REPORT 4

SUSTAINABLE DEVELOPMENT AND THE FUTURE OF CONSTRUCTION INDUSTRY IN HUNGARY

GYÖRGY KUNSZT

SCIENTIFIC SOCIETY FOR BUILDING (ÉTE)
Fö U 68
1027 Budapest - HUNGARY
Tel : +36 1 201 8416 - Fax : +36 1 1561215

with the cooperation of

LÁSZLÓ BÁNHIDI
ANDRÁS SOMOS
ÉTE

ANNA GÁSPÁR
BAU-DATA

GÁBOR MADARAS
ÉMI

NATIONAL REPORT

CONTENTS

1. PREFACE

The International Council for Building Research and Studies CIB established its Working Commission W82 in order to carry out future studies on building and construction. This Commission started in 1995 a project to deal with prospects of sustainability in the field of construction.

In Phase 1 of this project participants tried to define the notion of "sustainable construction". At the start of Phase 2 the title of the project was fixed as "Sustainable development and the future of the construction industry" and it was decided to take 2010 as the closure of the period to be discussed. The very aim of Phase 2 became to get preliminary national answers to five questions accepted by participants at the beginning of Phase 1. Having discussed these preliminary answers at the end of Phase 2, "Instructions" had been worked out how to prepare detailed national reports in the framework of Phase 3.

The "Instructions" presented a slightly modified set of the original questions and this set was accepted by the participants.

It was accepted too, that the aim of Phase 4 will be to compile an international synthesis of the analyses having been made in Phase 3 on national level.

The present study tries to answer the questions put in the "Instructions", following an Introduction which intends to give a general view of the Hungarian situation; it was accepted by participants at the discussion of the "Instructions" that the national reports should present general surveys of the countries in question, trying to give impressions about the social, economic and environmental constraints prevailing in the given countries.

It was also required to describe the methodology used when elaborating the individual national studies, completed by an appraisal of the study by an organization independent from the team preparing the study.

The authors of the present study had been trying to fulfill all these requirements.

2. INTRODUCTION

2.1 Preliminary remark

People concerned in problems of *sustainable development* may meet serious conceptual difficulties arising from logically incorrect extensions of the original meaning of this expression.

The original meaning of the expression "sustainable development" referred to the fact that certain features of modern economy, certain fascinating achievements e.g. in the industries or in transportation technologies resulted in grave ecological effects. It was concluded that neither any kind, nor any degree of economic, industrial or transport development is sustainable when ecological damages have to be avoided.

This was a conceptually stainless usage of the expression.

Confusion started when the notion of sustainability became used for negative phenomenons having nothing in common with industrial or transport technologies which induce ecological failures. An outstanding example of this is *poverty,* stressed so extremely in so important planetary documents dealing with sustainable development as the Brundtland-report or the "Agenda 21" accepted in Rio.

It is quite clear that certain degrees of poverty should not be tolerated, the negative phenomenon of poverty is, however, not an outcome of development but an outcome of the lack of it. That means that in certain cases the problem is not the *sustainability of development but the tolerability of underdevelopment.* As a consequence of this: should somebody be interested in clearing the full set of the negative features of the situation he (or she) had to deal with both of these aspects of reality, that means with the sustainability of the development just as well as with the tolerability of the underdevelopment.

As a compromise the two aspects might be coined into the unified expression:

sustainable development and underdevelopment

It might be argued that a remark of this type is very informative when preceding the national report of a country struggling with heavy problems of underdevelopment or at least with problems of a socially very unbalanced development.

In the case of the least developed countries not represented so far in the sustainability-project of CIB W82, the problem of underdevelopment is of crucial importance for all aspects of construction activities. The remark done here was made having in mind also the problems of the sustainability issue of the least developed countries.

2.2 Economic, social and environmental constraints of the overall development in Hungary

2.2.1 Economic and social constraints

The economic constraints of Hungarian development are partly an outcome of the more than four decades rule of a political and economic system having a very low efficiency. They are also partly a consequence of a very difficult transition from the formerly planned East-European economy to the market economy of the Western hemisphere including all the other parts of the world which already are extremely significant from the economic point of view.

Before the collapse of the COMECON about 50% of Hungarian exports went to Western and about 50% to Eastern Europe. After the collapse the COMECON market became almost totally lost, because the so called socialist countries became unable to pay for the goods they imported regularly from Hungary. In the same time these goods were not competitive enough on the Western market. All this meant that the overall export decreased in a substantial measure and this induced a serious decline of the GDP.

A further difficulty arose from the fact that - well before the collapse - the Hungarian government took considerable loans from foreign (mainly from private Japanese) sources in order to avoid political disturbances in the country. As the government was not able to repay the loans, the first governments of the transition period inherited a grave foreign debt. As - in the meantime - the GDP decreased seriously and - in the same time - all the imports had been liberalized, the stability of the national economy became extremely threatened.

Fortunately, from the late 80‘s the Western capital became more-and-more interested in investing in the Hungarian economy and from the early 90’s in buying Hungarian firms being near to competitiveness. General Motors, General Electric, IBM, Ford, Philips, Suzuki, Audi, Siemens and others (often even large size construction firms) came in and in some industries exports started to grow definitely.
Other industries became, however, obsolete or even bankrupt and as even in the most profitable privatized firms the number of employees was greatly reduced, a high rate of unemployment followed. A high number of profitable minor and a number of medium size Hungarian firms came into existence but these have been unable to counterbalance unemployment significantly.

In consequence of all these changes the governments were forced to take drastic measures in order to save stability. The basic step was a heavy reduction of the real value of salaries and pensions, followed by strong reductions in the costs of education and health care. Due to these measures the foreign debt was reduced considerably. In the same time incomes in the successful firms and branches (banking, trade, some services, etc.) became fairly high. It was recently published that the average of the

economically most successful 20% of the population is seven-times larger than the same value of the economically most helpless 20%. This is an unheard-of ratio in a formerly "socialist" country: there are a few hundred thousand people able to live on a really luxurious level and a few hundred thousand being fairly near to starvation and becoming frozen.

A serious segregation of the Hungarian society is in progress and it is heavily aggravated by the situation of a rapidly propagating ethnic group: the gipsies. For the time being they constitute about 5% of the population of the country; their integration into the society is extremely difficult and the period of political and economic transition is extremely disadvantageous for them: they represent the group the most exposed to unemployment and many of them live under miserable conditions. One of the most serious difficulties of their integration is their cultural backwardness in spite of their talent for music and arts occurring so often among them. Under the given circumstances a relatively high number of gipsies are driven to irregular behaviour, sometimes to crime.

