Structural Response of Storied Building for Orientation of Shear Wall

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Abstract: *Shear wall is mainly provided in multistoried building for safety to the structure against seismic load. It is also purposely carried lateral load resisting system for high rise building. The main aim of this analytical work is to determine the solution for location of shear wall in high rise building and to study the linear static and linear dynamic analysis. Adequate location of shear wall in multi-storey building reduces the displacement due to earthquake. The objective of this study is to determine the behavior of building under different orientation of shear wall. To achieve the objective, building frame has been analyzed with different location / places of shear wall. However the orientation of shear wall in high rise building is to be analyzed before designing of multistoried building as part of research. Therefore, the analytical work is focused on determination of the appropriate location of shear wall in high rise building which performed by using Etab-2017 software.*

Keywords*: Shear wall, Storey displacement, Response spectrum, orientation, ETABS-2017.*

1. INTRODUCTION

The shear wall is provided in the reinforced concrete (RC) buildings component like vertical plates. These walls are located at foundation level and or are continuous throughout the building height in high rise building. The shear wall is usually vertical member in structure which repel the lateral load in seismic zones also resist the shear, moment and axial load etc. It delivers more strength to the building situated in earthquake zones. Shear wall offers significant role in many existing reinforced concrete building positioned in seismic zones are deficient to withstand earthquake.

It can resist large horizontal earthquake forces and provides large strength and stiffness to the building. The direction of orientation of shear wall plays important role in RC building structure. The most common load which can shear wall resist is the wind load and lateral load. The design of this work is based on IS 1893-2016 to study the various location of shear wall. Baghel et al. [1] presented the counter the impacts of lateral load acting on a structure due to shear walls. It is exhibited that these walls gives high strength and stiffness towards their direction of their orientation which diminishes harm to the structure and its contents. Mishraet al. [2] studied the efficacy of shear wall in resisting horizontal forces in high rise building. It is observed that the location of shear wall decreases shear force, bending moment and also reduces displacements. Venkateshet al. [3] presented the performance of internal shear walls compare to external shear walls. The effect of position of shear wall in building has been evaluated for structural behavior. Harneet al. [4] studied strength of RC shear wall of high rise building at different locations. The influence of shear wall on overall stability of building has analyzed. Sibgathullahet al. [5] examined the story float when shear walls are placed at corners of building. It has been observed that most of the extreme diminishment in float esteems is acquired. Dubey et al. [6] presented the construction sequence for gravity loading structure, without considering of seismic loads. It is found that the development arrangement examination for any structure gives more strong result to planning. Eswaramoorthi et al. [7] presented that shear walls are best when put at the fringe of the building. Zone factor of specific area assumes significant role in the behavior of a structure. Prayogoet al. [8] examined the bare frame system without and with shear walls at various locations. It is evaluated that shear wall plays a most significant role in increase the performance of structure under the lateral forces. Dhawale and Narule [09] studied the P-delta effect on high

rise building. Linear static analysis and nonlinear static analysis on high rise buildings with different storey carried out and explored the need of P-delta effect. Gupta et al. [10] presented the three different kinds of buildings G+6, G+16 and G+25, it has been observed that there is decrease in lateral displacement and storey drift for structures with shear walls when compared with the typical RC structures without installing shear wall. Kalshetty and Narule [11] presented the response of multi-storey building under biaxial excitation using softwareSAP2000 v17.It is found that considering biaxial forces is necessary for an accurate determination of response and also to reach an adequate design for serviceability earthquake. Ahirkar and Narule [12] and Ahirkar and Narule [13] presented the seismic evaluation of buildings with nonlinear static pushover analysis using SAP2000 software. The outcomes are compared based on performance point, hinge formation pattern, yield strength and lateral stiffness. Esmaili et al. [14] presented the utilizing shear walls for both gravity and bracing system and it is unsuitable neither theoretically nor financially. It has been explored that not simply main walls are acknowledged to pass on seismic loads, but also they allows a huge level of gravity loads.

As per previous research updated, this project has been carried out to check and compare the seismic response of multi-storied building for various location of shear wall so that one can choose the best useful in construction in earthquake area. Analytical study has been conducted to evaluate the relativity among factors such as storey shear, storey displacements, maximum storey drift of all models during earthquake. Following models have taken into accounts for analytical work on four models of multistoried building.

1. Regular bare frame- Model 1.
2. Shear wall at corner of building- Model 2.
3. Shear wall at central periphery of structure- Model 3.
4. Shear wall at center- Model 4.

2. ANALTICAL WORK OF MUTISTORIED BUILDING WITH SHEAR WALLS

Following parameters for analysis of multistoried building with shear walls at different positions are incorporated as shown in table 1.

Table-1: Parameters for Analysis of Multi-Storeyed Building

- **Geometry**

Items	Dimensions
No of Levels	11 no
No of Storeys	10 no
No of Slab Levels	9 no
Foundation Depth	3m
Storey Height	3m
Plan	24mX24m

- **Grade of Material**

Materials	Grade
Grade of Concrete	M35
Grade of Steel	Fe 500

- **Dimensions Data**

Designations	Dimensions
Slab Thickness	150 mm
Beam Size	230X500 mm
Column Size	550X550 mm
Shear Wall Thickness	230 mm

- **Load Data**

Type of Loads	Designations	Load Intensity (kN/m^2)
Live Load	Each Slabs	2
Super Dead Load	Each Slabs	1.5
	Each Storey Beams	10.35

- **Seismic Data**

Seismic Factors	Values
Seismic Zone	III
Zone Factor	0.16
Importance Factor	1.2
Soil Type	I
Response Reduction Factor	5

