

Democratic Transition of Architectural Language in Egypt after Revolution

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Abstract:

Urban in Egypt has suffered from the distortions resulting from irregularities of laws, which greatly increased significantly after 25th Jan. revolution in Egypt. Research focus on one of the main reasons for this problem, is using the only existing community discourse, which pursue punishment strategy for offenders.

Research touch on some of these violations such as: building on agricultural, government land, aggression on private or public urban spaces, breaches of Egyptian construction law terms, and local code norms.

It proposes another additional policy "language" depend on conviction and enlightenment of benefits and objectives of these architectural constrains. Through many approaches, such as: aesthetical, logical, quantitative and environmental approach.

Research applies these approaches through comparative methodology on case study to explain how we can convince peoples with many of architectural decisions avoiding the hard way. It proposes some tools to activate this strategy between architects, country belonging authorities and community.

Keywords: Architectural Language, Architectural Policy, Architectural Strategy, Democratic Architecture.

1. INTRODUCTION

"You must see just what I see" It is an ancient pharaoh rule consisted for a long past time in Egypt the main policy "language" of sequential governments to manage and organize the architectural process on building, urban and planning scales. This policy depends mainly on punishment strategy against architectural law violators, to push citizens to submit the official vision of architecture. But the great increase of architectural legislation breaches which, occurred on the absence of country executive power on 25th Jan. revolution in Egypt, demonstrate clearly the fiasco of using this policy alone.

Therefore, these violations must be reduced to prevent destruction of local urban environment, before it becomes a reality may be difficult to change for many coming years. It also cost the treasury a lot of money to overcome the consequences of these violations, such as: cost of upgrading the infrastructure networks (sanitary, water supply, electricity, telephones and roads) to meet the needs of these unlicensed facilities; cost of raw materials wasted in construction; cost to remove these violations.

I do not pretend that, these irregularities emerged after the revolution, but its percentage increased significantly after it, which necessitated revision of the political discourse of society.

The research aims to present a solution for this problem depending on a new parallel democratic architectural policy “language” adopted the principle of persuasion and awareness of the harmful effects of these irregularities on the individual and society, in line with the democratic transition, which formed after the revolution and it was impossible to adopt the language of deterrence and punishment alone as in the past. It uses multiple scientific approaches enabling the evaluation of the community itself and not by regulators.

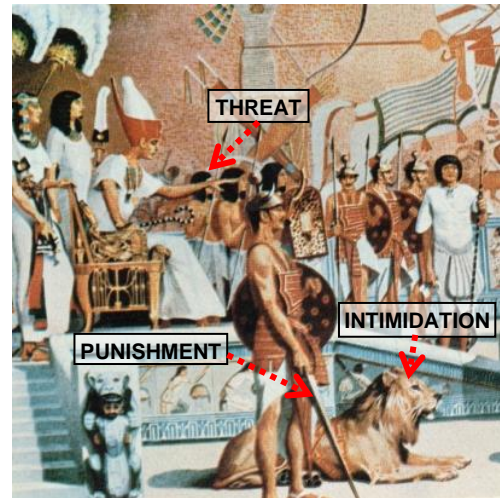


Fig. 1: Ancient Pharaoh Strategy (Ross, 2012)

2. BACKGROUND & METHODOLOGY

Many research presents and develop many urban strategies, polices and mechanisms to apply. Overall, they talked to decision-makers, actors, designers, planners etc. However, they didn't focus to address society, to simplify their language for it, convince others of what they offer to them. Some studies revise and develop laws and penalties for offenders. In fact, we prep research and develop strategies to address ourselves, while community has another trend.

2.1. Methodology

Research follows a comparative methodology to explain the deference between violation and the correct situation should be exist at one of the common breaches through proposed scientific approaches; aesthetical, logical, quantitative and environmental approach to achieve mentioned goal.

2.2. Historical Background

Paradoxically, one of the oldest democratic urbanism strategies found in ancient Egypt.

Many ask why the ancient Egyptians didnot build themselves a dam protects them from floodwaters such as Ma'rib dam at Sapa civilization in Yemen (built in 8th century BC - fall dawn in 575 AD), despite all those great architectural pylons? One of them, Al Hassan Ibn al-Haytham's mathematician and optics scientist (965 – 1040 AD), came from Iraq to Egypt for this reason but he retracted.

The answer to this question will interpret; how they preserve agriculture land over thousands of years and limiting urban sprawl on it. How they were able to provide workers to build more than half of the existing world's monuments?

I found three benefits for that:

- a) Flooding of agricultural land in the flood season makes it impossible to construct on it. So, they built houses at the top level away from the flood (fig. 2), this preserves arable land.
- b) In this period (between June and September) farmers stopped cultivation and transferred to build their giant buildings. So, there was no need to forced labour as some references have mentioned, (fig. 3→5)
- c) This flood enriches the agricultural land = more healthy foods for Egyptians without chemicals as the case now.

