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ROLE OF LOGISTICS IN CONSTRUCTION PROJECTS

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Abstract

India is the fast emerging leader in global economy. Its contribution in international trade is quite substantial. The country is witnessing overall growth in the various sectors. This is most cognisable in the construction sector. This was, indeed, badly hit during the demonetisation of 500 and1000 rupees notes. It has regained the momentum now.

The introduction of RERA - Real Estate (Regulation and Development) Act 2016 has brought in discipline with both the Builders and also the Buyers. All the transactions have become fully transparent.

The city and the outskirts are witnessing tremendous activities in construction in small scale and large scale. With the latest techniques in construction and the wide spread use of precast concrete, the projects are completed in record time. Delays in completion are very rare now.

The increased disposable income, movement of people from rural to urban areas for employment purposes, prohibitive rental charges in the city and the attitude of youngsters especially, to own an apartment right at the young age are just a few of the many reasons which contribute to large scale construction activities, all over.

Methodology

Personal visit to two sites. Observation and Discussion.

Contours	**Details**
No. of sites visited	2
No. of floors	3 and 7
Covered Car Parking/Lifts	Yes- in Both
Round the clock security	Yes – in Both
Power Back up	In the Second Site
Children Play Area	Yes – in Both
Super Market/Visitors' Lounge/GYM/ATM	In the Second Site
Statutory/RERA Compliance	Yes – Both
Proximity to Important Places	Only the second site
Availability of Female workers	Negligible in both sites
Use of Machines at Site	Normal in First and Remarkable in Second

Necessity for Logistics in Construction Projects

Construction work is characterised by more of manual activities and more of machineries as well. The degree of same differs from projects to projects. For a simple project, it is heavily labour oriented. For large projects with more apartments in each floor, the manual activities and that of machines, both are in high proportion. In fact, use of machines is far more than use of workers.

In the case of small projects which are more of labour oriented, the need for logistics is negligible. The Builders of such projects are also not professional builders. They do construction work as a part time business and some of them are in permanent payroll in some organisations.

Their pattern of construction is "cash and carry - as and when possible".
They are not very particular in project completion within the stipulated date. Delays are inevitable. The implementation of RERA is compelling even the small builders, who are coming under the purview of same, to strictly adhere to the system.

They may not have reliance on logistics but compliance with RERA is to be ensured.

The Logistics comes in place only for the large builders who do mega constructions. They are identified by more of floors and more of apartments in each floor. The area of the apartment too, is larger than that of others.
Goes without saying that more the activities more the associated problems as well. This is quite pronounced in the case of construction projects. Unexpected occurrences and jerks are quite common in construction sector. If things are not properly planned and executed, the concomitant loses would be huge and would lead to awful repercussions.

Even established builders who are in the field for years, have burnt their finger due to poorly paid attention on logistics.

The scenario is fully different now. The need for Logistics is keenly felt particularly by large builders. While many of them were already in practice with SCM (Supply Chain Management), the new entrants in the field first decide on a safe and sound Logistics Support.

They will embark on other activities only after satisfactorily and successfully fixing the Logistics Support. They freeze in the Logistics First and then only the other things. This relieves them from many big bothers. Even new entrepreneurs boldly venture on construction projects, thanks to effective logistics support.

The buying pattern of established large scale builders is that they do outsourcing directly from the suppliers. This gives them tremendous benefits not only in price but also in other important aspects such as honouring committed deliveries, improving quality in line with the expectations of the builder, attending to service aspects immediately and other post sales issues.

As such, they are free from the routine bothers and are able to concentrate on other important things in the project execution.

The suppliers too are happy in fully associated with the project right from the inception. A sort of bond is established between them. This is giving them mutual benefits and bringing out a win-win situation.
It is quite appropriate to note that "Because Outsourcing is becoming more strategic, firms ought to outsource more and by outsourcing more, outsourcing will become more strategic".