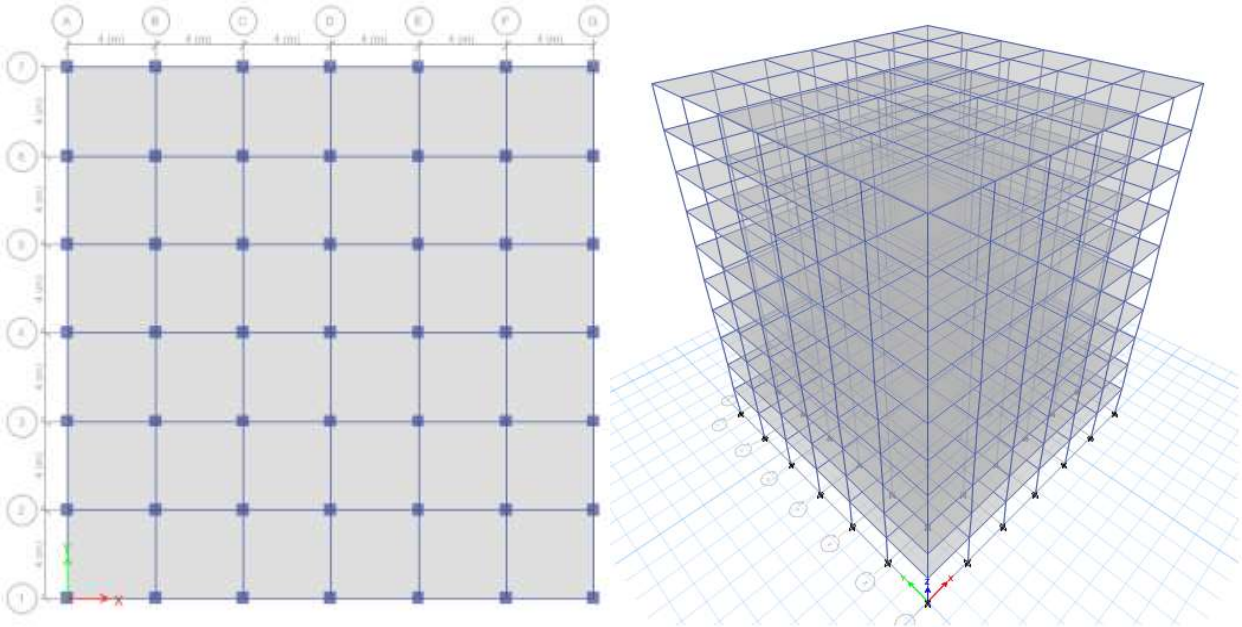

Figure 1: Basic Plan for Model

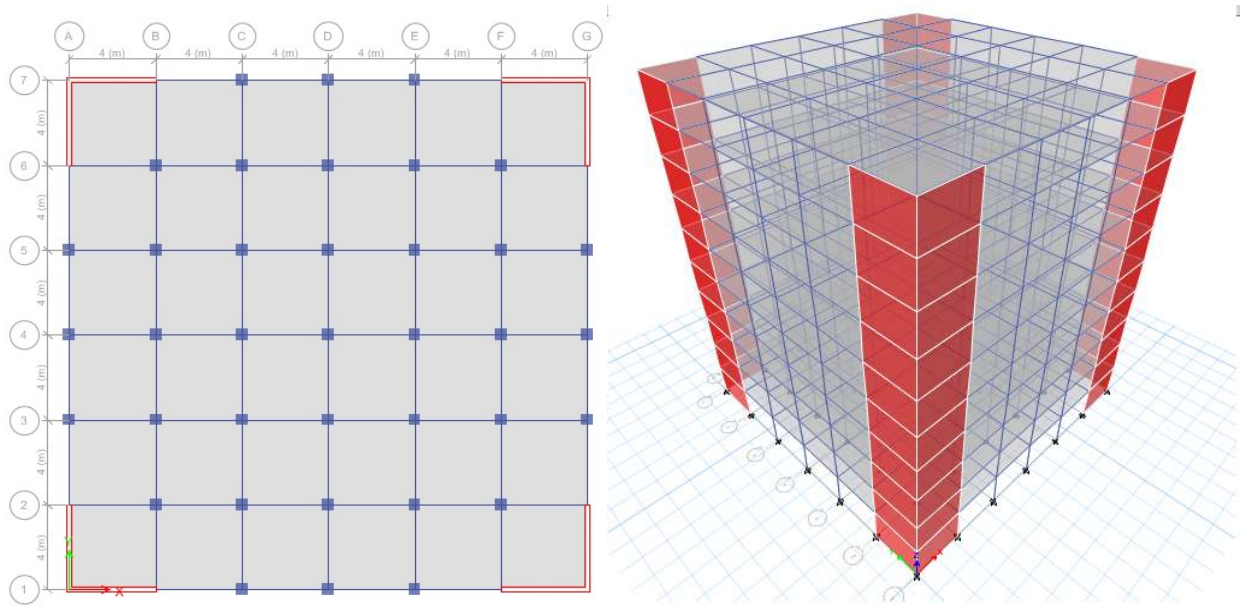

Figure 2: Shear Wall Position of Model-2

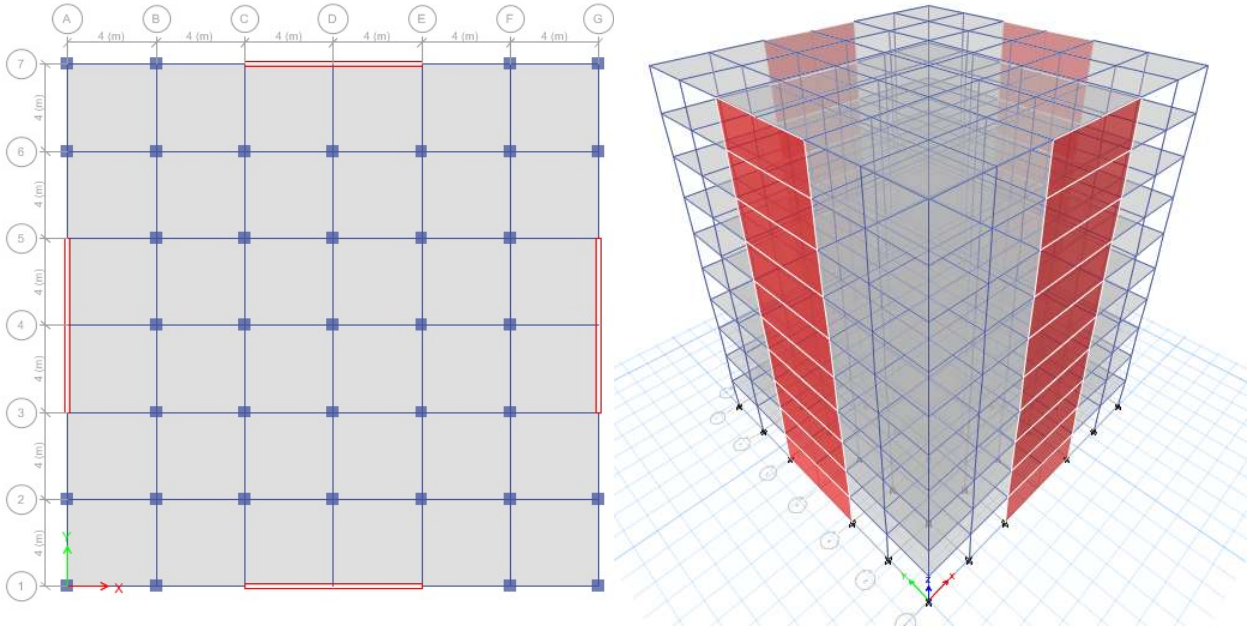

Figure 3: Shear Wall Position for Model-3

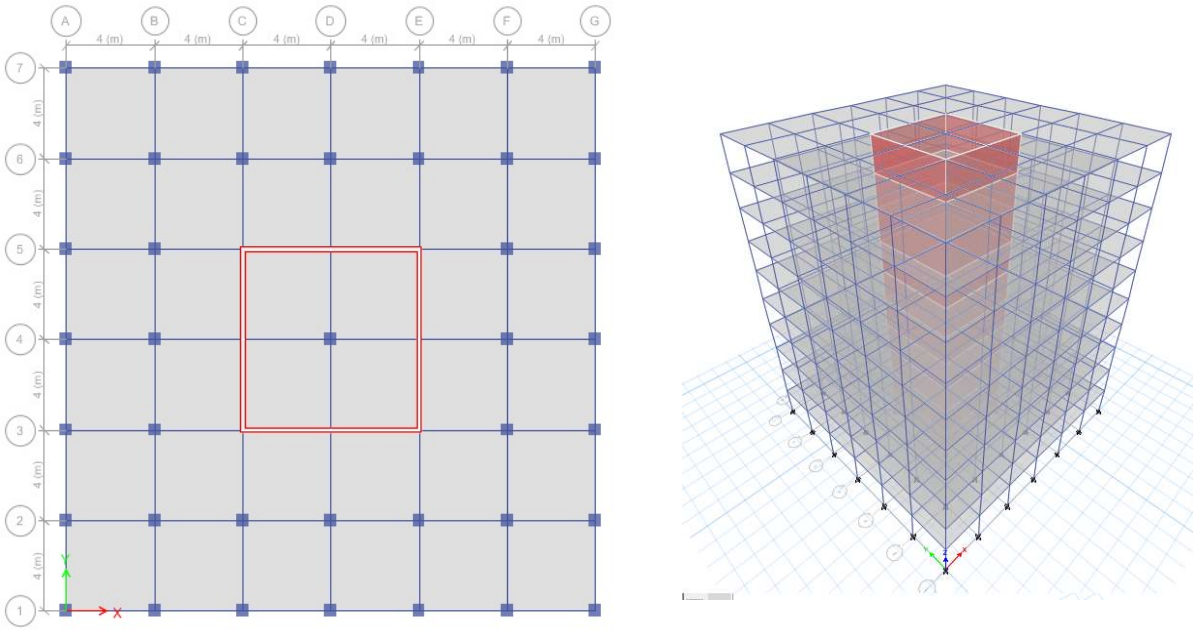

Figure 4: Shear Wall Position for Model-4

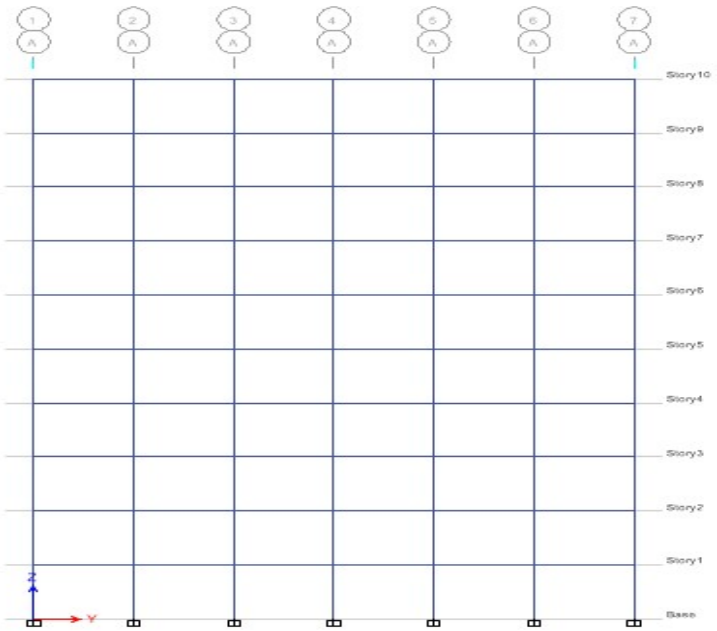

Figure 5: Basic Elevation of All Model

3. RESULTS AND DISCUSSION

The results are obtained based on displacement, storey drifts, mode vs. period and base shear. Table-2 and Table-3 show storey displacement in X and Y direction for EQ and RS respectively and figure 6 and figure 7 are respective figures. The drift outcomes displayed in Table-4 and Table-5 and its graphical representation in figure 8 and figure 9. Table-6 shows mode vs. period and figure 10 is its graphical representation. Table-6 indicates the base shear and its graphical representation in figure 11. Table 2 indicates the values of storey displacement, as the height of

building increases correspondingly also increases the lateral displacement of building. Increase in height of building decreases the lateral stiffness of building. The maximum lateral displacement was obtained on the top floor level in each model which at storey 10 the lateral displacement is 13.24, 8.50, 6.96 and 4.24 for model 1, 2, 3 and 4 respectively. The storey displacement calculated for model 1 is 9.002 times more than model 4. In table 3, the maximum lateral displacement was obtained on the top floor level in each model which at storey 10 the lateral displacement is 10.98mm, 6.86mm, 6.40mm and 3.49mm for model 1, 2, 3 and 4 respectively. The storey displacement calculated for model 1 is 7.49 times more than model 4.

