

POLSKI UNIWERSYTET NA OBCZYŻNIE
W LONDYNIE

ZESZYTY NAUKOWE

SERIA TRZECIA, NR 3, 2015

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HABITAT 21.
THE SELF-SUSTAINING, INTELLIGENT
CITIZENSHIP COMMUNITY. A NEW MODEL
OF HUMAN SETTLEMENT / AGGLOMERATION

*The harmony between opposites
constitutes the essence of the World.*

BACKGROUND

Humanity from the start of its existence has striven to create the ideal social and physical environment. Towns and the built environment are a manifestation of the political, social, economic and spiritual force of values of the period.

The best example of the above aspirations is illustrated by garden cities devised by Ebenezer Howard devised garden cities, who in the 19th century developed his analysis of society into programmes for the physical environment, description of ways of life, town diagrams, using these images as political tools for social change. This example testifies the power of urban / architectural images showing the potential of new socio-physical forms to support healthier, happier ways of life.

At the beginning of the last century, as a reaction to the then existing socio-political situation, there arose a new movement – modernism. The aim of modernism, being a progressive intellectual position with a number of connotations (social, economic, political, spatial), was the creation of a „New World” to end poverty and social inequality. Architecture, town planning and engineering in this period, were seen as the main tools that would lead to social / political transformation.

The Agenda 21 at the UN Rio de Janeiro Earth Summit in June 1992 to adopt „sustainable development” policies was followed by the EU summit in Lisbon 2000 („Knowledge based economy”), but implementation of posited ideas on global and local levels remains unsatisfactory.

Rapid technological development in the last 50 years and a number of new and various offshoot industries (eg. Information Technology, Virtual Reality) are accelerating the process of civilisation across the entire world. This brings increasing and quantifiable benefits to people, but, is at the same time accompanied by some negative environmental effects. Also society itself has lagged behind the dynamics of technological development leading to social problems which are widening.

Single-use housing development, nursing homes / sheltered housing built exclusively for the elderly are hardening social divisions and fostering senility. Schools – with their institutional structure sustaining passive education. Sport complexes – which tend to underpin the concept of the majority as passive spectators of commercialized sports entertainment.

These require to deepening of knowledge of man’s environment within the field of cultural anthropology, a broader image of the ecology of the life of man:

- The sociology of urban agglomerations, applied environmental psychology, the taxonomy of behavioural science to satisfy the functional and aesthetic needs of a diverse set of people.
- This is because users change with time, new repertoires develop and values of society shift.
- Towns / urban agglomerations – centres of information, transportation, communication and social interaction – defined more than any other parameters by increasing demands for energy, which is the heart and the life-blood of our civilisation.
- The exponential growth of use of IT (information technology) and VR (virtual reality) as a new technologies that have fundamental influence on the organisation of future urban structures aiming for self-sufficiency.

The above, as well as decreasing traditional sources of energy with their negative influence on the biosphere, require progressive solutions as well as a holistic approach in order to improve the existing situation. It also constitutes a challenge

to provide a new proposal of broad-scope model settlement to achieve a balance in the environment within the sphere of technological achievement through creation of new social structures – The Self-Sustaining Intelligent Citizenship Society.

HABITAT 21

The urban agglomeration / community unit capable of performing important social, civic and cultural functions can be defined – from an ecological standpoint – as sustainable if it can generate all necessary resources and render any arising pollution harmless.

INTRODUCTION

The aim of Habitat 21 (H21) is the creation of a New Model of Human Habitat – an innovative, flexibly designed, intelligent urban agglomeration, a plan the main purpose of which is to integrate human activity in space and time, to achieve – in the broad sense – self-sufficient social community groups, coherent agglomeration – the size of which is dictated by market forces.

APPROACH

It is proposed to use Goal Satisfying Methodology (GSM) / Environmental Design Field (EDF) to achieve the above goal – the creation of the Habitat of the 21st century.

GSM integrates a necessary spectrum of expertise and concern, including Building Information Modelling (BIM) management, ensuring co-ordinated and communicable inputs at all levels. It also leads to greater identification, responsibility and pride for all those taking part in this process after completion.

