BUILDING HEIGHT REGULATION PREPARATION PRACTICES IN ADDIS ABABA: GAPS AND IMPLICATIONS

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ABSTRACT

Contrary to its long urban history, Ethiopia has a very short history of urban planning by local professionals and large-scale implementation of plans. As a result, gaps are expected not only in implementation of plans but also in preparation of planning components such as building height regulations. Studies aimed at identifying these gaps and their implications, not only for the study city but also for regional urban centers have, however, been quite scarce. By studying four cases of building height regulation preparation processes for Addis Ababa during the past 22 years, this study is aimed at contributing to filling these gaps. Its findings indicate that there were significant gaps in both the analytic and participatory components of building height regulation preparation processes in the city. The former gap, in particular, had implications for all the major elements of the building height control: its thematic scope, spatial scope, control status, the roles of related building regulations and urban design, and for the development and protection of the green elements of the city which may play vital infrastructure roles. The study recommends basing building height regulation studies on strong analytical or conceptual framework and using not only technical but also political or participatory processes, generally, and revisiting the current building height regulation of Addis Ababa in the light of the general recommendations specifically.

Keywords: *Building Height, Planning Components, Thematic Scope, Spatial Scope, Control Status, Addis Ababa*

INTRODUCTION

Public control of building height- the 'vertical dimension of buildings expressed in terms of either the number of stories or vertical measurement from plinth'- is part of public control of urban development whose major objective is to make the manner of use of urban land consistent with certain goals. These goals were historically focused mainly on the interests of 'historical actors' such as the state, the military and the church. In modern societies public concern is expected to be with public or the common interest, which originally started with health and safety, but gradually came to include, though controversially, goals such as convenience, economy, amenity, and equity [1][2]. One of the major factors that influences effectiveness of the control is adequacy of the control document which, in turn, is influenced by document preparation and evaluation experience. These experiences are quite short in Addis Ababa and other Ethiopian urban centers since their history of urban planning and, especially, plan implementation is quite short. Therefore, gaps in the building height control study processes and outputs are expected. These gaps and measures to fill them are the foci of this study.

Objectives and Scope

The main objectives of the research is therefore: to identify and reduce gaps of building height regulation preparation processes in Addis Ababa and contribute to improvement of effectiveness of building height regulations in the city and other Ethiopian urban centers.

Although the factors that influence building height are many, the ways in which the influences are realized are mainly two: direct or uncontrolled influence, in an unplanned urban development context, and mediated through building height control in a planned urban development context. The scope of this research is limited to the latter: it does not include study of the whole range of factors that influence building height and their influences realized outside building height control system.

METHODOLOGY

The study was conducted mainly by using a case study approach. A total of four cases including a first regulation in 1996, two revisions following urban plan revisions in 2002 and 2015 and an intermediate revision made in 2010 by a university: the Ethiopian institute of Architecture, Building Construction and City Development (EiABC) were studied. The main methods of data collection were interviews, document analysis, and participant observation in the case of the latter revision.

Conceptual Framework

The term building height regulation suggests building height control having approval by a legislative body or having a statutory status. Statutory status, however, is not a mandatory status of building height controls since administrative status is also common in many countries. In studies for both cases two major gaps are commonly of wide ranging consequences: gaps in the output, specially, in the control objectives and gaps in control study processes. This section will discuss these gaps and attempt to indicate their implications with particular emphasis on development and protection of the urban green infrastructure.

Building Height Control Objectives: The Thematic Scope

If building height control is only one of an array of controls needed to safeguard the public interest in urban development which are indicated to include health, safety, efficiency, convenience, amenity, and equity it means it can protect only some of the interests while the remaining must be protected by other controls. These interests appear to include mainly safety, amenity, and equity. Health goal protection requires mainly prevention of unsanitary conditions, air and water pollution, poor ventilation, lack of sunlight in buildings, and crowding. These are requirements which need mainly control of land use type, building lot coverage (BAR), distance between buildings (setback), and floor area ratio (FAR) rather than building height. The situation is similar for Efficiency and convenience goals. Efficiency or economy is concerned with the intensity of use of resources such as land, public works (infrastructure) and public funds [1] [3]. In the context of urban planning it is concerned with maximizing the number of persons served by the resource and minimizing per capita cost of the service through appropriate land use location and intensity. On the other hand, convenience is concerned with the 'ease of moving people and goods from one destination to another and it is measured in terms of walking distance and transportation time'.