Table-2: Storey Displacement in X for EQ Direction (EQX) and In Y for EQ Direction (EQY) Condition

Storey	Model 1	Model 2	Model 3	Model 4
Base	0	0	0	0
Story1	0.886	0.28	0.227	0.159
Story2	2.483	0.877	0.69	0.434
Story3	4.240	1.683	1.319	0.793
Story4	6.001	2.627	2.065	1.220
Story5	7.696	3.649	2.885	1.696
Story6	9.272	4.699	3.739	2.203
Story7	10.673	5.736	4.596	2.726
Story8	11.835	6.729	5.43	3.249
Story9	12.700	7.657	6.228	3.760
Story10	13.244	8.509	6.969	4.242

Table- 3: Storey Displacement in X for RS Direction (RSX) and In Y for RS Direction (RSY) Condition

Storey	Model 1	Model 2	Model 3	Model 4
Base	0	0	0	0
Story1	0.870	0.250	0.229	0.143
Story2	2.399	0.766	0.681	0.383
Story3	4.013	1.448	1.283	0.688
Story4	5.547	2.229	1.983	1.045
Story5	6.940	3.057	2.739	1.437
Story6	8.166	3.892	3.517	1.850
Story7	9.202	4.707	4.288	2.273
Story8	10.026	5.479	5.033	2.693
Story9	10.618	6.199	5.742	3.103
Story10	10.983	6.861	6.403	3.490

Table-4: Storey Drifts for EQX & EQY Condition

Storey	Model 1	Model 2	Model 3	Model 4
Base	0	0	0	0
Story1	0.000295	0.000093	0.000076	0.000053
Story2	0.000532	0.000199	0.000154	0.000092
Story3	0.000586	0.000269	0.00021	0.00012
Story4	0.000587	0.000315	0.000249	0.000142
Story5	0.000565	0.000341	0.000273	0.000159
Story6	0.000525	0.00035	0.000285	0.000169
Story7	0.000467	0.000346	0.000286	0.000174
Story8	0.000387	0.000331	0.000278	0.000174
Story9	0.000288	0.000309	0.000266	0.00017
Story10	0.000181	0.000284	0.000247	0.000161

Table 4 highlights that in case of storey drift, if the height of building increases, correspondingly storey drift also increases up to certain height and then it decreases. The maximum storey drifts are 0.000587 at storey 4, 0.000350 at storey 6, 0.000286 at storey 7, and 0.000174 at storey 8 for model 1, model 2, model 3 and model 4 respectively. Table 5 shows that, if the height of building increases, then storey drift also increases up to certain height and after that it decreases in respective directions. The maximum storey drifts are 0.000518 at storey 4, 0.000282 at storey 6, 0.000261 at storey 6, and 0.000142 at storey 7 for model 1, model 2, model 3 and model 4 respectively.

Table-5: Storey Drift for RSX & RSY Condition

Storey	Model 1	Model 2	Model 3	Model 4
Base	0	0	0	0
Story1	0.00029	8.30E-05	7.60E-05	4.80E-05
Story2	0.00051	0.000172	0.000151	8.00E-05
Story3	0.00054	0.000228	0.000201	0.000102
Story4	0.000518	0.000261	0.000234	0.000119
Story5	0.000478	0.000278	0.000254	0.000131
Story6	0.000431	0.000282	0.000261	0.000139
Story7	0.000376	0.000276	0.00026	0.000142
Story8	0.000309	0.000263	0.000252	0.000141
Story9	0.00023	0.000246	0.00024	0.000138
Story10	0.000145	0.000225	0.000223	0.00013

Table-6: Mode VS Period

	Period			
Mode	**Model 1**	**Model 2**	**Model 3**	**Model 4**
1	0.907	0.67	0.6	0.465
2	0.907	0.669	0.6	0.465
3	0.825	0.439	0.418	0.398
4	0.291	0.174	0.151	0.133
5	0.291	0.174	0.151	0.117
6	0.266	0.102	0.1	0.117
7	0.163	0.08	0.069	0.079
8	0.163	0.08	0.069	0.057
9	0.15	0.049	0.045	0.057
10	0.108	0.049	0.043	0.057
11	0.108	0.046	0.043	0.044
12	0.099	0.034	0.031	0.038

Table 6 indicates that with reference to above output after the addition of shear wall in the building, natural time period decreases. Hence, it proves the significance of shear wall in the multistoried building. If time period is more, the structure is more flexible and if natural period are less the structure is more rigid. In all models the minimum time period is observed when shear wall is installed at center of building which is shown in model 4.In table 7, base shear is an estimate of the maximum expected lateral force on the base of structure due to seismic activity. The value of base shear is maximum at model 4 where shear wall at the center of the building.

Table –7: Base Shear

Parameter	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Base shear(kN)	1410.58	1559.36	1557.55	1584.66

In figure 6, the outcome of analytical work through software indicates the comparison of values of shear wall between storey vs storey displacement. The maximum lateral displacement was obtained on the top floor level in each model which at storey 10 the lateral displacement is 10.98, 6.86, 6.40 and 3.49 for model 1, 2, 3 and 4 respectively. The storey displacement calculated for model 1 is 7.49 times more than model 4.

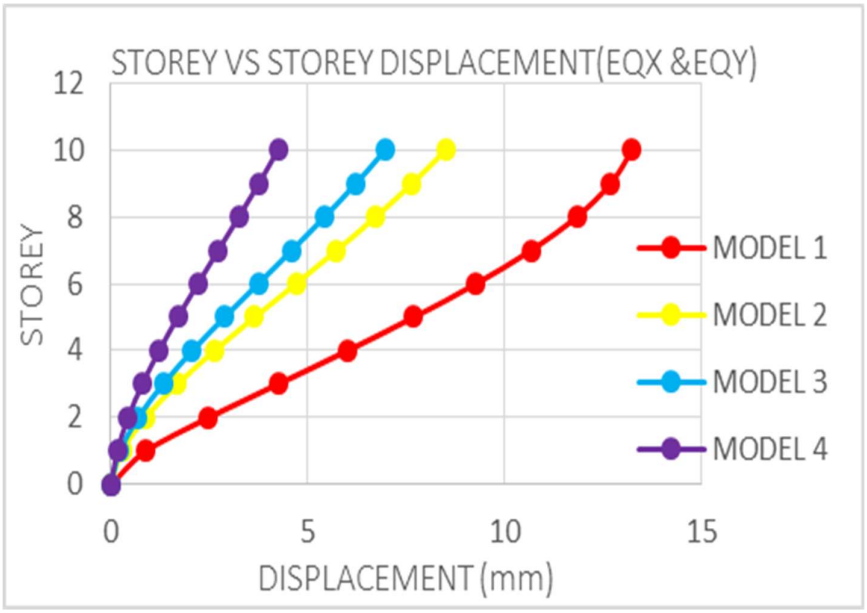

Figure 6: Storey VS Storey Displacement (EQX & EQY)

The result of analytical work in figure 7 through software point out the comparison of values of shear wall between storey vs storey displacement. The maximum lateral displacement was obtained on the top floor level in each model which at storey 10 the lateral displacement is 10.98, 6.86, 6.40 and 3.49 for model 1, 2, 3 and 4 respectively. The storey displacement calculated for model 1 is 7.49 higher than that of model 4.The result of analytical work through software indicates the comparison of values of shear wall between storey vs storey drift as shown in figure 8. The maximum storey drifts are 0.000587 at storey 4, 0.000350 at storey 6, 0.000286 at storey 7, and 0.000174 at storey 8 for model 1, model 2, model 3 and model 4 respectively.

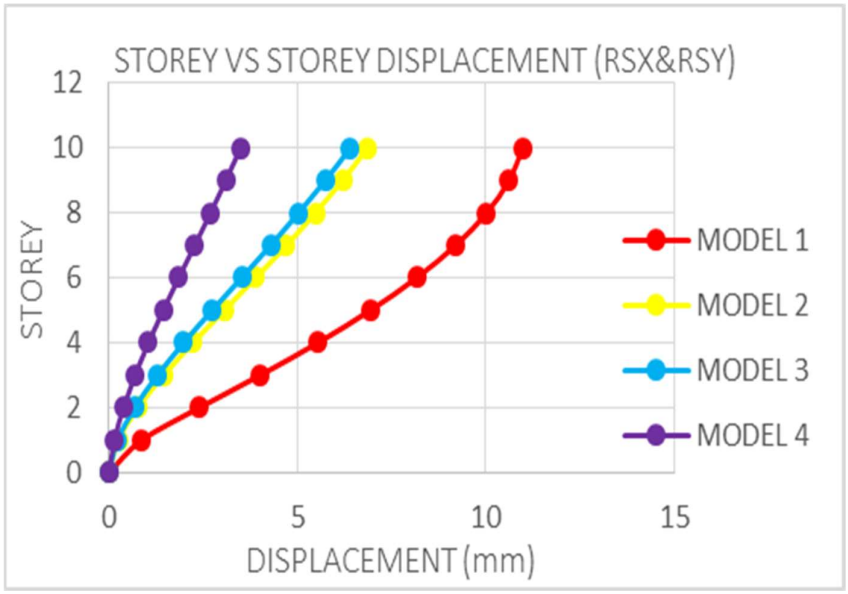

Figure 7: Storey VS Storey Displacement (RSX & RSY)