(Source: Pages 148 – 149. Book name: Out Sourcing – Design, Process and Performance. Author: Michael J. Mol, published by Cambridge University Press, The Edinburh Building, Cambridge CB28RU, UK. Copyright Michael J. Mol 2007. ISBN: 978 – 0 – 521 – 86410 – 7 and 978 – 0 – 521 – 68278 – 7)

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Benefits of Logistics

The builders, whether big or small and new or established are totally free from the bother of worrying about critical things for construction. It enables them concentrate on other important things for timely completion of the projects.

By relying on excellent logistics support, the builder entrusts the responsibility with the Supplier to ensure timely delivery of the inputs required at the site. The Supplier is fixed for ensuring not only timely but also a thoroughly safe delivery of the items ordered by the builder. This forces the supplier to send the items through a sound and reliable transporter.

This also gives the benefit to the builder in as much as the 100% satisfactory items are delivered at his site, he need not worry about the breakage or discrepancy between the billed and the delivered.
Any short supply is to be replenished only by the Supplier as he owes the accountability for supplies exactly as per order terms. Similarly, if deficiency is found in quality standards, he has to take back the rejected items and ensure fully quality conforming items immediately at the site. As such, the Builder is completely free from this main bother of supplies – both in quality and quantity.

The representative of the first site made a private remark that since the builder always resorts to local purchase, as and when necessary, he has to make compromise on quality standards. He said that due to this practice, he uses cement of different brands, of course of the same grade, as they are available at the time of his purchase.
While broadly the cement of a particular grade may be same to all, each brand of a specific manufacturer has its own unique features. The Construction Experts say that it is necessary to use the same specific brand and grade of cement throughout the construction. This is more acutely felt in the case of multi storey buildings.

Since the builder is able to precisely plan his requirement for the entire project, he is able to make good bargain with the suppliers on price aspects. Definitely, larger the off take, greater the concession in price.

Some suppliers also give incentives, for off take beyond a specific limit, in terms of free transportation etc., to their customers. This gives two pronged benefits – to the builder to plan his requirement accordingly and the supplier to get the order book full from a specific customer (builder). Large scale builders stand to benefit greatly by this. In fact, this is the underlying principle of Supply Chain Management.

It was noted from the Engineer of the second site that due to their dominance in the field (by virtue of size of the project and also of their established reputation over decades), they demand many services from their Suppliers.

The suppliers are to ensure safe delivery of the inputs in the go down of the builders. This only means that the supplier cannot simply absolve his responsibility by just leaving the materials in the site and go away. He has to ensure that the items are safely kept at the go down of the site or at the instructed place as per builder. In other words, the contract of delivery is to ensure safe physical delivery to the entire satisfaction of the customer.

The Engineer further said that since they predominantly use precast concretes, the supplier of the concrete also takes up the responsibility of arranging crane and required specialists and related labour force to unload and safely pile up the items at the appointed place.

The general labourers at the site may not be aware of the handling of the precast concrete and their rough or careless handling may cause damage to the materials.

Since contractually, the supplier is held responsible for satisfactory delivery of the materials at the appointed place of the builder, in his own interest, he is more careful in arranging cranes, other related items and group of skilled labourers.

This is yet another main advantage of Logistics Support.

The responsibility of the builder is to honour the bills of the supplier. He is, literally, free from the tantrums of supplies. Time is the essence of contract and especially, in construction activities, each activity demands valuable time from the engineers to the site in charge, throughout the completion.

If petty things steal the time, greater things will elude the attention or will lead to occurrence of mistakes. Either way, it is costly.

How to Choose the Logistics Support

While the Logistics Support gives a plethora of benefits to the builder, a poorly chosen supplier or a wrong supplier base will simply goof up the whole project, mounting losses to the builder.

The builder may have the cover of legal recourse in compensation from the supplier but will it compensate the shatter of good will of the builder? Large builders are always specific in this aspect.