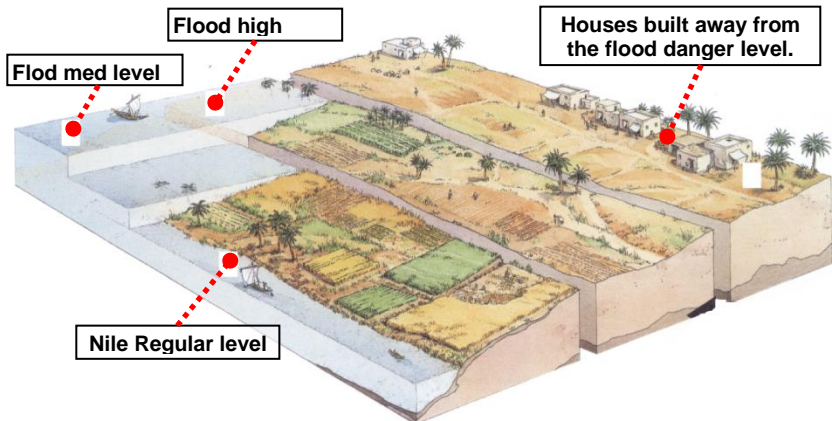


Fig. 2: houses built at the top level away from the flood range (Ross, 2012)

It should be noted that, the High Dam in Aswan (1970) saved Egyptians from many famines and floods, but the failure of the existing strategy to prevent construction on agricultural land has led to the erosion of agricultural land over the years. This enhances the importance of this research.

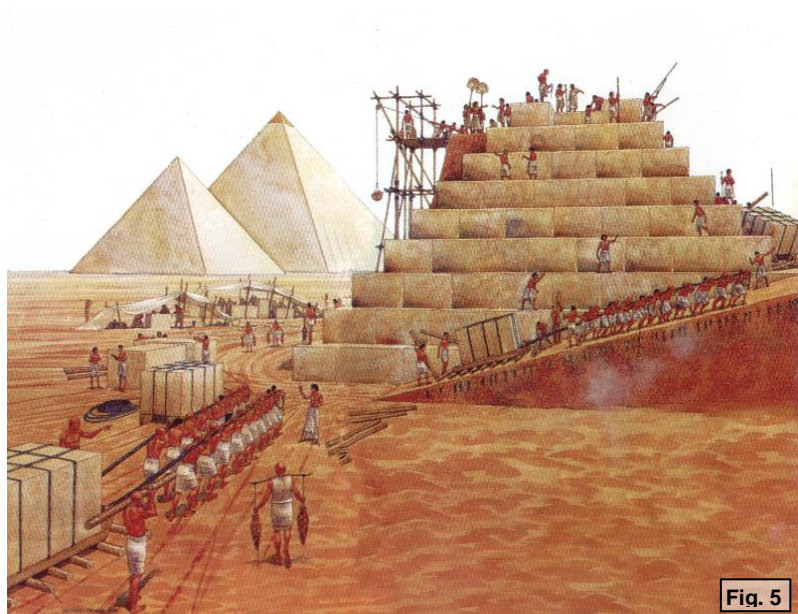
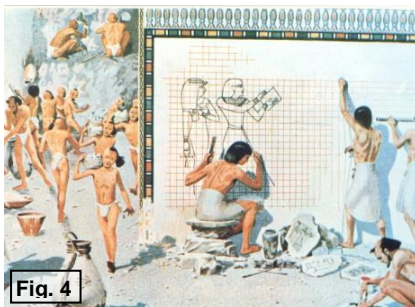


Fig. 3→5: Flood Season increase number of workers for construction (web network, 2013)

2.3. Existing Democratic Experience in Arch.

Recently, some countries such as G. Britain, Germany and Scandinavian countries use stimulus strategy towards environmental aspects, to encourage the community to use environmental solutions, which are usually more costly than using minimum standards of traditional legal solutions.

U.K. use tax exemptions to incite this polices, such as: climate change levy (CCL) tax exemption for activities, equipment and buildings that use renewable energy; minimize carbon tax, which is determined according to the amount of carbon in the fuel used to produce construction materials to push using of Eco-friendly raw materials (Ref. 10).

In Egypt: there are proposals to stimulate investors to build environmentally friendly buildings by giving them a grace period to pay the premium price of the project land, forcing them to use solar heaters; but it still under study.

3. ACCOMPANIMENT VIOLATIONS TO 25TH JAN. REVOLUTION:

This section monitors the most common urban irregularities in Egypt, which increased during and after the revolution, and mentions the main reasons for its spread.

3.1. Common Violations

3.1.1. Construction on agricultural or desert lands

The agricultural land on Nile banks considered a great national wealth inherited from our ancestors, but we did not stop bulldozing land and building on it. Increase of these infringements due to the projects that regulate the flow of river water and control its level. Such as: Isna, Qanater aqueducts, Aswan low Dam and High dam. So, the water no longer flooded agricultural land as before on flood season.

Total violations on agricultural land from 25th Jan. revolution to 23 July 2013 = 652,901 cases \approx 27,529 acre (Fig. 6→8), and on desert land \approx 400,000 case with total area \approx 1 million acre (Ref. 9, 13)

Despite the sanctions and laws that criminalize this action, but it still on the rise (Fig. 6).

