

# Towards Liveable and Sustainable Egyptian New Cities: Learned Lessons from Columbia, Maryland

Shimaa A. Ali

**Abstract-** After more than thirty years of their establishment, 26 New Cities in Egypt are attracting less people than the informal areas. The main objective of this paper is to form a new vision for liveable sustainable Egyptian new cities that attract people to live in, using the descriptive, analytical, deductive methodologies to achieve the research goals. The research starts with discussing the “NCs” definition and its dimensions, and then it explores the major features of sustainability, explains the relationship between the economic, urban, environmental, and social forces shaping the sustainability in developing the new cities. Afterwards, the research focuses on presenting the current situation of the Egyptian experience in developing new cities in the desert areas and the major pertinent impediments, and then analyses the international experiences of sustainable New Cities, Columbia, Maryland in USA. In addition, the case study analysis is a part of a field visit and surveys done by the researcher during Winter and Summer 2015. Finally, the research draws from the previous analyses, the lessons learned from the American experience, the implications for developing Sustainable NCs from inception through completion, in addition to managing the following on-going operations.

**Keyword-** Columbia, Egyptian New Cities, Maryland, New Cities "NCs", Sustainability.

## I. INTRODUCTION

Egypt suffers from a lot of urban problems, such are: Accelerated population growth, limited developed areas, in addition the majority of the population is living on about 6% of the total area on the narrow strip of the Nile Valley and Delta. Over the past few decades, the population density has increased significantly to accommodate the growing population (Fig.1, 2). Therefore, the government had to agree on some new strategies to face Egypt’s future challenges; one of the main urban development strategies of Egypt is planning and developing projects of new cities [4]. Egypt has 26 new cities, which were planned and being developed all over the country over three generations from 1970 till 2010 [3].

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Fig. 1 The mother Egyptian cities around the Nile Valley and Delta.



Fig. 2 Egypt map

One of the saddest facts of the New Cities in Egypt is that “after more than thirty years of their establishment, New Cities are attracting less people than the informal areas”. None of the new cities have reached their target population and the vast majority have not even reached 50% of their target, even among the early ones founded in the 1970s. [4]. Because of its highly rapid increased population growth, which is reached 95 million in 2017, and 100 million by 2020, and projected to

reach 120 million by 2030. Egypt is planning to develop more 44 New Cities in the coming few decades according to Egypt strategy 2052 [4].

The research asks a question of: "How we could build New-New cities and avoid the same scenarios of the current New Cities?" the research advocates that "applying for sustainable principals in developing the New-New Cities will help in building liveable sustainable communities", which will be qualified for the urban future challenges, as well as, attracting more people to live in. Moreover, the research explores the major features of sustainability, which lead to the sustainable community development. It explains the relation between the economic, urban, environmental, social forces shaping the sustainability in the new cities. It draws on experience with planning of sustainability schemes through the learned lessons from the American Experience to form a future vision of Egyptian Sustainable New cities.

**Problem Identification:** New Cities in Egypt are attracting less people than the informal areas.

**Research Importance:** This research is an enquiry into the success or failure of new communities, and the underlying causes. It addresses both the functional objectives of growth and vitality, and also the wider sustainability criteria.

**Expected Results:** The project is a problem-oriented applied research, and will deliver a practical guide with recommendations for both policymakers and enterprises in urban development. It will provide a unique and innovative perspective on what is now a worldwide problem in the face of rapid urbanization.

## II. NEW CITIES

New Communities (NCs) are a hallmark of urbanization. Wherever they are created — in semi-rural "Greenfields" with low residential densities and with little or no previous growth, or in compact, high-density urban towns that exemplify the "Urban Renaissance" these new forms of human settlement achieve a range of social and economic goals, from improved housing and job choices to safer, more stable living environments to large, diversified living environments.

NCs usually include a variety of types of housing and employment opportunities, community and recreational facilities, retail and commercial services, schools, health care, and public services, and both active and passive open spaces. NCs here are classified as planned, long-term, mixed use, and residential population settlements from 1,000 to 100,000 in urban or suburban areas. NCs are designed, created and operated in comprehensive manner by single, cohesive organizations [2].

