

Maintainability of Condominiums Constructed for Low-Income Families in Sri Lanka

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Abstract

Sri Lanka now has a prime market for “vertical growth” and the private sector has become the main developer. However, the government has also contributed to these developments through the condominiums constructed for low income families. These were built for the purpose of re-settling people from shanties and recently, Tsunami victims. These condominiums have shown significant failures and problems. This paper looks at some of these problems; specially maintenance. Three types of condominiums were selected to study. Interviews were conducted with management corporations, selected occupants and professionals in the relevant authorities. The study focused on understanding maintainability problems related to technical facilities, management, social condition, and legal background. Twenty five technical management, social and legal related problems were observed that occur during the maintenance and operational stages. Some of them have become a huge burden to the government. Further, the study identified eight strategies from substantive experts to eliminate these issues now and in future attempts.

Keywords: Condominium, maintenance issues, low income family, shanties, Sri Lanka.

Introduction

With the growing population, the problem of shortage of houses for low income families has become a critical problem in Sri Lanka, similar to other developing countries (Alaghbari *et al.*, 2009). Further, high levels of poverty and unemployment, and increased land costs have contributed to the formation of squatter settlements surrounding many urban centres. As a result, some areas in the Colombo city have been occupied by shanties in the capital city.

As a sub-set to the condominium, the condominiums for low income families were originally built by the Government to resolve the housing demand for low income earners and shanty dwellers (Karunaratne, 1978). In most of the cases

in Sri Lanka, these people represent the lowest community features and majority of them engage in fishery while others are pavement sellers, labourers, day workers and all that lower level hard working people (Lorensuhewa, 2009).

The local Government was the sole developer of these condominiums in the past. After 2004, a number of condominiums for low income families were constructed by non-governmental organizations to re-settle Tsunami victims. The condominiums developed for such people in Sri Lanka were varied from 2-9 storey buildings (according to the list of registered condominiums in CMA, 2009). Most common types are 2-4 storeyed and most of the housing units have individual

amenities together with common amenities such as common stairways, corridors leading to individual dwellings and balcony spaces.

Maintainability and sustainability of these condominiums has become an issue due to lack of provisions made for their maintenance management without considering the users, lifestyles and financial backgrounds of these low income earners (Wimalaratne, 2005b). Thus, various management legislations, regulations and strategies have been established for management of condominiums including this category, as similar in other countries like Hong Kong and Singapore (Hui, 2005; Edirimane, 2006; Yip *et al.*, 2007). The Common Amenities Board (CAB) under Common Amenities Law No.10 of 1973 (Ministry of Justice and Judicial Reforms, 1982) was established for management of common amenities and elements of units of accommodation. However, with the increased number of condominiums and the inadequacy of the provisions in legislations, CAB was converted into the Condominium Management Authority (CMA) empowering to regulate entire condominium activities by Apartment

Ownership (Amendment) Act No. 39 of 2003 (Wimalarathna, 2005a). This mainly covers the legal aspects such as creation of condominium property, consequential formation of Management Cooperation (MC), management of common amenities, sales easing, dispute resolution and revisions to the condominium property (Edirimane, 2006). Thereafter, this has become the legal body for the management of condominium properties and administration of the common elements and cooperate assets including regulating power for above purpose (Hewamanne, 2007). However, the existing problems in the condominiums built for low income families were yet to be resolved. Therefore this research study examined these problems and focused to establish strategies to reduce the burden to the Government and for future development.

Research Methodology

Three condominiums built by the local Government for low income families, located in Colombo metropolise were selected from the list of registered condominiums in CMA up to 2009 (Table 1).

Table 1: Case study description

No	Building Age	Occupants' Background
Case A	55 years	low income - less educational background
Case B	40 years	low income - mixed educational backgrounds
Case C	50 years	low income - less educational background

The existing problems of these condominiums and strategies to address these issues were explored conducting interviews with three target groups as,

1. Chairmen, secretaries and treasurers of MCs of three condominiums and a sample of selected occupants who have interacted with supporting functions were selected to identify existing problems faced by the occupants.
2. Two experts of CMA were interviewed to validate the findings

from the occupants and to identify further issues which were not captured from the occupants. Further, they were asked possible solutions for the issues identified.