Their Supply Chain is Traditional and age old. They never get lured by the glib advertisements or the sales talk of the different suppliers in the market.

The Site Engineer of the second site said that their supply chain is quite old and are with them for the well past thirty years. They have also grown along with the builders. Their assured and continued business support enabled the supplier to venture on many 'Quality Improvement Process' in production'. They (the builder) enjoy the supreme quality of the product.

He further said that pricewise, theirs may be marginally higher than that of others (rivals). But, surely, all their customers know for certain that the higher price is for the premium quality features they show in construction. Such is their reputation in the field – thanks to Supply Chain Management.

The construction activities are more and large projects are coming up at all places – particularly in the city and the outskirts. The situation now is something like never before.

A wise builder would never get taken away by advertisements but would always see the actual prerequisites of a dependable supplier. The following aspects must be seen before finalising the Logistics Support.

- How long the supplier has been in the business?
- What is the list of his clientele? A reputed supplier would always have major builders in his list. This vouchsafes his commitment in delivery and honouring the customer requirements. A good customer list is a credential to the supplier. A wise builder would always have a word with such customers, to verify the authenticity of the statement.
- Reputation of the Supplier. This is quite essential. They may be in the line of business for quite some time, but when their back ground shows litigation with customers often, it only confirms that the supplier is lacking business ethics in practice. Legal issues should be nil or most minimal.

A supplier with more number of legal cases only proves that either he is incapable in meeting the delivery requirements of his customers or not very discrete in accepting orders or customers, per se. It speaks foul of the supplier, either way.

- Technical capability. This is yet another important aspect. In the rapidly advancing technology nowadays, we see two peculiar scenarios. Some old time suppliers are either not willing to invest hugely on technology or remain content with their size of business they presently have. The other scene is that the entrepreneur may be new in the field but wholeheartedly willing to invest in technology and earnest in adhering to customer requirements fully.

A wise builder would only choose the second source, though new, as he will come a long way in business.
Today, we see many age old businesses giving way to newcomers by way of Amalgamation or Absorption. They surrender themselves to the new entrants gracefully. The new entrepreneur has the twin benefits of acquiring the plant and machinery on the one side and more importantly the valuable business guidance from the former, on the other side.

- Willingness for Continuous Improvement. The whole business world is now switching over to Continuous Improvement. The concept of JIT (Just In Time) is being slow pedalled with the emphasis on Continuous Improvement.

This is due to the fact that all large builders have more than one source in their supplier base. One could be with the pride of JIT and the other would be with the latest quality updates.

A prudent builder would have an adroit mix of supplier base. Construction business is quite peculiar that even a marginal delay of two days will result in huge loss to the contractor (builder) eating away his legitimate profits, though outwardly will not show any symptom of halt of work or otherwise. The profit calculation of small builders goes haywire mainly on this score.

Price Consideration. Nowadays, all Suppliers are offering the comparable products to end users. They are vying with each other in technical superiority as well. Though all other things do have a bearing in determining the right choice of suppliers, it is an indisputable fact that price, even today, does play a vital role in selecting the supplier.

A supplier cannot take unilateral decision in fixing exorbitant price in the cover of Technical Superiority. Hence, he should keep his price structure on par with others and should be smart enough in clinching the deal by offering other marketing benefits such as volume discount, after sales service etc.,

It should be noted here that "Customers do not value product features at any price. If the price rises too high, they will be prepared to sacrifice value and opt for a lower priced product"

(Source: Pages 121 – 122. Book name: Exploring Corporate Strategy – Text and Cases – Seventh Edition. Authors: Gerry Johnson, Kevan Scholes and Richard Whittington. ISBN: 978 – 81 – 317 – 1925 – 1, first impression 2008, second impression 2009, published by Dorling Kindersley (India) Pvt Ltd, Licensees of Pearson Education in South Asia, Head Office at 482, FIE, Patpargang, Delhi 110092, India)

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Factors affecting Logistics Support

It is quite relevant to discuss about the factors that affect the success of Logistics Support in construction projects. While there are so many things, we will concentrate discussion on the important ones which will have a direct bearing.