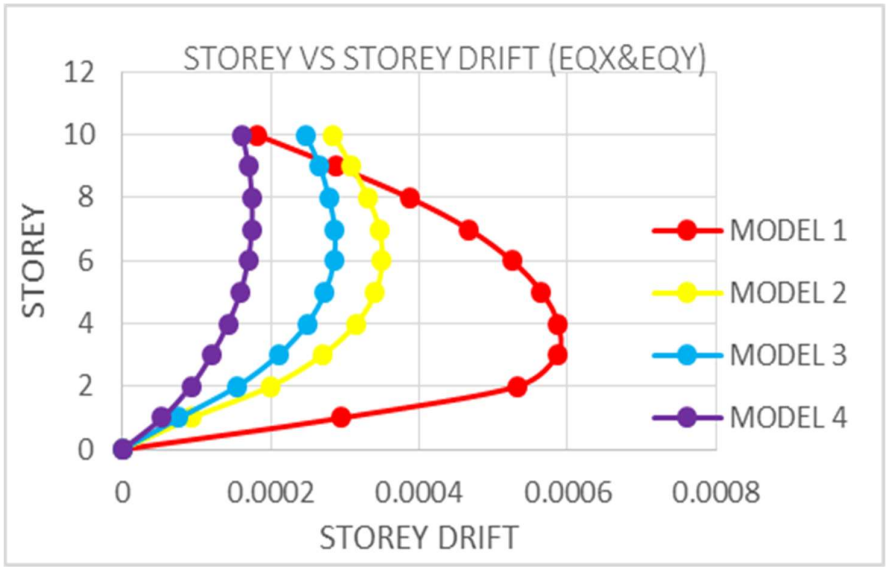

Figure 8: Storey VS Storey Drift (EQX & EQY)

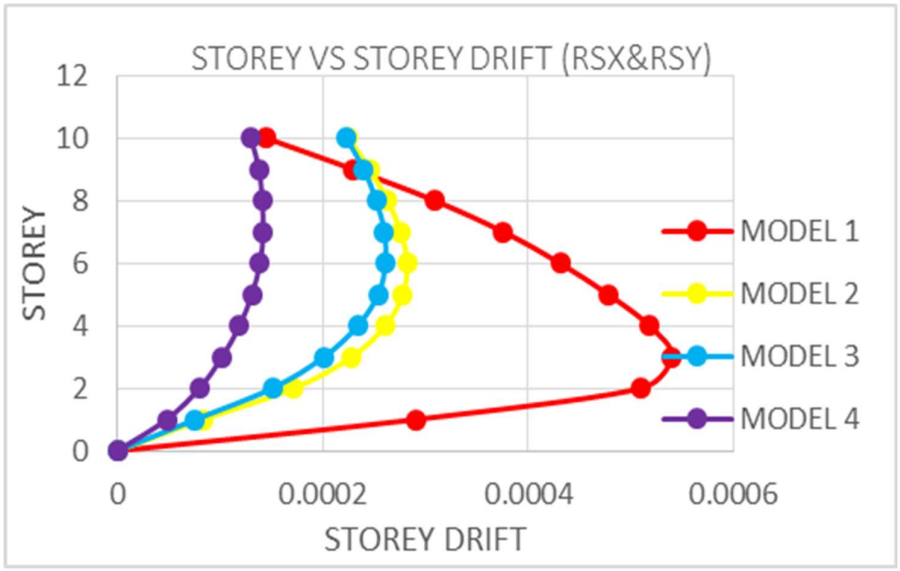

Figure 9: Storey VS Storey Drift (RSX & RSY)

The result of analytical work through software directs the relationship between storey vs storey driftof shear wall as showninfigure 9. The maximum storey drifts are 0.000518 at storey 4, 0.000282 at storey 6, 0.000261 at storey 6, and 0.000142 at storey 7 for model 1, model 2, model 3 and model 4 respectively.In figure 10, the result of analytical work through software indicates the comparison of values of shear wall between mode vs natural period. In all models the minimum time period is perceived when shear wall installed at center of building as shown in model 4.In figure 11, the base shear is an estimate of the maximum expected lateral force on the base of structure due to seismic activity. The value of base shear is maximum at model 4 where shear wall at the center of the building.

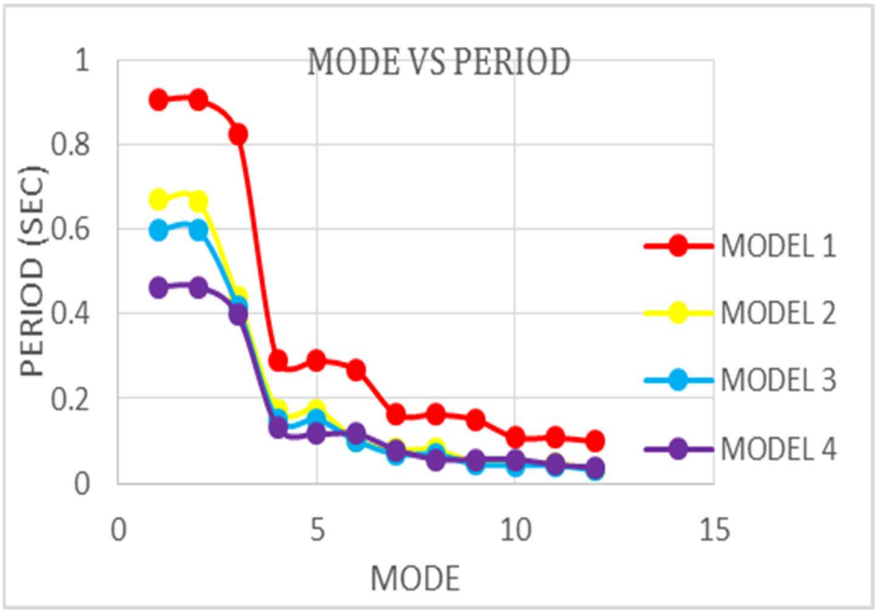

Figure 10: Mode VS Period

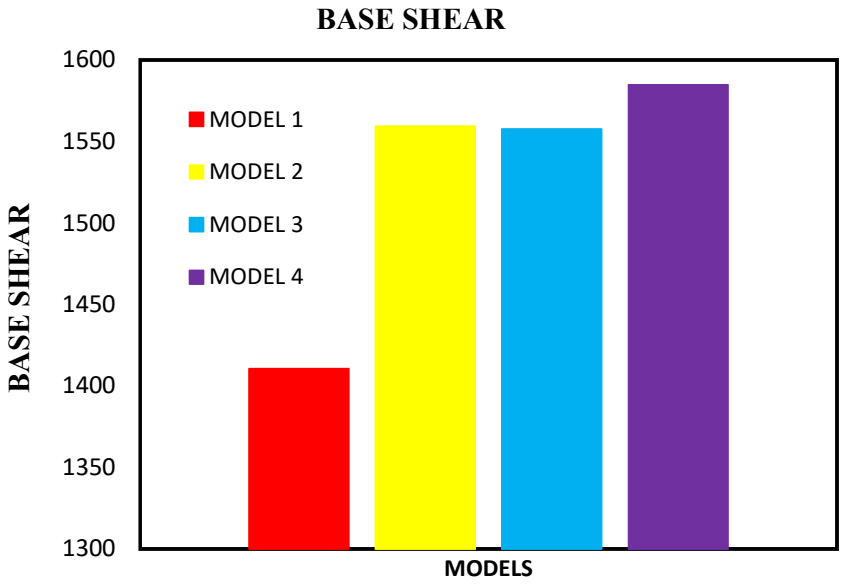

Figure 11: Base Shear for Models

4. CONCLUSIONS

Following conclusions are drawn after analytical work for all models with variable positions of shear walls where similar earthquake data is adopted.

1. Appropriate location of shear wall in multistoried building minimizes the shear force, storey displacements and bending moment.
2. The shear wall located at the center of plan as core is a decent option for reduction in member forces and lateral displacements.

3. The performance of internal shear walls is better than that of exterior shear walls, while external shear walls are an alternative to internal shear walls in seismically damages structures.
4. Dynamic analysis reduces storey displacement, storey drift, storey shear etc.; it shows that linear dynamic analysis gives improved estimate of forces and therefore analysis of building becomes more accurate as well as economical.
5. The structure designed by linear dynamic method is more effective than linear static method.
6. The story displacement for model 1 is found 3.12 times higher than Model 4 after seismic analysis of all building models.
7. The difference between seismic analysis and response spectra analysis for displacement is 17.07%.

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INCREASE IN SOCIAL AND ECONOMIC GROWTH OF A TOURIST DESTINATION BY DEVELOPING TRANSPORTATION SYSTEM

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ABSTRACT

Any tourist destination becomes an important place when there are a lot of tourism activities with better approach facilities. Foreign tourists also visit places which have good connectivity from the airport. This research study is for Mandwa, Alibaug (located near Mumbai Maharashtra state), which is a destination which may not be an international port of call but has one of the highest counts of tourist gathering at one place. It attracts the ocean and the beach; the last sunset is seen at this place. In India, Mumbai, Goa and Cochin are considered as major port destinations, thus connectivity to such area will play a vital role in development of the Country. Mandwa is the nearest connectivity to Mumbai and Tourism is the main industry in Alibaug, so developing such destination is a call of need now. A great opportunity to utilize Mumbai connectivity to Alibaug will increase the social and economic growth of the residents of Alibaug. This study is an attempt to give a proposal for a best connecting terminal at Alibaug and analyze the benefits of the project proposal.

Keywords: *Economic Growth, Infrastructure, Social Growth, Tourism, Transportation*

I. Introduction:

Alibaug located about 110 kilometers from Mumbai, and is a little town with sandy beaches, clean unpolluted air and plenty of forts and temples.But currently, lot of developments are taking place in that city, Alibaug city is having a great potential to grow as an economic and socio-cultural hub across Mumbai's shoreline. It is also developing as trans-harbor economic hub across Mumbai's redefined shoreline. Due to which connectivity through different modes of transport has come into focus, which will redefined the pattern of connectivity.