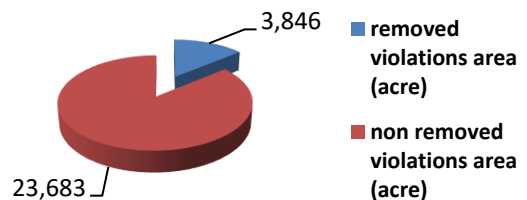


Fig. 6: Violation on agriculture land (Ministry of Agriculture, 2013)

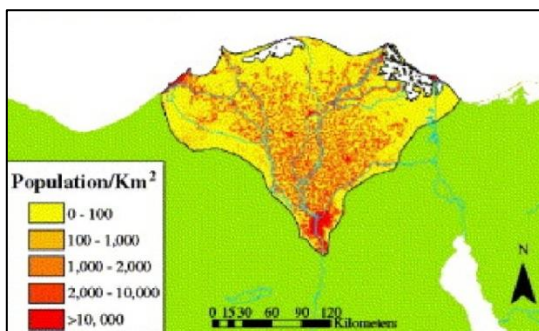


Fig. 7: Urban spread through Nile delta (web network, 2013)



Fig. 8: constructions on agriculture land (Al-Tawansy, 2013)

3.1.2. Aggression on urban spaces

Completely or partially aggression on private or public urban spaces such as: build an extension for ground floor at surrounded open area (Fig. 9); deduct area from public urban space for another unlicensed used (Fig. 10, 11).

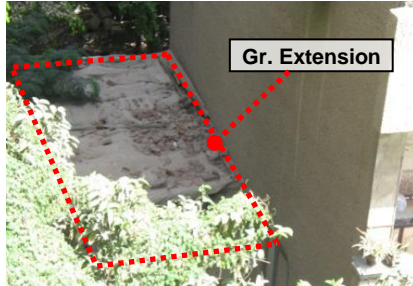


Fig. 9: Unlicensed extension at residential building (Al-Tawansy,2013)



Fig. 10: Aggression on public urban space at Gamaet Dowal St. (Al-Tawansy,2013)



Fig. 11: Gov. closed office used with surrounded public area by neighbour shops at Gamaet Dowal St. (Al-Tawansy,2013)

3.1.3. Building scale, violations

Commission one or more breaches of Egyptian construction law terms and local code norms, such as: building maximum heights, number of floors, limits, minimum area of open courts and its ratio, change of space or building use ignoring license adaptation, and new function requirements: security, safety rules, and use proper materials....etc. (Fig. 13→15)



Fig. 12: Building has two additional unlicensed floors (Al-Tawansy,2013)



Fig. 13: wrong design for window and elevation (Al-Tawansy,2013)



Fig. 14: St. lighting column cross building terrace (Al-Tawansy,2013)

3.2. Main reasons of these violations

- Unawareness or ignorance of these laws and rules.
- Lack of social awareness of the harmful effects of these irregularities on society and urban environment

- c) Weakness of the regulatory bodies and mechanisms
- d) Loss of the responsibility, because of multiplicity of supervising authorities
- e) There is no acceptable alternative in many cases. If the government offer lands, facilities and services for citizens, with an affordable cost, they will not violate.
- f) Administrative corruption, disregarding part of these irregularities.
- g) weakness and non-dissuasive of penalties
- h) Absence of deterrence power after revolution, which has the authority to remove irregularities.

3.3. Punishments “Penalties”

- These sanctions represent the existing basic strategy for dealing with mentioned violations (imprisonment, fines, stop work, not give license for building activity, demolition and removal ...etc.)
- Imprisonment and a fine not exceeding 2000LE or one of them for encroachment on agricultural land in conformity with article (372 bis) of the Agrarian Act No. 122 of 1980
- One year's imprisonment or a fine or one of them when trespassing on desert land in accordance with article 23 of Act No. 143 of 1981
- Imprisonment and/or a fine and write-off of varying union records in accordance with articles 98→110, 5th section, of the unified Egyptian construction law No. 119/2008
- The penalties stipulated in the disciplinary regulations of the Egyptian syndicate of engineers such as: notice, warning, stop enrolment in records...etc.
- Sanctions of “Egyptian federation of construction and building contractors” against contractors who have judicial sentences.

Despite the sanctions and laws that criminalize these actions, it is still on the rise, demonstrating the failure of this strategy alone.

4. APPROACHES TO APPLY THIS PROPOSED STRATEGY

These approaches are means to implement proposed democratic strategy based on comparative methodology between right and wrong conditions through some comparison criteria to help the architect to explain his point of view to the others.

4.1. Aesthetically approach.

Beauty touch or artistic sense is one of the most important criteria to evaluate architectural work. But it is relative; varies from one person to another, what you see beautiful may be not beautiful for me. Often, the offending situation is worse at all levels. However, there are some criteria can be logically invoked to evaluate the beauty of building. To help architects and clients as well

4.1.1. Achieve a logical aesthetic criterion:

It is non-measurable criteria, but it could be inferred logically. Such as stability and steady of pyramids shape, symbolism as Ron champ church form symbolize the nun bonnet, abstraction such as office building of Johnson wax company by “Frank Lloyd Write” abstract mushroom shape, expression, this mean building form and exteriors must reflect its function, such as Dubarah palace at San bolivar square in Cairo, which had been reused as a primary school, but elevations still only reflect the original activity. While must of the ugly violated constructions does not reflect building use (Fig. 15→22).

