

Establishing the Fire Fighting and Prevention Movement of Population in the Urbanization Period in Vietnam

Luong Khac Vong
University of Fire
Hanoi, Vietnam

Nguyen Tuan Anh
University of Fire
Hanoi, Vietnam

Abstract—The process of urbanization in Vietnam has formed many high-rise buildings, amusement center, business locations ..., but the fire prevention and fighting has not been popularized by the habitants and leaders of establishment. Therefore, one of the most important solutions that need to be promoted is to improve the quality of activities to build the movement of the entire population for fire prevention and fighting. This process requires the attention of the party committees, urban government; officials performing tasks need to take the initiative in grasping the situation; diversifying forms of implementation ... If activities of officials in management on fire prevention and fighting are good and creative, it will move to awaken the awareness of the habitants, and the habitants will carry out, continue to influence to the others.

Keywords—fires fighting and prevention, establish the movement, urbanization, state management, population

I. INTRODUCTION

According to the statistics of the Urban development Agency under Ministry of Construction, in Vietnam, the urbanization recently has strongly developed, population in urban areas increased from 24.0% in 2000 to 30.04% in 2010 and has been grown up to 35.1% in 2018.

According to statistics from the Fire Prevention, Fighting and Rescue Police Department: During the period from 2002 to 2018, there were 35,882 fires in whole the country (excluding forest fires), killing 1,311 people, injuring 3,333 people, causing property damage of VND 15,215.83 billion. 22,114 fires happened in Urban area, accounting for 61.63% of the total number of fires [1]. Total land area of urban areas is 2,900 km², accounting for 0.872% of the total land area of Vietnam, 332,698 km².

Along with the increase of the process of urbanization is the increase in the number of fires in urban areas. The statistics from Fire Prevention, Fighting and Rescue Police Department also clearly show that the number of fires, fire damage increases, the occurrence of fires caused serious consequences also mainly concentrated in the areas with high urbanization rates [1].

In some locations, many residential areas were builded,

Corresponding Author: Luong Khac Vong, University of Fire, Hanoi, Vietnam.

the number of population and constructions rised significantly, at the same time, a large number of new constructions of which scale was growing were created. The urbanization plays the main role in economic growth and poverty reduction in many provinces and cities, leads to the increase in economic, cultural and social centres, consequently, accelerates the economic, labour and population distribution restructuring. The urban areas is the places where the huge number of products is consumed, the large number of labour force is attracted, but these are also the places that have many burdens such as unemployment, migration, which cause the overloading of the infrastructure, the pollution and uncertain social security. This issue influences obviously the fire fighting and prevention activities.

On the authority of the 445 / QĐ – TTg on 07/4/2009 of Prime Minister about apporval of the adjustment of overall planing on the development of Vietnam’s urban system up to 2025 and the vision up to 2050, the urban areas will be 4,000 km² in 2020, will be home to 45% of Vietnamese population. This number is predicted to be 50% in 2025 [2]. As a result, the increase of the number of fires will bring more serious consequences, which will directly affect state management on the fires fighting and prevention work.

In the current legal system, there is only QCXDVN 01: 2008 / BXD Vietnam construction standard – construction planning, in which section 2.7.4 Urban fire fighting and protection planning provide for the establishment of the fire fighting and prevention team: “*In the urban territory, there are compulsively the fire fighting and prevention stations including central stations and local stations. The maximum service radius is ≤ 5 km and ≤ 3 km, respectively of each central station and local station*” [3]. According to this rule, our country needs over 1,000 central and local fire fighting and prevention teams. However, there are only 262 teams now and the establishment of the new teams also encounters many obstacles relating to human resources, equipment procurement and station building... Because this rule was not legalized, the provinces have lack of legal basis to arrange construction site, land fund for fires fighting and prevention teams.

From the above analysis, in the process of urbanization, many cities, towns, urban areas and new

residential areas have been established in the condition that the State has not set up enough units to implement fires prevention and fighting work. Therefore, in order to carry out the work of fire prevention and fighting, one of the most important solution is improving the quality of establishing the fire fighting and prevention movement of population.