This new pattern not only includes highways and expressways but also waterways. Mumbai city is exploring new modes of travel in form of water based linkages. These long-delayed waterways will help create new suburbia in peripheral locations, connecting the Island city with space on which to boost economic and tourism activities. Coastal development is taking place in form of Breakwaters, catamarans, Jetties, Roll-On Roll-Off (Ro-Ro) services, Hovercraft services which will describe the growth potential of Mumbai's shoreline.

II. Need for developing Transportation systems:

As Alibaug is emerging under MMRDA, development in education, industrial, transportation and tourism sectors have boosted. This led people started migrating in Alibaug city for employment and business, which ultimately

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increased the market of the city. This growth had tremendous impact on urban development and economic growth of the city. After that Tourism industry was emerging in large scale. Residents of Alibaug started investing in real estate, hotels, retails, resorts etc. Growth in tourism industry also opened new sight for employment, revenue generation, globalization which helped city to grow.

Fig-1: Map Showing Connectivity (Road & water) of Alibaug and Mumbai Capital

Finally for all these developments transport systems came into focus, a good and convenient transportation system will provide flow of tourists and maintain the economy. Some proposals for road transit development are already working processand tremendous increase in traffic which leads to road congestions. The other issues are faster and better transportation needs to be developed. Thus it is essential to think over and reimage the spaces of transportation system.

Cities play very important role in generating economic growth and prosperity. The sustainable expansion of cities largely depends upon their physical, social, and institutional infrastructure. There are basic trends that determine transport demand such as increase in urban population, household incomes, and industrial and commercial activities, tourism industry etc. Thus development of urban transport infrastructure will maintain and improve the growth of the city. There are lots of proposed project for improving transit system of Alibaug city.As per MSTDC traffic by road service is increasing day by day due to increase in population and people travelling in and around Mumbai and Greater Mumbai. To reduce tremendous pressure on road service along with road development, water transit facility should also be developed. Mumbai is facing increase in migration and flow of people, Alibaug being nearest famous tourist spot needs to have smooth connectivity with larger capacity.

III. Literature Review:

Economic growth in the Alibaug region will benefit from Ro-Ro services linking it with SoBo(south Bombay), Dr. Niranjan Hiranandani (published on November 08, 2017)

Better connectivity by good transportation system enhances the Economic growth, Alibaug is fast emerging as the luxurious and leisure spot in Mumbai's vicinity, and premium real estate development is all set to make its presence felt, economic growth will get a boost as enhanced connectivity through Roll-On Roll-Off (Ro-Ro) ferry based connectivity reduces the travel time, and brings Alibaug closer to Mumbai. This paper is about the development strategies of Ro-Ro services.

Growth of tourism in the Alibaug region has been one of the key initiatives of Maharashtra Chief Minister Devendra Fadnavis, and various steps to enhance connectivity between Mumbai and the jetty at Mandwa have been announced by the state government, Dr. Niranjan Hiranandani Founder & CMD - Hiranandani Communities & National President - NAREDCO. The passenger terminal at Ferry Wharf for east coast inland water transport to Mandwa (Alibaug) is 'work in progress', and is expected to be completed in 2018. Roll on - Roll off ferry services, which will enable taking cars across from Mumbai – Alibaug will make things easier.

"Maharashtra Chief Minister Devendra Fadnavis has announced that sea-based Ro-Ro services would link South Mumbai, Navi Mumbai and Alibaug; and that the services would start by end-2018. He added that the provision in this regard had been made in the

new ports policy, which apart from ferries, also mentions catamaran and hovercraft services. This is definitely good news, and once this project being completed as per schedule, connectivity between South Mumbai and Alibaug will translate into a few minutes across the sea," said Dr. Niranjan Hiranandani. Navi Mumbai and Panvel along with Alibaug have potential to develop into an economic powerhouse, and this sort of connectivity will provide a fillip to the positives that the Navi Mumbai Airport will bring to the region.

In terms of enhanced connectivity, for a coastal city like Mumbai, the sea-based Ro-Ro services for connectivity to Mandwa would be an apt option, rather than the long, circuitous drive from SoBo via Sion and Panvel.

Alibaug: Evolving into an Economic hub just across Mumbai Harbour (Monday, May 07, 2018)

This paper demonstrates the future scope of economy hub across Mumbai situated on the shores of the Arabian Sea. Alibaug is situated a short distance away from the Mumbai shoreline. Development of the Mumbai harbour and Alibaug will have potential to be the social and economic hub. This change will happen as a result of enhanced round-the-year waterways which will redefine the paradigm of connectivity.

From expressways and highways to waterways: Mumbai has been exploring new modes of commute in form of water-based linkages. Exploring long delayed Waterways will develop new suburbia in peripheral locations connecting the Island city to boost economic and tourism activities. 'Coastal development' is an apt example to describe this growth .The Maharashtra Chief Minister has mentioned that sea-based Ro-Ro services would started from 2018, and would link the triangle formed by New Bhaucha Dhakka in South Mumbai; Nerul in Navi Mumbai and Mandwa, near Alibaug. The Mumbai Port Trust is building a terminal at New Bhaucha Dhakka; CIDCO is similarly building a terminal at Nerul, while the Maharashtra Maritime Board is doing the same at Mandwa. He added that the provision in reference to this had been made in the new ports policy, which apart from ferries, also mentions catamaran and hovercraft services. Once this gets completed, connectivity between South Mumbai and Alibaug will translate into a short and swift ride across the sea.

Fig-2: Road map

IV. Modes of Transport in Alibaug:

- By road

Road connectivity is fully loaded as the major highways – NH-6, NH-3, NH-4, NH-17 approach to Mumbai and connect to Alibaug. Thus the road consists of major logistics transportation, goods and services, public transportation and private vehicles. These all create lot of traffic and consume time to travel. Thus road widening and other developments are being done to overcome the issue. Alibaug can be approached easily from all major cities of India- Delhi, Ahmedabad, Chennai and Mangalore.

- By water

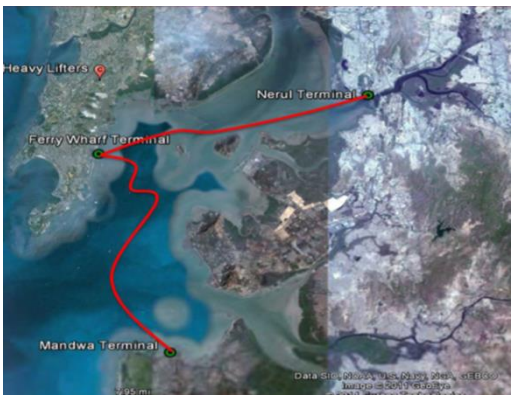


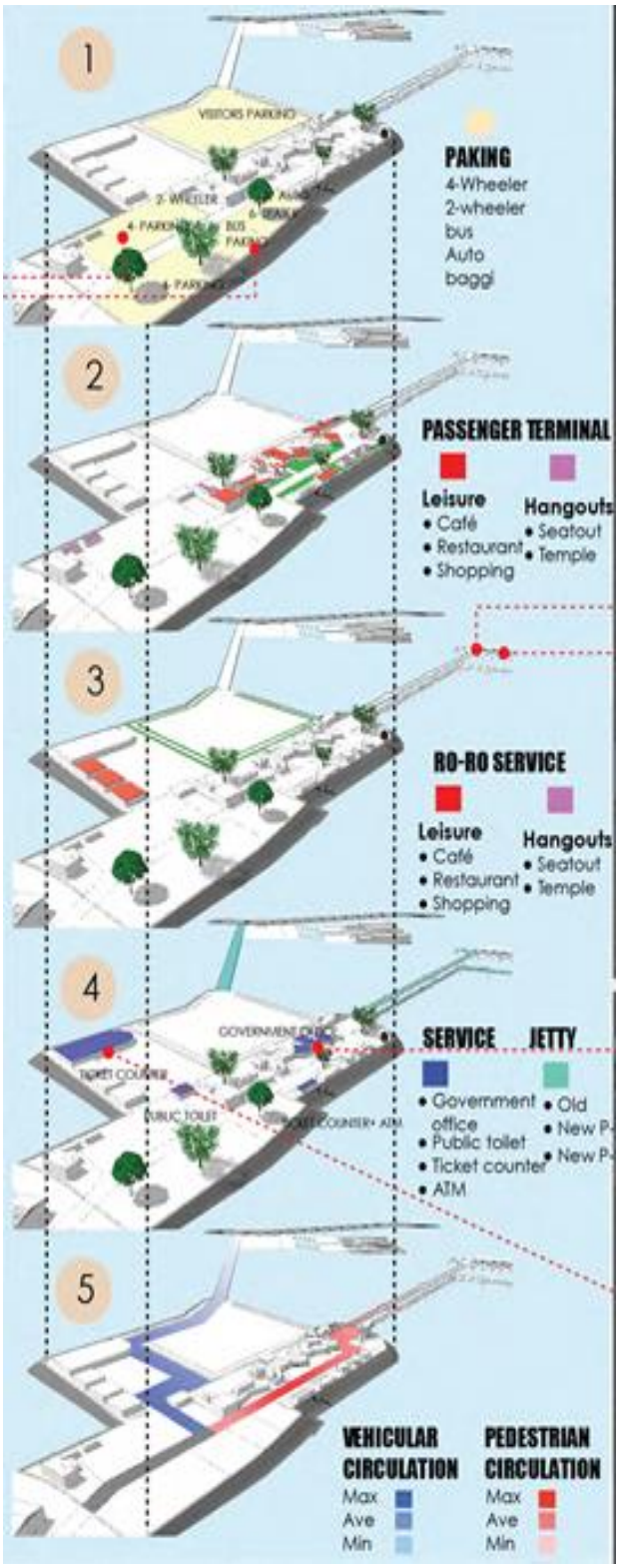
Fig-3: Inland water System Route

Inland water system allows ships and cargos to use inland water ways with ports or terminals. The road congestion in traffic can be avoided by an inland water transport system that would facilitate people travelling from Mumbai to Alibaug as well as NaviMumbai to take their vehicles along with them through coastal road and facilitate their travel further in a short span, saving a lot of time in a cost effective and eco-friendly way.

