Housing Policies Impact in Ageing Chinese Families.

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This paper discusses the relationship between the housing size policies and the two main alternatives of choice between "ageing in (private) place" and the alternatives of (public) nursing home. The first assisted by the family or local community, the other by public service.

The framework of this study is current housing practice and future demographic scenarios forecast for 2050 in China, with an estimated population of 330 million above 65 years old.

Macao Housing policies often follows the Hong Kong model of very small units, clustered in high density towers, with little room for multi -generational solutions that could provide family self-support that will be an economic relieve for the state.

This paper studies the current situation, with the focus on Macao and Hong Kong, and propose alternatives solutions for a more sustainable city and harmonious society within an ageing scenario.

Key Words: Ageing in Place, Public Housing, Asian Cities, Sustainability

1. Introduction to the growing number of ageing population.

This discussion paper is the result of answering a recent public consultation on social housing in Macau[1] organized by the Housing Department, as well the influence of a presentation related with the question "Is the family, rather than the state, the more effective social security?" This presentation was don with occasion of the IFNGO and OFAP[2] joint international conference on the topic "Reinforce the Family, for a better and sustainable future", held in Macau during October 2013. Both to OFAP and the housing department I am grateful for this opportunity for research.

It is a preliminary study with several references to Asian cities, like overcrowded Hong Kong and Macau as well to green cities like Singapore. These cities share many similarities with the ones in mainland China. The study is based in information from different sources, from academic papers to government websites and local observation of urban reality.

Under the United Nations parameters China is now considered an aging society, with an unprecedented and enduring number of ageing members that will be pervasive in all aspects of and stages of life. In 200o China had 87.9 million of its population above 65 years old. By 2050, the number of older persons (above 65 years old) in the world will exceed the number of young for the first time in history[3], with an increasing number of elderly living alone that will reach an estimate 330 million in 2050 (fig 1).

Government expenditure in social care for the elderly will increase in proportion of the decrease of younger population in working age. More human resources will have to be diverted from different industries in order to be allocated for servicing the aged members of society.
Under the above scenario housing and facilities for an aging society is a priority for many governments, particularly in Japan, Korea and Singapore. Where to start in the equation city planning, development and quality of life?

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[1] http://www.ihm.gov.mo

[2] OFAP is the Organization of the Families of Asia and the Pacific, an NGO based in Macao.

[3] http://www.un.org/esa/population/publications/worldageing19502050/pdf/62executivesummary_english.pdf

"To put the world right in order, we must first put the nation in order; to put the nation in order, we must first put the family in order" (Confucius). It is not by ignoring or procrastinating a growing problem that solutions will come. On social issues the longer the procrastination of a problem, it becomes more difficult to resolve, because all three factors for the success of Project Management (Time, Human Resources, and Budget) will diminish. In Urban Planning this can be translated in the bankrupt of cities or regions as it was the case of Detroit, with large parts resemble gosh town with high crime and poverty rate. Only cities are becoming overpopulated, on the countryside the opposite phenomenon is happening. Statistics show that global trend is to start reduce the global population, that will start decreasing at an accelerate rate in 25 year's time. (add reference to www.overpopulationisamyth.com). This reduction is related with the total fertility rate, which indicates the reduction of the average number of children born per women worldwide.
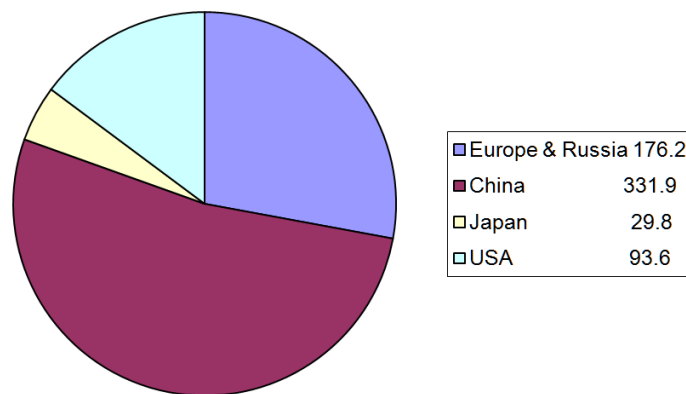

| ☐ Europe & Russia 176.2 |
■ China	331.9
☐ Japan	29.8
☐ USA	93.6

Fig.1. Graphic indicating in Millions the number of aged estimated for 2050 by the UN Population Division

Solutions originated in Europe and America may not be adequate in China, which has a very different cultural, social and economic Background. Comparative intercultural studies (Trompenaars 2012) on human behaviour and relationships indicates that Asian cultures have strong tendencies for living and work in group, providing a favourable ground for high density. In Chinese culture (Beijing, Hong Kong, Macau, Singapore, etc) it is for the government to provide housing, at least social housing. Under this scenario what can be the right balance between family needs and state service delivery?

Real Estate experts are facing a new problem and need in Chinese society. "Historically, there was no need for retirement homes in China as traditional courtyard houses comprised five to ten individual small houses, allowing several generations to live under the same roof" (Thomas Lam [4])

In Confucianism society, it is the family the one that have direct responsibility for caring for ancestors. The key stone for social order and harmony is the physical and moral structure of the family: Filial piety (孝, *xiào*) implies to be good and to take care of one's parent, which is also a manifestation of the ren (仁). To reinforce this obligation in a modern age were family groups are scattered in different areas was created a law to implement this filial obligation.