## III. SUSTAINABLE AND URBAN COMMUNITY DEVELOPMENT

As there are many definitions of sustainability and sustainable development, one of them: "Understanding the interconnections among economy, society, environment". In addition, **Sustainable Seattle** describes sustainability as "long-term (cultural, economic, environmental health and

vitality) with a focus on long-term sustainability, along with the importance of connecting our social, financial and environmental well-being" [5]. The research will concentrate on these definitions as a main vision for sustainability.

### A. Urban sustainability

Today's cities face a big challenge, managing the heavy reliance on ecosystem services. It results in the depletion of natural resources and biodiversity, and efforts to mitigate and adapt to climate change, while prioritizing the quality of life and public health. A sustainable city can only be one where material and energy resource inflows and waste disposal do not surpass the capacity of the surrounding environment of the region. In other words, urban consumption must equal or be below what the natural environment — such as forests, soil and water bodies — can provide in order to achieve environmental sustainability, and the resulting pollution must not overpower the capacity of the environment to provide human and other ecosystem members with the resources.

**Sustainability depends on social, economic, environmental and governance factors, and it's an interactive process.**

### B. How are Sustainable Cities Created?

To create a sustainable urban environment, it is important to measure and evaluate policies, infrastructure, socio-economic factors, resource use, emissions, and any other processes that contribute to the metabolism, prosperity, and quality of life of the city and profit from that. This will allow officials of the city planning authorities, and governments in general, to identify areas of opportunity as well as concern, and to respond with a long-term perspective by developing realistic sustainability goals.



Fig. 3 Venn diagram representing the standard dimensions of sustainable development. Adapted from Tanguay, 2009, and referencing concepts proposed in WCED, 1987.

### C. Urban Indicators for Sustainable Cities

' Urban sustainability indicators are tools that allow urban planners, city managers and policymakers to evaluate the socio-economic and environmental effect of new urban designs, facilities, policies, waste management systems, emissions and citizens ' access to services, for example. We make it possible to recognize challenges and stresses, and thus

to identify areas that would benefit from being tackled by good governance and science-based responses. It's very hard for cities to be both liveable and strong economically. Not one city has achieved the balance between people, profit, and the planet. The ranking, from Arcadis, a global design firm, and the Center for Economics and Business Research rates the performance of cities based on social, cultural, and economic factors. A city is scored on each of the three sustainability factors; the sum of those is its overall score. A number of indicator tools are developed all over the world to measure, and evaluate the issue about the sustainable communities. There were **scalable, easy-to-use indicator frameworks, such are**. The research chooses the International Indicators for Sustainability to be used in the analysis of the case study.

- CHINA URBAN SUSTAINABILITY INDEX
- CITY BLUEPRINT
- EUROPEAN GREEN CAPITAL AWARD
- EUROPEAN GREEN CITY INDEX
- GLOBAL CITY INDICATORS PROGRAM
- **INDICATORS FOR SUSTAINABILITY**
- REFERENCE FRAMEWORK FOR SUSTAINABLE CITIES (RFSC)
- STAR COMMUNITY RATING SYSTEM
- CITIES ECOSYSTEM EUROPE
- URBAN METABOLISM FRAMEWORK
- URBAN SUSTAINABILITY INDICATORS

*D. International Indicators for Sustainability*

Sustainable Cities International's Sustainability Report Indicators took a different approach to developing an indicator set than the other frameworks mentioned so far.

It started with case studies of several varying sized international cities. We picked metrics that were common to several cities from this knowledge, easy to understand and incorporate, and covered several relevant sustainability goals. The result is a core indicator set that, regardless of size or location, is flexible, easy to implement and relevant to cities. The metrics cover a wide variety of sustainability targets. Nevertheless, the Health and Governance metrics are given little weight. The report incorporates the list of indicators into an easy-to-use Cities Toolkit. This includes guidelines for assessing a specific town's needs and setting baseline targets, as well as best practices gleaned from case studies.