Roll-on Roll-Off technique shall help the people travelling from Greater Mumbai to Nerul and Mandwa to take vehicles along with them in the Water Transport System; this will drastically reduce their cost of travelling as well as their time travelling.

V. Project Proposals:

Intention of the design is to reimaging the spaces of Mandwa jetty and to create a highly efficient water transport system. Maximum people travelling through jetty are tourists,thus provisions are given from tourist point of view- their needs and requirements. The Design is a combination of transit hub / gateway terminal + tourist center, where the focus is mainly to provide connectivity between water transport and road transport and its benefits on local residents and tourism. This project will increase the Social and Economic development, employment and also provide a different approach towards Mandwa jetty. The site is approachable for the passengers from multiples entries but for vehicles and buses from singular entries. This makes it easy to maintain the traffic and also increases the legibility and viable. Basically the design is to expand the ferry terminal which will increase tourism industry and economic growth.



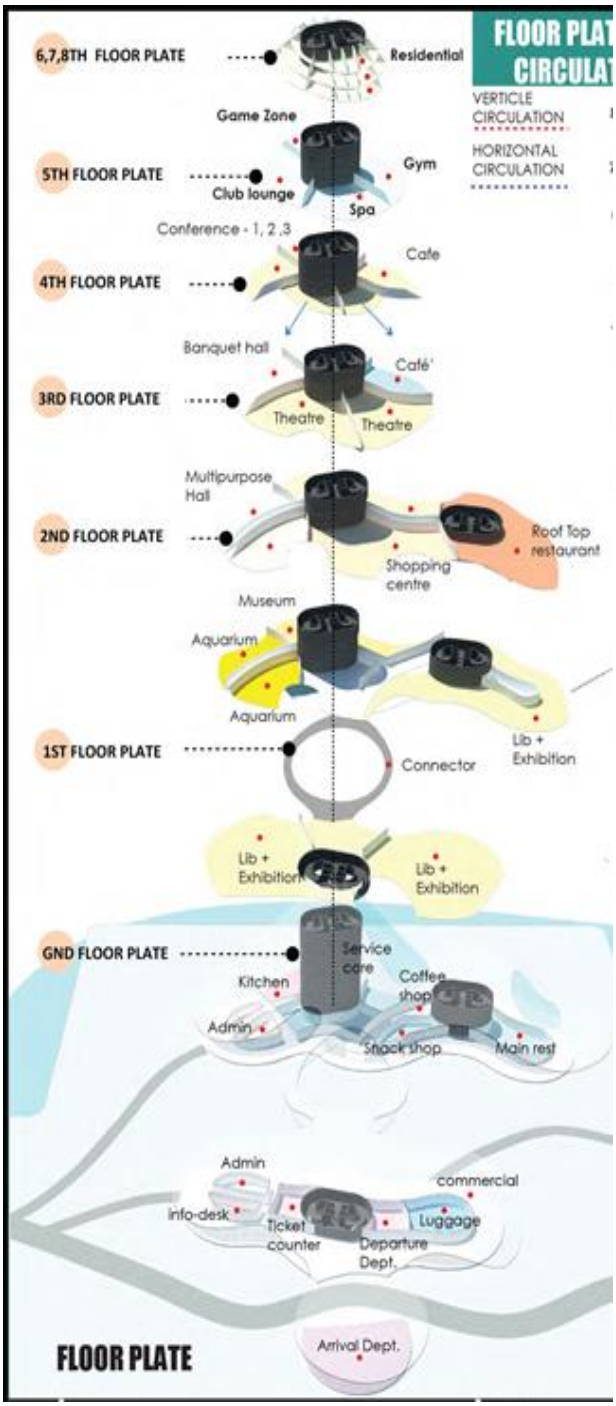


Fig-4: Existing transportation analysis and Project proposal

VI. Role of Transportation system:

- As transportation provides access and trade to different locations it develops and strengthens the social and economic growth of the region.
- At urban level, transportation has a strong impact on the development of the city which may be residential industrial and commercial patterns. A major connectivity nearby leads to rise in infrastructure, land rates and other activities.
- The quality of transportation derives the quality of tourist area, thus attracting more tourists.
- Transport is considered as an important sector of the economyas it connects business and household sectors in different places.
- Business sector involves in tourism and industrialization along with commercials. This leads to economic growth as the business runs only when large amount of people visit the place from different places.
- Household sector develops due to transportation as people migrate and work in the nearby companies. Transportation in household sector connects townships, schools, gardens, parks and amenities, which is social growth.
- In a tourist destination the major business are in hospitality and residential sectors.

However, transportation demand cannot be derived, improvements are essential for increasing the productivity and visitors. It is also depended on the investors and firms whether they are users or they are willing to use the flow of visitors using the transportation facilities. Targets should be to attract Foreign Direct investments (FDI) to build new amenities and facilities which will benefit the attempt of developing transportation system.

VII. Social and Economic Development:

The project consists of pathway and Ro-Ro services along with commercial activities such as shops, cafeteria, museum, aquarium,

shopping center, library and exhibition, multipurpose hall, game and club, residential and departure. Such a terminal with all facilities at one place benefits the commercial activities and also increases tourism. This will provide employment to many native people of Alibaug. The recreational spaces- Open Amphitheatre creates social activities between different people. It can help in promoting the history and culture of the place. Social interactions help in exchange of knowledge and create a strong community. Such spaces are important where people from different places arrive at one place. This terminal serves as a improved transport system that reduces load on local transportation as well as provides social and economic dominance.

Increase in Tourists also leads to more congestion and pollution levels and insufficient infrastructure to support the increase. Inland waterways may reduce the traffic congestion and pollution. Insufficient infrastructure is when transport system is weak, no amenities or commercial facilities like shops and other activities. This project overcomes all the issues by directing the traffic at right way and management schemes such as private-public transport links grouping and characteristics, and marketing providing everything at one place.

Alibaug is a biodiversity and natural beauty rich area thus being sensitive, improved infrastructure will help in maintaining the ecology of the place. Once the ecology is disturbed and starts to degrade, tourist visits reduce and again affects the economy and socialism of native people. Conservation of existing historical monuments is also important as well. Revenue and benefits gained from tourist flow should contribute in preserving the monuments and biodiversity of the place. A well maintained natural place will always benefit in growth of the city. Thus careful planning is necessary to ensure sustainability. Improper planning of transportation destroys the biodiversity rich areas. Future development pattern of the city is depended on improved and quality infrastructure of the city. Important buildings make the place remarkable and memorable for tourists. This project can serve as an important building for the city.

VIII. Conclusion

An attempt to provide both social and economic growth at one place is beneficial to the whole city's tourism and development by appropriate transportation system. Background study of existing development of the area is important to provide a well planning. Planning of transportation in natural areas involves various considerations of the requirements of the native community and visitors both. The destination development and growth process should be understood for better outcomes. Alibaug is emerging and developing thus management of all aspects is important as it is a place depended only on Tourism. Connecting water and road transport is also a tourist activity proving interest to travellers and will reduce impacts on the national highways. The cost effectiveness of developing transportation cannot be derived but providing maximum possibility of providing social and economic as well as environmental characters may provide the best. Reduced travel time results in increase of labour productivity as the terminal connects road and water transport which is less distance as compared to highway road route.

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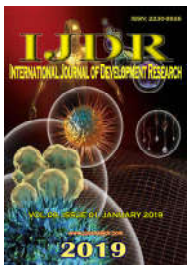

ORIGINAL RESEARCH ARTICLE OPEN ACCESS

ADDRESSING THE DICHOTOMY OF FOREIGN AID

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ABSTRACT

Does foreign aid really work? Many inhibited questions raise such a vociferous debate. The standard definition by the 2OECD- DAC explains "Foreign aid (or the equivalent term, foreign assistance) as financial flows, technical assistance, and commodities that are designed to promote economic development and welfare as their main objective (thus excluding aid for military or other non-development purposes); and are provided as either grants or subsidized loans." When a large scale conflict or disaster happens in the world, governments and other donors come together and commit extraordinary resources to address the crises in the affected country. This paper addresses the dichotomy of conditions which determines the effectiveness of foreign aid. These foreign aid programs, primarily aim to address poverty alleviation, promotion of development, growth and self- sufficiency, as their long term goal. But, have these programs in their humanitarian attempt to do so, been successful enough? The success of aid depends on the supporting infrastructure, policies, governance and implementation of the process set in place by both, the donor and the recipient countries. It explores the multiple objectives of aid and the relationship between aid and growth. Presenting the case study of Bangladesh, analysis on the effectiveness of foreign aid along with its conditionality is discussed.

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INTRODUCTION

Let us dig deeper into the debate and have a look at the dichotomy being pointed out in this paper. What stands as the biggest obstacle to achieve in many of these Aid goals is public apathy. The way the citizens react and understand aid. Foreign aid aims to promote economic and human development. Citing Foreign Aid as *"an unprecedented economic experiment"*, Peter Boone in his paper, introduces us to this topic with a critical viewpoint. He discusses how historically, foreign aid programs had been launched long before the emergence of compelling theories or evidence that proved their efficiency or answered the question of whether they could work. (P. Boone, 1995) Supporting his theory, this paper aims to discuss the multiple motivations and contradictory objectives of aid.