This approach will not only guide new development proposals, but will at the same time address the need for upgrading quality of life for our society, where people enjoy living, working and spending their leisure time, leading to happier and healthier society.

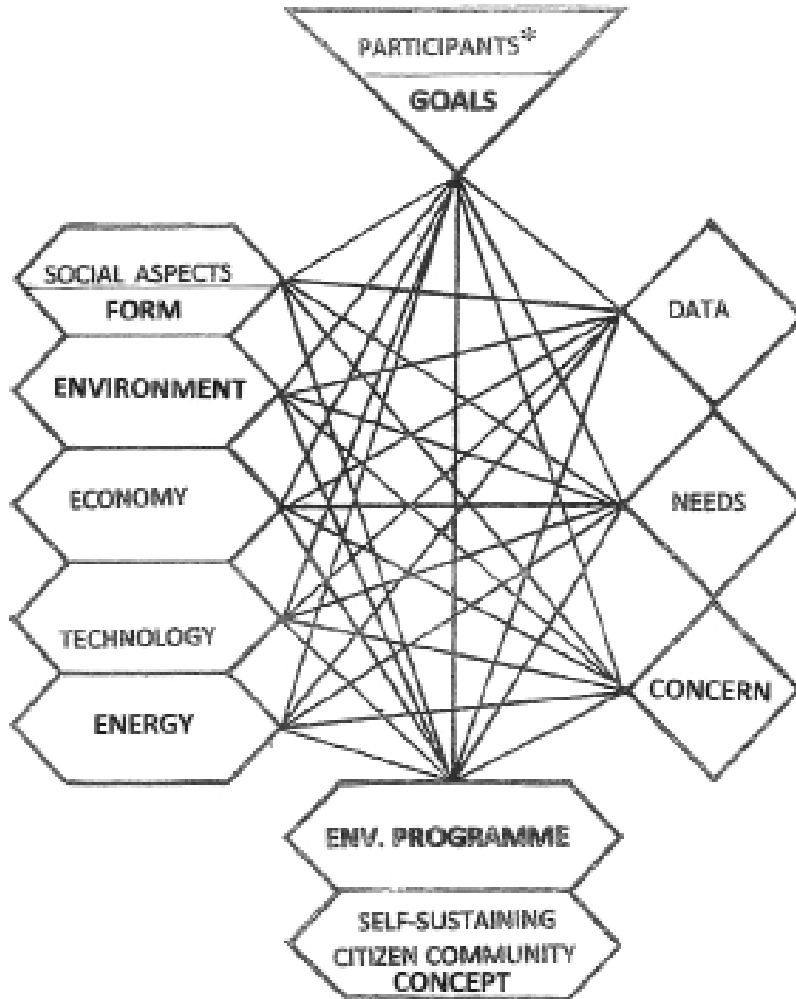
THE SELF-SUSTAINABILITY PROGRAMME

This forms a broad platform for the development of resources and facilities to meet the rising expectations of the „consumer” of the built environment, which will match human environmental needs and the environment.

The broad platform of the self-sustaining community should address the following main aspects of existence :

1. Domicile and work – the habitat concept attempts to achieve consistent environmental quality for society as a whole.

DIAGRAM 1. GOAL SATISFYING METHOLOLOGY
USER NEED ENVIRONMENTAL PROCESS



* Spectrum of all necessary professional disciplines, Sc. Institutions, Soc. organizations, developer, contractor
Source: prepared by Włodzimierz Bronic-Czerechowski

2. Education – oriented to the future, focussed on the main stages of human life, replacing the present passive increasingly obsolescent education system. The main objective of a new proposed system should be development of pupils' abilities to learn to their full potential throughout their life and acquire the ability to relate and choose through social interaction / integration. This should lead to the creation in the future of a new social structure – the intelligent citizenship community – and through „SEED Programme” – society (SEED – sustainability, environment, energy, demonstration).