Over the years, state management agencies on fire prevention and fighting have competently completed this solution. They advised the Party committees and the authorities in issuing documents guiding fire prevention and fighting activities to the habitants. They also coordinated with the social organizations in disseminating knowledge on fire prevention and fighting law ... However, besides the achievements, there are still shortcomings. For example, it remains the lack of centralized direction; the material facilities serving the fire prevention and fighting are still lacking and out-of-date; the content of propaganda is limited, uncertain, inefficient and inappropriate with learners; many new urban areas and residential areas are not advertised for fire prevention and fighting ...

The above-mentioned shortcomings are due to the lack of documents guiding the contents of building a movement for the entire population to prevent and fight fires for local fire fighting and prevention Police; the ignorance of the executives and leaders; the lack of coordination among various types of media; the limited fund investing in the construction of public movement.

In Vietnam, there are some researches such as "Some solutions in order to improve the effectiveness of the fire prevention and prevention in production areas in the industrialization and urbanization period in our country" of Dr. Ngoc Son Nguyen [4], "Propaganda and dissemination of law, knowledge and skills on fire prevention and fighting for pupils and students in current situation" by Dr. Quang Hai Le [5], "Fire Protection Management and Disaster Protection Management in Museums" by Tuan Anh Nguyen [6] ... They mentioned the effective of propaganda building the movement of the habitants for fire prevention and fighting, but did not mention specifically the organization of implementation in urbanization period.

In some countries like France, the popularity of the fires fighting job is reflected in the fact that it is considered as one of the best jobs in the world. Many high school students choose this job; in Vietnam and many Vietnamese people have not knowledge about fires fighting job.

Fire safety of existing buildings decreases with time. Based on factors such as space constraints and high construction costs, the increase in hardware construction is difficult, especially in existing hotel buildings due to 24-hour operations. Fire safety management is the most important part of a fire safety evaluation system, which includes fire prevention, and evacuation and mitigation

strategies. This system will assist owners in performing improved fire safety management measures with little hardware update [7].

A decision-making model for managing personnel movement in fire emergencies is presented. For certain groups, decision models recommend one of two basic actions: (1) people remain where they are; or, (2) the person moves to a safer area inside or outside the building, including the means to travel to the recommended location [8].

Building fire risk analysis is used as the basis for managing fire risk. The average fire risk on residential buildings is measured in detail. With a detailed type of fire risk model developed, fire risk management measures can be undertaken to improve the fire safety level of the building and reduce the risk of fire and subsequent damage. In the analysis of fire risk, the building process using cluster scenarios, the number of death victims and property loss directly selected as an index of the risk of building fire. Fire risk management steps can be taken to improve the building fire safety gradations and reduce the level of fire risk and subsequent damage [9].

The most important aspect of the security of a building in the presence of fire is the possibility of escape from danger. Understanding how individuals behave in fire and fire evacuation cases is essential if we want to bring appropriate fire safety measures with residents' needs during an incident. Critical factors that determine the fire response performance of residents are the characteristics of fire, human and buildings. Fire conditions in all building compartments can be predicted by the Smoke movement through movement and flame growth. Emergency evacuation under conditions of fire at mass transit stations is of great concern especially in developing countries. Different fire locations, heat release rates, passenger loads, ventilation conditions and material properties are considered under fire conditions at subway stations. This indicates that the rate of heat release has a weak effect on the evacuation of fire emergency, but the location of fire, passenger capacity, ventilation conditions and material properties have a major impact on fire evacuation. Furthermore, the five parameters have a combined function of fire emergency evacuation [10].

Fire safety regulations change because compliance with prescriptive requirements is being replaced or equipped with an approach based on performance-based design. However, this shift in regulatory practice raises important issues regarding regulators' ability to provide competent oversight of fire safety techniques. There are two major obstacles to this: doubts about whether fire safety techniques are mature enough as a profession; and concerns about whether the probabilistic nature of fire risks makes fire safety engineering unsuitable for self-regulation [11].

II. METHODS

The methods used during the study period:

This paper analyses and enumerates the fires from 2002 to 2018, finds out the relationship between fires and urbanization, and establishes the fire prevention campaign for residents. Some characteristics such as number of fires, urbanization index, damage of fires, habitant's knowledge about fire prevention, fire fighting and rescue. Analyzing result shows that most of the worst fires occurred in the urban zones, especially in the workshops such as the fire on 15/9/2013 in Hai Duong shopping mall; the fire on 11/10/2015 at the CT4 apartment in the residential area Xa La, Ha Dong District, Hanoi; the fire on 10/5/2016 in Phu Dat apartment, Binh Thanh, Ho Chi Minh city ... In reality, the number of the materials, products and the constructions grow up more and more with the population increase, in the condition that the management of Fire fighting and prevention Police is still weak, knowledge of habitants about fire prevention and fighting is not enough. This leads to the risk of increasing fires and fire damage.