In case of the bulk of the Hungarian Society the birth-rate is very low, one of the lowest in Europe. The aged part of the society is already fairly high and it will be considerably higher in the coming decades. In the last few years the population has already started to decrease, in spite of immigration which has been kept low up to now. This is partly due to the fact that most of the (often illegal) immigrants want to use the country only as a transitory home, as a - rather hopeless - step in coming into the West. Illegal immigrants live mostly in camps. The number of Yugoslavian refugees is still fairly high.

Both Hungarian and foreign experts think that from now on a significant improvement of the Hungarian economy is very likely: the worst of the troubles of transition seems to be over. A substantial, further restructuring of the economy and of the society is, however, even in this case indispensable. This further restructuring will very likely concern industry as well as agriculture and in a very high degree the realm of services.

2.2.2 Environmental constraints

Pollution of the natural environment

The main domestic sources of *air pollution* are vehicular traffic and some industries. The situation is worst in Budapest and in the neighbourhood of thermal power stations scattered in the country. Car density is much too high in the capital lacking parking places and facilities; due to the unfinished highway-ring surrounding Budapest a considerable amount of foreign and domestic lorries must pass through the inner parts of the city when making international or long-distance domestic deliveries, etc. Not all the thermal power stations and portland cement factories are supplied with up-to-date filtering facilities and this causes serious damages in the vegetation and in the settlements nearby. It is a permanent struggle for keeping air pollution values below European standards.

Practically all the rivers of Hungary arrive from foreign countries and consequently a considerable part of the *water pollution* is due to foreign contaminations. The situation is seriously aggravated by Hungarian industries and by Hungarian cities as well. The network of public cleaning plants has to be developed or updated significantly, and further measures inside of industrial plants should be demanded very strictly.

The *pollution of the soil* is in some parts of the country very serious, partly as a consequence of uncontrolled usage of fertilizers, partly as an outcome of the gap between municipal water supply and sewerage. The pollution of the soil induces the pollution of the subsoil water which makes in these regions availability of drinking water very scarce.

As practically the whole area of the country is a lowland having only smaller regions built up of gently sloping hills there is no reasonable possibility of creating hydro power stations. Due to this fact the energy supply of the country had been based on thermal power stations run by using low quality domestic brown coal. As even these coal mines are getting to be exhausted and as also the domestic oil wells give only a very modest contribution and also due to the fact that some uranium was found a few decades earlier, a fairly large nuclear power station was created, which provides roughly half of the energy needed on a national level.

Management of wastes involves the most striking dangers of course in the case of the nuclear power station. The station had been built before the collapse of the Soviet Union and according to the original contract the Soviet partner took upon himself the responsibility of removing the nuclear wastes and burying them in Soviet territories. After their collapse the future of this service became somewhat uncertain, although it has been continued. Nevertheless, for the sake of absolute future safety, the Hungarian nuclear power station decided to build its own cemetery; this was the largest project using reinforced concrete which was realized by Hungarian construction firms in the last years (involving also British subcontractors).

The total amount of solid wastes generated in 1992 had been 84 million tons. From this amount the share of hazardous industrial and agricultural waste was 4 million tons. The amount of municipal solid waste was equally 4 million; the construction and demolition waste came to 8 million tons that time. The waste management is not fully solved: e.g. in 1992 still more than 10% of the municipal solid waste was not treated at all.

The state of the built environment

In 1993 the population of the country was roughly 10 million and it was living in just over 3000 settlements. Almost 2 millions were living m the capital and 1,2 million in cities having 100.000-300000 inhabitants. Almost 2000 settlements had less than 1000 inhabitants and more than 1000 had less than 500. The overall population of these very small villages had been almost 1 million. Due to a fairly dynamic rate of urbanization a considerable proportion of the younger population is abandoning its

native settlement and is migrating to the cities; there are villages where the population decreased to some dozen old people. A number of the almost empty villages are occupied by strata of the society which have a high birth-rate and have difficulties in getting integrated into the society as a whole (mainly gipsies). Some abandoned villages are getting to be used by well-to-do groups for recreational purposes.

The dwelling stock is estimated as almost 4 millions dwellings for a population of about 10 millions people, one has to take into account, however, that a high number of houses in abandoned villages are empty and the housing stock of many cities is very old lacking due maintenance and repair for several decades. The situation is especially grave in some districts of Budapest which are getting to become slums; after a few serious catastrophies a growing number of houses had to be evacuated because their structural safety became very dubious. Renovation and reconstruction of the aged part of the housing stock is one of the most pressing challenges of the Hungarian economy.

The neglected renovation and reconstruction of the housing stock is mainly a consequence of smashing its private ownership at the beginning of the Stalinist rule in the country and allocating it to a state which was subjected in that time to the Soviet claims of the cold war. From 1990 the privatization of the housing stock is in progress and is almost finished. Nevertheless, the renovation and reconstruction activity remained in the field of low-cost housing extremely low as a consequence of the economic weakness of the new owners, who mostly are the old inhabitants themselves buying their homes for a low price well below the real market value.

The richest group of the society constructs relatively luxurious new houses for their own purposes. This part of the society is, however, not interested in low-cost housing and the Western capital which supports a vibrant construction activity hardly finds the area profitable. They are attracted mostly by hotels, office buildings, banks, industrial plants, warehouses, garages and even highways, these latter in form of concessions. From time-to-time there is an interest also for abandoned plants of bankrupt industries and agricultural facilities if they may be easily rebuilt and used for new functions. The construction-minded Western capital often uses also Western construction firms in Hungary.

The Hungarian state, the municipalities and the churches support a series of construction works which can not get financed by profit-oriented resources. In Budapest attractive, neomodern, "high-tech" architecture was produced for building a new centre for information technology at the Budapest Technical University, and in the same style a huge national headquarter for the police was erected. This institution became heavily overburdened by corruption scandals and crimes characteristic for a transition society. The "hightech" architecture in Budapest often applies special, imported building materials. In the countryside a relatively high number of medium and small size municipalities created cultural centres and numerous churches have been built to satisfy needs neglected for several decades. Most of the countryside cultural centres and churches have been realized in a newly emerging special style of

Hungarian architecture called "organic" and using often indigenous building materials to considerably reduce costs strongly.

