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New forms of dwelling – sustainable urban communities

1. Introduction

New types of settlements have been built world wide, offered as answers to the urban crisis of large cities and representing experiments of new settlement lifestyles closely knit with the open spaces with many features of sustainability. Although these settlements differ and are being built in different parts of the World, they do have many features in common and can be coined eco-settlements. Their development is based on good transport connections influenced by the development of information and communication technology. Receiving information and possible electronic links with distant places allow the establishment of numerous activities in suburbs and the countryside, that were formerly predominantly located in cities (commerce, administration, production etc.). In sustainable agrarian communities, nature-friendly types of agriculture are gaining in favour.

Small settlements similar in size to villages are known, but they can also be bigger and composed of several smaller units. Often they are pilot examples of new settlement types, often financially supported, at least in the early stages, by particular countries and various foundations.

2. Characteristics of eco-settlements

There is no general definition of eco-settlements. However the so coined communities do have certain common features:

- **human scale** and emphasis on **social community ties**,
- **participation of members** in settlement management and improvements, a kind of self-government,
- tendencies for replacing **social values**: the classical capitalist value system where economic gain and high income of the individual and constant growth of efficiency are the main indicator of success, is being replaced by other values, above all stressing the quality of life,
- **comprehensive** settlement design with maximum level of independence,
- human activities are **sustainable**, i.e. with minimal effects on natural processes while simultaneously supporting healthy human development,
- **social and economic stability** of the settlement, that can successfully develop even in the future.

The **human scale** of the settlement implies a community composed of such units where all the inhabitants are familiar with each other and where everybody feels ones influence on the communities development. Experience shows that the upper limit of such a unit is 500 inhabitants. If the group is larger it can become over bureaucratic or decompose into several separate parts. The noted size applies to very stable living conditions. Under conditions of typical for a dynamic post-industrial society, where employment and residential circumstances can easily change, the size is even smaller, even less than 100 people. In the Danish communities they established that 30 households and 75 people is the upper limit, still providing a sense of a compact unit. They also showed that in order to provide variety and full experience, the lower limit also has to be set, i.e. at least 15 households or 40 people. Therefore the units have to be suitably dimensioned, ensuring familiarity, and not too small, thus providing a plurality of population groups and their activities. An adequately dimensioned group also ensures safety (security) in the settlement (Context Institute 1994).

Comprehensively designed settlements are those, where all the main functions of life (living, work, shopping, social life, and leisure) are manifested in balanced ratios and intertwined. Contrary to such orientation, in most settlements of the industrial society, these functions are separated into housing, production (industry), commerce, recreation, transport etc. The size of most exceeds the human scale. The concept of eco-settlements replaces their large scale with specialisation and integrated functions, so that eco-settlements can become an understandable micro-cosmos of the whole community.

The latter doesn't imply the possibility of an eco-settlement to function self-sufficiently or isolated from the neighbouring communities, as can be explained on the example of employment. Within an eco-settlement there should be a certain number quantity of employment possibilities for its inhabitants, but daily migration to work (within or outside the settlement) cannot be avoided completely. Certain services and other activities cannot be placed in all the communities, e.g. hospitals, universities, cultural institutions, airports etc. Certain institutions however can be positioned in adjacent settlements, as is the case in the Mondrogon co-operation (Great Britain). With suitable organisation of

activities and networking between settlements even larger institutions can operate successfully. On the smaller scale (concerning local functions) these communities nevertheless can be fully functional.

The goal of these settlements is that human activities are sustainable, and **bio-centric orientation** is manifested in the relations between humans and nature. People should be aware of their position in the natural system and respect its principles. The opposite principle is the economic-ethical principle, with emphasis on satisfying human needs from the aspect of profitability. Similarly the anthropocentric principle also cannot apply to balanced sustainable development, allowing humans the right to an humane environment and suppresses activities that can create a hostile environment as such, while simultaneously not seeing that human activities run in conjunction with natural processes.