3. Four experts in the relevant fields were interviewed to identify causes, challenges and possible solutions for the issues in the condominiums for low income families.

To enhance the validity of data collected, interviewees were selected on the basis of their experience, and the

degree to which they interact with supporting functions.

Interviews were normally lasted for 45 minutes to one hour. During interviews, a brief explanation about condominium management, maintenance and legal background of condominiums was given since; the researcher was found through the pilot study that the occupants and relevant parties were less aware about theoretical background on condominium management. An interview guideline focused on four problem areas such as technical, management, social and legal was used during the interviews. These four areas were established based on literature findings (De Silva, 2012) and the pilot study.

The summary of the findings of existing issues related to above four areas were used to develop the interview guide to identify possible solutions to overcome them. They were focused to identify short-term and long term strategies. Short-term strategies were seek to take immediate

respond to relief the maintenance burden faced by the occupants, whereas long-term strategies were identified to reduce and eliminate recurrence of existing issues. Unstructured interviews were conducted with six experts as mentioned in 2nd and 3rd target groups. Since these strategies were established for efficient management of condominiums, they were named as “maintainability strategies.”

While interviewing, note taking and tape recording (with permission of the interviewee) were done to maintain the accuracy of data collection. Finally, interview transcripts were developed to produce a readable version of interview data. Content analysis was carried out to extract key issues in these condominiums.

Results and Discussion

Twenty five key issues related to technical, management, social and legal were explored during interviews and illustrated in Table 2.

Table 2: Key issues in condominiums built for low income families

A) Technical	B) Management
A1. Physical defects A2. Deficiencies in accessibility A3. Poor parking facilities A4. Poor spatial arrangements A5. Safety and health issues A6. Issues in building services such as, <ul style="list-style-type: none"> • electricity and water supply system • sewerage and waste water system • solid waste system A7. Security issues	B1. Lack of awareness/training programmes on condominium lifestyle B2. Lack of management strategies B3. Lack of actions against illegal works B4. Bad image of occupants about CMA B5. Difficulties in collection of management fees B6. Poor management of management fund B7. Insufficient funding in the management fund B8. No income generation avenues in the management fund
C) Legal	D) Social
C1. Unawareness about the Act C2. Lack of coverage for maintenance management in the Act C3. Lack of implementations of the Act C4. Violation of government regulations such as unauthorized constructions by occupants C5. Lack of procedures to eliminate unauthorized alterations	D1. Lack of privacy and related issues D2. Unethical behaviours in common areas D3. Issues in sharing common facilities D4. Social and mental stresses D5. Lack of facilities for functional areas

Technical Issues

General building condition, lighting, electricity, water, sewerage, solid waste, space, ventilation, accessibility, parking, health and safety and security were studied to identify the technical related issues.

The physical condition of these condominiums were poor due to lack of maintenance and deficiencies in the usage. Many physical defects (A1) such as cracking, spalling, corrosion and water seepage were observed at the external side of all these buildings (Figure 1). Heavy fungus in external wall of case B was observed. Further, in some locations, plants have grown on the walls due to water leakages. Condition of the roof is critical as it was left unrepaired for a

longer period of time and thus it needs a huge budget which exceeds the financial limits of MCs to rectify the condition. Temporary evacuation of users in the upper floor is required when repairs are carried out. One of the occupants in Case B said “we have only SL Rs, 75,000/- in the management fund and the costs for maintenance will be around SL Rs. 1,000,000/-”. Therefore, they have no idea that what will happen to the building if the situation will continue in the future. The internal bathroom areas were seriously leaking and individuals have the responsibility to repair the defect. However, due to their economic background, this is beyond their capacity.