Investigate the actual state in Hanoi, Ho Chi Minh city, Binh Duong, Bac Ninh ... Some obstacles in fire fighting and rescue can be found as lack of water resources, the limitation of traffic, the uncertain technique distance in fire prevention and fighting. Investigating result shows that Vietnamese urbanization certainly affected fire prevention and fighting work and posed many problems to solve.

Investigate the actual situation of the public movement of the fire prevention and fighting in the urbanization process. The research collected statistic of number of fire prevention and fighting teams and civil defense teams, and performance result of these teams. The research also used the methods of sociological investigation to collect the information and reviews from the executives. Most of them recommended that it is necessary to primarily establish the movement in fire prevention and fighting for the community, specially pay attention to the method of this work.

III. RESULTS

State management agencies need to advise the Party committees, urban areas' government to implement the task of organizing the movement in fire prevention and fighting, especially for new urban areas and residential areas:

Promote the implementation of Directive No. 47-CT / TW dated 25/6/2015 of the Party Secretariat on enhancing the leadership of the Party for fire prevention and fighting and the dynamic Action Program of the locality [12]. Immediately after the Directive of Party secretaries, Provincial Party promulgates implementation instructions. However, in the new urban areas, apartment buildings, new complexes of construction works have not had full management of party committees. Therefore, the implementation of the Directive as well as the provisions

of the Law on fire prevention and fighting still entangled;

The leaders of the provincial/municipal Residents' Committees to promulgate regulations on the building of the community movement in fire prevention and fighting, especially in the urban areas, residential areas ... The documents have to be propagated and disseminated on the mass media;

The leadership and direction must ensure the establishment of timely, frequent, continuous and long-term prevention and fire fighting campaigns. Through awareness raising activities, guide the lawful actions for the community.

Officials should implement the situation and determine the right content to propagandize to build the movement of all people for fire prevention and fighting in the process of urbanization. In order to improve effect of the movement of the entire population to prevent and fight fire, all people enthusiastically carry out the fire prevention and fighting work, it is required that the Fire Prevention and Fighting Police force grasp situation, gather clarification of information about:

Measures implemented and effectively achieved for each type of establishment, especially for urban areas, apartment buildings, new offices and areas with high urbanization rates;

The ability to realize and implement of the habitants, specifically, residents in apartment buildings, staff working in offices in high-rise buildings;

Specific characteristics of constructions, specially pay attention to apartment buildings, office buildings ... This is a new type of establishment in the process of urbanization, and people living and working in this project are less interested in fire prevention and fighting;

Financial resources can be collected for this activity.

This information is very useful, helps authorities better understand about habitants and constructions. With more information, state management agencies more effectively organize propaganda: propagating in depth topics focusing on specific subjects, domains and industries; regularly reforming propaganda content, making propaganda content specific, easy to understand and easy to implement; making propaganda forms to be more diversified and plentiful ... In addition, in the process of organizing the implementation, it is necessary to have policies to encourage fire prevention and firefighting teams and all people enthusiastically carry out the fire prevention and fighting work.

Improve the capacity to propagate, disseminate and educate the law and knowledge for state management officials in fire prevention and fighting; renovate the contents and programs of law dissemination and popularization; highlight the responsibilities of heads' agencies, organizations and households in fire prevention and fighting task:

Associate with the University of Fire to train the special subject “Build the movement for the entire population to prevent and fight fires in residential areas and urban areas”, and organize training to improve education capacity, disseminate law and knowledge of fire prevention and fighting for officials who perform the task of state management on fire prevention and fighting. At the same time, increase socialization through extensive training to the population of urban areas;

The state management agency for fire prevention and fighting in urban areas survey, grasp the need of population to learn the laws and knowledge of fire prevention and fighting. In each locality and region, population may have different needs to learn the laws and regulations, fire prevention and firefighting knowledge. Thereby the state management agency for fire prevention and fighting select the content and legal provisions on the specific fire prevention and fighting work which is practical, easy to understand, easy to remember to propagate and popularize;