Sustainable principles of eco-settlements are:

- high level of preserved natural habitats,
- production of healthy food, obtaining wood and other bio-resources with respect to preserving systems,
- recycling waste products as much as possible,
- refraining from using products with negative impacts on the environment,
- low energy consumption and use of alternative systems for its production (wind, solar energy).

Parallel to these sustainable principles the aspect of **healthy human development** is also important. Here one should point out, that without healthy individuals these communities couldn't be successful. Healthy development is seen as a balanced, integral development of all aspects of human life: physical, emotional and mental. Such healthy development should be manifested in the life of individuals and even the whole community.

The desire for **social and economic stability** should provide successful development of the settlement even in the future. The goal is to establish communities that will be successful in the long run by respecting all the mentioned principles. They should include economic, social and environmental aspects and refrain from in-ecological activities.

3. Layout and organisation of the settlement

In the sense of **optimal spatial organisation** of the settlement layout, it is necessary to observe:

- harmonic integration of the settlement into the environment and its *genius loci* (aspects of geography and specific climate): respect to existing local circumstances, topography, system of subterranean water, vegetation, micro and macro climate,
- adequate development density,
- respect for balanced relations between public, semi-public and private space in the settlement layout,
- planned mix of spaces of residence and work, mixed land use,
- separate organisation of car traffic and parking, within the settlement pedestrian and cycling traffic should prevail,
- maintaining as many natural and green surfaces as possible, surface greenery on buildings etc.

Construction measures, applied to eco-building, are:

- correct orientation of buildings,
- paving material for roads, allowing drainage of rain water,
- instead of canal systems for draining rain water, vegetation systems and surface drainage of water should be introduced,
- zoning of spaces according to heat consumption hierarchy,
- using the South facades of buildings for accumulating heat
- execution of roof constructions with maximum heat retaining capabilities,
- insulation of all external surfaces, insulation of windows against loss of heat, use of multi-layered glazing for windows and green houses,
- protection against heat and cold with selected vegetation,
- use of passive and active solar energy,
- use of soil and vegetation for preserving heat, use of thermal pumps,
- climatic reflective zones adjacent to windows, doors (integrated green houses, winter gardens, potted plants on window ledges),
- balancing of humidity and temperature in the building with adequate wall and floor construction that retain heat,
- maximum use of recyclable energy resources,
- use of natural and ecologically suitable materials without chemical or radioactive emissions,
- economic use of water and use of rain water in a separate system (for watering plants, cleaning, flushing toilettes),
- economic manipulation of waste matter in construction and households,
- using local building material etc.

4. Examples of various urban communities, eco-settlements

4.1 Chrystal Waters (Australia)

The project has been running since 1985. The main emphasis is on the settlements social structure and joint decision making by all the inhabitants. The work of McHarg (*Design with nature*, 1969) influenced its creation, the first »permaculture« village. Well thought out land use prevails. The design of the settlement and particular houses aims at integration with the natural surroundings, also by using natural materials.

4.2 Cerro Gordo (Oregon, USA)

Cerro Gordo is a model of a suburban eco-unit, started as a demonstration and research project. It lies on the banks of Lake Dorena, near the seat of the Oregon University. Here they introduced new principles of management, planning and economic support, with emphasis on the cultural aspects of life. The project is not envisioned as a community of the select few, but as a prototype of a general community of the future. The proposed land use layout was also heavily influenced by the work of McHarg.

4.3 »Cohousing« – Danish method of designing and organising a community

For quite some time the Danish have been researching and experimenting with new types of living in residential communities, where the interplay of co-operation, openness, joint activities are emphasised. According to their experience the ideal size of such a unit is 18–25 families. Some of these

units are placed next to each other in rows so that several units can mutually organise common service activities, such as day care centres for children, shops and other services.

The common surfaces assume various shapes:

- The open space is composed of gardens and playgrounds,
- The buildings contain larger common rooms for social gatherings, usually a large kitchen and refectory, as well as a common laundry; certain communities have music rooms, play rooms, workshops, offices and rooms for guests.