"The notion that aid can alleviate systemic poverty, and has done so, is a myth. Millions in Africa are poorer today because of aid; misery and poverty have not ended but have increased. Aid has been, and continues to be, an unmitigated political, economic, and humanitarian disaster for most parts of the developing world."(D. Moyo, 2009)

African economist and author, Dambisa Moyo discuss the so-called glamorade of aid in her stinging critique, "Dead Aid", arguing that aid is not a solution, rather a problem in context to Africa and its development. She talks about elected governments to be made accountable to the domestic citizenry and not to donors, bringing forth an underlying subject of public apathy. *"No society would appreciate their whole policy and their future of their children to be depended on donors who don't actually live in the country."*(D. Moyo, 2009)

Another contemporary standpoint in the favour of this argument is offered by the Bill and Melinda Gates Foundation who launched their organization in 1997 focusing on innovative and economic solutions to foster growth and development. In recent years, they have been very vocal about the distorted picture that is portrayed to the world about the countries that get aid.

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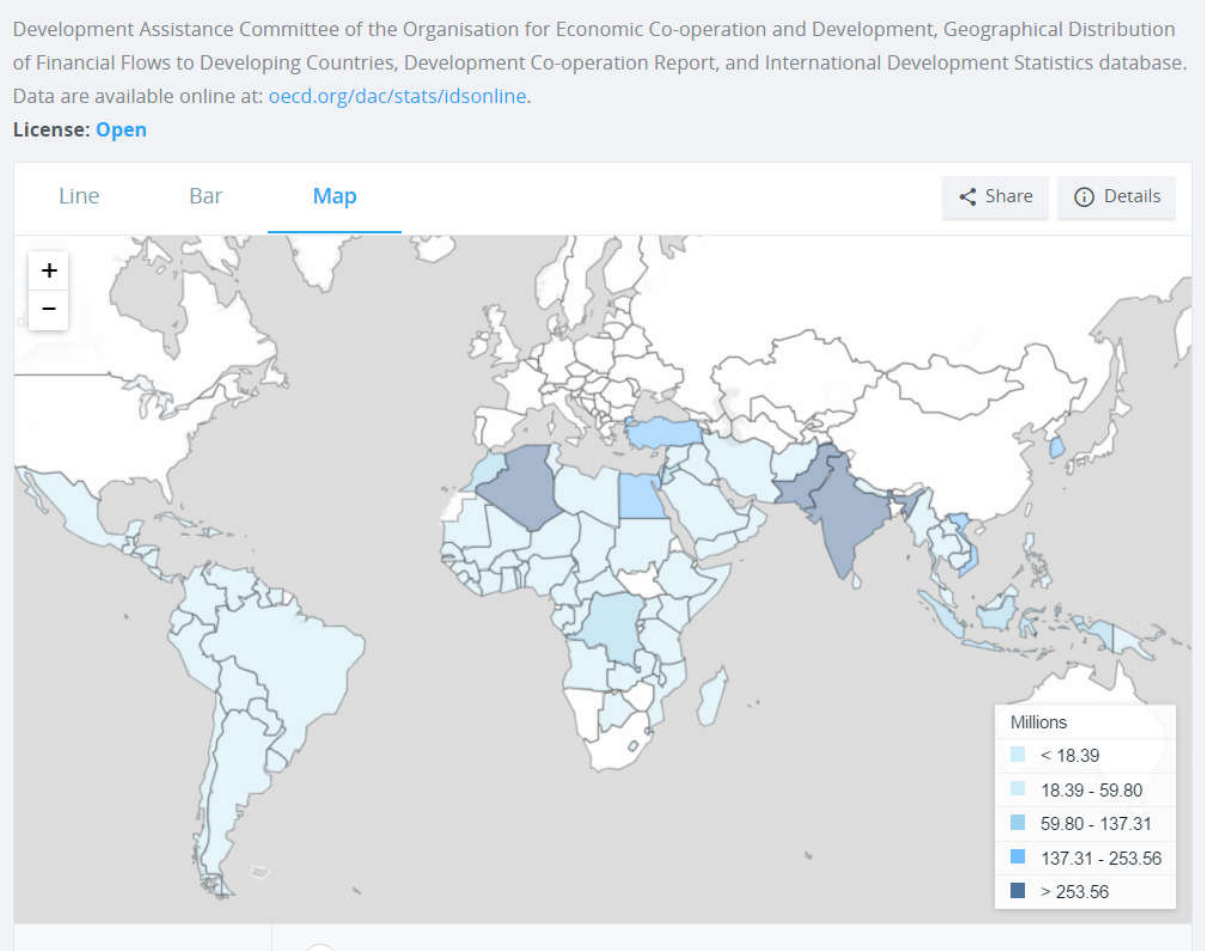
"I worry about the myth that aid doesn't work. It gives political leaders an excuse to try to cut back on it—and that would mean fewer lives are saved, and more time before countries can become self-sufficient...broadly speaking, aid is a fantastic investment, and we should be doing more. It saves and improves lives very effectively, laying the groundwork for long-term economic progress." (Bill and Melinda Gates, Annual letter 2014)

Types of aid and assistance

To understand the dimensionality of Aid disbursements and derive workable solutions, we need to first understand the types of aid and the context in which they are referred to. Foreign aid is given with such different purposes in mind that though precisely measured, the sheer diversity of disbursements makes identification of effects almost impossible.



The controversy of the donor's objectives

*"The challenge of aid is not isolated to the (Millennium Development goals) MDGs. Donors expect aid to help achieve many other objectives, including the promotion of international peace and security."(*M. McGillivray, 2005) Many developmental objectives which, the practice of foreign aid targets, are based on the fundamental assumption that aid works in alleviating poverty. Yet its effectiveness in achieving these objectives and other developmental outcomes has been questioned for decades. While the intentions from the very beginning were that foreign aid would finance productive investments in order to help developing countries achieve 'take-off', the first studies to assess the returns to aid yielded mixed result. Another theory suggests that aid is now thought to have a positive impact and that donors are paying more attention to the developmental criteria in the application of Aid framework by employing better empirical methods and gaining access to details analysis to its impacts. (McGillivray, 2003a, 2002b). When the economy is weak, the people who suffer the most are the poorest. "*There is evidence that Aid's impact on growth is contingent on the policies of recipient countries, so that while aid works in all countries it works better in countries with better policy regimes"* (Radelet, 2008).

The DAC classifies aid assistance into three broad categories;

1. Official development assistance (ODA),
2. official assistance (OA)
3. Private voluntary assistance.

While the ODA is the largest form, consisting aid provided by donor governments to low-middle income countries, OA is the aid provided by governments to richer countries with per capita income higher than $9,000 approx. and to countries that were officially a part of the Soviet Union and its satellites. Examples of such recipients could be Bahamas, Cyprus, Israel Singapore, etc. Private voluntary assistance includes funds and grants by NGO, charities, foundations, private companies, etc. These funds are channelled through what is commonly referred to as multilateral and bilateral aid. This framework is briefly explained in Fig.1.

The OECD distinguishes these two channels as follows:

"Bilateral aid represents flows from official (government) sources directly to official sources in the recipient country. Multilateral aid represents core contributions from official

(government) sources to multilateral agencies where it is then used to fund the multilateral agencies' own programmes."

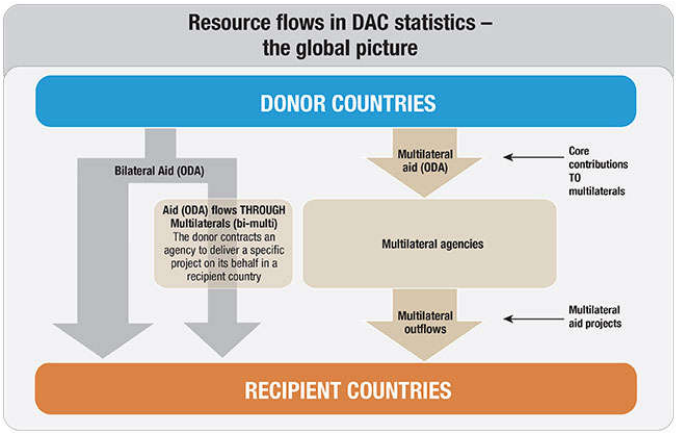


Figure 1. Source: http://www.oecd.org/dac/stats/faq.htm

In some cases, a donor can contract with a multilateral agency to deliver a programme or project on its behalf in a recipient country. Such cases are typically counted as bilateral flows and are often referred to as Bi/Multi." (Oecd.org, 2018). Another doubt that develops after explaining this distinction is about the difference between multilateral agencies and the aid received through (Non-Profit organizations) NGO's or private organization. The simplest distinction is the governance of the organizations. Multilateral agencies such as the [3]UNDP are governed by the representatives of the governments while NGO's and private organizations do not have direct government representatives involved in their governance. They generally have representatives acting in their private capacity.