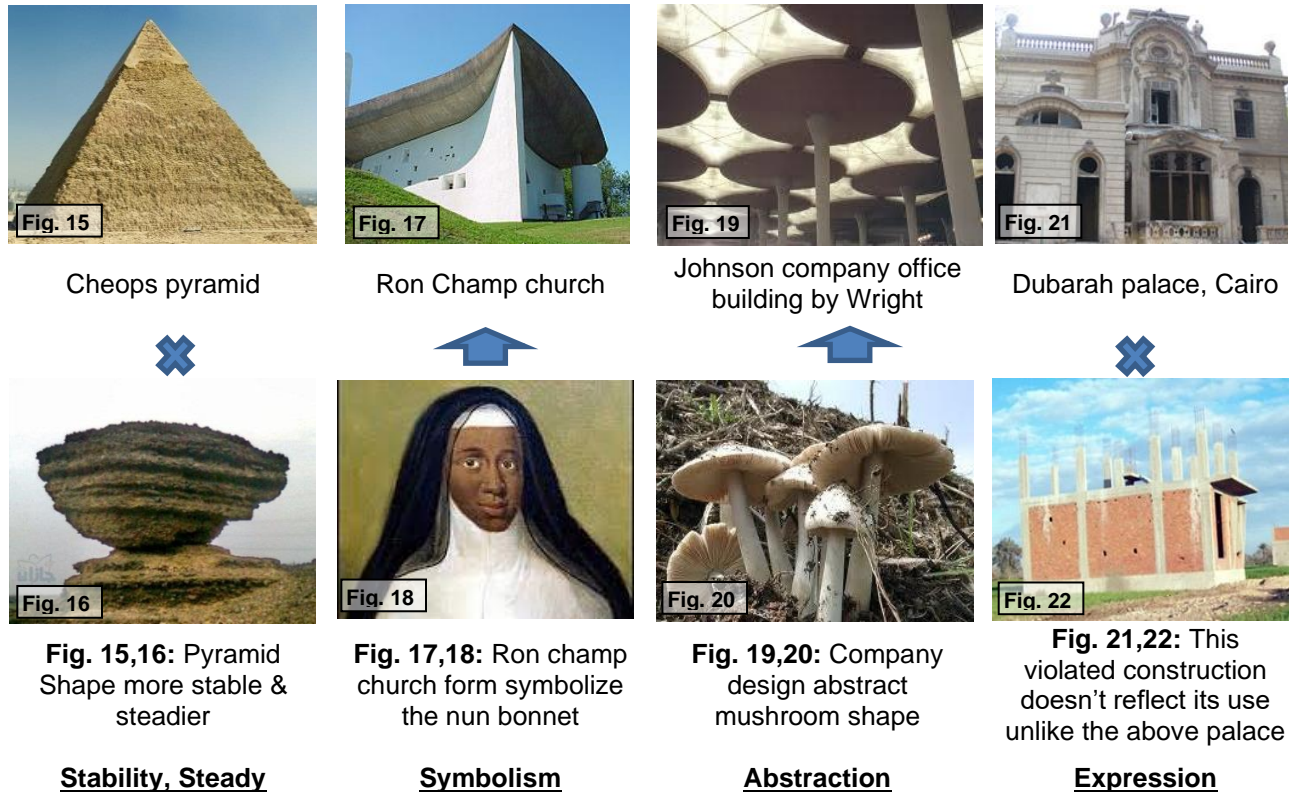


Fig. 15→22: logical aesthetic criteria (web network, 2013)

4.1.2. Use of regular geometric concepts or shapes

Symmetry, harmony, contrast, repetitive, unity, suitable proportions, scale and use regular geometric shapes all of these criteria contribute to make building design more beautiful. These criteria are tangible or measurable. It usually is missing in illegal constructions (Fig. 23→25).

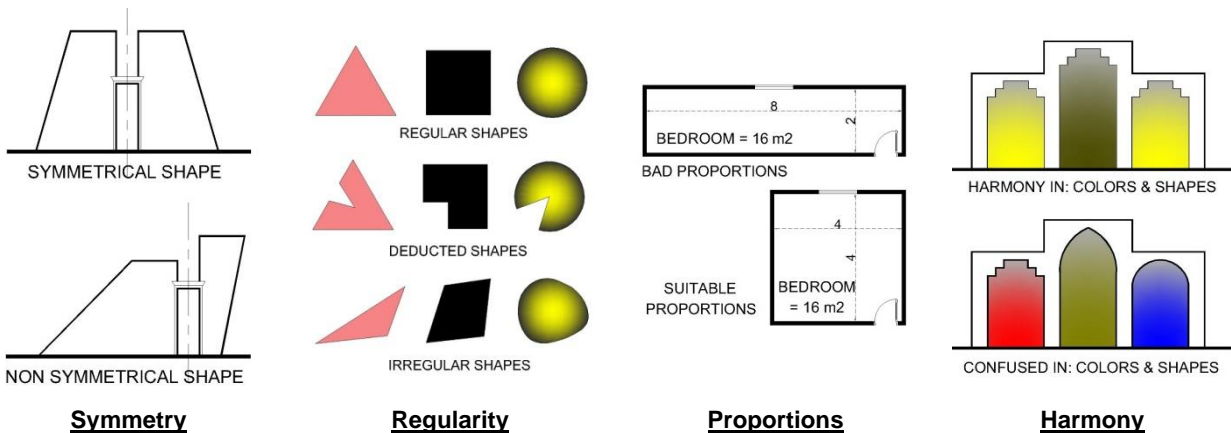


Fig. 23: regular geometric concepts and shapes (Al-Tawansy, 2013)

4.1.3. Use decorative elements or distinct structural system

This is the lower level than mentioned above. Building could be more beautiful by using:

- a) Attractive finishing materials or colors such as: marble, granite, aluminum sheets...etc.
- b) Decorative elements such as: cornice, frieze, classical column orders, landmark...etc.
- c) Special construction system such as: shell construction, suspended structure...etc.
- d) Design tools such as: natural or artificial lighting, greens and landscape...etc.