3. **Health** – requires development of programmes emphasizing prevention, encouraging physical activities complemented by a new food retailing concept, which may well revolutionise present shopping systems and bring significant benefits to society in general („Eco-market 21” – W. Bronic-Czerechowski, deposited to London’s Patent Office).
4. **Leisure and Recreation** – to provide playgrounds, sports, cultural activities within walking distances of parkland. Local centre facilities all within walking distance (under 10 min.).
5. **Servicing infrastructure** – should form the basis of the self-sustainability of an eco-community where ultimately buildings will become a major energy source, including energy through solar technology.
 - **Waste** – to be processed on factory lines to produce product of value to industry and agriculture.
 - **Water** – conservation programmes to ensure recycling for industrial processing and non-potable domestic use.
 - **LED lighting** – saving energy out and indoor.
 - **Communications** – home automation, use of most recent technology.

CONCEPT OF A NEW MODEL OF HABITAT – H21 (SEED)

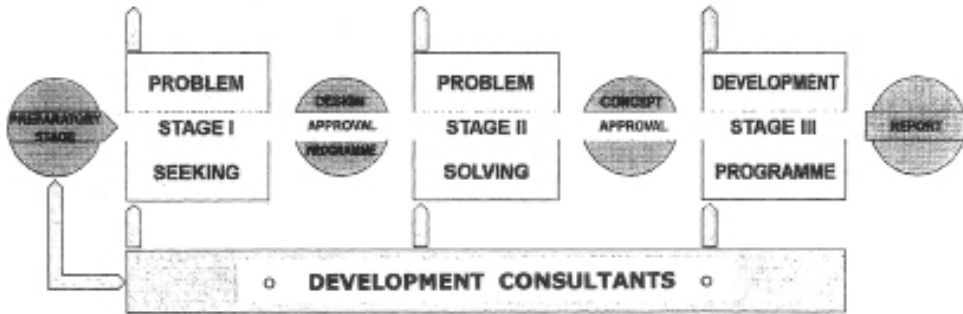
The development of sustainable, culturally stable citizenship communities is the key requisite for the future prosperity of any country.

The concept of a new community will rationalise human settlements, optimising life under habitat conditions, humanising the relationship between home, work, a new education system and recreation. The habitat concept attempts to achieve environmental quality for all residents, as they will have authentic contact with nature in mixed-use settlements.

Site selection should be carefully considered, preferably with the south exposition, uncontaminated and not in proximity to landfill sites, as it could have a profound effect on habitants’ health. This is because the environment rather than genetic factors pose the greatest risk to health.

The socio-economic aspects – viability determines size of the eco-community at approximately 60 ha, including parkland (approx. 40 ha planned land use and parkland settings – 20 ha). 40 ha comprise approximately 2000 households (approx. 5000–6000 inhabitants), which can support all necessary amenities and generate sufficient energy. The cost of the proposed manufactured housing system – to be viable – requires a production minimum of 2000 dwellings p.a. The cost would then be lower than that of traditional construction by up to 20%.

DIAGRAM 2. PRE-FEASIBILITY STUDY PROCESS DIAGRAM
 (USER NEED ENVIRONMENTAL PROGRAMME)
 ◦ CLIENT / USER / SOCIAL ORGANISATIONS ◦



MOBILISATION	ENV. ASSESSMENT	APPROVAL		APPROVAL	PROGRAMME	RECOMMENDATION
	POLICIES				CONSTR. BUDGET	
GOALS	STRATEGIES		OVERALL DEVELOPMENT PLAN			
	PHYSICAL				PROFITABILITY FORECAST	
	SOCIAL		SCHEMATIC DESIGN			
ACTION PLAN	COMMERCIAL				SECONDARY BENEFITS	