The design principles follow those stated by Christopher Alexander in the book »A Pattern Language« (Alexander, 1977):

- **Strong social ties** between the inhabitants are important. Organising spaces for human contacts is more important than designing private places. Pedestrian paths should enable meeting although excessive pedestrian routes can diminish contacts. Open spaces intended for informal meetings should enable surveillance from private places. The main common space should be the starting place of all paths leading to separate homes;
- **Addition of separate communal units** enables the provision of more common services, such as day care centres for children, common programmes for the elderly, cultural events, workshops and education;
- **Placing individual housing units in rows** implies lower energy consumption, better pedestrian access to individual homes and common spaces and prevents the feeling of anonymity, as seen in high-rise residential buildings;
- **The common building** should be located on a visible and accessible site. Its design should stimulate ties and communication. It has to be large enough to facilitate a common kitchen and refectory, meetings and social gatherings. The furniture should be comfortable, with intimate lighting and good acoustics. The furniture shouldn't appear regimented, but homelike;
- **Open spaces** are organised as public, semi-public and private; passages from one to another should be transparent, stimulating communication;
- Common playgrounds for children have to be included and surveillance from homes enabled. Their design should be colourful;
- Each housing unit should have its own entrance and backdoor to the garden;
- Units of different sizes and shapes have to be provided. Their design should be flexible allowing expansion;
- Private units can be relatively small, because the community has common rooms for meetings, social gatherings, guests etc. Even the private kitchens can be smaller; emphasis is given to common, organised meals. In the future the common rooms will supposedly grow and the private units will become smaller, as was shown in the research findings on needs;
- Car access is limited, the inner space of the settlement is segregated for pedestrians and children;
- The community should be organised in such a way, that it could facilitate working from home; common office space should be adequately equipped with computers, computer links, fax and copying machines etc.

4.4 Centre Aztlan – an example from Latin America

They are trying to establish a self-sufficient agrarian community. The most important source of income is the land, but also a cultural design centre, crafts and activities. Ten years

ago they started a plantation on rather poor, infertile soil. With natural additives and fertilisers they improved their yield and managed to create fertile surfaces, as well as forested areas. The centre of the community is a renovated and adapted hacienda from the 17th century, built in stone, bricks and wood. These are the materials also used for building homes; they are equipped with solar collectors, equipment for rationalising water consumption, recycling material etc. Because of substantial initial investment, they aren't as yet financially self-sufficient, but will be in the near future.

4.5 High Wind, USA – an example of a community built in 1977

The people live in new and older homes. In 1980 they built the first bio-home, a new energy efficient concept, whose construction was sponsored by the government. Since then, 4 homes were built, environmentally adapted by their building concept, use of passive and active solar energy and subterranean storage of heat. The community has large expanses of land for food production, but income is obtained from other activities as well (book and record shop for alternative groups, networking centre, publishing and printing their newspaper).

4.6 Foundation Ganas, Staten Island, New York

The community has 50 members living in five Victorian type buildings. The main goal of the community is to promote individual thinking and better co-operation in solving common problems. They support different ideas, inclinations and lifestyles.

4.7 Ballerup, Denmark

New principles, applied in the settlement design and organisation:

- the new neighbourhood works better, than a small town
- easy access to public transport is important, an acceptable pedestrian distance is a 10 minute walk,
- diversity and intertwining of urban functions,
- emphasis on high quality architecture, variety and differences,
- variety of population groups according to income, profession and age,
- it is managed as a self-governed community,
- urban ecology is important (green surfaces, construction materials, architecture),
- because of its human scale, the settlement is composed of different complexes of 20–50 housing units,
- included are privately owned, non-profit and social homes.

5. Conclusion

Certain individuals envision eco-settlements as traditional villages. However eco-settlements are not traditional villages, but represent a post-industrial phenomenon. They grew from present needs and possibilities of our information society. Their development is separate or within the framework of urban and suburban areas.

The main reasons for their creation were:

- large numbers and densities of people, anonymity and isolation of individuals in large cities,
- new techniques and technologies enabling better long distance communication,

- desires for closer ties with nature,
- new level of consciousness, namely, that physical space and natural resources are limited commodities.