Sector	Indicator	Measures
Economy	Unemployment rates/ Jobs	Underemployment/employment/ vunenployment rates; Percentage of green jobs in the local economy; Average professional education years of labour force
	Economic growth	Annual GDP growth rate; Annual GNP growth rate; Net Export Growth rates (% increase of country's total exports minus the value of its total imports per annum; Foreign Direct Investments (Capital/Earnings accrued from listed FDI's per annum)
Environment	Green spaces	Percentage of preserved areas/ reservoirs/ waterways/parks in relation to total land area; Percentage of trees in the city in relation to city area and/or population size
	Reduce greenhouse gases/ Energy efficiency	Total amount of GHG emissions per city and per capita; Percentage of total energy consumed in the city that comes from renewable sources
	Mobility	Transportation mode split (Percentage of each mode of transportation, i.e. private, public, bicycles, pedestrians); Average commute time and cost
	Water quality/ Availability	Total amount of water availability; Water quality index/score; Proportion of population with access to adequate and safe drinking water
	Air quality	Levels of Particulate Matter (PM <sub>10</sub> - mg/m <sup>3</sup> ); Levels of Particulate Matter (PM <sub>2.5</sub> - mg/m <sup>3</sup> )
	Waste/ Reuse/ Recycle	Recycling rate (Percentage diverted from waste stream); Volume of solid waste generated
Social	Complete neighbourhood/ Compact city	Access to local/ neighbourhood services within a short distance; Crime rates; Measures of income distribution and inequality
	Housing	Percentage of social/ affordable/ priority housing; Breakdown of housing sector by property type (owner occupied/ rental, single occupant/couples/family/multifamily etc.)
	Quality public space	Percentage of roadways in good condition; Percentage of green space (public parks) coverage in relation to city area and/or population size
	Education	Number of schools with environmental education programs; Adult literacy rate
	Sanitation	Percentage of population with access to water-borne or alternative (and effective) sanitary sewage infrastructure
	Health	Mortality rate/ Life expectancy; Percentage of population with access to health care services

Fig. 4 Sustainable Cities International's Indicators for Sustainability list

Source: <http://sustainablecities.net/>



Fig. 5 The relation between features, levels, and profiles of sustainability, adopted by the author

*A. Sustainable Community Development: Features, Levels, and Profiles [7]*

The many distinct characteristics of sustainable community development will be grouped into a system of twelve main characteristics and categorized into three major scales or levels where activities are taking place in favor of sustainable community development and implementation barriers. Figure 5 shows the relationship between sustainable group features, rates and profile.

IV. THE EGYPTIAN NEW CITIES

Although the concept of building "desert satellite cities" had been suggested since the 1950s, after the war of 1973 and the

dawn of the "Infatih" [open-door] policy [8] the real push toward the desert occurred. According to Law 59/1979, the New Urban Communities Authority (NUCA) was formed to serve as the responsible body for developing, maintaining, selecting sites and preparing master and comprehensive plans for new cities. A development map for Egypt had been prepared by 2017, including 26 new cities representing new urban areas aimed at absorbing 12 million residents, which is 50% of the expected annual growth by 2017 [1] (Fig. 6).

**Facts about the Egyptian New Cities.**

- Total area of the new cities is about 750 thousand acres.
- Population until 2006: about 1.8 million people.
- Population until 2013: about 6 million people.
- Total Population Density of 17 persons / acre (for the developed area of 350 thousand acres and 8 persons / acre for total area).
- The Egyptian New Cities showed similar characteristics, which are: Single-use master plan composed of sectors, districts, neighborhoods, and City Centre, car-oriented master plan, and low density expanded developments [3].



Fig. 6 The first 3 generations of the new cities in Egypt

- **NUCA has consistently deviated from its social role and instead took on the role of real estate developer.** As for NUCA's investment allocation, the bulk of the investment is directed to: housing, sanitation, roads, electricity, water, infrastructure, maintenance, services, telecommunications, and agriculture, see (Fig.7).

- **Have the New Cities meet their goals or not?** New Cities attract fewer people than the informal areas after more than thirty years of its establishment. Not a single new city has reached its target population and even among the first ones established during the 1970's, the vast majority have not reached 50 per cent of their target (Fig. 8).