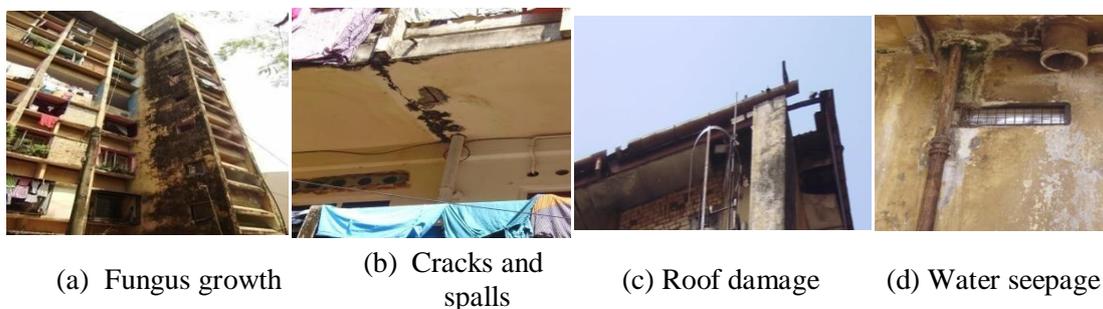


Fig. 1: Examples for A1: Poor physical condition

These units are designed with common corridors as access ways. However, in all case studies, accessibility (A2) of common corridors were disturbed by flower pots. In Case A, the openings of the refuse chutes were constructed in this common corridor and thus the width of the corridor has narrowed down (Figure 2). Further in Case C, some people have used to keep garbage along the staircase by obstructing the accessibility (Figure 3).

These blockages may seriously affect in an emergency situation where occupants would have been evacuated immediately. In case C, there is a considerable gap between two steps and thus foot may be locked between steps in an emergency situation.



Fig. 2: Insufficient accessibility due to the refuse chute



Fig. 3: Access was is blocked by the garbage bags

Availability of vehicle parking (A3) is one of the considerable factors in these condominiums as they were not designed for this facility. However, this was not a critical issue as most of the occupants do not have their own vehicles, other than a bicycle. Interviewees of Case A and C said, *“we had parking places earlier days, but now these places are controlled by a group of people for collecting money as parking fees from outside vehicles”*. They further added, *“residents have to pay parking fees for their vehicles to these gangsters in some instances”*. A member of MC further expressed,

“Neither, the MC nor the CMA has any power to take any legal action against these kinds of illegal activities.”



Fig. 5: Blocked drainage channel

In Case B, the external wall of the light room where all electricity meters of the housing units have been installed was leaking. One occupant said *“once there was a fire in the light room and one person was burned and died”*. Further, people have misused this room for other activities such as storage for their selling items and cardboard scrap (Figure 6). This has been increased the fire risk and on the other hand, there was no fire protection system or fire alarming system. These were the situations where the accessibility was purposefully obstructed to the room. Therefore, the electricity meter reader has been embarrassed by this lack of accessibility and the same electricity bill was given for all housing units without observing the meters.

These units are designed for a small family with maximum of five members (A4). It was noticed that users in some of these units have changed the original design by adding partitions within the houses to meet the requirements of increased family members. It was said that most of these alterations were unauthorized. Subsequently, the indoor comfort level has seriously reduced due to restrictions made for natural ventilation, lighting and space by these unauthorized alterations.

There were several safety and health issues identified (A5). The dengue epidemic was the most influenced health issue in these condominiums. This situation has been created by the blockages of the drainage system (Figure 5).



Fig. 6: Stored cardboard scrap and selling items

Issues related to building services include problems relating to cleaning water tanks, sewerage lines, and solid waste management (A6). In case B, cleaning of water tanks were left unattended due to unsafe access caused by deterioration of the provided access system and also due to practical difficulty of preparing the tanks empty for cleaning. Further, it was identified that the sump hasn't cleaned for a long time and there was a heavy layer of mud in the sump and main water tanks.

Solid waste has created an awful health hazard in these condominiums. In case A and B, solid waste was dumped around the refuse chutes due to various reasons such as broken chutes and garbage

collectors who are searching for cardboards and metal pieces (Figure 7). Stray dogs and cats carry these waste and dump in everywhere within the premises (Figure 8). The situation has been



Fig. 7: A broken chute

In Case B, one said, “*some people have illegally constructed boutiques by blocking the drainage channels*” (Figure 9). Further, in Case C, most of the waste water lines have been corroded and blockages were identified at several locations. Some occupants have constructed separate waste water lines to



Fig. 9: Construction over a drainage channel

Management Issues

The lifestyle in condominiums is different from what it is from individual dwelling units as many families live in a single building sharing common amenities. So for people who have not used to this lifestyle need a longer period to acclimatize to unique behavioral patterns in it. Therefore, CMA as the governing authority can consider conducting awareness programmes to educate them on the new lifestyle. This would get many benefits over wrong usage of the facility (B1). For an example many

triggered with the disorganized collection by the outsourced cleaners. Under this circumstance, spreading of mosquitoes, flies and rats has become a critical health issue.