It is partly a product of the 'locational arrangement of land use and the relationship that each functional use area bears to every other one and partly on the intensity of land use' [1]. Low land use intensity may increase city size and lead to long walking distance and transportation time and less convenience. Excessive intensity may lead to congestion and long transportation time and less convenience. Both goals require land use intensity control which require FAR, BAR and setback controls rather than building height control. Building height control does not necessarily insure land use intensity since buildings with different heights may have similar floor area or vice versa. In contrast, safety goal protection has, historically, been requiring building height control in many respects. For example, for centuries, fire safety goal has been requiring limiting height of buildings to those that allowed manual and external firefighting and rescue operations. Structural safety goal has been requiring limiting building heights to the engineering performance of traditional materials and structural systems. These limitations have, however, diminished currently with the advent of 'internal firefighting and suppression mechanisms such as firefighting lifts, stairs and lobbies, dry and wet water mains and automatic fire extinguishers such as sprinklers 'and with the development of steel and reinforced concrete and more advanced structural engineering [4]. Currently flight safety goal is the major safety goal that requires building height control in many countries. This goal is discussed briefly below.

Flight Safety

Flight safety goal implementation requires preventing interference of physical elements with takeoff and landing heights of airplanes. The goal, therefore, applies only to cities having airports and to urban areas within airplane landing and takeoff zones. Takeoff and landing heights of airplanes in these zones are protected by taking these heights as surfaces called flight 'obstruction limitation surfaces.' For large airports these surfaces are commonly of seven types and include: 'approach' and 'takeoff climb' surfaces, which fun out of both ends of the runway and 'conical', 'inner horizontal', 'inner approach' and 'inner transitional', and 'balked landing', surfaces located above the areas on both sides of and around the runway. The surfaces have slopes, heights above the runway, and required distances from it which are determined by air navigation control authorities. Height controls are used in order to protect these surfaces from penetration not only by buildings but also by trees, construction cranes, antennas, etc. [5].

Amenity

Amenity goal is concerned with creating, enhancing and preserving the visual and experiential qualities of urban areas that provide inhabitants with positive feelings and experiences such as comfort, enjoyment, visual delight, identity and pride [1]. Building form is one of the factors that influence these qualities and height is one of the elements of building form which include material, scale, proportion, and shape and its control becomes important in order to implement the goal. Others include 'distinctive locations and vistas, or foci and axes, natural features special building groupings with symbolic significance and so on', skyline, the enclosure they provide to public spaces, historical and cultural landscapes and landscape elements such as green infrastructure, land form, water, and views from public places [1]. These, basically, include everything that form the public realm which is the subject matter of urban design. One of the major elements of this realm is building, making building height control once more essential for implementation of this goal. For example, a building's height can disrupt the experience and quality of a historical or cultural landscape and a pleasant natural or manmade view.

Building Height Regulation and Urban Green Infrastructure

Beginning from the 1970s, urban green supply approach has been shifting to green infrastructure development approach [6]. The rationale for the shift was the recognition that the role of green space was not limited to the traditional objective of amenity but included playing infrastructure role and supporting environmental sustainability, which is one of the three pillars of sustainable development and which is concerned with keeping the demand of development for resources such as water, energy, soil, etc. and its rate of waste generation within the supply capacity of the planet and its waste absorption capacity respectively [6].

While traditional urban planning relied on engineered infrastructure or 'grey infrastructure', a 'network of channels, pipes and ditches which are highly costly, energy consuming, and environment polluting' 'green infrastructure' which is a network of 'local and broader landscape-scale' natural and manmade elements are being increasingly used to provide a wide range of services. At local level this network includes parks, public green space, allotments, private gardens, trees, urban forests, green roofs and walls, rainwater harvesting systems, and permeable pavements. At the broader scale, it includes natural landscapes such as forests, flood plains and wetlands [7].

The various services supplied by harnessing these elements include :'storm water management and flood control, water supply, absorbing and sequestering atmospheric carbon dioxide, filtering air and water pollutants, stabilizing soil to prevent or reduce erosion, providing wildlife habitat, decreasing solar heat gain, and reducing energy usage through passive heating and cooling' [7]. In particular, green space can make storm water management possible through hydrological process whereby water can move downward reduce flooding and the cost of grey infrastructure, on the one hand, and enter an aquifer, regenerate the ground water and increase the water supply on the other [7].