These elements often miss in illegal constructions (Fig. 24→26).

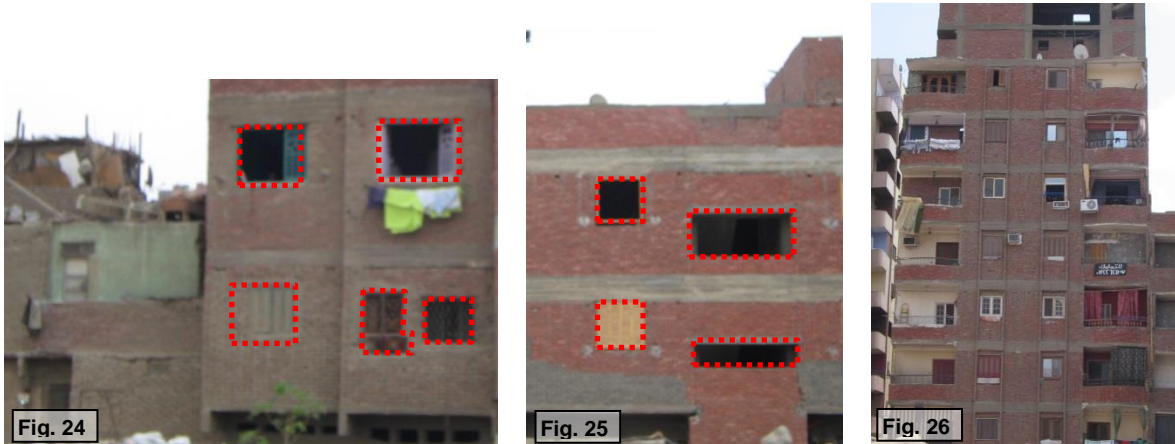


Fig. 24,25: Irregular & Inconsistent openings = ugliness (Al-Tawansy, 2013)

Fig. 26: Violated construction exterior without finishing materials = ugliness (Al-Tawansy, 2013)

4.2. Logical approach

The logical approach is comparative method uses better than or worse than, while some things are difficult to measure or calculate. This way is the easiest one. It could be applied on many cases. And it can be used by non-specialists and for society discourse. For example: ventilation, lighting and solarization calculation at case study could be calculated, but it will take more time, it needs to be aware with calculation methods and relevant computer programs. Therefore, using comparative method with some simple graphics could be adequate (Fig. 27→32)

4.3. Quantitative approach

This approach uses profit and loss language according to numbers or measurements, to clarify difference between wrong condition “violation” and right condition. This language understood and respected by the people. Such as: cost of construction, maintenance, energy, operation and running cost. This method requires that architect must be aware with the electromechanical systems in the building and how it work, in order to design the appropriate space for it. But this way is more difficult, need specialist. After all, there are many assumed variables give approximate results, but it acceptable to explain the difference.

4.4. Environmental approach

It depends on the environmental aspects to justify decisions and laws such as: ventilation, lighting, solarization and choose eco-friendly materials. Environmental solutions are often more expensive, so, this approach usually used parallel to one or more from the previous approaches, to convince others with its economic feasibility in the long term.

5. CASE STUDY

Open court was selected as a case study, because it is one of the most widespread violations in Egypt. And for its environmental importance to the building, such as: thermal comfort, natural ventilation, lighting...etc.

Case study has two conditions for open court one of them has wrong dimensions (1m x 1.5m), and the other is right with correct dimension (3m x 3m), at building consist of ground and three typical floors. It has many comparison criteria using the above-mentioned approaches to explain the difference between the two conditions, to find out the best. (Fig. 27→33), (Table 1, 2)

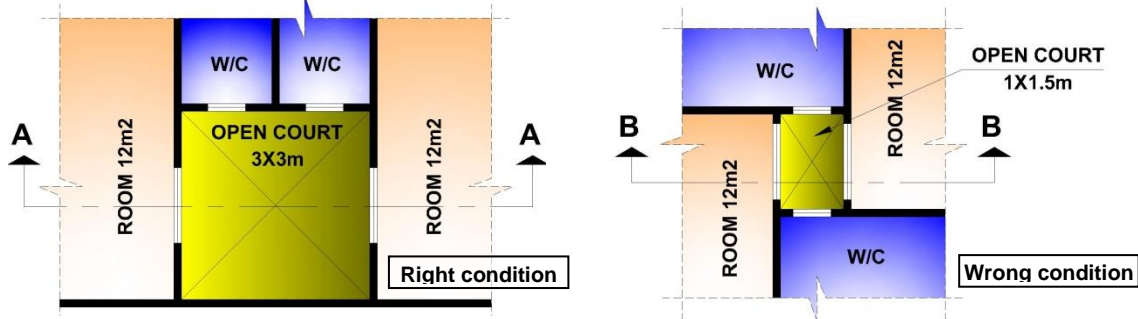


Fig. 27: Open court case studied conditions (Al-Tawansy, 2013)