Fig. 8: Waste are dumped all over the premises

overcome the problem. However, most of these constructions have blocked the existing manholes and obstructed the entrance for cleaners in some locations. In addition, it was noticed that there was no efficient system to maintain and clean the drainage lines in all cases.

cracks were observed in the slabs of the kitchen areas of Case B, due to the vibration created by using traditional “mortar and pestle” for grinding purposes.

Members of the MCs highlighted that they need guidance and support from CMA to make them train how to run the MC (B2). One member in MC said “*we don't get enough support and cooperation from the CMA. We meet the officers of CMA once a year during renewal of the registration of the MC*”. Due to this lack of communication and guidance, members of the MC are not well aware about their exact roles and responsibilities, extent of

powers they have, etc., when managing these condominiums. Further, most of the MCs are running without a constitution as their knowledge is insufficient to develop their own. The CMA as the governing authority can get involved, under such circumstances.

There were many illegal incidences noted during past months in Case A (B3). Use of corridors and stair cases in lower floors for illegal works during night time was identified as one of their biggest threats. Members of the MC of Case A, added “CMA has not taken any action when we forward this problem to them,” informing they have no power to act against these situation (B4).

It was identified that major maintenance works were due when the MCs were established in these older condominiums. This situation was created due to non-attendance of the corrective maintenance works for a longer period and thus originated a huge amount of budget to rectify the existing problems at the time of taking the management by MCs. Interests of the deposits in the management fund, which was established by collecting Rs. 5,000 to 7,500 (US\$ 45-68) per housing unit, were allocated for maintenance and utility payments in common areas (interview with an expert in CMA). This amount was required to pay as a one-time deposit for maintenance, when occupying the new apartments. Additionally, monthly collection for maintenance and operations fees can be used for managing common area facilities. However, the deposits in the management fund were not sufficient to carry out a single job activity. Under this existing critical situation (B7) MCs expect helps from the Government. Thus, CMA should look for alternative solutions to reconcile the situation or create means to generate income to the management fund (B8).

Collection of maintenance and operations fees was highlighted as a critical issue by MCs (B5). Some of the occupants haven't had willingness or ability to pay their monthly fees. In this regard, MCs have no legal power to take

actions against them. This situation is unfair for those who are paying their contribution. In this regard, it was proposed that “CMA should take a leading role to establish a proper mode for collection of management fees from low income condominiums.”

It was said that the CMA has not monitored progress of MCs, how transactions were done, how maintenance works were carried out and what was the maintenance strategy, etc. Further, it was suggested that the CMA to establish procedures for collecting maintenance fees, service charges, procurement, etc., to make the process transparent to everyone. This may help MCs to maintain the trustworthiness of its management process. Therefore, CMA should consider appointing a “manager” or a “managerial body” who can coordinate all logistics in the condominium management process (B6).

Legal Issues

Most of the occupants were not aware of the condominium law (C1). Thus the majority of the people have no knowledge on their legal boundaries. Therefore, it was noticed that most of the houses have been modified without seeking the approvals (C4). Therefore these changes were not included into the original plans which are appeared in their deeds.

It was highlighted about the noise and vibrations creating from the illegal construction works which are generally carried out during night time in the housing units. However, lack of procedures to eliminate these unauthorized work, are defined within the condominium management process taken by the MCs and the CMA (C3, C5).

Lack of regulations for maintenance work has resulted in poor attention for maintenance of condominiums. (C2). Sever deterioration of the appearance created by fungus and algae growth of these condominiums may cause as a result of this situation (Figure 10).



Fig. 10: Sever fungus and algae growth

Social Issues

It was observed that there were no issues regarding sharing common welfare facilities such as community hall and children's park except in one case (D3). Generally, the community hall is used for various functions such as small parties and wedding parties. Further, it was said that people are encouraged to take care of these facilities. However, in Case B, facilities provided in these places were not taken care well.