The private garden component of green infrastructure is one of the larger contributors to green infrastructure in many cities. For example according to Mathieu et al. and Loram et al. cited in Cameron et al. [8], their contributions amount to as high as 47% in countries like the UK and even 50% in cities like Dunedin, New Zealand. However, this component is strongly influenced by building height control and related controls.

For example a minimum FAR of 1:5 and a maximum building height of 5 floors leads to 100% BAR and no supply of open space for green and no contribution of the plot to green infrastructure development. In this example, FAR can be reduced to save space for green; but, still, the space can be saved if building height remains constant or is increased. In both cases one of the factors responsible is building height. In addition building height control can affect even the amenity aspect of green infrastructure. Quantitatively, it can influence the area of green infrastructure elements for buildings located in parks and urban forests by influencing BAR, if the latter is not controlled.

Qualitatively the height of buildings can influence the visual appearance of green elements of a city and affect their contribution to visual quality of the city.
BAR control, which is considered as part of building height control in Ethiopia, has more direct influence on open space supply and on potential supply of green space. If there is BAR control there can be open space supply as a matter of public interest. If there is not, there can be supply only as a function of private interest. Moreover, open space supply does not automatically translate into green supply; it must be supported with use control or incentive.

Social equity

Social equity is generally defined as the redistributive goal of planning which aims at correcting the tendency of markets to distribute their resources unevenly between rich and poor [3] [9] . One of the resources that may be distributed unevenly by the market is urban land. For example, in many cities the land market has been soaring the value of inner city land, which has traditionally been place of habitation and livelihood for low income populations, and exposing them to displacement.

One of the ways in which land value causes this problem is by limiting economic feasibility of property development to high rise and high-tech buildings. High rise buildings often require heavy structures and advanced construction systems which are unaffordable to weaker economic groups. High land value also has the implication of raising FAR, concentrating development in few locations, and leading to its uneven distribution among urban areas and among land owners of a city [4]. Therefore, implementation of the equity goal requires instruments such as building height and FAR regulations.

Building Height Control Study Approaches

If building height control is one of the elements of urban planning its study approaches are likely to be similar to general urban planning approaches. Urban planning is, basically, a process by which decisions are made on the future state of a settlement. The decision making process is likely to require, on the one hand, technical knowledge and analysis because settlements are man-made physical structures and, on the other, political processes because the structures are made for people who are likely to have conflicting interests.

Modern urban planning, however, arose as a mainly technical process. The methodology of Architecture, the professional base in which it had developed during the mid-19th century when increase in urban population and economic activities began to lead to large-scale problems of health and order and when deciding the state of settlements in advance began to become very important, was dominated by the design methods of creativity, intuition and synthesis which were all professional [10]. Analysis itself became part of the method mainly when following the industrial revolution, unplanned and intuitively planned cities have failed to accommodate rapidly increasing populations and economic activities and when these approaches were criticized for being inefficient, unscientific and fragmented. Response to these criticisms first led to procedural changes such as the Gedesian 'survey-analysis and plan' and eventually to the development of the comprehensive rational planning model and the birth of urban planning as a separate profession.

The model later evolved into what came to be known as the 'synoptic' model in the 1960s and 70s by also embracing the systems framework which was the ruling paradigm in many fields during that period. The framework was highly technical: it required viewing the city as a whole, consisting of mutually interconnected parts, and analyzing these interconnections by using standardized procedures and models which were largely mathematical [10]. Urban planning began to incorporate political processes when beginning from the 1950s the comprehensive rational planning approach was exposed to criticisms such as viewing the problem of planning as procedural, focusing on the conflict between the public and private interests only, and ignoring the diversity of interests.

It was argued that there were diverse interests, some of the interests viewed as public were group interests, urban development is fraught with competition and conflict among these interests, the weaker of these interest groups needed support, and that intervention in this situation needed not only analysis but also 'participatory planning', 'advocacy' 'mediation' and 'conflict management.' These led to the development of approaches such as Advocacy Planning, Trans active Planning, Communicative and Collaborative Planning [10]. An important common aspect of these approaches is public participation in decisions concerning the future state of settlements. However, traditional participation models were based on face-to-face contact and required investment of money (for transport for example) and time on the part of the participants.