Man, family and society order was crystallized in many cultural patterns and architectural typologies, apparent in the courtyard house and (fig.2) in its many variations where the hierarchy and functions of different members are reflected in the layout of facilities.
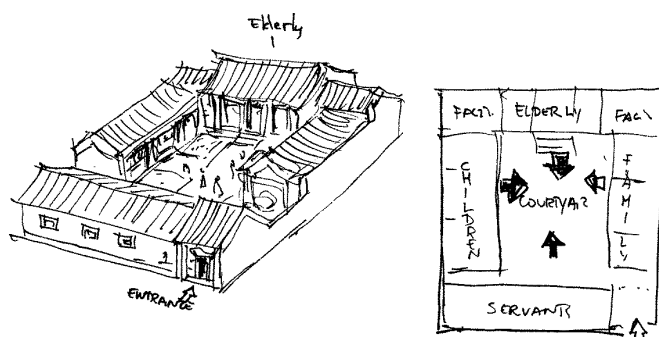

Fig.2. Traditional concept of Chinese four size house where the courtyard is the place for multi generations cooperation. Drawing by FVP

Outside China, the model of care inspire in filial piety was successfully implemented in the village style facility of Hogewey in Holland[5], for aged people with dementia, that

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[4] http://www.knightfrank.com.hk/content/upload/files/Reports/General_markets/retirement_eng.pdf. Thomas Lam is the Director, Head of Research, Greater China for Knight Frank

[5] http://www.theguardian.com/society/2012/aug/27/dementia-village-residents-have-fun

provide several club style (singing, shopping, painting, gardening, etc) places and activities that stimulate the elderly to be kept busy and happier among normal people and experts trained for acting in this environment. The positive results here are a showcase to the world. The current alternative is the use of hospital beds[6] and human resources, which in Britain could reach 25% of beds occupation[7].

Caring for the aged facilities will be one of the greater challenges in urban planning, and resources management in the 21st century.

2. Principles and fundamental concepts of the housing

Housing policies play a key role in social harmony, helping in organized societies to solve the problem of dwelling in slums. The household in which we live is the first environment in which the human being learns and develops in a natural way, in the heart of a family and in an environment that is comfortable which we call HOME.

The model of housing that we choose today will, in large part, define the model of the citizen of the future, as housing is inevitably a means through which the family is educated and well-formed or, in the contrary an unwelcoming and depressing place.

The three pillars of social stability are: a) food and nutrition (survival); b) Work and employment (sustainability); c) home (family shelter, comfort, social peace).

The Chinese family in particular understands the concept of extended family, including three generations that support each mutually. It is only natural that the first generation, given its experience and more available free time, supports the education of third generation, freeing up the second generation, that are the core if the nation work force, for their commitment in professional activities and career pursuits. Educating and nursing the young is in itself a work a natural full time employment within the family,

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[6] http://www.telegraph.co.uk/health/elderhealth/8956907/Emergency-admissions-for-dementia-patients-rise-12.html

[7] http://www.alzheimers.org.uk/statistics

which is reciprocated by the natural care that the younger generation gives to the older ones. This three-generation model (3GM), living side by side, has proven extremely effective as, not only does it eliminate or reduce the need to employ persons external to the family to manage domestic matters, but it also reduces the economic burden and human resource investments of the state, and society in general. The three generation model enables the natural development of society, in mutual respect and caring for all its members.

The 3 GM is the model that best corresponds and facilitates the concept of 'Ageing in Place', that is defined as: "the ability to live in one's own home and community safely, independently, and comfortably, regardless of age, income, or ability level (Wikipedia).

 "Ageing in place[8], requires swimming in a bigger tank". The elderly should not be considered as a useless or burdensome member of society, who is sedentary and awaits care from others but, in the contrary, should be kept useful and occupied as much as possible with real responsibilities in diverse family and social activities. Ageing in Place means aging together, in-group, with proper support, oppose to the situation of ageing isolated at home.

3. Investing in the quality, security, comfort and durability of housing, allowing for the growth and retirement (ageing in place) of all citizens

In terms of economic expenditure for the State, as well for benefit to have an healthy family life, the best concept to support is that of 'ageing in place', in a familiar location where the family had developed their social network of friends and family that provide mutual support. Architecture and urban layout plays and important role in the ageing in place concept.

Academic studies undertaken in Japan reveal that the houses/ apartments of social housing constructed in the 1970's, with moveable walls and flexible space configuration,

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[8] http://aginginplace.com/

allowed residents to adapt to the needs of growing or declining family unit structures within the same space, without the need of procuring new housing that is effectively bigger or smaller in square footage. This is the case of the Tsurumaki 3 Housing Estate in Tama New Town, in the suburbs of Tokyo[9] (image below).

Architecture provides the physical framework for family and community life, contributing for happiness or depression. Space shape, colour, light or darkness, furniture, texture that constitutes the framework of human life can contribute to welcome or depress the users of interior or exterior spaces. Small squares or living rooms facilitated social interaction, corridors and walls contribute for exclusion.

For an "ageing in place" approach, it is necessary not only to apply universal design criteria but also to provide spaces with room, enough size for flexibility in changing functions. Size and layout flexibility are critical for ageing in place adaptation, providing the ground for flat reconfiguration, making it a very attractive system not only for families living in the place for decades but also for newcomers.

A house or flat too small, like most social housing programs in Hong Kong and Macau are too rigid for future adaptation, making impractical that two or three generations live side by side and support each other in a daily base, contributing for the isolation of the elderly, abandoned to its own resources. Woo (2012) denounce the "prision-ism", prison type design concept present in many public facilities, like housing in Hong Kong.

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[9] (JAABE, Journal of Asian Architecture and Building Engineering/November 2007.p 245-250. Kazunobu Minami, Aging Post Occupancy Evaluation of Layout Changes on Adaptable Housing)

Fig. 3. Example of flexible housing, catering to family unit fluctuations (2 generations) from 1982 to 2005, in the Tsurumaki 3 Housing Estate. Key: M# (father and age); F# (mother and age); m# (son and age); f# (daughter and age).

The elderly should not be left to live alone, as it is happening to a great number that live in small flats. Isolation is one of the most painful stigmas for the aged, aggravated by the fact that over 25% of the aged group will suffer from Alzheimer, dementia and/or physical impairments and reduced mobility, thus needed to live in communally supportive groups, with some additional care of nurses and medical professionals. Most of local 'nursing homes' are not effective, allowing for depression, insecurity and a strong sense of lowliness for those who have dedicated their lives for the good of the nation. It is already expected that China shall suffer from a similar population ageing rate as Japan, presently exposing a significantly grave prospect[10].