It was observed that there were no mental and social stresses among the people living in older condominiums (D4). Most of them have been adapted to the "high-rise" lifestyle and environment in these older condominiums due to their longer stay. Some of the occupants have been living in these places since their birth. However, this was not the situation in condominiums given for resettling of Tsunami victims.

However, some issues were explored in common facilities (D5). Once, it was said that the *door of their housing units was not wide enough to take in the coffin on the event of funerals*, in Case B. However, society within this living style has adjusted to help the neighborhood by offering space from their own houses for functions such as weddings and funerals. Further, corridors, staircases and ground floor were used for such events.

The other highlighted issue was lack of privacy in all cases (D1). In Case A, it was observed that the doors of the each opposite housing units were located face to face and therefore inside of the house can be seen by the other party. The

windows of the housing units were located along the corridor and that has also reduced the privacy of these people.

Use of the common corridors and staircases by loiterers and smokers has become a critical social issue (D2). Further, staircases of some buildings were occupied by drunken people and for other illegal activities during the night. It was identified that such behavioural patterns are very hard to change unless there are very strict rules to avoid above actions.

One said "*mixing of cements is done on corridors when construction works going on in the housing units*".

Maintainability Strategies for Minimize Issues in Condominiums Developed for Low Income Families

Common issues in these condominiums are summarized in Table 2. These issues were discussed with four experts in the industry and two experts in the CMA to explore effective strategies to restore the situation. It was suggested to focus on long-term and short-term strategies. Long-term strategies are defined as actions that can be taken at the early stages to get future benefits. Thus, these strategies can be applied during the design stage to minimize maintenance management issues. Short-term strategies can be focused to get immediate improvement in the efficiency of maintenance management. Thus, these strategies can be applied during the occupancy stage. Eight strategies were proposed for effective management of these condominiums as shown in Table 3.

Table 3: Maintainability Strategies for effective management of condominiums for low income families

Long-term strategies	Short-term strategies
<p>Strategy 1: Considerations of end users</p> <p>Strategy 2: Considerations on future maintenance</p> <p>Strategy 3: Enrolment of a facility manager</p> <p>Strategy 4: National level maintenance policy</p> <p>Strategy 5: Enforcing legal power</p> <p>Strategy 6: Extending of CMA's role</p>	<p>Strategy 7: Government support for maintenance backlog</p> <p>Strategy 8: Adapting for condominium lifestyle</p>

Considerations of End Users

Consideration of end users has a great impact on maintainability and sustainability of a facility (Tiun, 2009; De Silva and Ranasinghe, 2010). For example, if the facilities can't be afforded by the users, their sustainability would become a major issue. Further, if the users do not have a proper knowledge on maintaining a particular building system, it deteriorates faster due to the wrong usage.

One expert mentioned, "*behavioural patterns that originate from "low income social backgrounds" may require habitual changes to get used to the condominium living style*". For example, it may not be practical to use "gas cookers" for cooking purposes due to poor income levels, although they were given this facility at the commencement of these condominiums. It was noticed that some people use other means such as firewood, which in turn creates risks for fire. Further, many cracks were observed in the slabs of the kitchen areas due to the vibration created by using traditional "mortar and pestle" for grinding purposes, although it was prohibited.

Therefore, suitability and maintenance affordability of the design and the structural detailing for its end-users should be considered right from the design stage to have maintainable and sustainable condominiums (De Silva and Ranasinghe, 2010). It was reported that involvement of representatives from users in some community development projects as an important step to get feedback on the design. However, the practices of these strategies have not established in the development process of condominiums in Sri Lanka.

Considerations on Future Maintenance

The requirements for maintenance can decide the cost of future maintenance and its technical easiness for maintenance (Al-Hammand *et al.*, 1997; El-Haram and Horner, 2002; De Silva and Ranasinghe, 2010). Therefore, decision to select low-maintenance materials, components, and elements to significantly lower the maintenance budget, and the downtime loss are very important for these types of condominiums, as they are running with a small maintenance fund due to occupants' low income levels (Buys and Nkado,

2006; Stoy and Kytzia, 2006). It was revealed that the economic factors such as insufficient budget, low income levels of the users and costly maintenance needs are some of the biggest challenges faced by the MCs in carrying out necessary maintenance without compromising the performance of the building. Thus, was identified that, some of the non-critical defects of the buildings have been postponed till they become major problems and repairing becomes impossible, under these circumstances.