2.2.3 Key-issue of the Hungarian development up to 2010

The most important characteristic of the Hungarian situation is that the country is one of the so-called "transition countries" of Central and Eastern Europe turning from a planned to a market economy. The problems of this transition was analyzed thoroughly in a study titled **"The Market Shock"** - An AGENDA for the Economic and Social Reconstruction of Central and Eastern Europe." The study was published by the Austrian Academy of Sciences/Research Unit for Socio-Economics, Vienna, 1992 and it was prepared by the so-called AGENDA GROUP consisting of 28 experts coming from 16 countries.

According to "The Market Shock" the transformation approach of the countries in question contained three basic measures:

(i) economic liberalization through the abolition of controls over prices and production;
(ii) macro-economic stabilization through control of the money supply and balancing of the government budget;
(iii) the sale of state property to private individuals and corporations*

Hungary, Application of the first measure resulted in 1990 in an inflation of 35% in, 50% in Czechoslovakia and 60% in Poland whereas it came a bit later to about 1000% in Russia and the Ukraine. Further features of the change became a serious decrease of the real value of wages and a serious rate of unemployment. A heavy struggle started in all these countries to manage the task of transition applying all the three measures mentioned and this resulted in the Central European area making progress and promising in Eastern Europe in very slow progress. In a short period of time the Central European countries (including Romania) identified the most important goal of their socio-economic development as to become members of the European Union. To achieve this they have to fulfill a number of crucial requirements stated from the side of the European Union: a low rate of inflation, closely approaching a balance of payments and a balance of the budget, as well as many other (also ecological) preconditions.

* It has to be remarked that due to the statements of "The Market Shock" these - in order to avoid major disturbances of the transition process - should be accomplished by five other ones as follows:
1. Making the Socio-Economic Context;
2. Creating the Market;
3. From Destruction to Production;
4. From Economic Emergency to Growth;
5. Making the International Context.

As for Hungary there is a chance to become a regular member of the European Union by 2000 or - in a worse case - somewhat later. Anyhow - as it is known also from the example of Spain and Portugal - the correct, or at least an acceptable integration may need even 10 years after the formal declaration of the membership. This means that from now (1997) on even to 2010 the very priority is and remains for Hungary to achieve membership within the European Union and ensure this works well. According to the conviction of the governing and also of the majority of the opposition parties within the parliament all the other problems and tasks of the Hungarian society and economy have to be subjected to this heavy priority. This should be valid - of course - also for the Hungarian construction industry.

3. GENERAL CONSEQUENCES OF THE MAIN ISSUE OF THE HUNGARIAN DEVELOPMENT ON THE SUSTAINABLE CONSTRUCTION IN HUNGARY

As the main issue of the Hungarian development up to 2010 is the achievement and the stabilization of the EU membership, ideas concerning the sustainable construction have also be derived firstly from the views prevailing in the leading member countries of EU often generated originally by American experts.

According to this we accept the definition of sustainable construction given by Charles Kibert in 1994 which says that:

> "*sustainable construction is the creation and responsible maintenance of a healthy built environment, based on ecological principles, and by means of an efficient use of resources*"

In the same time we tried to stress on several occasions that in a high number of countries there are very unhealthy built environments (or at least subenvironments) which can not be abolished and rebuilt in a sustainable way due to the lack of adequate economic resources, and this problem should be taken as a substantial concern for sustainable construction. In spite of our efforts at some meetings of CIB W82 the Kibertian definition remained unchanged, although it is out of question that there are depressing slums and masses of homeless people even in some of the most developed countries.

In a similar way we consider the Kibertian model for surveying ecological principles, resources and phases of the building and operating process as a very productive one, although we think that the human resources and the clearance of miserable urban areas are indispensable.

We think that research efforts done in some EU countries represented in CIB W82 aiming at the development of a system of requirements for sustainable construction gives us an excellent possibility for orientation and save us from making in-depth work

on such abstract requirement systems. The work done by the French, the Dutch, the British and the Finnish members of W82 should be valued highly.

So we can concentrate on our special problems of sustainable development and the problems of construction in this development framework. As said our main issue is to achieve and stabilize EU membership for the country; this means that in the construction field those tasks have priority which serve to fulfill this membership goal, and tasks irrelevant from this point of view have not much chance to get substantial priority.

Let us see our special problem areas by trying to answer the "ancillary" questions put by point 2. of the Instructions.

4. SPECIAL CONSEQUENCES

4.1 Cities and transportation networks

As it was described in the part of our INTRODUCTION dealing with the built environment, about 2 million of the population is living in a metropolitan area (Budapest), 1,2 million live in cities having 100 000 – 300 000s inhabitants and almost a million (cca 800 000) lives in villages below 1000 persons. The remaining 60% of the population is living in settlements between 1000 and 100 000 persons; one third of this (a bit less than 1 million) live in cities having a population of 20 000 - 100 000 inhabitants. Should we take 20 000 as the boarderline between the rural, and the urban settlements, we could say that the ratio of the rural and the urban population is about 50-50%. Due to the Hungarian legislation the urban population larger as a number of settlements below 20 000 inhabitants are legally (and often also factually) cities.

Now, a considerable rate of urbanization is characterizing the country's society, with the consequence that a serious decay of the built environment is in progress in some rural areas (especially in villages below 1000 or even below 500 inhabitants) and - in the same time - the pollution problems of the major cities become graver and graver. Some towns having industries which turned to be obsolete in the last few years give special cases of environmental decay.

There is a consensus in the country that the development of the medium-size towns and cities (50 000 - 300 000) would be most preferable, it is, however, accepted also fairly unanimously, that before 2010 there are neither governmental nor municipal means to influence these urbanization processes significantly. Changes depend mostly upon decisions of the foreign and partly the indigenous capital as to the location of new investments. Up to now the western part of the country has been preferred by foreign investors almost exclusively, creating an almost threatening difference between the Western and the Eastern region. A governmental program to counteract this loss of

regional equilibrium is under preparation and even foreign aids are foreseen for solving this crucial problem.

As to the positive side of the national consensus concerning the basic construction tasks aiming at the improvement of the built urban environment, it is agreed that the country has to concentrate on the transportation networks connecting us to the neighbouring countries as well as the transportation networks we have within the country and within our major cities, firstly within Budapest. It is agreed that the development of the transportation networks should have the priority both from the economic as well as from the ecological point of view. This development is the crucial prerequisite of the overall economic progress as well as of a decisive reduction of the air and noise pollution in metropolitan and urban areas.

