. Doing away with obsolete models of evaluation would help with selecting the right project at the right time and avoiding the mistake of rejecting projects for the wrong reasons.

7.2. Limitations

The location of all the case studies in one region might be considered a limitation of the study, but India has millenium old megaprojects that are still working and where many large megaprojects are currently being planned and executed. This increases opportunities for validating CGMs worldwide.

7.3. Directions for Future Research

This study opens up opportunities for research in transport infrastructure, roads, utilities, and projects of social importance, which should not be evaluated as business projects with the iron triangle of schedule, budget, and benefit within an artificial narrow time frame before the project reached full potential.

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7.6. Highlights

- Common good projects must not be selected with only their financial returns and evaluated by the iron triangle of cost, schedule, and projected benefit.
- A recent example is the extremely beneficial European Tunnel, which was declared a failure for many years due to inappropriate tools.
- Megaprojects are better classified by the ABC model for correct analysis and evaluation and for application of appropriate tools.

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