Allocation of NUCA investments across different items 2015/2016

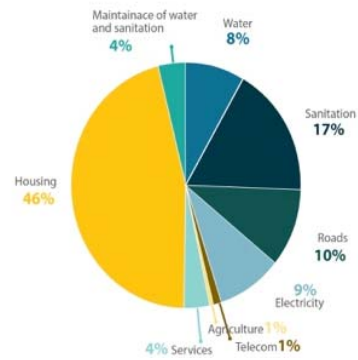


Fig. 7 NUCA investments [6]

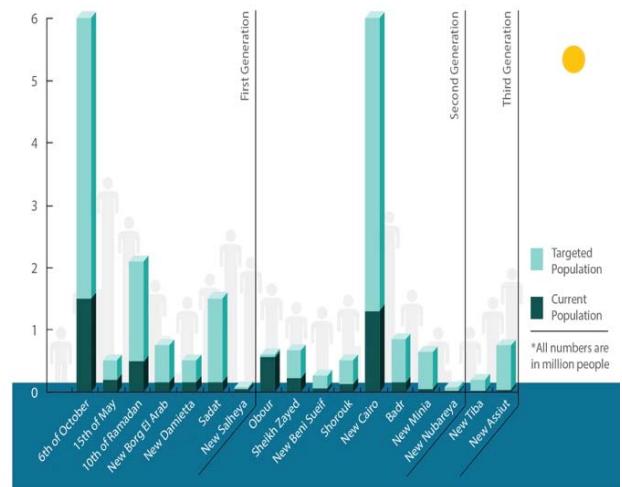


Fig. 8 Targeted population for new cities  
Source: <http://www.tadamun.info/2015/12/31/egypts-new-cities-neither-just-efficient/?lang=en#.V0iErsdvcym> [6]



Fig. 9 housing didn't reach to the poor  
Source: <http://www.tadamun.info/2015/12/31/egypts-new-cities-neither-just-efficient/?lang=en#.V0iErsdvcym> [6]





Fig. 10 Correlation between spending  
 Source: <http://www.newcities.gov.eg/Default.aspx>

**So many reasons affect the Egyptian NCs to achieve its target such are [1]:**

- Unemployed capacities in the housing area.
- In most instances, the houses NUCA is building do not hit the poor and middle classes and do not fulfil their work, housing, education and other needs, Fig.9.
- Burnt energies: in two main elements, human being and machine because of the lack of sufficiently available public transportation.
- Wasting the government budget on building cities can hardly reach 10% of its target, see Fig.10.
- The targeted size of new cities is large and takes a long time until it secures full elements of settlement and achieves its objective.
- Slowly growing population.

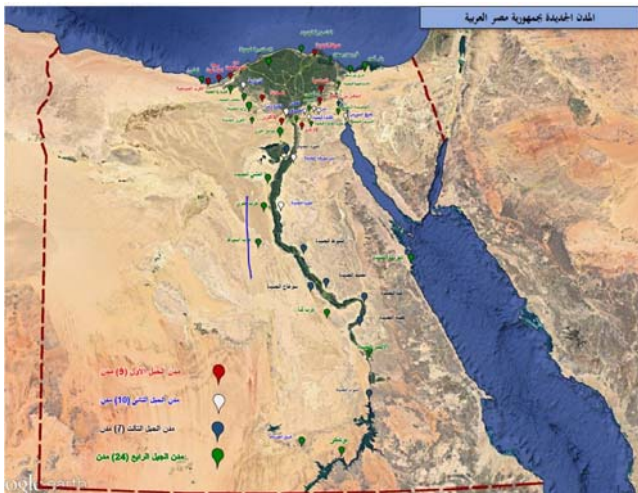


Fig. 11 The four generations of Egypt new cities  
 Source: [http://www.newcities.gov.eg/know\\_cities/default.aspx](http://www.newcities.gov.eg/know_cities/default.aspx)

Egypt strategic plan for urban development aims to increase the built up area, and developing the urban communities, and civilized cities. Currently, the government is done with housing projects, infrastructure, services and utilities in the new urban expansion areas.

UNCA started with developing and planning 14 new urban communities out of 24 (New Capital Cairo, New El Alamen, New Mansoura, East Port Said, Nast in the West of Assuit, El Galala, West Qena, New Ismailia, New Rafah, New Farafrah,

New Oubour, New Toushka, East of Ewinat) to achieve the total number of 50 new cities from the four generations. With total area 380,000 feddan, which equal 50% of the total area of the new communities, developed in the last 40 years.

The new urban communities are planned to occupy 14 million people and provide 6 million job opportunities. From Egypt strategic plan 2030, the country is working to increase / double the built up area in Egypt from 6% to 12 %.