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[10] http://www.stat.go.jp/english/data/handbook/c02cont.htm

"Ageing in place" results in a better quality of life for the elderly community while, simultaneously reducing the government expenditure in social services.

If the state assumes the main responsibility, then the cost for housing and nursing the elderly services will go up in a sky-high scale as it is happen in Japan, cutting the expenses and human resources allocated to other sectors. In Japan the current imbalanced proportion in age groups are: 12, 9% (0 -14 years old), 62% (15-64), 25% (above 65), with double numbers for above 65 when comparing with teenagers (below 15 years old)

In Japan, the steady ageing of the country's population is reflected in the government expenditure in services for the elder (fig. 4) growing from its formation after the war. The aging of society is leading to the shrinking of the economy.
The burden of caring for the aged can be address in a solidarity perspective by promoting family care and nursing facilities, or with a Nazi style "Final Solution" translated in the euthanasia laws that help terminate the life of the aged or the ones in less useful society, thus threatening the safety and trust necessary for social life and human dignity. From ancient times, on poverty period when society or government could not take care of the elderly comes the "Ubasute" Japanese tales, of abandoning an old woman" in the mountain or desolate place for die from starvation, or exposure. Ubasute may come back to live in Japan if the social security expenditure (Fig.4) keeps increasing with projections that 25.6% of its population will be over 65 by 2030, growing the trend to have higher death than birth rates, decrease to 95,2 Millions in 2050[i].
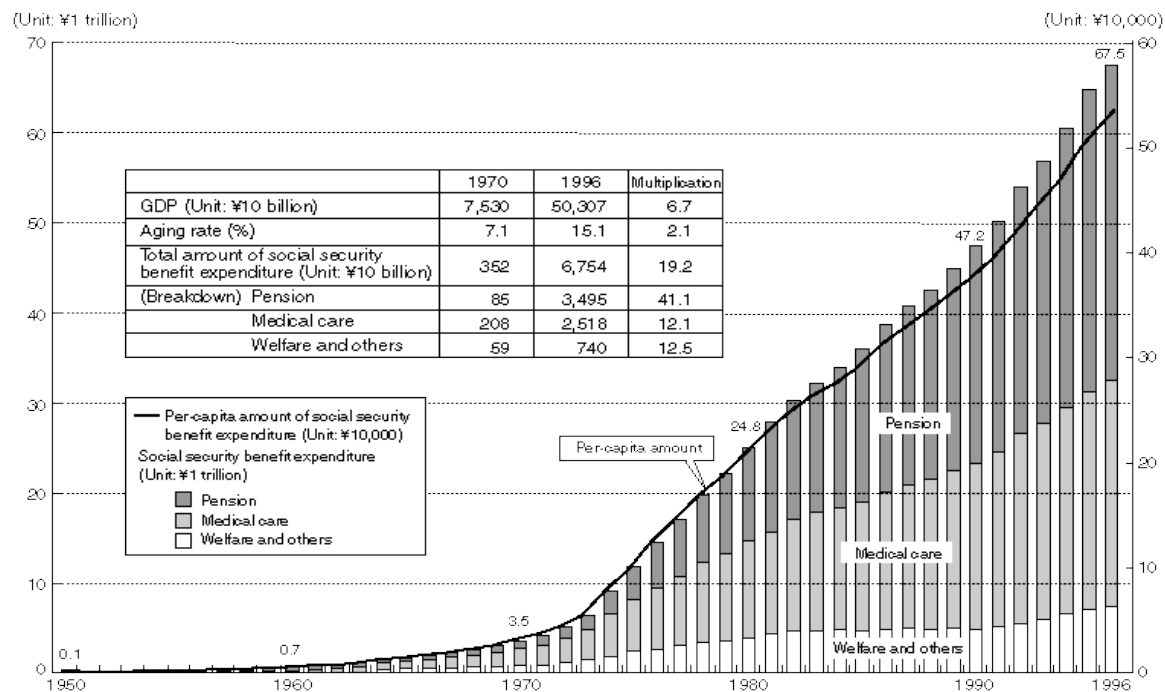
The table inside the figure:

	1970	1996	Multiplication
GDP (Unit: ¥10 billion)	7,530	50,307	6.7
Aging rate (%)	7.1	15.1	2.1
Total amount of social security benefit expenditure (Unit: ¥10 billion)	352	6,754	19.2
(Breakdown) Pension	85	3,495	41.1
Medical care	208	2,518	12.1
Welfare and others	59	740	12.5

Figure 4. Social Security Expenditure, by Japan's National Institute of Population and Social Security Research . Data from (http://www.stat.go.jp/english/data/chouki/23.htm). The values expressed in the graph compare the government expenditure in social security (in trillions of Yen) with the growth of life expectancy, from 1950 to 1996.

The values expressed in the graph compare the government expenditure in social security (in trillions of Yen) with the growth of life expectancy, from 1950 to 1996. Falling birth rates makes cost exponentially higher. 25.6% of its population will be over 65 by 2030, growing the trend to have higher death than birth rates, decrease to 95,2 Millions in 2050[ii]. The only way to invert the ascending slope of deficit is to increase the birth rate.