Studies show that while people are willing to make these investments when they have immediate stake in the decisions, they are less interested when they have not. That means stake-driven types of participations or stakeholder participations appear to be more effective and sustainable than general public or citizen participation types, especially, if the latter require face-to-face contact. Arnstein's seminal study [11] has also indicated that most of 'citizen participation' which were dominated by 'manipulation', 'therapy', 'informing', 'consultation', and 'placation' are largely 'non-participation' and 'tokenism' while real participation types which included 'partnership', 'delegated power', and 'citizen control' were quite rare a situation that has implications for public motivation for participation. Nonetheless, efforts are being made to make the citizen participation types less costly and more sustainable by introducing "online public participation" which uses software, websites and even social media such as face book and twitter [12].

Analytical Framework

The literature review has provided four major aspects of building height control namely its objective, its document preparation process, its spatial scope, and its status as a general data analysis framework. The framework's specific elements, its linkage to building height control, the linkage of the latter to related building regulations, to factors influencing building height and ultimately to building height itself are provided diagrammatically below: (Fig 1).

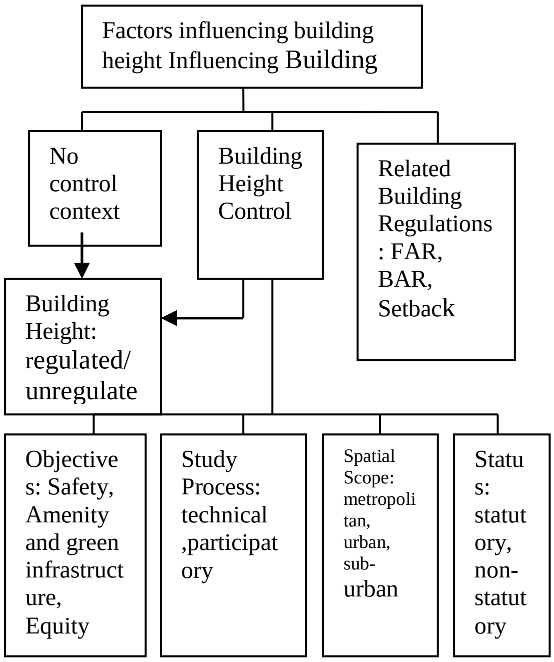

Fig.1 Analytical Framework

Case Studies

Introduction

The history of urban planning in Ethiopia is significantly different. The practice of deciding the future state of settlements in advance was a very recent phenomenon. Modern urban planning was introduced during the Italian occupation of the country, from 1936-41, not in the context of rapid industrialization. Therefore, it was dominated by the expatriate technical approach, during the occupation, an approach which continued even after liberation due to absence of local professionals. Local professionals, largely architects, began to involve in city planning beginning from the 1985 plan for Addis Ababa, but they did not begin to take lead position until the 2002 plan and full control until the 2015 plan for the city. Ethiopia's post-liberation history of large-scale urban plan implementation is even shorter: it is limited to the post-1991 period. Prior to that, there were constraints on basic requisites of plan implementation such as public investment capacity, private investment, and public regulation capacity of the latter. The post-liberation pre- 1974 period lacked the first and third requisites.

The communist era of 1974-1991 lacked all perhaps except the regulation capacity. It was only the market transition period of post-1991 which is associated with a more complete emergence of all the requisites. Accordingly, Addis Ababa got its first building height regulation only in 1996. Since then there were a total of four revisions of the regulation, two following revision of the city plan itself and two other intermediate ones. This section will present data on the regulations selected for this study first and their analysis next.

Table 1: The 1996 Building Height Regulation [13]