Site Condition

The construction in the heart of the city is posing space restrictions. It is quite easy and comfortable for logistics support to play around effectively with lot of open space around in rural areas where the cost of land is reasonable. The builders allot enough space for "unbuilt area".

This gives a comfort for hassle free operation at the site.

The situation in City is different. Land costs are at shocking levels. The offering rate gives only a reasonable margin to the builders. Hence, they want to use the maximum space for building purposes and reluctantly part with only the most necessary piece of land for complying with statutory requirements.

The prescriptions of RERA are so strict that if the construction is done without leaving the minimum statutory space, the builder would be sternly dealt with.

Hence, with minimum open space and maximum construction, the logistics support suffers freedom of operation. This curtails their speed and efficiency.

This is with respect to the minimum open space available in the site.

The construction in the heart of the city is having one more disadvantage. The neighbouring places are already built, the space for construction is very precise with little space left over for free movement of machineries or cranes. This affects the free flow of JCB, Cranes and Trucks etc., at the site.

When the Cranes should also be simultaneously put into use with the trucks, it calls for tremendous care and caution in operation, for even a slight error in handling, would cause serious damages to the neighbouring properties.

This, again, is only a check on the efficiency of the Logistics Support.

Material Planning

The personnel in charge of materials planning must be an experienced person with a proactive approach. He should be an expert in the overall scenario of the materials under purchase for the projects.

He must also be a technically sound person to determine and demand the quality standards from the supplier. He should also be an expert in the continuous improvements to be carried out in the materials in line with the construction processes being followed in the industry.

He should have all the qualities of a Consultant to benefit both the project for whom he is in charge and also the supplier. The suppliers should gain product support knowledge from him.

His job is not merely that of a clerk to simply assess the quantity requirement and order the same. He should have all the knowledge required for the quality of the product that he is ordering.

He should also be an able Liaison between the Builder and the Suppliers. He must seek valuable guidance from the technical experts in the field, study them and put them into practice in both the site for which he is in charge and also pass on the valuable advice to the suppliers who are in the supplier base.

His role is most valuable and indispensable in the project execution.

While this is not properly followed in small sites where the owner himself assumes all the roles to do things at his convenience (they will go in for sale of the apartments only after they are fully built, with their own money and hence in their own leisure style they do things), this is rigorously followed in large construction companies. Materials Manager should be a wealth of information – technically and commercially. In a way, he is the person scheduling the project.

In this regard, it is worthwhile noting that "Effective Project Scheduling is really a multistep process. The availability of appropriate resources always has a direct bearing on the duration of project activities. Materials are a common project resource that must be considered in scheduling".

(Source: Pages 378 – 381. Book Name: Project Management – Achieving Competitive Advantage". Author: Jeffrey K. Pinto, Pennsylvania University, first edition by Pinto, Jeffrey K, published by Pearson Education Inc., publishing as Prentice Hall, Copyright @ 2007, ISBN: 978 – 81 – 317 – 2715 – 7. Published by Dorling Kindersley (India) Pvt Ltd, Licensees of Pearson Education in South Asia, H.O. 482, FIE, Patparganj, Delhi 110092, India) [3]

Co-ordination with Suppliers

This is of paramount importance for the success of Logistics. While the Materials Manager plays a pivotal role, he should be supported by a team of dedicated personnel comprising Finance, Administration and Insurance.

Large Construction Companies function like MNCs. They have fully structured Departments and properly laid out functions for each. This is the main reason for their continued success.

Proper co-ordination with suppliers is a must for the success of logistics. There are definitely occasions where the materials may have to be diverted to a different project, going by the exigencies occurring. This is a common feature with big builders who simultaneously undertake various projects at different locations, at a time.