For the ones needing Long-Term Care (LTC), Nursing Homes (NH) is a need as a specialized and long-term alternative to hospitals and clinics. LTC is a range of services required by persons with a reduced degree of functional capacity, physical or cognitive, and who are consequently dependent for an extended period of time on

help with basic Activities of Daily Living (ADL). The OCED/EU report[11] elaborated on this "personal care" component that is frequently provided in combination with basic medical services such as "nursing care" (wound dressing, pain management, medication, health monitoring), as well as prevention, rehabilitation or palliative care. Falls – universal design, Diseases, Alzheimer, cancers, diabetes, stroke,

The market for nursing home (NH) care and other long-term care (LTC) services is one of the most heavily regulated sectors in the US economy[12], with several quality controls, and check and balances in place. In Macao and many places in China regulation policies are minimal or absent.
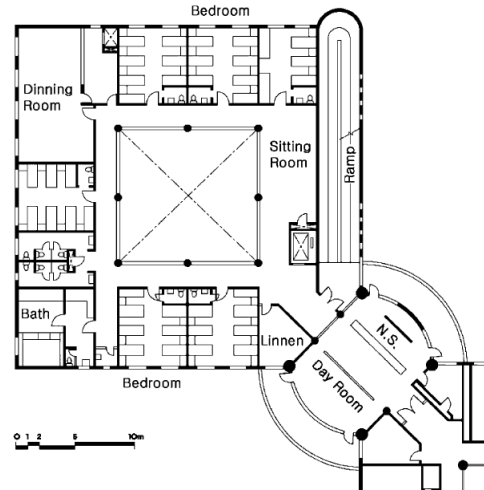
For cases where there is little or no family support, in which medical assistance is needed, it is necessary to also develop special housing models that are additionally expensive for the government and families in special situations (as outlined below). The majority of public inquiries in a research (Soonjung Kwon and Kwango Kim 2005) reveal a preference for 'ageing in place' models, in the habitual residency. The alternative is nursing homes, with different criteria of staff and residents per room that differ from culture to culture as well economic capacity (Fig.5. & 6), with the US, in the top of the list, and Korea in the lower end, among the cases in a study (US, UK, Japan and Korea)

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[11] OCDE report. A good life in Old Age? Monitoring and improving quality in long term care. OECD/ European commission 2013. P. 49

[12] Ibidem OCDE report 2013
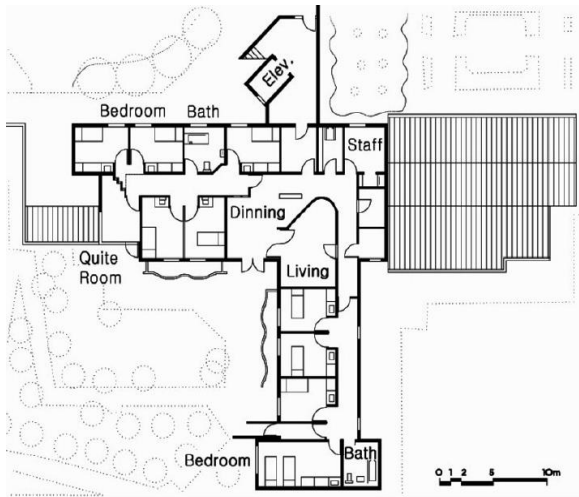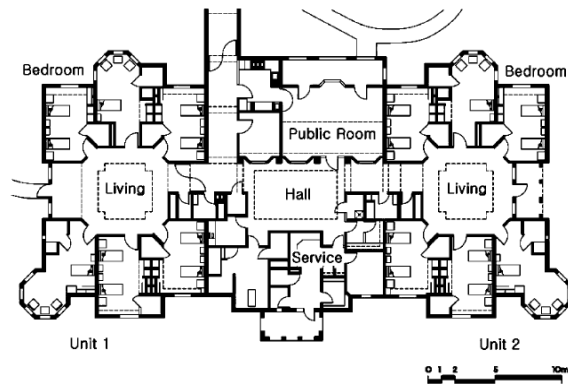
Woodlands Nursing Home, U.K. 1995   *Joonggye Nursing Home, Korea 1995*

Fig.5. Example of Nursing Homes layout in UK and US.

A facility or a city friendly for the aged and multi generation environment are not completed without the proper open spaces with good quality universal design standards, well landscaped, focus in pedestrian use, beauty and safe lively places. These conditions are factor that contributed for citizen's happiness as was defined in a city like Copenhagen[13], which is also the world leader in environmental concern.
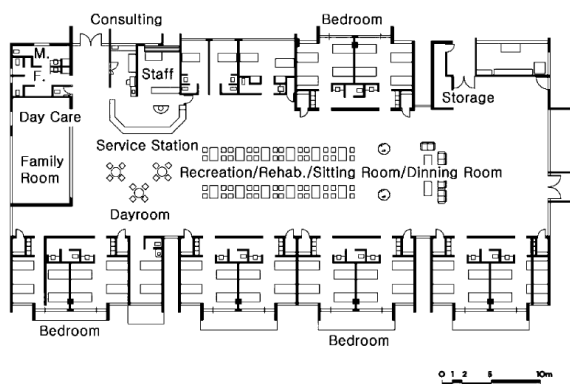
Care Home Sirai, Japan 1995   Parkvue Nursing Center, US 1995

Fig.6. Example of Nursing Homes layout in Japan and US.

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[13] http://www.newworldencyclopedia.org/entry/Copenhagen

The opposite is also true, bad building environments contributes for depression and bad behaviour and unhealthy societies as were the case of the already demolished Kowloon Walled City[14] in Hong Kong or the Pruitt-Igoe Housing Project, St. Louis, Missouri (1956–1976).

To this effect, there is a need for proper design space that allows for these diverse activities: for example, facilities for physical exercise, reading areas, cooking, Tai-Chi, Majong, and chess game, music therapy (group singing or karaoke). The public areas of buildings should allow for communal activities such as Chinese Opera, religious functions, topical medical examinations/consultations, swimming and games, and other ludic pursuits organized by the community. This is possible if the housing designs are flexible, as long as the structure permits flexible layouts as it happens, for example, in office buildings.

Old age may be the time for well-deserved rest, the golden age, etc, or the nightmare or purgatory of having to live alone amongst strangers in an environment that is not familiar, that will contribute to the isolation and unhappiness of the elderly. Accordingly, the present choice of model and type of housing shall affect the future profile of society in Macau, its happiness and harmony.