Economically it is of utmost importance for Hungary that it lies at the intersection of the roads connecting Western Europe to the Balkans and West-Southern Europe (Italy e.g.) to Ukraine and Russia.

In the same time it is only the superhighway between Vienna and Budapest which is finished as yet and the construction of the superhighways to Kiev, Bucharest, Beograd and Zagreb reached only the half of the distance from Budapest to the Hungarian border. This work should be finished as quickly as possible.

The most pressing shortcoming of the domestic Hungarian road network is the fact, that the superhighway connection of all the major cities is (or will be in the next phase) running through Budapest which is very disadvantageous: It is a further important construction task to overcome this shortcoming.

As both the international as well as the domestic road network is heavily concentrated to Budapest it is of utmost important to have a superhighway ring encircling the capital city. As a matter of fact: only the southern part of this ring has been already constructed; it is an urgent task to finish the northern part too.

Last but not least also a substantial extension of the underground railway system is indispensible in Budapest. A part of the extension should be finished before 2000, the entire program may run, however, even up to 2010.

As far as the principles of a sustainable urban development are concerned, our experts responsible for planning consider the practical problems arising the most clearly expressed in the *ECE Guidelines on Sustainable Human Settlements Planning and Management* (ECE/HBP/95; ISBN 92-1-116646-2) as follows:

- "How can the use of raw materials and energy be reduced in building and construction? How can construction waste and waste from building demolition be reduced and their recycling increased?
- How can the amount of energy used in buildings and the emissions produced (mainly sewage) be reduced?

- How can the treatment of solid wastes in the human settlements sector be made more efficient and recycling increased?
- How can the consumption of energy in the human settlements sector's transport system and their emissions be reduced?
- How can we preserve the coherence of the landscape in order to consider the ecological, aesthetic aspects, as well as opportunities for outdoor pursuits, and how can we maintain existing ecocycles between urban and rural land?
- How can we conserve, establish and develop the continuity of the green part of the landscape or green corridors?"

Some additional and more concrete tasks are listed in a chapter of the *Transport Policy of the Government of the Republic of Hungary* (Budapest, 1996) titled *Urban and Metropolitan Transport*. Some items of this chapter are the following ones:

- "In urban transport, so as to reduce congestion as well as emission and noise pollution, it is necessary to slow and eventually, to halt, the contraction in public transport;
- various installations, measures are needed in suburban and outlaying areas: parking facilities at railway and bus stations and at transfer points; ... P + R parking with easy access, supplemented by attractive service units ... will have to be provided ... An attractive fee structure in public transport is needed, so as to increase its usage as opposed to private vehicles. At the same time, it should also be accessible and affordable to those most needing it ...
- In densely populated areas of major cities, in zones of protected historic or architectural importance, and those serving rest and recreation, private vehicle traffic should be limited" etc.

In spite of the rather firm national consensus giving first priority to the different types of transportation networks in all regional and urban levels of developing the built environment, also a number of other priorities have been recently redefined. The Ministry for Environmental Protection and Regional Development prepared comprehensive guidelines for both its problem areas in 1996 and in the same year similar guidelines were outlined also by the municipal management of Budapest. Some of the major issues of these documents are as follows:

- The country is divided into 138 minor territorial units and all of them have been valuated according to the EU-norms to identify areas of dynamic progress as well as areas of decay. This valuation has to be used as basic information for governmental and/or municipal decision making;
- About 70% of the interrogated settlements indicated difficulties in managing municipal solid wastes;
- There is a 43% gap between the population of the country connected to municipal water supply and the population connected to public sewers; only one-third of the total waste water piped out is cleared biologically;
- The rehabilitation of a number of abandoned industrial plants and areas in the country not solved as yet;

- Special attention should be given to counties and cities entering into economic and cultural cooperation with counties and cities of neigbbouring countries; some of them are supported by PHARE programs;
- The suburbanization and de-urbanization processes going on around Budapest should be controlled keenly and a comprehensive master plan should be worked out for the whole Budapest agglomeration having a population of about 3 millions (almost one-third of the country);
- The city (the downtown part) of Budapest should be extended in order to give space to the numerous new functions it has to fulfil; in the same time its residential function should not be lost;
- Spread of large-scale suburban shopping centers and shopping malls should not be allowed to destroy fully the traditional urban structure of Budapest;
- Green areas should be maintained resolutely in Budapest and brownfield investments should be offered trying to rehabilitate with these offers the wasteland of abandoned former industrial areas.

4.2 Buildings and the building process

The planned economy decades (characterised by the Soviet domination) drove the almost fully state-owned building industry of that time to operate in the framework of very large governmental construction programs. At the start of this period (in the early 50's) practically the full capacity of the building industry had been used for creating huge plants for the heavy industries; the solution of the serious housing needs of the society - aggravated by World War II - had been neglected almost totally. After the revolution in 1956 the government did not dare any more to neglect these needs of the broad population, and in the late 60's a very large-scale housing program had been initiated which became the dominant task of the construction industry in the 70's. A number of other needs had been neglected in this second - the housing - period again.

One of the most pressing one of these needs had been a very unpleasant shortage of hotels. This shortage was fairly disturbing also on the domestic level, it was, however, keeping back the development of foreign (western) trade and tourism gravely. This shortage gave the first impetus to western capital to take the role of initiation: western investors started to create a number of hotels in Budapest, some of them on a fairly ambitious level (Intercontinental, Hilton, etc.). Although all these hotels have been designed by Hungarian architects, the investors influenced heavily the design process too by determining all the specific functional requirements. In some cases the investors penetrated also into the construction phase bringing foreign construction firms as general contractors.

After 1989 construction became exclusively market-dominated and all the large-scale governmental construction programs got terminated. In some fields the (mostly foreign) market forces resulted in remarkable growth, so e.g. in building office buildings, warehouses, shopping centers and shopping malls. As already mentioned, foreign capital has been taking part also in developing the built infrastructure (parking

facilities, highways, etc). In spite of all these developments the total output of the construction industry decreased dramatically, as e.g. the rate of social housing and non-profit public works (schools, hospitals, etc.) fell very low.

The firm BAU-DATA dealing with market information analyzed the distribution of the number of ongoing construction projects between 1991 and 1995 in Hungary and they got the data contained in Table 1.