To ensure this with the Suppliers, the first and foremost is to have the same totally with themselves at the Site and in the office. The Site and Office should work in perfect unison. The requirements of the site must be translated into orders on the suppliers.

There should not be any delay in this action. Of course, what matters to the supplier is only an official order from the office of the site. If there is any lacuna in this regard (poor co-ordination between the site and the office), the ultimate suffering will be inflicted only on the sites.

Before issuing strictures on the suppliers, the people concerned at the site and office should ensure proper compliance of things, as demanded by their functions.

Commitment level of Suppliers

It is quite important that the suppliers must ensure timely deliveries as per order. Order terms must be fully understood and executed without fail. Nowadays, with the help of advanced programmes in the system, things are made absolutely easier.

Even then, mistakes do happen in terms of either lack of communications or miscommunications. This must be avoided forthwith.

The Supplier should also have parallel departments at his end – if not departments, at least, people of identical functions to show it into action of what is required by them. Continuous monitoring of the situation with closer follow up and interaction is a must. This is a prerequisite for the success of the supply chain.

In fact, even established builders come across of situations where the suppliers slide in commitments and are going to the level of challenging contractual obligations. Many builders have litigations with the suppliers on the delayed delivery and lack of quality standards.

Some Builders have also seriously suffered on the investments they made in the technical knowhow of the suppliers, to cater to their demands. Some Suppliers resort to making use of the Builder's investment on technology to service other customers (contractors) of identical requirements, as well. Technically, they may argue but morally it is certainly not right. Bad business practice.

Large builders too, have burnt their fingers in this regard.

For the success of the logistics support, as the builder does have, the supplier too should have and follow the same level of commitment in both letter and spirit.

However good the suppliers are and their reputation is, it is always advisable to have more than one supplier in the base. Large scale builders have more than one supplier and their pattern of business is giving opportunities to both – perhaps, with varying degree of order placements.

Since they undertake two to three projects at a time, they do not want to take risk (but at the same time, enjoy the benefits of Supply Chain Management) and hence would place their orders on 2 – 3 dependable suppliers. This is one of the contributing factors for their success and dominance in the field.

In this regard, it is quite relevant to note that "A firm must consider whether to use multiple suppliers or a single source for materials. Many firms single source for many reasons such as (i) priority supply (ii) prices/volume discounts (iii) lower costs (iv) better quality control (v) lower freight costs and (vi) lower inventory costs. However, single sourcing presents several risks including (a) exposure in time of shortage, fire or strike, (b) Supplier price increases and (c) Supplier complacency about quality and customer service.

(Source: Pages 21 – 22, Book name: Logistics. Authors: David J. Bloomberg, Stephen LeMay, and Joe B. Hanna. Copyright @ 2002, Prentice Hall Inc, (now known as Pearson Education Inc) Upper Saddle

River, New Jersey 07458, USA. ISBN: 978 – 81 – 203 – 2163 – 2. Published by Asoke K. Ghosh, PHI Learning Pvt Ltd, M97, Connaught Circus, New Delhi 110 001) **[4]**

Size of the Product and Site

This concept is relatively new in determining the success of the logistics support. Nowadays, a lot of improvements have taken place in every aspect of construction. The one such is the use of Precast Concrete. This is gaining currency in almost all major projects. Large scale constructions rely on this. This makes activities simpler, faster and fitting perfectly. Consumption of time is greatly reduced.

Besides, use of man power at the site is also brought to the minimum. It is a fact that machineries do a perfect job and more reliable execution than men. More of machineries relieves the builder from HR risks at the site. It is a fact that higher the deployment of manpower at the site, greater the risks are.

The Field Experts recommend Precast Concrete only for large sites with many floors and many apartments in each floor.