The quality of housing reflects in some way the quality/capacity of a person/family that lives in that space: "I think that when you invite a person to your home, you invite them to yourself." – Oprah Winfrey (agingplace.com)

Table 1, shown the relation of area per person and beds per bedroom in some of the most developed nations in the western world and Asia. Area distribution is important indicator of the quality of the space (Soonjung Kwon and Kwango Kim, 2005)

Nation	Area per bed of a facility (m^2/Bed)	Area per bed of a residential unit (m^2/Bed)	Number of residential units in a nursing unit	Number of beds on a residential unit	Number of beds in a bedroom

[14] Lambot, Ian & Girad Greg ()City of Darkness: Live in Kowloon Walled City.

U.S.	53.8	38.3	2.6	13.7	1.3
U.K	36.0	23.6	3.2	11.4	1.3
Japan	48.8	32.0	1.5	18.6	1.8
Korea	29.9	15.5	1.4	39.5	4.9
Average	43.7	28.4	1.8	22.6	2.5

Table 1. Comparative map of different housing solutions for the elderly, in different countries.

Size is not a question of fashion but a factor that contributes for the quality of living in the facility. This is manifested in the room size and numbers of beds per bedroom, showing greater density in Korea. The US and UK offers better public spaces inside the facility as well better landscape outdoors. Other characteristics were also analysed in the paper like corridor spaces and cloisters-courtyards, all spaces influence in the quality of the facility.

A fundamental principle is to consider housing a right and fundamental need for the healthy development of the human being, and not only as an economic asset, pieces in market where sole objective is placed in the selling and offering the maximum number of "units", instead of proportioning quality and functionality for extended families (3 generations). There are many studies exposing the influence of housing conditions on human behaviour. Healthy living conditions helps to generate good citizens, while lower or bad housing conditions leads to depressive and crime ridden environments.

Housing should be planned for people and not the other way around, whereas people are "projected" into a space that limits their dignity and freedoms, as is the case in prisons and make-shift refugee camps[15]. Universities, NGO's and government will

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[15] Both Macau and Hong Kong have played a role as refugee cities from the Second World War to the beginning of the Deng Ziao Ping's 'Open Door Policy', in the 1980's. During this period, most citizens were born outside of Macau, but came from immigration of large numbers of

benefit from mutual cooperation in the research and management models of facilities for the aged.

4. Need for shifting the policy of providing quantity for quality and family participation.

The policies of social housing in Hong Kong (from which Macau takes many ideas and formulas) and those of Singapore are practically identical in theory. The "quality" difference that gives the edge to Singapore is the size of the flats, that is much more generous that their counterpart in Hong Kong or Macau. Size is not a question of fashion but a critical need for living with dignity and aging in place.

However, the population of Hong Kong is often discontent and vocal in public demonstration about their problems while, in Singapore, residents are more content. The reason behind this discrepancy is not only due to the high price of housing, but also the space or basic square footage available per unit. Today in Singapore, 95% of the population is a home owner (HDB flats) and there is no longer any housing built in the old 'emergency' planning (small units) models design to accommodate a population living in slums or in inadequate conditions. Housing is generally planned with areas over 75m^2 (seventy five square meters) and options with 3, 4, 5 rooms, alongside executive models, designed according to the needs of the population and with areas varying between 70 to 130m^2, have experienced a strong rise since the 1990's[16].

Another important aspect of Singapore's success is the regulation and control that the government imposes on housing market speculation, allowing for the protection of citizens, the city, and the economy, the nation against national and international crises such as the current financial crises that is affecting the United States and Europe.

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political and economic refugees, and resulting in many areas of the city being occupied by makeshift housing (for example in the areas around the Avenida Colonel Mesquita, the Ilha Verde, the neighbourhoods of Porto Interior, Ka Ho, etc)

[16] http://en.wikipedia.org/wiki/Public_housing_in_Singapore

Once again, the example of Singapore is a good one because it uses efficient mechanisms to control speculation. For example, an investor from abroad must have a local partner to ensure the security and maintenance of apartments, making it easier to keep them 'lived-in' and avoiding the stigma of housing without inhabitants and inhabitants without housing.

Fig.7. Singapore Real Estate and Public Housing (Punggol), both developments with quality of public and private spaces, landscaping, integrated sports/ leisure facilities, commercial and cultural spaces.

Buildings should be planned in a way that allows for expansion, combining or dividing of apartments, adapting to the needs of families in which several generations may live side by side, or in adjoining floors (duplex), with the possibility of direct communication.

The priority in the last decades in Singapore has been to provide universal housing with dignity and quality, with good landscaping practices, leisure and sporting facilities, accessible commercial activity, allowing for a balance of social wellbeing, social pride, and moreover, enabling for the rising value of the real estate market.

Both in Hong Kong and in Singapore, the priority of social housing was to resolve urgent problems, supplying hundreds of thousands of families that lived in makeshift habitation

with a real home. Planning has been oriented towards these pressing needs, such as that of housing the thousands of refugees and homeless after the Christmas fire of 1953, in the slum neighbourhood of Shek Kip Mei. Although it has a different historical context, and a much smaller territory, Macau has simulated urban planning initiatives from Hong Kong, using models of high density housing, not only in luxury residences but also in economic and social estates.

In Hong Kong, a housing authority (HKHA) is responsible for the management of the Housing Estates, the prevention of squatting and for the promotion of housing policies. The authority operates the Tenants Purchase Scheme (TPS), the Home Ownership Scheme (HOS) and the Private Sector Participation Scheme (PSPS).

Fig.8. Social housing in Singapore, with generous interior dimensions and healthy exterior environments, with large green spaces and leisure facilities.

The emergence of the Housing Society (HKHS) with its not-for-profit charitable goals of social development and promotion marked and important shift. The urgent housing problems were resolved and by the end of the 90's the government effectively ended all direct intervention in the residential market, correcting the abuses of the PRH (Public

Renting Housing) through a moderate policy of privatization and home ownership (through the Home Ownership Scheme), followed by a PSPS (Private Sector Participation Scheme) and the introduction of a strategy of HPLS (Home Purchase Loan Scheme), with the purpose of promoting social stability (Chiu 1994), of these the BFS (Build for Sale Scheme) being the most stable.