	1991	*1992*	*1993*	*1994*	*1995*
Industry, trade, agriculture	23%	17%	14%	14%	12%
Civil engineering, infrastructure	14%	25%	33%	34%	38%
Housing	14%	11%	13%	17%	17%
Office, hotel, catering, tourism	40%	30%	14%	13%	12%
Education, health care,sports	9%	17%	26%	22%	21%

Table 1

Looking at the data of Table 1, one can say that at the start of the transition period the market was highly interested in offices, hotels, catering and tourism, it became, however, in this field soon saturated and civil engineering, infrastructure has been clearly taking the leading role.
The same market research firm BAU-DATA prepared a forecast up to 2000 shown in *Table 2.* In this case they used the categories as common in the data-exchange within EUROCONSTRUCT. The values refer to billion Hungarian forints calculated with the prizes in 1995.

construction	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
residential	150	145	160	170	185	205
non-residential private	90	100	100	110	115	118
non-residential public	20	20	20	20	20	20
sum of new construction	260	265	280	300	320	345
renovation residential	60	60	70	80	85	95
renovation non-residential	70	80	80	70	72	74
sum of renovation	130	140	150	150	157	169
civil engineering new	140	140	150	160	170	180
civil engineering renovation	70	70	70	70	72	72
sum of civil engineering	210	210	220	230	242	252
construction output total	600	615	650	680	720	766

Table 2

According to Table 2, civil engineering seems to keep its role gained in the former period as shown in Table 1. Further forecasts up to 2010 are not available, as yet, due to the prevailing conviction of experts, however, the output of the residential renovation should be much higher then now. Should it remain impossible to allocate much higher resources for this task, a catastrophic breakdown of a huge part of the existing housing stock would not be avoided.

Maintenance and renovation is the weakest point, the most critical phase in the overall Hungarian building process.

We touched upon this problem already in our INTRODUCTION dealing with the state of the built environment and we stressed its weight in a number of districts in the capital city.

In order to identify the specific problems of the maintenance and renovation of the residential buildings we have to see first the distribution of the roughly 4 million housing units according to the building material of the walls of the buildings in question. A bit more than one quarter of the total volume (mostly old one-family houses in rural areas) had been built of adobe or have sometimes even simply rammed mud walls. A bit less than a quarter of the total volume consists of multifamily houses produced by using industrialized building systems applying reinforced or sometimes only plain concrete as their basic material; these systems had been valuated as very progressive solutions for social housing in the 60's everywhere in Europe. The other half of the housing stock has been built by using bricks for the load-bearing walls.

Now, in case of the old adobe houses (often very valuable as remarkable pieces of folklore in architecture) one has not to face serious problems of thermal insulation, they are, however, in many cases gravely damaged by moisture coming from rainfall and wind, or from the groundwater. Due to very small windows the ventilation is never acceptable. In the same time it is practically impossible to eliminate these shortcomings in course of a reasonable renovation; in most cases demolition would be the single way of getting rid of these unhealthy buildings, adequate resources for replacing them by healthy ones, are, however, rarely available. In some cases technologies for artificial drying may be used with advantage and demolition may be avoided or at least postponed.

In the case of the system-built social housing stock poor thermal insulation and the need for replacing the aged, built - in network of pipes feeding the used building services produce the crucial tasks of renovation. According to recent calculations
600 000 - 800 000 Hungarian forints are needed for a correct new subsequent thermal insulation in case of an average-size apartment. This sum is larger than the net average yearly income of the population.

In case of the older buildings made of brick the most dangerous structural parts are the chimneys. This comes most often from the fact that these chimneys had been made for heating with coal, the heating was changed, however, to apply natural (sometimes

artificial) gas. The combustion product moving off leaves, however, sulphuric acid on the inner surface of the chimney and this devours the chimney just up to collapse if not observed earlier. The trouble caused by this corrosion is often the phenomenon that the corrosion product blocks up the smoke channel, the smoke turns up and intoxicates the room it is coming from: this may be lethal for the inhabitant(s).

Apart from the adobe houses and the oldest set of the residential buildings made of bricks with very thick walls, the heat transmission coefficient U-value of the entire existing housing stock made of bricks is very bad, 1,1-1,3 W/m2 Kelvin in contrast to the value of 0,6 required nowadays in Hungary; in some highly developed countries even more lower values are very common. As we have seen subsequent individual insulation of apartments is very expensive. In case of the reconstruction of whole neighbourhoods of system-built reinforced concrete houses the average cost may be much lower. The heat transmission of the windows is very often much worse than that of the walls; since the 70-es better ones are also produced.

At the end of 1996 a comprehensive study dealing with the problems of the built environment and of the construction industry had been submitted to the Houses of Parliament. This document dealt with the renovation problem of the residential building stock in very grave terms. It stated that for a balanced situation at least
40 000 housing units (one-family houses or apartments respectively) should be built yearly (4 units per 1000 inhabitants), whereas since 1992 we build yearly only
20 000 - 25 000 units. The neglected renovation of the stock of multi-family residential buildings alone needed a sum of at least 400 billion forints which would be almost 10 % of the GDP as a whole and almost 50% of the value of all the investments (data from 1995). This value is extremely high and with time passing it is increasing likely in an exponential character.

There are a few neighbourhoods in Budapest where comprehensive, full renovation-programs had been successfully realized. Their lessons should be learnt and propagated.

4.3 Components, materials, services

In the 60’s and in the 70’s - partly compelled by Eastern European construction policies, partly impressed by the general western enthusiasm for system building the state-owned Hungarian construction industry used building systems when executing the large-scale social housing program as well as when erecting industrial or public buildings. For social housing e.g. the French system CAMUS and the Danish system LARSEN-NIELSEN had been introduced, for industrial plants he British CONDER, for schools the CLASP, a British system again. Besides them also genuine Hungarian systems had been available both in the field of the heavy systems using reinforced concrete as well as in the field of the lightweight ones using steel, plastics and plasterboard. At the end of the 70’s the firms engaged in social housing run already
10 so-called "housing factories", 4 of them Budapest, 6 in the major cities, with a yearly capacity of 3000-4000 apartment each. At the time of their introduction almost

everybody had been happy with all these systems, but from the early 80’s on almost everybody hated them. This turnover was partly an outcome of the poor quality of life experienced in the huge, heavy, monotonous housing blacks, partly it was a form of protestation against the Soviet type society symbolized by these blocks seen as housing monsters. (As a matter of fact we acquired CAMUS in its form developed in the Soviet Union being technologically much more mechanized than the original system was m France.) Better informed people also knew that in the meantime in Western Europe system building came absolutely out of fashion giving place to "post-modern" architecture representing "human scale" and preferring "environment-friendly", "organic" materials. Realizing all these changes also Hungarian architects reinvented bricks and timber as the basic materials of architecture.