Location	Proposed building height
Meskel Sq. to Gotera (Debrezeitrd,)	G+7-G+10
Meskel Sq. via Olympia to Bole airport	G+7-G+10; G+5-G+8
Mexico Sq. to Building College via end of bus route No.3 to Ayer Tena	G+7-G+10
Menelik Sq. to AddisouGebeya (Belay Zeleke Rd.)	G+7-G+10; G+5-G+8; G+4-G+6
AbunePetros Sq. to General Wingate school	G+5-G+8; G+4-G+6; G+2-G+4
Meskel Sq. via Ourael to Megenagna	G+7-G+10; G+5-G+8; G+4-G+6
Megenagna to CMC	Not available
Megenagna to Kotebe (Dessie Rd.)	Not available
AratKillo via SidistKillo	G+10 and above; G+7-G+10; G+5-G+8
AratKillo via British Embassy to Sholla	G+5-G+8; G+4-G+6
Theodros Sq. via Somale Terra via Teklehaimanot Sq. to Merkato	G+10 and above; G+7-G+10
Meskel Sq. via Hilton to Menelik Palace via Theodros Sq. Churchil Rd. via Mexico sq. to LeGare and back to Meskel Sq. (areas within the CBD)	G+10 and above; G+7-G+10; G+5-G+8; G+3-G+5

Table 2: The 2002 Revision [13]

Urban Area		Building Height (stories)	
		Minimum	Maximum
Main city center area	Main roads, sub arterial roads: 20m and above	G+4	As per LDP
	Cherkos area (20m deep on both sides of major roads)	As per LDP	As per LDP
	All other areas	As per LDP	As per LDP
City sub-center	Main road and sub-arterial roads: above 20m	G+3	As per LDP
	All other areas	As per LDP	As per LDP
Plots facin	Bole road	G+4	G+10
	Other areas	G+4	G+7
Junction points on major arterial roads		G+4	As per LDP
Plots facing southern ring road		G+2	G+7
Flight zone	Zone 1		Runway elevation +45m minus lot elevation
	Zone 2		Runway elevation +135m minus lot elevation
All other areas		G+0	G+4
	street width below 20m		1.5 x street width

Table 3: The 2010 Revision [14]

Areas of the City	Building height (stories)	FAR (max)	BAR and Setback
Main city center (inner zone)	34-55	1:7	Minimum BAR for all areas --- 80% Front Setback: 0 for building height = street width60 degree (1.73:1) for height above street width in
Main city center (intermedi ate ring)	21-34	1:5-1:7	
Main city center (outer	13-21	1:4	

ring), sub-center (Megenagna), tertiary centers (BisrateGebriel and Gotera)			34-55 height zone and 1.5:1 in others Rear Setback = Height of the building /2 (which is tan 63.5 degree) Side Setbacks with lateral openings X=(HB/8)-SW/2 where x is setback; HB = height of the building and SW= right of way width
Sub-centers (Ayer Tena, Kality), Tertiary center (Meriluke)	8-13	1:4	
Tertiary centers (Saris, Kotari, Betel, Tor Hailoch and Wingate)	5-8	1:4	
Merkato, Piaza area, Nodes, development corridors, the old city core, The buffer zone around the "old Menelik palace", transition zone, the rest of the city and the ring road	0-5	1:4	

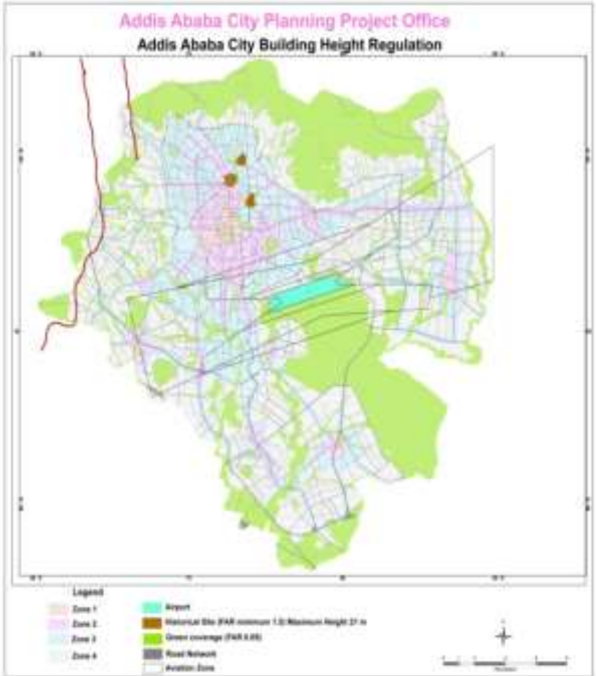

Fig 2: The ‘Final’ 2015 Building Height Regulation Map

Table 4: The 2015 Revisions (Version 001) [15]