For a smaller site, onsite concrete only is recommended by them. The reason behind this is that Precast Concrete is costly. Not only that, it calls for lot of machineries as well for proper erection at the site. The site should also have sufficient space for hassle free erection and also enough space for storage of such items, for subsequent use.

Size of the product determines the success of the logistics support.

The same way, the size of the site too determines the use and success of logistics support.

Availability of Supporting Machineries

In large construction sites, machineries do major portion of the work. Some jobs cannot be handled by labour force and machines only should be deployed for same. The outstanding example is “precast concrete beams”. These can be safely lifted, erected or kept at wherever required to be positioned, only by cranes and not by labourers.

The crane is just holding the beam till such time the position is fully fixed to erect the beam. It is quite true that it is just impossible for labourers to hold such a load, safely, even for a minute.

In large sites, use of machineries is quite at an extensive level. Majority of their construction is on precast basis. Not only Cranes, but also other machineries are required for precise execution of the work. When cranes are not available to lift and erect the precast beams, the builder should only pay unnecessarily to the trailer operator for holding the trailer.

It is also important that the success of Supply Chain Management lies in its effective operation of same. There should not be any communication gap at all in the loop. Any information to be passed on to one source, should equally be made available to the entire chain of people in the loop. From the practice it was observed that any information may be required from any one at any point of time.

In other words, no work should wait for want of any instructions or guidelines. In the second site, it was observed that both the Supervisor and also the Site In charge were provided with Laptop and they are constantly in touch with all, at all times.

The success of Logistics Support largely depends on free flow of communication, closer interaction and personal rapport of people concerned in the entire loop.

Conclusion

Small builders do their construction activities basically from their own capital. They are interested to advertise about the project only at the completion stage. The reason is that they have freedom of operation and they can also wait for the apartments to be fully sold out.

In the event of any financial crunch, they will just stop the activities till such time they fully get over the situation. Once it is made ready, they are sure that sales takes place immediately or within a reasonable period of time. They can afford to wait till then.

They never make any calculations about interest loss or opportunity profits but simply do the work at their own convenience.

This is the main reason that they do only small construction.

The construction in city is tiresome and taking longer time than scheduled. The reason is that due to very limited space available at the site and also with fully built up areas all around, they have to be very careful (without causing any damage to nearby buildings) in their activities and this necessitates delays.

Female employees are gradually reducing in construction sites. There are two reasons for this – one is that nowadays, all the activities are machine oriented and labourers have to do only supporting functions to machines. This calls for physical strength and ladies opt out.

Second is that they get more opportunities in corporate companies in housekeeping areas. They also show their preference towards this as they get many benefits in the office such as free meals, allowances etc., besides good working atmosphere.

Recommendations

The Role of Logistics is not fully understood by majority of builders. Even in the case of large builders, except a handful of builders of repute who have been in the field for decades and a few new entrants as well, the Supply Chain Management concept is not fully popular.

It may be true that with excellent road developments and availability of all materials easily, the construction activities will not suffer for any inputs. The important thing is that SCM enables the builders to go ahead with the projects with least of worry about anything. For a builder concerned about future, SCM is the only answer.
A delay of even one day is quite costly in major construction sites. The losses it causes are huge and the builder only has to bear with the same. A fully planned and followed Logistics Support Functions relieve the builders from all the bothers. They can devote their valuable time for bother free activities in the speedy completion of the projects.

With the availability of men and materials on time, concentration is made only on construction and this results in perfection in the process and on time or even early completion of the projects.

There should be perfect co-ordination between the sites and the office of the builder. This is quite necessary as any gap in this will throw things out of gear with the suppliers as they are not fully provided with precise information on time.

Many issues arising out of contractual obligations with the suppliers are basically due to communication constraints.

The success of Logistics Support lies in timely and open communication with all concerned. It is a fact that deliveries become an issue basically due to communication errors.
The builders should take the suppliers into their confidence and share all the information needed, basically technical inputs, as this will go a long way in their business relationship and mutual benefits.