It has to be mentioned that even before 1989 the Hungarian construction industry became acquainted not only to the - one could say - "closed" systems developed in Western Europe as CAMUS, LARSEN-NIELSEN, CONDER, CLASP, etc., but also to a series of components and machineries being able to be used in a very flexible - one could say - in an "open system" way. Now, after 1990's unlimited liberalization of the construction market all the building components, materials and equipments to be found on the Western European market became available also for the Hungarian architect. A number of western manufacturers created even affiliated firms in Hungary as POTAIN-Hungaria, HÜNNEBECK-Hungaria, SIKA-Hungaria, etc., but you may be supplied with any Western European building product - as a rule - in 72 hours. The old socialist Hungarian building product market characterized by a continuous scarcity is replaced by a market of abundance: in this special sense we have day-by-day possibilities as if we already were a full member of the EU; with sufficient resources, you may apply as sustainable technical solutions as available in Western Europe. You may reduce your energy consumption, you may improve the quality of your indoor air, you may choose materials of much higher durability, you may reuse your demolished old concrete as aggregate for a new one, you may manage your fluid waste much better than before, etc.

4.4 Human resources and skills

The communist coming to rule in 1948 smashed the private Hungarian construction industry without delay and a state-owned large-scale construction industry was created at once. Even individual craftsmen had been hardly tolerated as private contractors; most of them were driven into cooperatives. All the (19) counties of the country got so-called "state-owned construction companies" and the capital city was supplied with more of them, also with specialized ones (for finishing works, for budding services, for industrial buildings, for public buildings, for housing, etc.). The number of employees of these companies moved most often between 3000 and 5000 in each of them. This preference of operating with (relatively) gigantic companies prevailed not only in the construction industry but also in all the other branches of the economy getting in some cases companies even over tens of thousands employees.

From 1989 on this structure of the economy has changed rapidly. According to data published by the Ministry for Transport („Transport Policy of the Government of the Republic of Hungary; Budapest, 1996") the number and sizes of firms in Hungary changed between 1989 and 1995 as shown in *Table 3.*

	1989	1990	1991	1992	1993	1994	1995 1st half
State owned corporations and cooperatives *							
0-20 employees	1253	1353	1810	2138	2525	3514	5668
21-50 employees	1402	1282	1373	1585	1830	1499	1475
51-300 employees	2758	2835	2991	2821	2660	2108	1760
301 or more	2426	2257	1878	1195	760	280	191
Corporations with share holders **							
0-20 employees	66	152	282	483	900	1010	1141
21-50 employees	51	118	175	254	400	378	427
51-300 employees	90	192	322	492	750	789	783
301 or more	99	183	292	468	750	709	628
Limited Liability partnerships **							
0-20 employees	3266	14336	34488	49478	65000	78036	82610
21-50 employees	799	2596	4498	5014	5600	6085	6136
51-300 employees	366	1237	1968	2343	2800	3149	2945
301 or more	33	125	208	262	330	346	325

Table 3

Note: * Excluding housing co-operatives and water works
** Excluding inactive firms and ones with unknown number of employees

After 1989 most of the large state-owned construction companies became bankrupt and dissolved to smaller corporatives with share holders and/or to limited liability partnerships. The dissolution of the construction industry was so heavy that according to a report of the National Professional Society of Building Contractors (published at the end of 1996) 96 % of the contractors had been working with less than 20 people in 1996: 1n the same time - according to this report - the number of employees of the overall construction industry decreased from 450 000 in 1989 to 150 000 in i996. This loss is partly due to the fact that in sake of survival a higher efficiency of the labour force is required, it results, however, mainly from the overall recession of the

Hungarian economy and from the special recession of the construction within the framework of the whole economy. In the countries of the EU - on the average - construction produced almost 12% of the GDP, whereas in the last years this ratio was less than 7% in Hungary. A by-product of the given economic situation is the fact that the labour-force working on the black construction market is estimated to
30 000 - 35 000 men in the mentioned report, many of them illegally employed foreigners.

A positive feature of the situation is that the Hungarian firms which survived become step-by-step more-and-more competitive when compared with foreign construction firms acting on the Hungarian market. A negative feature is, however, that the actual quality control in construction is not really able to face all the difficulties and this is - of course - very disadvantageous in terms of constructional sustainability.

In the planned economy phase of the Hungarian development most activities had been heavily centralized and over-regulated. From the start of the transition period the role of the state was to be narrowed down and also its methods were to be changed substantially. Together with the right of accrediting building permissions also the task of quality control in building was given to the municipalities having been, however, not prepared to exert it adequately. Therefore, a certain re-strengthening of the responsibilities of the state seems to be indispensable. It is also clear that in this field some roles should be given again to certain civil organizations. In order to do this the chamber of architects and the chamber of engineers - having been terminated by the communist regimes - have been reestablished and they started to reorganize their activities.

Sustainability in construction is to a great extent simply a problem of quality; therefore the skills needed for a sustainable construction should be given firstly by the education and the training of architects, engineers and technicians. Their traditional curriculum did not involve, however, the study of the special issues of sustainability, so neither a general training in ecology, nor the special studies needed for conservation, reuse, recycling etc. Therefore, postgraduate three-years courses had been started to train environmental engineers already in the 80-es at the Budapest Technical University and these studies started to penetrate also into the undergraduate courses from the early 90-es. So at the Faculty of Architecture undergraduates are obliged to study a subject called "Architecture and Ecology". Sensitivity for and information on ecological and environmental problems are raised and given also on lower levels of education, including even teaching in elementary schools.

4.5 Research and development

Before and after World War I. building research had been carried out a1most exclusively at the Budapest Technical University in Hungary. In a few cases also laboratories of the cement industry and of major construction firms as well as a few invention-minded architects had achieved findings to be mentioned even in an international context. After World War II - joining the fairly general European trend of

that time to establish independent governmental building research institutes owned neither by universities nor by the industry, the Hungarian Institute for Building Science (ÉTI) was founded in 1947, adapting a role similar to the Building Research Station has had in Britain since the 20's.