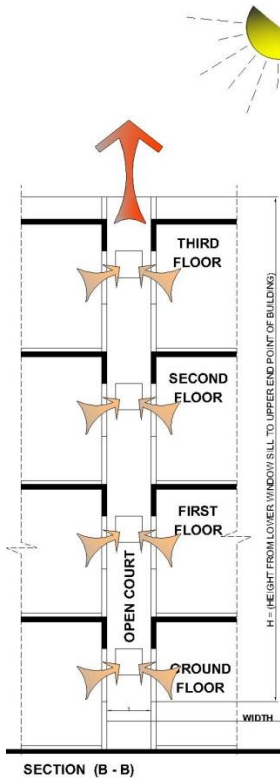


Fig. 28: Ventilation at wrong cond. (Al-Tawansy, 2013)

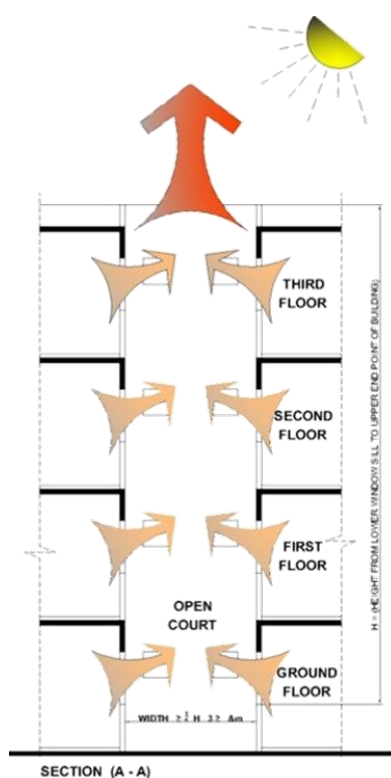


Fig. 29: Ventilation at right cond. (Al-Tawansy, 2013)

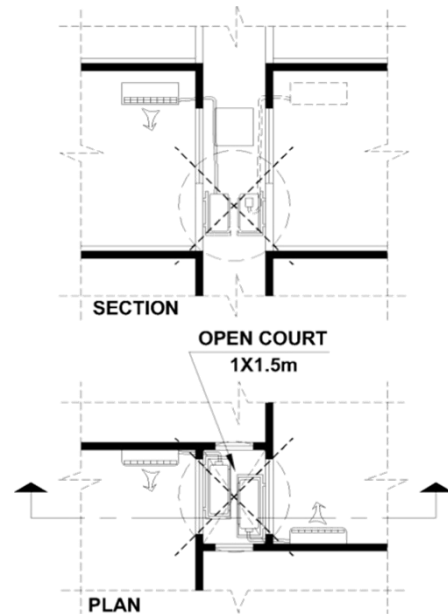


Fig. 30: Bad efficiency for A/C units (Al-Tawansy, 2013)

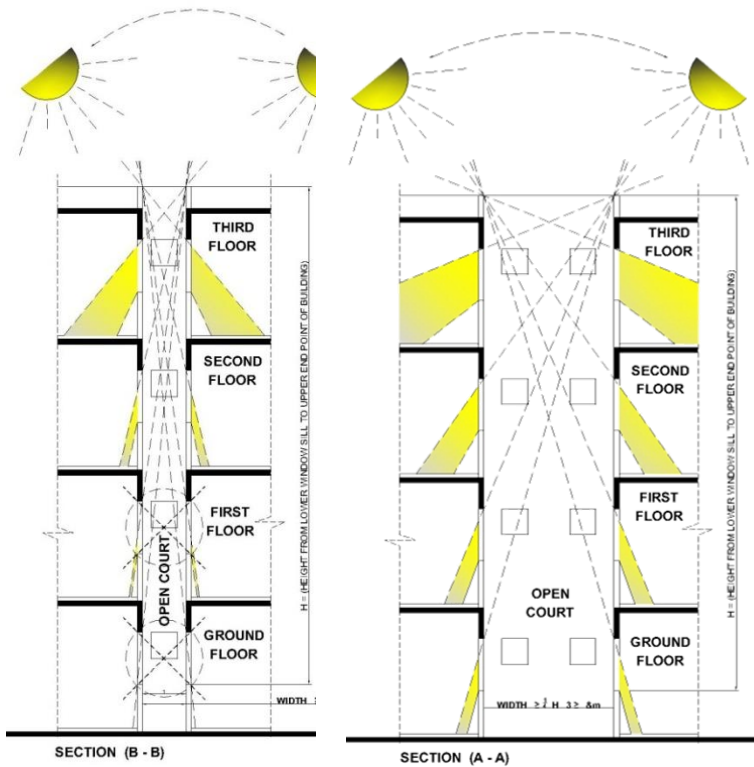


Fig. 31: Lighting & Solarisation at wrong cond. (Al-Tawansy, 2013)