The objective of this policy, both in Hong Kong and in Singapore, was to increase social stability and support for government. The policy resulted well in Singapore but not so in Hong Kong, in our opinion, because of the quality of housing available, whereas Singapore had an offer of more spacious quality apartments. The problem is not the policy but the quality of the final product, which can either represent a dignified home or a much-improved cage for humans.

Often the misused concept of "free market" helps speculation, frame working urban development focus on the social housing policies and projects that are mushrooming in many Asian cities. This development model favours quantity not quality, thus sacrificing quality of life. In reality, there is no 'free market' in housing, because it is not affordable to the majority of citizens, due to the limited number of companies that can compete for auction in land plots. Only a restricted commercial elite can purchase land lots at the inflated prices presented in public auction, and thus fuelling the government strategy of using land sales to support the public coffers. While in Macau the main source of government revenue is linked to the casino industry, there is no need to copy the Hong Kong model, created in colonial times.

Considering the limited land resources in Macau, real estate speculation greed camouflaged in "free market", should be regulated.

Otherwise there is the risk of neglect basic need of citizens, a human right, and not a speculative asset for improvement of finances. Because of this speculative environment, the allowed 'free market' in real estate policy in Macau and Hong Kong has contributed to the social imbalance and the creation of effective 'ghetto' communities of the disenfranchised, which represents a policy contrary to those supported by the United Nations (State of the World Cities 2008/9 Harmonious Cities, UN-Habitat).

In Hong Kong, the benefit of the investment in real estate is a pillar of the economy, alongside being an international financial market and stock exchange. The pillar of the economy of Macau, and of the government's public finances, is not the real estate market but the gambling industry, tourism and a variety of service-based sectors. While the real estate market has a limited impact on the economy, it can have a strong negative impact in society quality of life and tourism by creating a 'jungle of cement' in such a small territory,

In case the government decides to adopt a similar strategy to that of Hong Kong, prioritising housing over other industries, it would be necessary to provide less land for the building of casinos, just as suggested in the original plan for COTAI, before the liberalization of the gambling market, where it was allocated the construction of 150,000 homes for local residents, 80,000 for non-permanent residents, in conjunction with public facilities[17] like schools, parks, sports facilities, hospital, day centres, market.

5. Applying modern and scientific policies of integrated urban planning, instead of the short-term planning sector-based system

What differentiates a developed city and society with high quality of life and that of an underdeveloped city or society is the planning and models of sustainability. After the Second World War, the majority of cities in Europe and Asia suffered from a state of complete ruin. Urban planning policies that addressed both the urgent housing needs, alongside infrastructure dedicated to education, sports and leisure, and cultural contributed to the success of countries that applied these overreaching long-term investments, in recovery and betterment of the human condition in individual and social terms. In Asia, the example of Singapore exposes how a city of slums and high crime rates was converted into one of the greenest and most 'advanced' cities in Asia, even the world, due to the highest quality of planning models, and rigorous and effective implementation of a sustainable vision for urban social policies.

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[17] Revista Macau 1998, special issue. p.7

The key to success resides in the long-term planning process which requires time. Short-sighted solutions, without serious and scientific studies, accounting for social, environmental and urban impact, lead to the accumulation of more problems. Quality solutions require time, to allow for the participation and input of specialists in different fields, such as health, education, landscaping, sports, architecture, transports, infrastructure, etc. Unfortunately, the 'fast food' type models imported into Macau are not the best for health and development of families in the city.

Instead of destroying the green areas which serve as the city 'lungs', other resources should be considered, such as the conversion of abandoned or unused industrial buildings (considering that most of the industrial activity of Macau has 'moved' to Zhuhai where real estate and remuneration rates are more competitive).

As promised by the government, and following the national and international recommendations, Macau would benefit from greater transparency in information and processes of use of modern methods in urban planning, including the creation and sharing of a GIS (Geographic Information System) that will help managing the city (Traffic, Schools, residential, health networks) as well to develop an interactive and update Master Plan. The lack of reliable data regarding the occupation rates of buildings, function distribution (commercial, residential, public), etc makes very difficult to determine the present situation of land usage and future housing needs. The 3D map of the city created and supplied for public use, like the one elaborated by Beijing Tsinghua Urban Planning & Design Institute with the cooperation of Macao's government, should in fact be at the disposal of institutions with responsibility in Planning, instead of being used exclusively for private service of one institution. An open and intelligent design and management of cities required the cooperation and partnership of the citizens.

Fig. 9. Application of GIS and 3D models for public consultations and effective integrated planning, resulting in higher participation levels and better solutions. Image from www.3D Macau.com

6. Better integration of the urban grid into models of vertical density construction, avoiding screen effect, blocking ventilation and pedestrian permeability.

Quality of life is link with quality of design. The old estate models, with high level podiums and towers that do not account for natural ventilation, should be avoided, as they impede on the fluidity of pedestrian life, as well as landscaping, tree plantation and green areas.