"Historically most aid has been given as bilateral assistance directly from one country to another. Donors also provide aid indirectly as multilateral assistance, which pools resources together from many donors." (Radelet, 2006)

Multilateral institutions like the World Bank, International Monetary Fund and various UN agencies include over 210 major organisations and funds as well as numerous smaller trust funds. (OECD. 2011). *"The professionalization of the development industry has made the ratio of bilateral to multilateral assistance now a matter of greater comparative interest. Approaches to aid allocation are being looked at more closely to assess their desirability and potential for replicability"* (Gulrajani, 2016)

The conditionality of foreign aid, the dependency it creates in the recipient countries and assessing the immediate vs. the long term effects of foreign aid has always been subjected to global controversies. Todd Moss et al., (2010) suggests that *"institutional development is an independent variable which affects the productivity of aid and is a recognized factor used to select and allocate to aid recipients"*. (Ojeaga, Paul & Ogundipe, Adeyemi & Ogundipe, Oluwatomisin, 2014)

From the recent examinations, a large amount of empirical data suggested that "*foreign aid exhibits a zero effect on growth or any other indicators of poverty, supporting the public choice theory*." (Ovaska, Tomi, 2003). However, Svensson (1999) and Burnside and Dollar (2000) discuss the effectiveness of aid in terms of growth when combined with the *"the right conditions, specifically the right policy and institutional environments."* Supporting this argument, Leeson (2008), offers an alternative explanation which suggests that most developing countries with weak institutions and bad policies, contribute to their poor economies. Thus, where aid is needed, it will be unhelpful because the necessary supporting institutions are lacking. Areas where aid does or can do some good, in countries with good or effective policies and institutions in place, it is not needed. And the dichotomy stands in these two statements. To gain a clear insight into these contradicting statements, a formal and detailed assessment of the region-specific case studies is very imported. We wouldn't be focusing on the case of Africa of any Sub-Saharan countries in this paper as enough as these regions have been over-evaluated, prejudicially assessed and criticized over the last few decades. The case study of Bangladesh offers a fresh perspective and is less dicey, so to say. It also showcases the gaps and inefficiencies as well as the progress stories over the last 40 years of its independent existence.

A case study of Bangladesh

In the last four decades, Bangladesh has achieved notable economic and social progress in the development context. Following a bloody war, when it became independent in 1971, there were many concerns about the country's economic viability. Predictions of Aid dependency and its long term effects were controversially discussed, while a few critiques referred the country as a *"test case of development"* (Faaland and Parkinson, 1976). They suggested that if a country with such colossal and profuse development problems could make development happen, then perhaps any other country could. Despite this widespread of pessimism, Bangladesh has made significant economic and social progress in the last 4 decades. The Diagram below shows us the evident comparison of Aid received compared to the overall growth in terms of [4]GDP in the country.

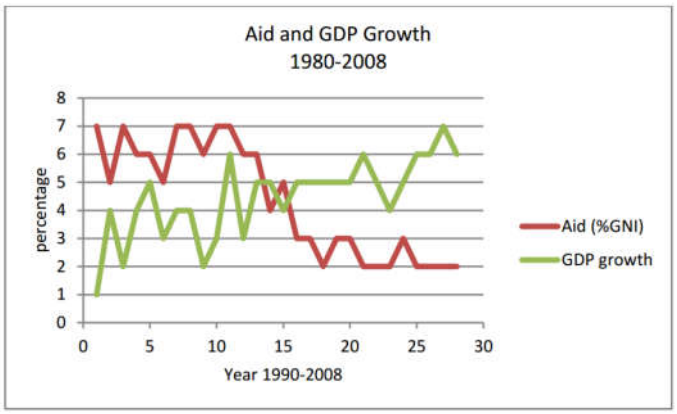
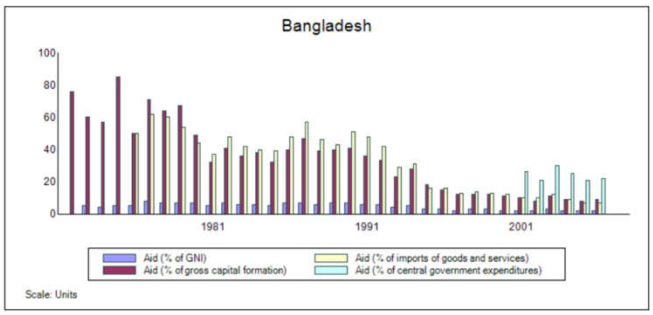


Figure 2. Net official development assistance to Bangladesh (% OF GDP) and gdp growth Source: data from WDI (2009)

Bangladesh has received a huge amount of foreign assistance over the last 3 decades. It received $48 billion of foreign aid with an annual flow that has ranged from $1.0 billion to $1.5Billion approx. from 1971 to 2008. The composition and the aid patterns did evolve over the years. Commodity aid was A significant factor in the early post-liberation period. However, in recent years, this has seen a decline almost close to zero as the country has become more self- sufficient. The policy-making/lending, as a general trend in following the international development guidelines, both at a macroeconomic and sectoral level has become significant and

is established as a part of the assistance program. This development has been accompanied by increasing focus economic and sector work, the formally known knowledge products, by multilateral institutions. The world bank has been the largest as well as the most influential lender to the country. It has also been the coordinator of aid donors in Bangladesh. The initial phase of development in terms of the effectiveness of aid yielded mixed results. The evaluation reports of world bank went as far as to argue that "a core constraint in the development process in Bangladesh was the government itself and its unwillingness to enforce the needed public sector reforms" (World Bank 1998b, p. 56). To address these issues, the World Bank imposed more stringent policy conditions and made several structural adjustments in its assistance program. Governance became the principal emphasis of its program. While the Asian development bank was the second largest lender, Japan has been the largest bilateral donor to Bangladesh.



Source: Data from world development Indicators (2009)

Figure 5. Foreign AID as a percentage of government expenditures, per capita income, imports and investment

"In the 1970s, soon after independence, external resources financed more than 70 per cent of the country's investment, but this had fallen to less than 10 per cent in 2005 (World Bank 2007b). This reflects, on the one hand, the government's relative success in mobilizing domestic resources and on the other, the increasing vigour of the private sector." (M.G.Quibria, 2010).

Nevertheless, it is still in its rudimentary stage of economic and social transformation and as Sachs (2005, p. 14) correctly noted, Bangladesh has barely managed *"to place its foot on the first rung of the ladder of development."* As the percentage of GDP showcased a steady growth, Bangladesh has received lesser foreign aid. The importance of aid as a source of investment has reduced over the years. The Center for Policy Dialogue, a premier think-tank of Bangladesh, in its policy seminar on aid effectiveness (organised in 2006) had the following sampling of views expressed by its participants:

- *The donors have a disproportionate influence on policies.*
- *Conditionality is limiting the policy autonomy of the government.*
- *The disjunction between the benefits of adjustment loans and the costs of adjustment acts as a disincentive to implement reforms.*
- *The reforms should be home-grown and vetted by parliament.*
- *Donors have had little impact on poverty reduction in the country.*
- *There should be more aid to higher education.*
- *The PRSP is a poor substitute for planning*
- *Reforms are not owned because they are imposed*
- *Donor policies are inappropriate*
- *The Washington-consensus has yielded few benefits for Bangladesh* (Cpd-bangladesh.org, 2005)

In spite of the fine results in the economy, the foregoing comments suggest that aid has been less than effective also has had a little direct impact on poverty reduction. Inadequate flow of aid could not help significantly in the growth process of an economy however, a large inflow of aid may also lead to economic pathologies such as the Dutch disease, i.e., the flow of aid causing an appreciation of real exchange rate and thereby impede the expansion of exports and growth of income. In the case of Bangladesh, there is very little or no evidence to suggest that foreign aid led to serious overvaluation of the real exchange rate and erosion of export competitiveness. Compared to neighbouring countries indeed, Bangladesh's real exchange rate has become increasingly competitive over time. Thus the apprehension that aid may cause [5]Dutch disease and overvaluation of the real exchange rate is unwarranted.

Conclusion

Aid as a practice could be ineffective for many reasons. It can be ineffective if it is inadequate or too much in quantity in relation to the country's need. If it is too small and erratic, it might not have any significant impact on the country's economy, growth and development. It is too large, it can lead to various social and economic problems and raise different forms of dependency. In a few cases, it can hit the country's absorptive-capacity constraint which could in return lead to delays and inefficiencies in aid utilization. Similarly, just on those lines, easy availability of aid can obviate the incentive for undertaking genuine reforms and the necessity of making hard decisions. It thereby perpetuates bad policies, poor governance and endemic corruptions. Poor policies can also emerge from donor's initiatives and conditionality. They can be out of synch with the requirements and one-size-fits-all policy impositions at times thwart the economic development of the county.

The market or the private actors should be allowed to coordinate the activities that promote economic success and bottom's up approach historically has worked, however, it may be more beneficial to the development process if the large scale, top-down government-supported agencies transform their outlook towards aid only in the monetary terms and start focussing on the multidimensional features of International foreign aid. This does not leave us with an impression that aid alone is the answer. Countries ultimately have to be able to sustain funding for issues like agriculture, health and ultimately wean themselves out of aid. We know though that aid can play a helpful role in putting countries on the path to independence by breaking the vicious cycle of poverty and disease. It, in a few cases, as we have evidently seen that a few countries and economies have transformed from aid recipients to aid donors in less than 50 years. Unlike the common perception that development aid is a large part of rich countries' budgets, an acknowledgement that no program is perfect and that there are ways to make aid more effective plays an important part in addressing the relationship between aid and growth. With the support of the analysis on the nature of developmental aid provided in this paper, one can infer that

aid is only one of the tools for fighting poverty and disease."*Wealthy countries also need to make policy changes, like opening their markets and cutting agricultural subsidies, and poor countries need to spend more on health and development for their own people."* (Bill and Melinda Gates, Annual letter 2014).

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