As late as the last three decades, new needs and views concerning necessary changes and sustainable lifestyles have been formulated. Even new technologies blossomed to the necessary level enabling changes in work patterns. We are of course at the beginning of a long period of transforming urban, suburban and rural space.

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Pictures

Picture 1: *Chrystal Waters (Australia): layout of the centre and views (source: Context Institute 1994; 32, 33)*

Picture 2: *Cerro Gordo (Oregon, USA): surfaces near the Lake Dorena (source: Context Institute 1994; 35, 36)*

Picture 3: *Example of the Danish cohousing movement, representing several communities with differing settlement design and architecture. These are responsive to the mentioned sustainable principles, but also active and passive use of solar energy, subterranean storage of heat, reuse of water, compost toilettes etc. Nearby is a wind driven electric power plant – Halsuaes peninsula (source: Context Institute 1994, 46, 47, 50).*

Picture 4: *Centre Aztlan, Querétaro, Mexico, where solar and wind energy are also exploited (source: Context Institute 1994; 61,62)*

Picture 5: *Examples of communities: High Wind, Plymouth (left) and Ganass, New York (right) (source: Context Institute 1994; 68, 69, 107)*

Picture 6: *New neighbourhood Ballerup, North-west of Copenhagen (source: Hartoft-Nielsen 1995; 58, 59)*

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Legal measures for achieving sustainable traffic in European cities¹

1. Introduction

Legal measures play an important role in achieving sustainable traffic in European cities. These measures substantially co-create the traffic system by alleviating traffic, choice of traffic modes, managing traffic flows etc., thus diminishing their environmental effects. Despite their utmost importance, these measures are effective, if they are a part of comprehensive traffic concepts.

The article presents results of the research project LEDA(2), financed by the General directorate for traffic with the European commission, within the framework of the 4th general programme of research and technological activities of the European Union (in continuation EU). 15 partners from 9 EU member states and 5 accession states took part in the project. The project was co-ordinated by the Regional institute for regional and urban development in Dortmund; Slovenia participated with a team from the Urban Planning Institute.

The aim of the project was to research those legal measures on the European level, that are suitable for redirecting traffic demand to benefit public traffic and non-motorised urban traffic. The focus of the project was directed into research of whether and under what conditions, particular measures can be transferred to countries with a different legal system. A part of the research was a comparative study of best measures Europe wide, distinguishing the LEDA project from others with similar topics. The goal of the project was also to help decision-makers on the local level in designing traffic systems.

The article starts with the starting points, i.e. the basis for the research concept. Methodology and results of the project follow them. In conclusion the main findings of the research are presented, as well as their relevance.

2. Starting points of the project

The enormous growth of passenger and freight traffic in most European countries is causing numerous problems. These are most dramatic in cities and their hinterland: congestion, accidents, pollution, consumption of energy and space, changed settlement pattern, loss of urbanity etc. Redistributing traffic modes from predominantly private motor vehicles to public transport and non-motorised modes, is the most common method of solving the problems. In European cities promotion of sustainable traffic modes is implemented in different ways and on different levels, based on different rationale and, above all, different measures:

- education and information measures focusing on establishing public consciousness about present problems with promotion of using public transport and non-motorised traffic modes;
- measures in infrastructure involve proposed construction that strengthen the role of sustainable traffic modes in new development, as well as changes in present infrastructure;
- a wide palette is offered by financial measures, reaching from parking prices to road tolls and various taxes etc.;
- legal measures applying to the concrete legal order, above all adoption of new laws and amending old ones, as well as other bylaws and legal norms;

The LEDA project is focused on the last group of measures and is therefore different from all previous projects dealing with similar issues, but seldom tackled their legal aspects. The legal aspect of measures is nevertheless extremely important and can have a decisive role in the long-term success of particular projects.

Although the project dealt only with legal measures, other measures that have a strong legal component were also included in the research. Segregating a separate lane for buses is a typical example of infrastructure measures, but because of division of the available road corridor and limited