After 1948 Hungarian building research became more-and-more influenced by the Soviet budding research system. As a consequence of this both the number of the governmental institutes and the size of their staff became much larger than in most countries of the western part of Europe. This was mainly due to the fact that in the Soviet Union - by principle - there was no industrial research at all and in the field of innovation everything was to be done by a vast, centralized network of governmental R&D institutions. These institutions happened to become very inefficient by the depressing difficulty of transferring research findings to industrial firms being not at all research-minded as interested only in the fulfillment of their production plan defined in quantitative terms.

Pushed into this bed - in a couple of years - Hungarian building research had grown to a network of seven governmental research, development and information institutes with a total staff of more than 5000 men having more than 1000 graduated research and information officers among them: a very exaggerated size for a country of 10 millions inhabitants. The main output of this network was the adaptation of the foreign and the creation of the domestic building systems brought into the practice of the Hungarian construction industry between 1960 and 1980.

From the middle of the 70's, due to the growing economic difficulties it became a heavy burden for the state to finance its R&D network in the building field. From about 1980 a slow erosion started with a loss of about 10% of the staff until 1985, a further 30 % until 1990 and a dramatic additional loss of 50% from the start of the transition until to-day: this means that only 10% of the original staff remained. Practically only one institute was able to survive, the former department of ÉTI dealing with quality control in construction becoming independent in 1963. Recently also the rest of ÉTI had been dissolved into it and now it exists with the name: Institute for Quality Control and Innovation in Construction (ÉMI). Independently from ÉMI a small group for research in urbanism and an other for building information do still exist maintained partly by the government and partly by practitioners respectively.

Parallel to these changes a considerable strengthening of research at the Budapest Technical University is in progress. This is an outcome of adapting the American system of granting PhD-degrees to graduate students having solved research problems in an organized way at research universities. For the time being about 50 graduate the working for their PhD-degree at the Faculty of Architecture in Budapest and they constitute a new, important and growing base for ongoing and future building research in Hungary.

In the field of basic research the National Fund for Scientific Research (OTKA) is acting as the most important sponsor. This fund is supplied by the national budget and

uses a system for academic as well as for governmental and even for industrial research teams on condition of aiming at the solution of a basic (fundamental) research problem. For development projects supporting may be received through the National Committee for Technological Innovation (OMFB).

For the time being ongoing and/or needed Hungarian R&D activities concerning the built environment may be listed as follow:

- Investigation of the changing role of Budapest in the Middle and South East European region;
- Investigating the growth and the problems of the Budapest agglomeration;
- Analyzing the consequences of the radial - Budapest centred - transport system of the country and identifying the next needed steps to develop annular and transversal contacts;
- Investigating regional changes in the country in order to apply EU methods for identifying problem areas (social and economic decay, areas of obsolete industries, unilaterally rural-agricultural areas, areas of high unemployment);
- Preparing agendas for developing areas for recreation and tourism;
- Fostering voluntary small-scale regional association of numerous small villages in order to achieve urban advantages ,without destroying the given settlement structure;
- Investigations for finding more dynamic ways of disseminating and using information technology in housing, building, planning and utilization of land;
- Investigating the technology of lignite-based thermal power stations in order to reduce the sulphur-content of their smoke (causing acid rains) without making their fly-ash a dangerous, intoxicating waste;
- Further on-the-site experiments in order to adapt American procedures of financing and constructing, to realize large scale projects aiming at "affordable housing";
- Improving and innovating diagnostical instruments and methods used when evaluating the physical state of buildings and neighbourhoods; special attention should be given. to the structural safety if suspended outside corridors are suspected of being deteriorated;
- To adapt or develop suitable technologies for renovating deteriorated residential and industrial buildings, or only some of their parts; also ideas for . rehabilitating obsolete areas should be generated;
- When renovating old buildings the flexibility of their use should be increased significantly;
- It is of crucial importance that renovation should practically always be coupled to supplementary application of suitable thermal insulation in order to reduce energy consumption substantially; the possibility of measuring consumption individually in every apartment of multi-family houses is a fundamental prerequisite of saving energy;
- Increased and improved use of passive and hybrid solar heating;
- Developing increased use of natural lighting to save energy;
- Means and methods for improving indoor air quality;

- Studying combined comfort effects of heat, sound and lightning in order to improve conditions for mental work;
- Research to improve durability of structural concrete and of external finishes;
- Research to increase the use of environment-friendly materials as adobe and to constructional recycling of wastes as fly-ash;
- Segregation techniques of debris materials of pulled-down buildings (for example the reinforcement from the concrete);
- Adequate use of explosion techniques in demolishing buildings and structures;
- Toleration levels in case of radioactive materials (e.g. timber coming from areas attached by nuclear accidents), etc.

4.6 Strategic recommendations for the management of construction companies

In periods of transition as prevailing now in Hungary and in the whole area of Eastern Middle and South Eastern Europe a *thorough study of the ongoing processes* in the national and in the international building field is of crucial importance.

Special attention should be given to all forms of *market information* and to all responsible attempts aiming at *short- as well as at long-term forecasts* of construction activities.

Market information and market forecasts should be able to deal *with all the significant branches* of the construction and of the building materials industry, including analyses of the relations between the different branches, evaluating importance and actual forms of cooperation.

Market information should be completed by international and domestic *product information* and by information about international and domestic *research findings.*

Based upon the most important statements of this study it is quite clear that the leading task of construction in Hungary will be the completion of the system of superhighways connecting the major cities within the country and connecting the country with all the neighbouring ones. Strong firms acting in the civil engineering field should try to gain the role of general contractors in realizing various stages of the superhighway-construction, whereas minor firms should attempt to undertake the construction of the auxiliary establishments as gasoline stations, ensembles of buildings for convenient rest on the way, proper parking places, etc. All these tasks are relevant both in the intercity relation as well as within the metropolitan area of the country with its heavy need for suitable park & ride connections, garages etc. In all these tasks minimizing negative environmental effects should be a major concern.

The second outstanding comprehensive area of getting stimulating commitments is *to serve the building needs of foreign and domestic capital* eager to fulfill profitable investments both in trade and the industries. Banks, warehouses, shopping centers, shopping malls, new or rebuilt industrial plants are the most preferred tasks. To acquire

special skills in any of these building types is very promising for a construction company. Many of these tasks get realized in areas of very dense traffic, so organization of the work causing minimum trouble is an outstanding feature of competence.