Source: prepared by Włodzimierz Bronic-Czerechowski

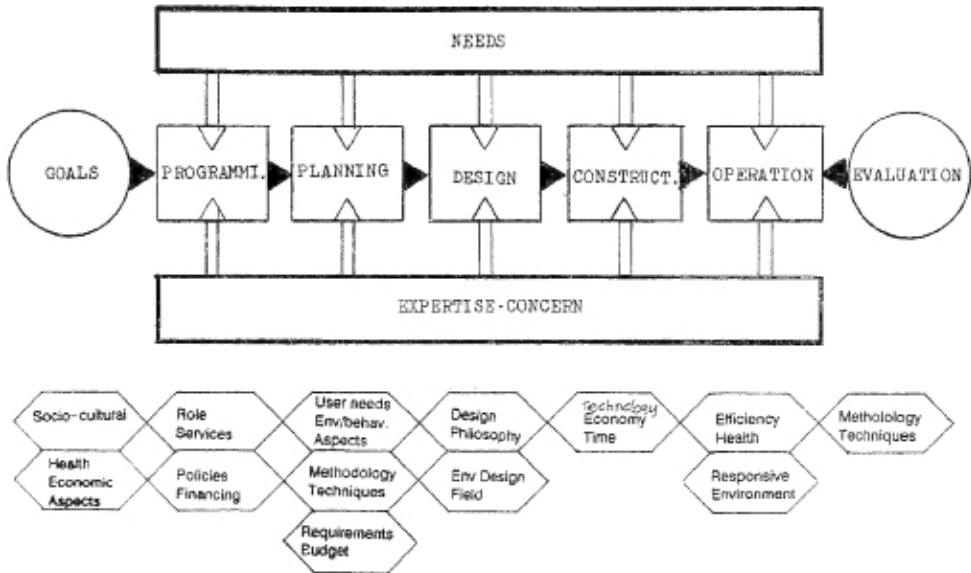
The proposed Self-Sustaining urban agglomeration contains approx. 14 000 households for 35 000–40 000 residents. Total area of 420 ha.

The eco-cell of the Self-Sustaining Community comprises a cluster of 20–30 dwellings plus elderly (frail) housing, the layout of which promotes habitants’ interactions, integration by providing communal meeting places (barbecues etc.) and playgrounds. It is also proposed – to make it special place – to provide translucent „artificial clouds” generating energy by day and reproducing it when required in the form of glowing light from the sky. A composition of colour, festival of warmth and welcome („solar technology” – organic liquid polymer more durable than silicon sprayed on translucent plexiglass / or thin translucent PV film).

The Community Core – comprising the community centre, new type of management-governance, services employment, commerce, health, cultural and recreation entertainment facilities. The artificial clouds could also be created at central areas. An appropriate mood could then be created to meet requirements of place, time and events, thus positively influencing the users’ behavioural patterns.

Parkland – adjacent to the community clusters and its centre, contains schools (with nursery classes), sports, recreational facilities. Plants to be selected for their ability to absorb carbon dioxide and release oxygen.

DIAGRAM 3. DEVELOPMENT DIAGRAM
(USER NEED ENVIRONMENTAL PROGRAMME)



Source: prepared by Włodzimierz Bronic-Czerechowski

Mobility – pedestrian network proposes walking distances well below 10 min. to services and educational facilities, health, recreational and parkland, work, public transport as well as cultural facilities. Thus encouraging pedestrian movement as well as directly linking local areas with the agglomeration centre via an additionally proposed covered pedestrian moving pavement. Collector roads will link communities to the main road and agglomeration centre. Minor access roads will serve community clusters without encroaching onto pedestrian routes.

Public transport will use an electric bus service. It is anticipated that in the future all private cars will become electrical as this technology is becoming more popular and widespread. A railway station at the agglomeration centre will connect the habitat to the nearby city centre and other major towns. In view of the rail renaissance, in the future, some consideration should be given to the creation of a solar powered vacuum trains system.

INFRASTRUCTURE

Habitat 21 will evidently allow for the most efficient infrastructure, the minimising of vehicular traffic due to easy pedestrian accessibility to all types of facilities.

Servicing infrastructure – the H21 community concept embraces a range of options for building design extending from low use of energy to the generation of power through the use of solar technology within the construction of the dwelling unit and recycling waste to energy.

Lighting holistic master plan – intelligent network gives not only streets and key urban landmarks the energy efficient LED light treatment (energy saving above 80%), but can also be used as the foundation for indoor environments and artistic events.