The heads of organizations, establishments and households are responsible for propagating and mobilizing other people to abide the law on fire prevention and fighting. Therefore, state management officers should specially pay attention to propagate and disseminate the law and knowledge of fire prevention and fighting to the heads of organizations, establishments and households, give them specific tasks;

The propaganda shall clarify that the telephone number 114 is the free fire alarm number, providing all information related to fire prevention and fighting for all people to understand and implement;

Establish volunteer fire fighting teams. State management agencies on fire prevention and fighting should pay attention to implement of this task dependent on the basis of Clause 27 Article 1 of the Law amending and supplementing a number of articles of the Law on Fire Prevention and Fighting. The Law amending and supplementing a number of articles of the Law on Fire Prevention and Fighting has taken affect for 5 years, but no volunteer fire prevention and fighting team has been established in Vietnam now.

Diversify forms of propaganda. Actual survey results at 5,523 establishments and 584 communes in Hanoi city show that the heads and members of the grassroots fire prevention and fighting team all wish to organize sport festival, fire prevention and fighting contest [1]:

Fire prevention and fighting sport festival is a form of organizing demonstrations on technical movements and sports in order to inspect and evaluate the results of training in fire prevention and fighting. Some games such as: good fire prevention and fighting family; good team of fire prevention and firefighters ... Members of teams overcome obstacles in confined spaces, move properties, use fire extinguishers to extinguish fires in petrol trays, use stamping blankets turn off fire in drums, save victims,

spray sprinkler boxes ...;

Fire prevention and fighting contest is a form of organizing competitions to learn about professional knowledge, check and evaluate learning results, fire prevention and fighting knowledge. There are organizational forms: grassroots fire prevention and fighting team propaganda contest; contest of understanding laws on fire prevention and fighting; contest of understanding fire prevention and fighting knowledge in the family ... The organization of the contest can be in the form of game show, choosing the right answer according to the given answer, presenting about fires prevention and fighting ... In the current period, due to the application of many information technologies, the choice of multiple-choice test is the optimal solution, easy to implement with many questions built up;

In fact, the organization of sports festivals of fire prevention and fighting has many benefits such as: appropriate to many objects; beneficiaries can do it right away, remember long after implementation; building a collective spirit of solidarity ... However, the organization of sports festivals and competitions is costly, the management and safety meet certain obstacles, so it has not been regularly prevented by the Fire Prevention and Fighting Police force. Therefore, in the coming time, state management agencies should coordinate with functional units of Culture and Sports Tourism, Labor Union, Fatherland Front ... to organize this implementation, and improve efficiency through each year of implementation.

Promote propaganda through the commune’s media, the facility’s internal media system. These methods have many advantages such as: implementing immediately because the commune-level communication system in Vietnam is relatively complete; only pay training cost for collaborators, so the investment costs for the organization are low. All of facilities, especially in urban areas, high-rise buildings ... have internal radio systems:

The district-level and commune-level People’s Committees use the communication media system for propaganda. This procedure should pay attention to praising and rewarding the typical well-done teams and individuals. The propaganda on fire prevention and fighting can be carried out weekly and shortly after a serious fire in Vietnam and in the world;

The Residents’ Committees of the wards and communes should proactively implement training and fostering fire prevention and fighting knowledge for the propagandists in order to raise efficiency of propaganda of fire prevention and fire fighting. Because there are specialized terms in the fire prevention and fighting which require the basic knowledge to avoid distorting the propaganda content;

Strengthen the propaganda that the citizens have the right to send complaints and questions about fire prevention and fighting through electronic communication of Residents’ Committees. When receiving the letter of the

habitants, it is necessary to quickly set up a working group to address the request or denounce in order to solve the dangers of fire prevention and fighting;

State management agencies should mobilize the public to participate in fire prevention and fighting. This procedure is able to help consolidate and organize semi-specialized forces in building the community movement. Especially in the Newly established urban regions;

Propaganda by banners, posters, leaflets on the occasion of fire fighting such as on the 4th October (The entire population is in charge of fire prevention and fighting), national holidays and New Year holidays. In addition, the local government agencies should require to hang up posters on the fire prevention and fighting for the power system, gas, flame at the plain sight.