**V. COLUMBIA, MARYLAND [2,9,10,11]**

In 1960, developer James W. Rouse conceived Columbia as a mixed use, mixed income, privately funded and developed "complete city" that "respected the land, provided for people's growth and made a profit."

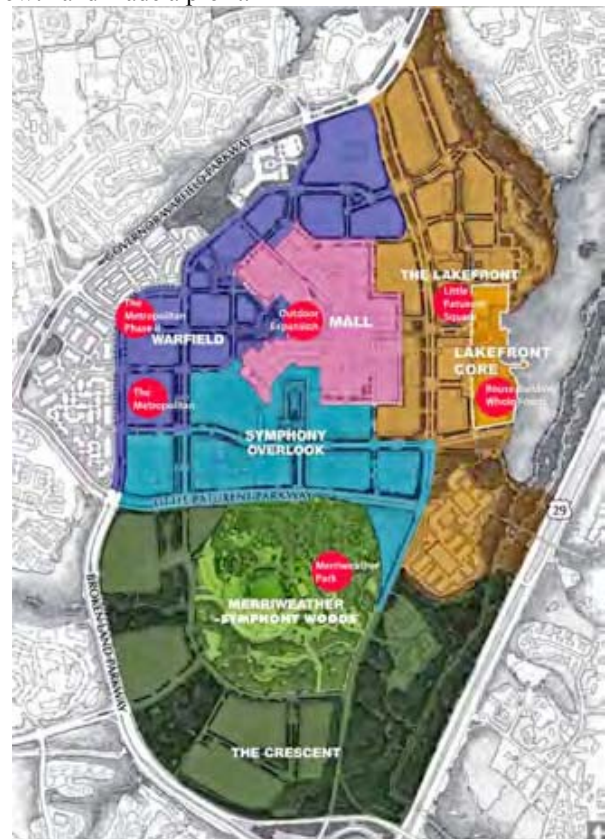


Fig. 12 Down town Columbia  
 Source: Maryland Planner, A publication of the Maryland Chapter of the American Planning Association, 2014

**A. Why Columbia, Maryland?**

- In the 1960's, the planned community of Columbia, Maryland was envisioned as new kind of American city that was rationally planned to avoid the problems associated with larger cities and sprawling suburbs [8].

- The International Down Town Association, Howard County, Maryland in the article "The Evolution of Columbia, Maryland, 2012" described Columbia as the "Best-known Master Planned Community", and the article described Columbia's master plan as a "New Kind of City"[8].

- Again, the Maryland Planner, A publication of the Maryland Chapter of the American Planning Association in 2014, analysed the down town Columbia in an article titled "A

look at Down Town Columbia at 2014”, describing Columbia as the “Best-Known Master Planned Community”. In addition, The Downtown Columbia Project is a 30-year master plan to turn the suburban-oriented Town Center in Columbia, Maryland into an urban community that is socially, economically and environmentally sustainable. All of that makes Columbia a compelling subject for study [9].

C. Columbia’s Analytical Framework for Sustainability [2]

Table 1. Analytical framework for sustainability, Columbia, Maryland

**1. Economic profile**

Employment Base: Secured major GE distribution facility; now 19 industry sectors onsite, including retail, office, education, health care, finance, hospitality, manufacturing, residential and commercial real estate.

Employment Opportunities: 5,500 business / government employers; 63,000 onsite jobs.

Employment Structure: Planned 1:1 ratio of jobs to housing units, on- and off-site.

**2. Urban profile**

Neighbourhood Structure: Planned variety of housing types for range of income levels;

Housing Unit Type / Mix: Single family (41%), Townhouse (26%), Apartments (33%) in 2010; Housing Unit Sales Prices: Single family (\$188.5K-1.1 M); Townhouse (\$110K-535 K);

Neighborhood Services: Facilities for children, community centers, paths / parks, elementary schools, swimming pools, complete lots.

**3. Environmental profile**

Sustainability Framework: Plan inserted into design guidelines (liveability, water, transportation, energy, ecology, materials); functional landscapes for storm water management; open space for place making in Downtown redevelopment; implementation by Downtown Partnership.