Communications – to assist in achieving further savings in household running costs and increased comfort H21 proposes full home automation to control accessibility, security and safety, environment, entertainment, monitor energy and water consumption. Also, the expected arrival times of buses / trains and tapping into an environmental advice channel, as well as use the most efficient communication system.

Water conservation programmes will ensure that „grey” water is recycled for irrigation, industrial processing and non-potable domestic use.

Waste and refuse – the eco-community will be equipped with a vacuum system for collecting, separating, reprocessing and extracting chemical-free end product of value to industry and agriculture.

Sewage treatment plant

Population of 5000

Sledge produced per day	60 m ³
Energy spare per day	12 therms
Recycled water treated per day	410 m ³

Refuse

Dry waste per day	5028 kg
Energy	24,640,000 BTU's
Recycled water would be an increasing resource to be exploited.	

The cost of the vacuum drainage plant is dependent on the area served, if the site is 40 ha only, there will be saving of about 30% irrespective of the population.

By using gas from the sewage plant to fire incinerator, the heat reclaimed from the refuse incinerators would provide 3000 gallons/hr (913 650 i.) of domestic hot water at 65°C, sufficient to provide the daily hot water requirements of approx. 1000 households. The cost of such a project would be in the region of 10% above the cost of providing a traditional infrastructure. However, there will be saving on land area and return on the by-products.

Therefore the infrastructure of the new H21 model, renewable energy as well as an integrated waste management strategy forms the basis of self-sufficiency leading to a balanced environment and „0” carbon dioxide emissions.

GOVERNANCE

It is proposed that the community of Habitat 21 will form – through management governance – their own water authority, not only to make use of purified rainwater but also to recycle urban waste, sewage and refuse for energy consumption and for agricultural purposes (organic fertilizer), thus attempting to make a substantial contribution to cost reduction for the habitant (local taxes) and to achieve **ecological equilibrium**.

NEW GENERATION HOUSING

A key part of H21 comprises the concept of a flexibly-designed housing system. The system is integrating in an **innovative way, through the use of the newest cutting edge technology in the manufacturing of residential units** (automated laser controlled erection management system). Social / technological solutions (photosynthesis, iodisation) with effective and low cost construction methods are implemented, while utilising high quality architecture.

The system allows for organisation and alteration of internal living space in accordance with changing needs and / or user lifestyle. The innovative, flexibly designed structure offers a place to live, which is within the reach of various social groups / classes – equally for the younger generation entering into „adult” life. In view of the sun’s therapeutic properties, all living rooms, bedrooms and conservatories, as well as gardens, are designed to face south.

THE HABITAT 21 DELIVERY

It is proposed that delivery of the Self-Sufficient Intelligent Citizen Community, a new model of Habitat 21, will be undertaken by a newly formed International Development Corporation, a public-private partnership, which will include construction and finance entities in its composition.

The use on a wide scale of the planned new urban structure SEED – the integration of science, technology and art – will also lead to the formation of a new social structure, Citizenship Intelligent Society.

WŁODZIMIERZ BRONIC-CZERECHOWSKI

HABITAT 21. NOWY MODEL OSIEDLA / AGLOMERACJI MIEJSKIEJ

STRESZCZENIE

Budownictwo mieszkaniowe w Polsce – wg statystyk GUS – zajmuje w stosunku do potrzeb, w prawie wszystkich wskaźnikach, jedno z ostatnich miejsc w Europie.

Miasta określa bardziej niż jakiegokolwiek inne parametry rosnące zapotrzebowanie energii, która stanowi **serce i puls naszej cywilizacji**. W Polsce zasoby energetyczne obliczane są na jedno pokolenie, bowiem około 50% energii elektrycznej konsumują obiekty budowlane, którą w około 95% generuje spalanie geopaliw.

Nagły rozwój technologii w ostatnich kilkudziesięciu latach powoduje przyspieszenie procesu cywilizacyjnego na świecie, przynosząc wymierne korzyści ludzkości, jednocześnie powodując zjawiska negatywne. Społeczeństwa nie nadążają bowiem za dynamiką zmian, powodując pogłębiające się dysproporcje w środowisku ludzkim, skupisk miejskich.