Zone	Building Height	FAR
I	Minimum G+19 or 70m and free upper limit	Minimum 10 [1:10] and free upper limit
II	Maximum G+19 or 70m	5-10
III	Maximum G+9 or 35m	1.5-7
IV	Maximum G+5 or 21m	0.5-3.0

Table 5: The Final 2015 Building Height Regulation [16]

Regulation [16] Zone	Floor Area Ratio (FAR)		Remark	Building Height (meters)	
	Minimum	Maximum		Minimum	Maximum
I	1:10	Unlimited	Main city center	70	unlimited
II	1:5	Unlimited	Collector street and above		70
	5	5	Local street		35
III	2	Unlimited	Collector street and above		35
	2	5	Local street		35
IV	0.5	Unlimited	Collector street and above		35
	0.5	3.5	Local street		35
Historical areas	0.5				21
Green areas		0.05			6

Analysis

The above data and others which could not be conveniently presented in the tables were analyzed below by using the framework developed in the literature review namely: the regulation preparation and review approaches, major elements of building height control studies including thematic scope, spatial scope, control document status, and implications for development and protection of the green infrastructure of the city.

Regulation Preparation and Review Approaches

Evolution of regulation preparation and review approaches in Addis Ababa generally appear to conform to the intuitive - analytic - participatory sequence. The 1996 regulation preparation process appears to be dominated by the intuitive approach: public participation was absent perhaps due to the legacy of the communist era while evidence of any literature review and significant scale data collection and analysis were not found. In the 2002 revision, there was significant rise in the analytic approach while there was even sharper rise in participation. The revision was based on a well-documented literature review and a good deal of data collection. The literature review, however, was not successful in accurately identifying the specific objectives of building height control, the importance of related building regulations (as there was no mention of FAR, BAR and setback), and that of urban design for definition of building heights.

On the other hand, the revision was made in a process considered by many, including the participants themselves, as the most participatory in the history of the planning of the city [17]. The participation, however, was not mainly of the ‘citizen participation’ type. It was rather largely of the stakeholder participation type driven, partly, by threats of loss of stakes as a result of replacement of the communal style 'free' supply of land with the private ownership style 'market' supply and, partly, by the prevailing building height regulation especially in major parts of the city exposed to urban renewal such as Merkato, the central market district.

The more documented case of Merkato indicates that the participatory process was quite effective: participants were organized, their involvement was quite intensive (bi-weekly meetings for two years was reported), and the impact on the building height regulation was dramatic: building heights were reduced from as high as G+9 to as low as G+2 in the center of the market district [17]. The stakeholder participations had also contributed to the rise of various citizen participation type initiatives through which the traditional master plan approach was transformed into the structure plan and local development planning approaches and through which, for the first and only time, building height regulation preparation power was devolved to local levels (Table 2). In the 2010 regulation study, while there was a sharp rise in the analytic approach there was a sharp fall in the participatory approach. Preparation of the regulation by a university had led to a research type study characterized by deep literature review and analysis of large volume of data. The literature review was successful in identifying the specific objectives of building height control and the importance of related building regulations (FAR, BAR and setback) but, like the 2002 review, the theoretical analysis was not successful in underlining the importance of urban design for determining building height. There were no bottom-up initiated stakeholder participations during this revision and, although the university had initiated various citizen participation sessions, partly due to its contractual obligations, there was no active public involvement apart from participation through supply of data and attending study and proposal presentation meetings by few stakeholders.

Finally, in the 2015 revision, while there was further decline in participation there was also sharp decline in the analytic approach. Similar to the 2010 revision, there were no significant bottom-up initiated stakeholder participations at this period and, partly because of absence of contractual obligations since the revision was done mainly in-house by the city planning office itself, there were, virtually, no citizen participations. Moreover, the revision did not involve significant data collection and analysis and significant literature review. Consequently, the specific objectives of building height control were not identified accurately and related building regulations were addressed only partly (only FAR control was suggested). The need for balancing of goals was not well appreciated as the unlimited FAR and building height for the city center suggest. Even the cause-effect relationship between urban design and building heights was understood in a reversed order as acceptance of a recommendation by a city center urban design report to determine building height for the city center rather by the city-wide building height regulation preparation process indicates [18].