Consultation of a maintenance expert during the development phase was proposed to identify low maintenance requirements, high-maintainable designs, materials and the expected WLC for maintenance requirements (De Silva, 2011). In this regards, the frequency and the method of cleaning and maintenance, and durability and suitability of the materials, components, systems, etc. are important factors. Therefore, the designer should make decisions based on the fewer needs for cleaning and maintenance. Increased maintenance costs was reported when special plant and equipment and special skills were used for maintenance and cleaning. Therefore, promoting “low cost” maintenance approaches can reduce the “maintenance burden” of low income occupants in these condominiums.

Enrolment of a Facility Manager

Strategic facilities management is focused to provide maximum comfort to the occupants at a minimum cost (De Silva, 2011). If this task starts during the project planning stage, the “pro active” facility manager can obtain the overall control towards taking correct decisions for cost effective maintainability strategies (Her and Russell, 2002; Stoy and Kytzia, 2006; Newton and Christian, 2006). On the other hand, facility managers are the “keepers” of databases and information systems that contain valuable operational and maintenance information on different building types (Preiser, 1995). This information from facility managers enriched with their vast store of practical knowledge and experience and the feedback from users of the building on

operational and maintenance problems, are excellent inputs for the designers in order to develop “low cost maintainable” buildings (Buys and Nkado, 2006). Thus the facility manager could be the “pathway” for providing such feedback and for persuading designers to take correct design decisions on any maintenance management issue, in order to make life easier for all stakeholders. In many instances, design related maintainability problems are highlighted due to the lack of communication between the designers and the facility managers (Chong and Low, 2006). Typical examples in these housing units were poor accessibility, privacy and space. Moreover, there is much evidence to demonstrate that poor design decisions continue to be repeated in every new building (Zubairu, 2001; Andi and Minato, 2004).

Chong and Low (2006) found that a facilities manager has very little control (i.e. about 4%) during the stage of occupancy to minimize maintainability problems and defects occurring from such deficiencies, whereas designers can take about 84% control over the minimization of these problems with the support of a facility manager.

National Level Maintenance Policy

In a holistic maintenance management approach, the maintenance policy plays a vital role as it dictates procedures, maintenance plans and operations to be used in the entire process (Coetzee, 1999; Cholasuke, 2004; Lee and Scott, 2009). There were many maintenance policies developed at the national level in other countries (e.g. UK, Singapore), sectors and organizational levels (e.g. NASA, Forces, Universities, Schools). Some of these policies such as the policy for the maintenance of Queensland government buildings, building maintenance policy for South Hams district council are very detailed. These policy statements emphasized the importance of maintainability in achieving the organizational goals and thus include many sections such as maintenance planning, budgeting strategy; risk

management strategy; financial management strategy; whole life costing strategy, and maintenance performance.

The revised Apartment Ownership Act No.11 of 1973 (Apartment Ownership (Amendment) Act No. 39 of 2003) is the only legal document in Sri Lanka to address some of management issues in condominiums. However, according to the experts, the extent of the document is not sufficient to fulfill the need. Thus, it is a timely need to develop a national level policy for management of condominiums. CMA as the governing body can take a leading role.

Enforcing Legal Power

According to the existing Act; the Apartment Ownership (Amendment) Act No. 39 of 2003, neither CMA nor MC as the immediate managing bodies has authorized power to take direct actions against illegal activities taking place in these condominiums. When a complain receives from occupants, CMA has to bound to common law or Urban Development Authority (UDA) regulations in case of an illegal construction to file a case as a private plaintiff. According to occupants, this system is inefficient or sometimes hopeless in taking quick responses and therefore some of the occupants continuously do the constructions violating the regulation. However, this is not a good system to maintain and needs an immediate attention to find a way forward to eradicate the existing situation.

Many occupants in these condominiums criticized the existing procedure of the CMA regarding these incidents. It was said, once they complained about an illegal construction in their condominium, they were advised to make a complaint in the police. However, occupants reluctant to do so, as it may develop personal annoyance.