Fig. 32: Lighting & Solarisation at right cond. (Al-Tawansy, 2013)

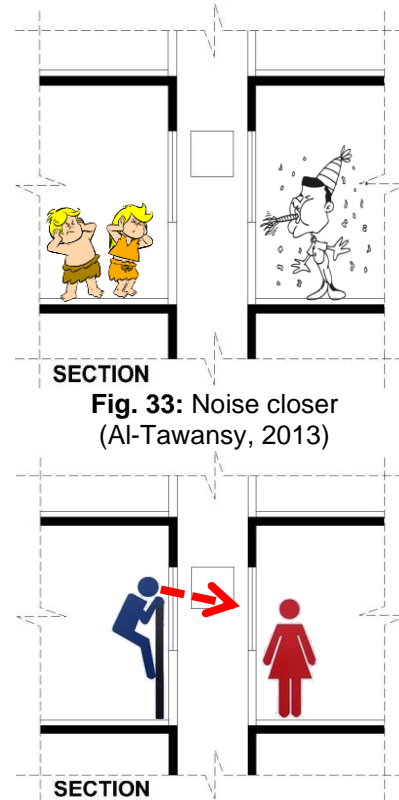


Fig. 33: Noise closer (Al-Tawansy, 2013)

Fig. 34: Visual Privacy is missing more (Al-Tawansy, 2013)

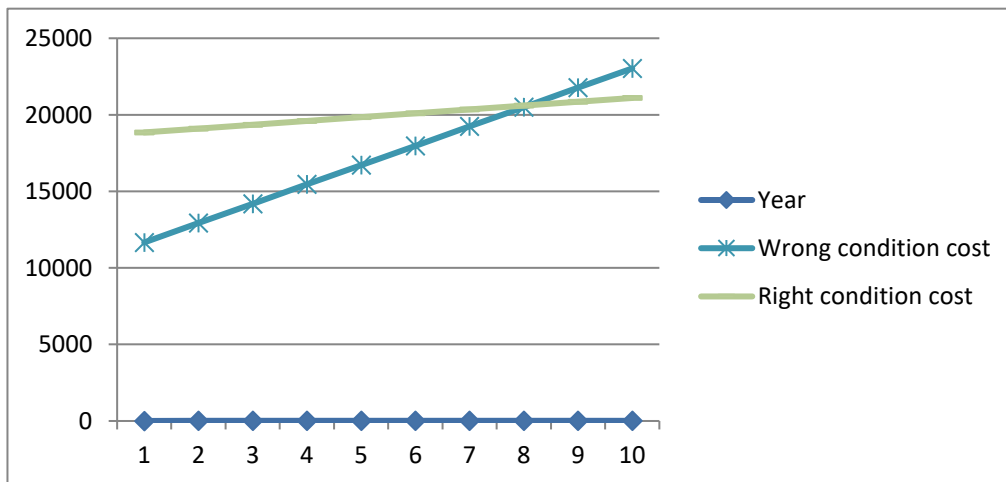


Fig. 35: Total cost of both cases reaches break-even point at 8th year, while running cost of wrong case still rising (Al-Tawansy, 2013)

Table 1: Cost comparison between the two alternatives of open courts using the quantitate approach (Al-Tawansy, 2013)