Thematic Scope

The 1996 regulation and all the revision studies had efficiency and flight safety as their main thematic scopes except the 2010 revision study whose focus was on flight safety, amenity, and equity. In the 1996 study the main objective was stated as to 'facilitate private investment in land and property development and insure efficient use of land and infrastructure' and aviation safety in relevant parts of the city and in the 2002 study as to maximize government revenue generation, and to facilitate private investment and the enhancement of the construction industry [13]. In the 2015 study out of the four objectives of the building height control study, three were focused on the efficiency or economy goal [19] which is actually the goal of FAR control. Even the 2010 study was not entirely free of this confusion:it includes concepts such as 'Economic Height' and 'Infrastructure Height' which should have been best termed commercial and infrastructure- feasible floor areas [14].

Amenity, however, was not omitted entirely. It was either marginalized or dealt with intuitively. In the 2015 study it was indicated generally in terms of creating 'good city image, streetscape and branding' and defining 'streetscapes with increased building height along corridors and reduction further away' [18]. It does not include protection, preservation and enhancement of traditional and historical areas and it is not clear how constant definition of streetscapes and reduction can be achieved in the context of varying heights of existing buildings and topography. The 2010 study was not free of this challenge too. The amenity goal was not limited to protection of existing amenity elements such as nature and heritage and historical districts. It also included creation of an aesthetic city-wide skyline by regulating the rising and falling pattern of building heights that emerges from the structure of land value and the city's polycentric future land use pattern by the Golden Mean Ratio (GMR): a ratio based on the number series 1,1,2,3,5,8,13,21,34,55... in which the third number is always the sum of the previous two [14]. The method assumed citywide public perception of urban form and a flat, open space, and existing structures free landscape. In addition, while the GMR is conceptually based on numbers, the building height control study was based on ranges and number of stories which, when converted to numbers, were inconsistent with the ratio.

There is no indication whether equity was the objective of the 1996 and 2002 studies. In the 2015 study allowing investment based on capacity was mentioned while specific preservation of access of low-income groups to inner city residential and socio-economic activity areas was excluded and 'clearing deteriorated areas' was proposed. In the 2010 study the five story recommendation for the historical and cultural parts of the city had also taken into account implementation of the objective of equity since at the time there was a wide practice of building houses for low-income groups by government by using up to five story 'cost efficient' condominium buildings and since those were one of the areas where housing and socio-economic activities of low-income groups were concentrated. In other areas of less historical and cultural significance but having similar functions, the five story recommendation was used as a minimum to open the possibility of redeveloping the areas for low-income groups without closing the possibility of accommodating other types of uses.

Spatial Scope

In Addis Ababa, the spatial scope of building height regulations has been evolving from the scale of a partial city (sub-urban) to a metropolitan scale. The 1994 regulation had a partial city spatial scope: it was limited to the high land value central areas of the city and its major transport routes and, of course, the east-west flight zone located south of the city [13]. Areas of equity and amenity concerns were largely located within the former scope but they were not treated differently. This scale was expanded to urban in the 2002 and 2010 reviews and to even metropolitan in the first version of the 2015 review which included the special zones of Oromia, an autonomous regional state surrounding Addis Ababa. The scope was later reduced to urban scale following deadly protests triggered by perception of the metropolitan scale of the plan as expansion of Addis Ababa into the autonomous region. The approach, thus, eventually became controlling building height everywhere not because flight safety, equity and defined public realm quality were concerns everywhere, but mainly because inadequate analysis had replaced these thematic scopes by efficiency which is actually the thematic scope of FAR control.

Control Document Status

All the four building height control documents are known as regulations but none appear to have passed through a standard statutory process and adopted by the city's legislative body. Therefore, they were all administrative documents with a statutory brand. However, given that the objectives of the control were inaccurate, the administrative status has been an advantage: its relative flexibility has been allowing the control implementers and even the regulation preparation consultants, as in the case of the 2010 study, to make changes when the inaccuracies of objectives posed problems of implementation on the ground. The 2015 final study has not sought to solve the long standing problem of inaccurate objectives by strengthening its analytic component. At the time of data collection for this study it was rather seeking obtaining the less flexible statutory status: its study report includes a section prepared in a statutory document format which is awaiting approval by the city council of Addis Ababa, together with the city plan [17]. If the status is granted, all changes are likely to require council approval and that is likely to make problems of implementation on the ground very difficult to solve.