The mega plot structure model depicted in the figure 10, it is unfortunately very common in Hong Kong, being exported to several cities in the region, like Macao. This concept of large podiums in the ground level, topped by a monolithic tower, is a formula imported from Hong Kong. It is a model that creates urban fortresses that block the natural flow of air and ventilation, defeating any effective landscaping at pedestrian street level. Moreover, it poses additional affronts to pedestrian mobility, security and fire risk. All this is contrary to the concept of ecological sustainable city, and green building precepts, making it difficult to find worse models of social urban planning.
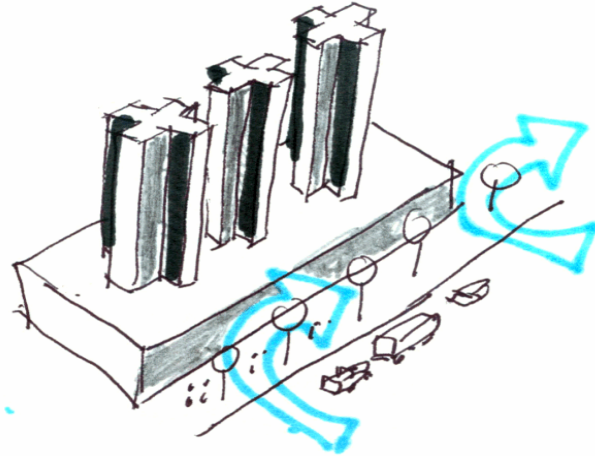
Fig.10. Negative impact on the urban fabric of large 'podium block with tower on top', a model imported from Hong Kong. This urban model creates walls that block the natural ventilation, disrupt landscape areas and create major difficulties to the mobility of pedestrians at the ground floor. The model goes against all desirable precepts of sustainability and green environmental design. Sketch by author.

A better solution for urban integration, allowing pedestrian permeability and flexibility as well providing a walk able environment and human scale is to liberate zones for pedestrian use, relocating underground the large block podiums. Automobile traffic and parking zones at an underground level contributes for better ventilation, natural landscape, reducing pollution and allowing for greater number of quality public spaces which are in fact essential for the healthy development of the elderly and children. Moreover, parking structures could be space-optimised in automatic parking silos, having the added benefits of lower pollution levels, higher parking capacity and greater security.
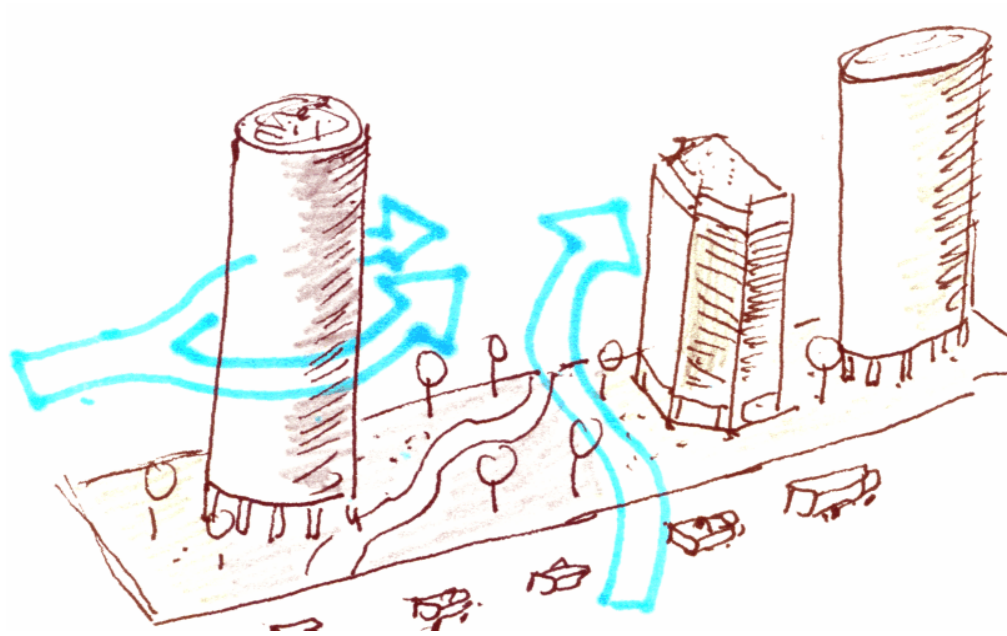
Figure 11. Represents a better urban integration model, allowing for a more sustainable and greener city. The building (residential, commercial, parking, etc) without podiums and enabling for better public spaces at pedestrian level (especially for the elderly and children), facilitation urban ventilation patterns and better parking infrastructure. Sketch by author.

7. Change of the isolation policy (of island territory) to one of openness and integration

The national development plans for China, of which Macau and Hong Kong are integral part, promotes cooperation for the reduction of the urban-rural gaps and contribute for increasing the mutual benefit in several areas like, economic, cultural, tourism, etc. Distribution and integration of regional diversity may also be applied to housing policy, similarly to the way it has already been integrated in education, with the transfer of Macau University to the Hengqing Island, serving simultaneously the residents of Macau and Zhuhai.

Macau is has a limited territory, on which it is unsustainable to continue building 'cement forests' in areas that critical and characteristics to the city, such as historical heritage zones, green spaces, leisure zones, all of which are essential to the integral and healthy development of the human being.

Fig. 12. Hengqing Island plan, providing for SPACE for the integrated and sustainable development of Macau, supporting the diversification of activities

Fig. 13. Diagram explaining the national concept of 3 axis and 4 levels of development for Macau, in the Pearl River Delta
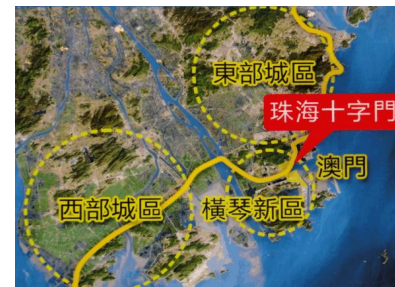
Fig. 14. Connectivity vectors and development of the panoramic corridor for the costal zone

The connectivity and integration of Macau and neighbouring regions is a reality, from the planned bridge to Hong Kong to the relocation of Macau University to Hengqing Island in Zhuhai, as well the actuality that many of Macau's citizens now reside in Zhuhai. Having space resources available in the neighbouring territories allows the city to maintain and preserve the essential areas for health, culture and tourism, instead of destroying them to build 'cement forest' housing units and destroying mountain in mainland China for land reclamation use.