Comparison Criteria		Wrong condition	Right condition
Area Cost	<p><u>Assuming:</u> m2 price = 2000LE price cost and inflation rate will be constant</p> <p><u>Required:</u> Cost of wasted space at open court = open court area x cost per m2</p>	$= 1 \times 1.5 \times 2000 =$ <u>3000 LE</u>	$= 3 \times 3 \times 2000 =$ <u>18000 LE</u>
Lighting Cost	<p><u>Assuming:</u></p> <ul style="list-style-type: none"> • Lighting (just for 2 rooms) • Room area = 12m2 x two rooms • Window area 1.2m x 1.2m • Using Luminary with florescent lamps x 40w / lamp for every room • Lamp lifetime = 1000 running hours • Lamp price = 10 LE • electricity segment price/kw = 20 piaster/kw (note: this is the common segment price but, this value is variable according to consumption) <p><u>Required:</u></p> <ul style="list-style-type: none"> • Luminary cost (similar factor so, neglected) • Annual replacement cost for lamps = (lamp annual running hours / lamp lifetime) x lamp price x 8 lamps per luminary • Annual Energy consumption cost = (lamps power/hr x running hours/month x electricity segment price/kw) x 12 months 	<ul style="list-style-type: none"> • Running hours \approx 16 hr/day • Annual running hours = 16 x 365day = 5840 hr/year • Annual replacement cost = 5840hr / 6000hr x 10LE x 8 lamps \approx <u>78 LE</u> • Annual Energy consumption cost = (8 x 0.040kw x 16hr x 30day x 0.20) x 12 \approx <u>368 LE / year</u> 	<ul style="list-style-type: none"> • Running hours \approx 8 hr./day • Annual running hours = 8 x 365day = 2920 hr/year • Annual replacement cost = 2920hr / 6000hr x 10LE x 8 lamps \approx <u>39 LE</u> • Annual Energy consumption cost = (8 x 0.040kw x 8hr x 30day x 0.20) x 12 \approx <u>184 LE / year</u>
HVAC (Ventilation & A/C) Cost	<p><u>Assuming:</u> For A/C unit:</p> <ul style="list-style-type: none"> • Cooling Capacity \approx 12,000 BTU • EER "energy efficiency rating" \approx 10 BTU/kw Input Power = 1.15kw • Device working rate \approx 0.55% <p>This ratio is variable according to the actual working time for external compressor and condensing unit and it's time off by thermostat. It is affected by operation condition and A/C unit efficiency (So, it has been measured from an actual similar case)</p> <ul style="list-style-type: none"> • Annual A/C working months \approx 7 months • electricity segment price/kw = 29 piaster/kw (note: this is segment no.4 between 351→650kw/month) • annual maintenance cost per unit \approx 100LE <p><u>For Fan:</u></p> <ul style="list-style-type: none"> • electricity segment price/kw = 20 piaster/kw (note: this is segment no.3 between 201→350kw/month) <p><u>Required:</u> Annual energy consumption cost for two units = (energy consumption for each unit kw x 2 units x running hours x 30day x unit working rate x electricity segment price/kw) x 7 months</p>	<p>Mechanical Air conditioning system may be required <u>Proposed:</u> DX Split unit \approx 1.5hp Cooling unit only</p> <ul style="list-style-type: none"> • A/C price cost = 3700LE x 2units = <u>7400LE</u> • Monthly energy consumption for two units = (1.15kw x 2units x 8hr x 0.55 x 30day) = 303.6kw • Annual energy consumption cost = 303.6kw x 7months x 0.29LE = <u>616.3 LE / year</u> • Maintenance cost = 100LE x 2 = <u>200LE</u> 	<p>Mechanical ventilation system may be required <u>Proposed:</u> Fan = 40w</p> <ul style="list-style-type: none"> • Fans price cost = 300LE x 2units = <u>600LE</u> • Annual energy consumption cost for two units = (0.040kw x 2 units x 8hr x 30 days x 7months x 0.20LE \approx <u>27 LE</u> • Maintenance cost (Neglected)
Total running cost		<u>1262 LE / year</u>	<u>250 LE / year</u>

Table 2: Comparison conclusion between the two conditions of case study using the mentioned approaches (Al-Tawansy, 2013)

Comparison Criteria		Right Cond.	Preference	Wrong Cond.	Approach	Ref.
Cost	Cost of wasted space at open court	18,000 LE	<	3000 LE	Quant.	Table 1
	Industrial lighting	39 LE / year	>	78 LE / year	Quant.	Table 1
	HVAC	600 LE =Fans price cost	>	7400 LE =A/C units price cost	Quant.	Table 1
	Running cost of lighting & HVAC	250 LE / year	>	1,262 LE / year break-even point reached at 8 th year	Quant.	Table 1 Fig. 35
Lighting & Solarization	Natural	Sunlight reaches all floors	>	Sunlight doesn't reach the lower two floors	Logical & Env.	Fig. 31,32
	Industrial	Luminaries turn on at night only	>	Luminaries turn on most of the day	Quant.	Table 1
Ventilation & Thermal comfort	Natural (Stack effect of open court working as passive solar vent. & cooling system)	Better efficiency	>	Bad efficiency	Logical & Env.	Fig. 28,29
	Mechanical	<ul style="list-style-type: none"> • Fan may be needed • More efficiency & lifetime for A/C if used 	>	<ul style="list-style-type: none"> • A/C will be needed. • Bad efficiency for A/C units, they will be closer. = shorter lifetime = more running cost 	Logical & Quant.	Fig. 30
Noise		Relatively, sound source beyond	>	Noise source will be closer	Logical & Env.	Fig. 33
Visual privacy		Distance between windows = 3m	>	Distance between windows = 1m	Logical	Fig. 34
General appearance		Scaffolding is easier to build here to finish the surface	>	Usually, there is no finishing for surface (difficult to put scaffolding at this narrow space)	Aesth.	Fig. 27
Heath		Better vent., lighting & solarization Less noise	>	Worse vent., lighting & solarization more noise	Logical & Env.	All previous

Env. (Environmental Approach), Aesth. (Aesthetically), > (Better than), < (Worse than)

Conclude from this study, that the wrong condition is the worst and more costly in the long term.

6. CONCLUSIONS & RECOMMENDATIONS

We can reduce urban irregularities using democratic strategy through above mentioned approaches, parallel to the existing used punitive strategy. We recommend the following mechanism to activate this language:

- 6.1. Simplify the language of Architectural discourse society, and maybe required for architects as well as, under the avalanche of laws and engineering codes issued periodically. And may be had not exposed in their studies.
- 6.2. Educate architects this language through training courses and curriculum to explain the laws and its amendments, engineering codes and its significance.
- 6.3. Use media tools to serve these objectives, and awareness of the harmful effects of these irregularities, on the individual and society.
- 6.4. Increase awareness of some basic urban concepts through primary education stages. Student study many fundamentals and principles of other engineering branches such as: mechanics, physics, chemistry and so on, but architecture hasn't the same attention despite its importance.
- 6.5. Recommend for further research to treat this strategy through other case studies explain existing common violations

Research contributes to develop the practical field by reducing the irregularities; and to knowledge by cognitive awareness of architects and the community, using this language.

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