Powyższe, jak i zmniejszanie się tradycyjnych źródeł energii oraz ich ujemny wpływ na biosferę, wzrastające problemy z usuwaniem odpadów miejskich wymagają nowych, progresywnych socjotechnicznych rozwiązań **holistycznych** – szeroko pojętej antropologii kulturowej, koncepcji nauk behawioryzmu – ekologii życia człowieka.

Wielobranżowy Projekt nowego modelu osiedla **Habitat 21 (H21)**, innowacyjnej struktury urbanistycznej i socjalnej, wytycza nowe kierunki oraz formy przestrzenne architektury i urbanistyki, ruchu pieszego i kołowego, transportu.

H21 adresuje aspekty: nowego systemu edukacji, zamieszkania i pracy, zdrowia i rekreacji, nowego systemu zarządzania. Stanowi propozycję zrównoważonego, samowystarczalnego osiedla społecznego, racjonalizującego i optymalizującego jakość życia człowieka.

Wielkość społecznej jednostki mieszkalnej / aglomeracji miejskiej, dyktowanej przez rynek, zapewni spełnienie podstawowych funkcji socjalnych, ekonomicznych, ekologicznych, przestrzennych, jak i politycznych.

Kluczowym elementem **H21** jest innowacyjny, generujący energię odnawialną, elastycznie pomyślany, różnorodny system mieszkaniowy integrujący – przy użyciu ostrza najnowszych technologii – rozwiązania socjalne i techniczne z efektywnymi, niskimi kosztami nowych metod konstrukcji, przy zachowaniu wysokiej jakości budownictwa.

Innowacyjny typ zabudowy o nowych formach – integracja nauki, techniki i sztuki – oferuje miejsce zamieszkania osiągalne dla różnych grup społecznych, młodego pokolenia, pozwoli na organizację przestrzeni mieszkalnej według zmieniających się potrzeb oraz stylu życia użytkownika.

Infrastruktura H21 stanowi nową propozycję strategii energii odnawialnych lokalnej generacji i dystrybucji, zintegrowanych z gospodarką odpadami miejskimi. Holistyczny masterplan inteligentnej sieci elektrycznej – oświetlenia ulic, kluczowych elementów miejskich, dominant, jak również wewnątrz inteligentnych budynków, łącznie z bezprzewodową, rekordowo oszczędną, ultraszybką komunikacją – prowadzi do oszczędności energii ponad 80%.

Powyższe stanowi podstawę samowystarczalności, prowadzącej do zrównoważonego środowiska, bez zanieczyszczeń biosfery (zero CO₂, CFC, HCFC).

Implementacja pilotowego osiedla **H21** ze środków prywatnych lub w partnerskim układzie prywatno-publicznym stanowić będzie paradygmat innowacji, podniesienia konkurencyjności, prowadzącej do rozwoju miast w Kraju i UE. **Zastosowanie** na szeroką skalę nowego modelu **H21** osiedla / aglomeracji miejskich, nowych struktur socjalnych – Programu **SEED** (akronim: *Sustainability, Environment, Energy, Demonstration*) – zmierzać będzie do stworzenia nowej obywatelskiej kultury społecznej, zdrowszego fizycznie i duchowo **społeczeństwa wiedzy**.

Realizacja obiektów o znacznie niższych kosztach nabycia miejsca zamieszkania i użytkowania, spowoduje ożywienie rynku mieszkaniowego, przemysłu budowlanego i przemysłów pokrewnych (meblarskich, elektrycznych itd.), prowadząc do rozwoju gospodarczego, bowiem podnoszący konkurencyjność nowy typ budownictwa mieszkaniowego – z uwagi na powyższe konotacje socjalne, ekonomiczne i technologiczne, przestrzenne, jak i polityczne – stanowi koło zamachowe rozwoju gospodarczego każdego kraju.

Słowa kluczowe: Habitat 21, zrównoważone środowisko, ekologia, energia odnawialna, nowe struktury, zarządzanie