8. Inter-regional cooperation contribution for ecological and sustainable development

The smart option is to one that is more ecological, although needing some political negotiations is more sustainable than the isolate development of cities. Macao will benefit from this cooperation by reducing or eliminating the need of new land fields that

destroy the riverside of Macau and mountains in China. Urban development friendly of the green environment, will help to release the construction pressure in the very small and overcrowded territory of Macau, where new constructions aggravated the pollution, traffic, Urban Heat Island effect, contributing for creating one of the most polluted and unpleasant cities on Earth. The graphics below shows the current anti ecological practices, as well the green alternatives, like creating a bridge and develop housing for Macau in Henging, a solution that is more efficient in ecological terms, but also faster (average 15 years) because there is no need of create a land field and wait for its consolidation before being safe to raise buildings in the unstable lands conquered to the river.
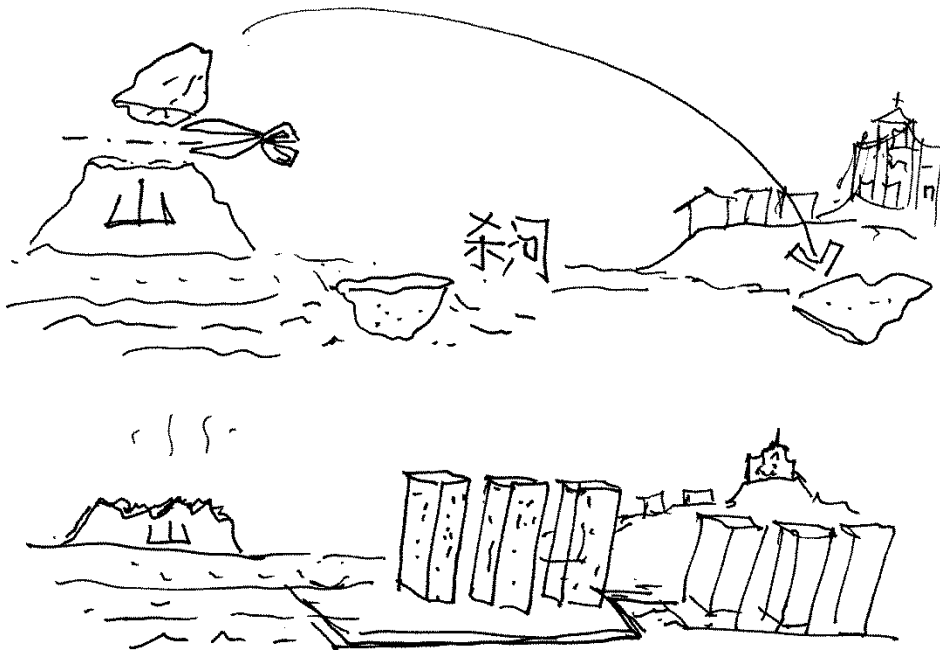

Fig 15. Destroying the mountains in mainland China and destroying the river for creating new urban areas for housing and other purposes is neither ecofriendly, a love for the country, neither sustainable

or the fast solution.

Fig 16. The faster and better solution is to create bridges and develop in areas that have space and scarce population, like Hengqing Island (less than 10,000 inhabitants for an land bigger than Hong Kong Island)

Macau territory is too small, already with a hyper density, and with the increasing population, and has no capacity and quality to accommodate an increasing population (following the current growth) that is estimated to reach 800,000 citizens in 2030, a more than a million in 2050. Simply there is no space in Macau, housing states have to grow outside the small peninsula in the neighbouring regions of Zhuhai and being communicated by modern, clean and large capacity means of public transportation.

This sharing and outsourcing of land for residential development will free Macao from the pressure of construction of towers and will help improve the tourist attractiveness as well to improve the quality of life of its citizens and visitors.

Fig. 17. New CBD Shijimen Zone with connections to Macau (image from journal Ou Mun Iat Bou*, 29 June 2010)*

9. Conclusions

Asian developed countries are rapidly approaching the 2050 "ageing Tsunami" a consequence of the demographic winter that will have dramatic consequences in national economy, social structure, security and stability. China is facing a scenario for the above mentioned reference year of with 25% of its population above 65 years old.

The response of several governments in Asia for accommodating the fast immigration of the majority of the rural population to cities, like Hong Kong, Singapore, Macau, for example, was to provide high density residential units through the building of high rises containing very small units, permitting a density of 2,000 inhabitants per tower. (Gutierrez et al, 2002). This scale of numbers is the "goose of golden eggs" for property developers. However this high housing formula worked well in an emergency situation, that was the case during the 1950-1960's, but created side effects, like scattering the traditional multi-generation Chinese families, in small flats across different estates in the city, making different to have mutual support, a key element for the success of the formula "ageing in place". Without this support, the aged members of the family find isolated and without support of the family when they need most. To fill in this need of social assistance the state have to step in, trying to fill the gap left by the family, thus creating a burden to the state, a burden that increases as the numbers of the ageing

population keeps growing. Not surprising, in Hong Kong, the poverty numbers keep increasing, particularly among the aged members of society.

Singapore realized the trap of building small social units that scatter the multigenerational systems and contribute for small families that create a deficit of youth population, thus favouring the ageing of society and increasing government expenses in social care.

Macau is a territory with large economic and financial resources and thus it is unjustifiable to continue supporting construction of low economic quality. The 'cement forest' model is not compatible with the Macau and Chinese governments' vision, of transforming Macau into an 'international centre for tourism and leisure", and provide quality and harmony for the city's resident families, plus creating an ageing and poverty scenario very similar to Hong Kong. It is time to reconsider this out-dated model and look for creative solutions, with more cooperation with the neighbouring regions like Hengqing, which will promote a better eco environment and improve the quality of live and sustainable development of cities.

Fig. 18 & 19. Image comparing Macau reality of forest of cement (left) with the concept for Tianjin Eco city, with quality exterior and interior space design, a solution that is possible within the ample grounds of Hengqing.

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[i] http://en.wikipedia.org/wiki/Aging_of_Japan

[ii] http://en.wikipedia.org/wiki/Aging_of_Japan