Thus, the Government should introduce new regulations or establish a legal division in the CMA to take immediate attention on these complaints.

Extending of CMA's Role

Having an effective management process in a building or an infrastructure is a key factor to maintain the performance right through its service life (Hui, 2005). The maintenance management processes can be varied based on the different regulations, property category (e.g. residential, commercial, etc.), property features, developer, and sector (e.g. government and private) to meet their unique objectives. Some countries like Singapore used developer mode management system to maintain government condominiums (Yu and Han, 2001; Hui, 2005). However, though the management processes used with various properties are different, the aim of an efficient process should be focused on providing a service of value for money to the property owners (International Facilities Management Association, 1993; Hegazy, 2006; Lam, 2008).

Thus, in the local context, it was suggested to extend the management role of CMA. Therefore, the existing role of CMA in the local context can be extended to following areas as,

- taking a more active role in establishing MCs
- developing a common constitution
- acting as an agent to the MCs to maintain its role
- enforcing to submit the management plan during the condominium approval stage
- enrolment of a facility manager to approve these proposed management plans
- developing maintenance guidelines

The existing structure of the CMA may require re-structuring to cater for these proposed services.

Government Support for Maintenance Backlog

To resolve this crisis situation due to backlog of maintenance, a considerable amount of money needs to be pumped to uplift the poor performance of these condominiums. Very recently, the Government has decided to allocate funds

to renovate some of the oldest condominiums in the country.

Strategies such as prioritization of maintenance were used for effective allocation of limited resources, ensuring the best solutions so as to optimize maintenance management (Jamali *et al.*, 2005; Buys and Nkado, 2006; Bardey *et al.*, 2006). Thus, it can pay an immediate attention on the most critical building elements. In Hong Kong, this maintenance prioritization strategy was used to clear the maintenance backlog that was caused by lack of maintenance budget due to the financial crisis during mid 70s (Shen *et al.*, 1998). The Housing Department of Hong Kong has successfully applied this criteria over a large number of housing units in Hong Kong (Lomas, 1997; Shen, 1997). Similarly, the Government of Sri Lanka can apply these effective strategies to clear the maintenance backlog created by the ignorance of corrective maintenance in these buildings.

Adapting for Condominium Lifestyle

Transforming the lifestyle of people from shanties and single ownership to condominium is a big change and a challenge. It needs certain adjustments and concerns that are in part the realities of high-rise living and sharing common facilities. This challenge has been successfully achieved in some countries like Singapore and Hong King during their rapid developing stage (Yuen *et al.*, 2003; Yuen, 2005a&b; 2007). Strategy of imposing strict management rules was used in Singapore to adapt its people to this new lifestyle.

In Sri Lanka, the experts suggested to conduct awareness and training programmes to meet the challenges caused by this transformation. Further, the CMA was suggested to take a leading role in this regard. Several Non-Governmental Organizations (NGOs) have conducted training programmes for occupants in their housing units. However, this must be looked at the early design stages facilitating to achieve this adaptation in an

easy way, specially with low level of educational background and income level.

Conclusions

Condominiums developed for low income families are suffered from many deficiencies during their maintenance and operational phase. These issues were identified and analyzed under four critical areas such as technical, management, legal background and social issues. Members of the MCs in these condominiums and experts from the CMA and in the field were interviewed to explore the issues and establish possible strategies to overcome these situations.

There were twenty five issues identified under technical, management, legal background and social aspects. Among them, number of management and technical related issues were higher than legal and social issues. Most of issues are very specific for these condominiums due to the nature of occupants' social group and their poor educational backgrounds. Some of these issues need immediate attention to prevent further collapse of the building conditions.

Eight maintainability strategies were established to improve the management process in terms of long-term and short-term. Long-term strategies were proposed to take actions right from the development stage to maintain easy maintenance and management throughout the life cycle of the condominiums. Short-terms strategies were established to take immediate reactions to make corrections to the existing problems. Different professionals such as designers and local authorizes can play a bigger role in proving necessary profession contribution.

These proposed strategies can be considered for future development of the condominiums in Sri Lanka to avoid maintenance burdens to the Government, its users and management bodies. Subsequently their performance, living styles and maintainability could be improved.

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