Ensure the fund for building the community movement in fire prevention and fighting:

The procedure requires some costs including gasoline, printing banners, leaflets, documents, depreciation, organizing workshops... All these costs need to be calculated and balanced;

The funds could be from individuals and organizations. For example, the electric company could support actively to print the propaganda content on the back of bills of payment; the paper-producing enterprises could print fire prevention and fighting instructions on cover of notebooks; print warnings on the catalogs of the highly inflammable equipments...;

The annual propaganda and dissemination funds are provided by the People's Committee;

The funds could be from the relevant research projects and subjects.

Annual budget of each division. It should be noted that, in the process of building urban areas, investors have reported funding sources for building the movement of all people for fire prevention and fighting according to the law on fire prevention and fighting. Every year, units should take initiative in estimating regular funding including the propagation section and establishment of the community movement in the fire prevent and fighting.

IV. CONCLUSION

The urbanization in Vietnam has led to a rapid increase in the population and building, in the context of the unprofessional fire prevention and firefighting. This has caused an increase in fire and damage. Therefore, in order to improve the quality of the state management on fire prevention and fighting during the urbanization process in Vietnam, it is to establish effectively the public movement of fire prevention and fighting. The implementation of this work should be carried out by various measures such as Party committees and authorities to carry out the task of organizing to build the movement of the entire civil defense fire and fires fighting; organize to grasp the

situation and determine the contents to be propagated in order to build the movement of the entire population for fire prevention and fighting in the process of urbanization; improve the capacity of propaganda knowledge of fire prevention and fighting for state management officers to perform their tasks; diversifying propaganda forms; promote propaganda through communal media; ensuring funding for activities. This is an important solution to help the people understand deeply the requirements of fire prevention and fighting activities, improve their knowledge and behavior suitable for the current urbanization process.

REFERENCES

- [1] The Vietnam Fire and Rescue Police Department, The annual work report from 2012 to 2018.
- [2] Prime Minister (2009), Decision No. 445 / QĐ - TTg dated April 7, 2009, orienting the overall planning for development of Vietnam's urban system until 2025 with a vision to 2050.
- [3] Ministry of Construction (2008), QCXDVN 01:2008/BXD Vietnam Building Code. Regional and Urban Planning and Rural Residential Planning
- [4] Ngoc Son Nguyen (2002), "Some solutions in order to improve the effectiveness of the fire prevention and prevention in production areas in the industrialization and urbanization period in our country" University of Firefighting and Prevention, Vietnam.
- [5] Quang Hai Le (2018), "Propaganda and dissemination of law, knowledge and skills on fire prevention and fighting for pupils and students in current situation" University of Firefighting and Prevention, Vietnam.
- [6] Tuan Anh Nguyen, Khac Vong Luong (2018), Fire Protection Management and Disaster Protection Management in Museums. *International Journal of Civil Engineering and Technology*, 9(9), 2018, pp. 2012-2016.
- [7] Chen, Y.-Y., Chuang, Y.-J., Huang, C.-H., Lin, C.-Y., & Chen, S.-W. (2012), The adoption of fire safety management for upgrading the fire safety level of existing hotel buildings. *Building and Environment*, 51, 311-319
- [8] Groner, N. E. (2016), A decision model for recommending which building occupants should move where during fire emergencies, *Fire Safety Journal*, 80.
- [9] J. Xin and C. Huang (2013), Fire risk analysis of residential buildings based on scenario clusters and its application in fire risk management. *Fire Safety Journal*, vol. 62, no. PART A, pp. 72-78.
- [10] Yang, P., Li, C., & Chen, D. (2013), Fire emergency evacuation simulation based on integrated fire-evacuation model with discrete design method, *Advances in Engineering Software*, 65, 101-111.
- [11] Spinardi, G. (2016), Fire safety regulation: Prescription, performance, and professionalism, *Fire Safety Journal*, 80.
- [12] The Secretariat of the Central Committee of the Party (2015), the Instruction No. 47-CT / TW dated 25/6/2015 on enhancing the Party leadership on fire prevention and fighting.
- [13] Murray, A. T. (2013), Optimizing the spatial location of urban fire stations, *Fire Safety Journal*, 62, 64-71.
- [14] Park, H., Meacham, B. J., Dembsey, N. A., & Goulthorpe, M. (2013), Conceptual Model Development for Holistic Building Fire Safety Performance Analysis, *Fire Technology*, 51(1).
- [15] Peih, Ooi; Othuman, M. A. (2012), An Assessment of Building Security System and Active Fire Protection System in Administrative Building. *Acta Technica Corvinieusis*, 4 (Okt-Des), 47-50.