Implications for Green Infrastructure Development and Protection

The 1994 building height regulation preparation did not include preparation of related building regulations such as FAR, Setback and BAR which are identified as those which actually have greater influence on the development and protection of urban green infrastructure by affecting lot based size of open spaces. In the 2002 review there was no shift in this regard although there was a major shift in approach from intuitive to analytic. Major shift in this regard came only in the 2010 review which included detail study of FAR, BAR, and Setback controls. But even then green infrastructure was never included in the objectives of these controls. Anyhow, this shift was largely reversed in the 2015 revision which maintained FAR control but reduced setback control and omitted BAR control altogether [16]. The rationale of the omission was the perception that 'the objective of BAR control was only to require private developers, improperly, to provide the city with open spaces while this responsibility actually concerned only the public sector.' This, however, does not appear a well-researched view. Internationally the public sector is not the only body responsible for open space supply in cities.

Findings, Conclusions, and Recommendations

The discussion above indicates that building height control study processes in Addis Ababa were characterized by gaps in both the analytic and participatory components. It also indicates that these gaps had wide ranging implications for all the major elements of building height control namely: the thematic scope, spatial scope, control document status, for related regulations and green infrastructure affecting elements, and for the understanding of the role of urban design in building height regulation preparation process. These gaps and their implications are discussed briefly below:

The Analytic Gap and its General and Green Infrastructure Implications

Analytic gaps were one of the major problems of building height regulation preparation practices in Addis Ababa. These gaps were mainly concerned with absence, lack of rigor, and incompleteness of literature reviews which distorted even core elements of the studies such as their thematic scope. Distortion of this core element and, especially, replacement of the thematic scope of amenity and equity by efficiency had been, on the one hand, compromising achievement of these objectives and , on the other, leading to wide-ranging implications for the other elements of the study: it has been expanding the spatial scope of building height regulations beyond the spatial relevance of their thematic scope; it has been treating amenity as a marginal issue and has been leading to definition of building height without urban design process, and it has been leading to omission and partial addressing of related regulations and as a result impacting on issues such as development and protection of green infrastructure of the city. These indicate that there is an urgent need of efforts to fill the analytic gap. This study is mainly aimed at contributing to that effort. It can be used to assist efforts to strengthen the analytic component of building height control studies not only in Addis Ababa but also in regional cities and towns of Ethiopia.

The Public Participation Gap

The literature indicate that urban planning has gradually evolved into both a technical (analytic) and participatory (political) processes. However, although there has been sharp rise in participation in planning in Addis Ababa from 1996-2002, there has been sharp decline since then. The brief rise itself was not in the form of public (citizen) participation but, largely, in the form of the immediate stake-driven stakeholder participation. That suggests there is a wide gap in the more sustainable former type of participations. As indicated in the literature review, the citizens side problem of citizen participation is not unique to Addis Ababa. What may be unique, though, is that while other countries are viewing the problem as partly caused by the time and transportation cost of the traditional face-to-face participation and exploring the potentials of online participation, these kinds of efforts have been quite rare in the city.

RECOMMENDATIONS

The gaps revealed by the study of the building height regulation preparation practice in Addis Ababa suggest the need for two general measures in order to improve the practice in the city and other Ethiopian urban centers:

Building height regulation preparation processes shall be preceded by a study of a conceptual or analytical framework, such as that constructed in this study, or shall critically develop and use the latter; and

Building height control study processes shall include not only technical processes, dominated by professionals and bureaucrats, but also political processes involving public participation. Specific measures needed, in the light of the above general recommendations, in order to improve the current building height regulation of Addis Ababa are:

Revisiting the height regulation of the city to fill its conceptual framework gap by critically developing the framework constructed by this study or by constructing a new one and Filling its public participation gap by introducing online participation as a supplement to face-to-face participation.

The study also indicates that failing to implement the above specific recommendations will have the following implications:

Building height in many parts of the city will continue to be regulated without objective, wasting public resources; The related regulation of FAR, which is unlimited in many areas of the city contrary to the limited nature of infrastructure in those areas, is likely to lead to overload of the infrastructure and its eventual collapse or ad hoc expansion of the infrastructure outside the study; andThe absence of the concept of private contribution to the green infrastructure development and the resulting exclusion of the related regulation of BAR from the regulation will waste the opportunities of private plots for contributing to the green infrastructure and achievement of the environmental sustainability objective in addition to amenity.

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