**4. Social profile**

Community Philanthropy: Columbia Foundation founded by Rouse for Howard County civic; now so many independent community foundations are

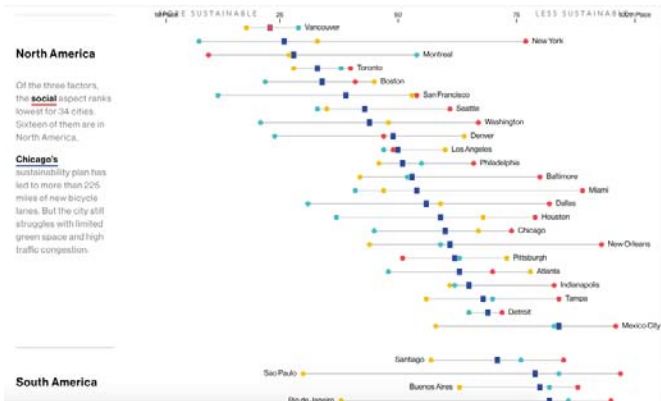


Fig. 13 North America City Ranking

Source: <https://www.nationalgeographic.com/environment/urban-expeditions/green-buildings/sustainable-cities-graphic-urban-expeditions/>



Fig. 14 Metropolitan Area of Columbia

Source: Maryland Planner, A publication of the Maryland Chapter of the American Planning Association, 2014

B. City Overview

□ Columbia was designed as a series of interconnected villages with supporting employment, civic, and service uses, surrounded a larger town center. Nine villages and 26 neighborhoods cluster people with related activities and facilities (schools, recreation centers, health clinics, amenities), interspersed with small retailers. Columbia is largely built-out, with about 100,000 residents, 40,000 households and \$100,000 + median household income.

founded.

#### VI. LEARNED LESSONS FROM COLUMBIA, MARYLAND: TOWARDS AN INNOVATIVE FRAMEWORK TO LIVEABLE SUSTAINABLE EGYPTIAN NEW CITIES

NCs differ from most conventional single-use real estate projects in six major respects: large-scale, comprehensive scope, □unitary organizations, multiple real estate uses and mutually reinforcing activities, portfolio financing, and partnership structure.

**1. Comprehensive Plans:** planning a short and long term needs and priorities, and manage the financial and organizational resources for massive projects.

**2. Building an Economic Model:** to imposing economic discipline to the physical planning, manage all the financial, investing, and marking aspects of the city.

**3. Work Group:** making a group of work to carry out a “reality-based planning”, with leading academics, practitioners, innovators, and experts from architects, planners, socialists and all fields.

**4. Public-Private Partnerships:** the cooperation between local government, public organizations, private – for profit, and not for profit organization “NGO’s” supports the success of Columbia.

**5. Public Participation:** new initiative in participating the local community, Columbia residents formed an independent “not-for-profit” organization to plan and develop 36-acre “cultural park”.

**6. Feedback System:** managing a feedback system between experts and executives with feedback- pushback of unconventional norms.

**7. Establish an Environmental Sustainable Framework:** following the sustainable design guidelines in architecture, landscape, and urban planning.

**8. Integrated Sustainable Community:** Providing variety of housing types, job opportunities, services, infrastructure, and transportation means, all within a sustainable framework.

**9. Sustainable Smart Cities:** Studying the possibility of developing and planning smart cities in Egypt to follow the rapid fast technologies.

**10. Resilient Cities:** A new trend of new cities, which is valuable to be studied to face the future challenges in Egypt “increase population, climate change,...etc).

#### VII. CONCLUSION

- The current Egyptian experience in new cities has been proving its effectiveness for almost four decades and all it has proved is that it has failed to meet any of its objectives. In spite of this, Egypt's most plentiful resource – property – has similarly become its most expensive and difficult to acquire resource. Land plays a social function rather than a purely economic one in a just urban governance system, based on a belief that the city belongs to everyone. This principle was completely lost through the land-commodification practices of

NUCA, and Egypt's cities are being developed not for the general public but for the privileged few chosen.

- Special management characteristics of NCs, such as: exceptionally large, complex projects requiring creative vision, creativity, massive investment, sophisticated organization, technical expertise and long-term cooperation between business and government. To achieve results, NC leaders and practitioners need to evolve at every stage of development and operations, from implementation to completion and on-going operations.

- The development of a sustainable new community is not just about the “built environment,” it has driven us to improve the built environment and/or the planning, financing, development and operation processes.

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