The third big area of construction is *to create or renovate residential buildings, neighbourhoods or even districts*. Although sufficient capital is available almost only in the case of high level villas, this huge area as a whole deserves heavy attention. In renovation works even small firms may be very successful if they are able to accommodate themselves to owners having only modest financial means; the crucial task in many of these cases is to unite a fairly high number of rather poor owners in order to achieve a high level of efficiency. In the same time even very small renovation tasks may employ a high number of craftsman as the need for them is extremely pressing. With the rapidly growing energy prices the need for better *thermal insulation* for example became very common.

In general: *the typical tasks of sustainable construction* as energy conservation, recycling of building materials, waste management etc. are so poorly covered by firms who are highly skilled in construction, that there is room for many undertakings willing to invest in this problem area.

A grave heritage of the Hungarian construction industry comes from the fact, that from the 50's to the 80's this industry was concentrated into some dozen very large companies working in an extremely autonomous way: this resulted in very low levels of cooperation. According to this it is one of the most important development needs of many of the Hungarian construction companies to improve readiness and ways of effective cooperation. This demands surely that the use of *information technology* should be enlarged in a substantial measure.

In the field of *computer aided architectural design* the progress in Hungary has been outstanding and this branch was able to achieve even a significant software export (e.g. the export of the ArchiCAD software of the firm GRAPHISOFT to the USA). Due to this progress Hungarian architectural design was able to overcome much better the same bad heritage of having been organized previously in too large design institutes. Hungarian construction companies should become at least as good in *computer aided management* as their fellow-teams of architects have been in computer aided design.

5. METHODOLOGY USED WHEN PREPARING THIS STUDY AND LIST OF REFERENCES

The principal author of this study started to investigate the problems having been dealt with here just after the Amsterdam meeting of CIB W82 in May 1995, where the first version of the five basic questions (cities, buildings, components, etc.) had been accepted. A bit later he was asked for by the leader of the sustainability project of the

commission in that time to elaborate a short analysis of the environmental constraints of the building sector in Hungary. In order to do this he contacted the Hungarian Ministry for Environment and Regional Policy for support with suitable data. He received the document *Environmental Indicators of Hungary* prepared by that ministry in 1994 and an other one titled *National Conception for Environmental Policies* elaborated by the same ministry in the same year. Using these documents and relying upon his own expertise he wrote a study titled *Environmental Constraints of the Building Sector in Hungary* and presented it at the next meeting of the commission in Ascot, October, 1995.

After the Ascot meeting participants had been asked for elaborating short answers to the five questions defined in Amsterdam; these short answers were to be presented in Sophia Antipolis in April 1996. As his study "Environmental Constraints…" already gave implicit brief answer to the five questions the author prepared only a short completing document titled *Appendix to Environmental Constraints of the Building Sector in Hungary.* making the answers more explicit. This Appendix was presented in Sophia Antipolis where problems and structure of the final study had also been discussed. The detailed Instructions for the final National Reports had been sent to participants in September 1996 by Mr. Casper Richter, the leader of the sustainability project in this (the third) phase.

Having received the Instructions the author contacted the secretary general of the Hungarian Scientific Society for Building (ÉTE), an associate member of the CIB represented by the author in CIB W82. It was decided to ask all the six Hungarian members of the CIB for participating in the elaboration of the final National Report: The Hungarian full member of the CIB Institute for Quality Control and Innovation in Building (ÉMI) and the individual member Ms Anna Gáspár accepted the invitation and it was decided to start the actual work after the meeting of the commission W82 in Bucharest, November 1996, which was to discuss and finalize the Instructions.

After Bucharest a team representing the three participating Hungarian members was formed; ÉTE became represented by three persons (the author, Prof. László Bánhidi, former director of the Institute for Building Services at the Budapest Technical University and Mr. András Somos, expert for renovating the residential building stock of Budapest); ÉMI became represented by Dr Gábor Madaras, research director of the Institute, and the market information firm BAU-DATA became represented by its director Ms Anna Gáspár, an individual member of the CIB.

At the first meeting of the team the studies "Environmental Constraints" and the "Appendix" were presented briefly by the author and this was followed by a brain-storming of the team focused on the questions as described in the Instructions and put down by the author. After this brain-storming it was decided to leave a couple of days to the members to study the full text of the papers mentioned and they were asked for answering subsequently the questions of the Instructions in the form of self-interviews fixed on magnetic tapes. These tapes were handed over to the author, who studied them and put individually further questions to the members asking for written answers. This

was done and this way the author became familiar with the ideas of the members in depth. This was the basic personal information given to the author before he started to write the national report.

Besides this the secretary general of ÉTE; Dr. Pál Seenger collected four recently elaborated governmental documents relevant for the national report. These were :

1. the National program for protecting the environment;

2. a Draft for a comprehensive conception of the regional development of the country;

3. the Transport policy conceived for the country;

4. a Report for the Parliament dealing with the built environment and the construction industry. These documents were taken as further information for the national report.

6. REFERENCES

1. Jan Kregel, Egon Matzner, Gernot Grabher: The Market Shock. Austrian Academy of Sciences, Vienna, 1992.

2. Environmental Indicators of Hungary. Ministry for Environment and Regional Policy, Budapest, 1994.

3. National Conception for Environmental Policies. Ministry for Environment and Regional Policy, Budapest, 1994.

4. Dr György Kunszt: Environmental Constraints of the Building Sector in Hungary. Budapest, 1995.

5. Dr György Kunszt: Appendix to Environmental Constraints of the Building Sector in Hungary. Budapest, 1996.

6. Making National Reports; Introduction and Instructions. Stichting Bouwresearch, Rotterdam, 1996.

7. National Program for Protecting the Environment. Ministry for Environment and Regional Policy, Budapest, 1996.

8. Draft for a Comprehensive Conception of the Regional Development of the Country. Ministry for Environment and Regional Policy, Budapest, 1996.

9. Transport Policy of Hungary. Ministry for Transport and - Telecommunication, Budapest, 1996.

10. The Built Environment and the Construction Industry. Committee for the Environment, the House of Parliament, Budapest, 1996.

11. István Bartke: Settlements and sustainable development. (In Hungarian.) Magyar Tudomány, 1996/9.

12. István Schneller: Urban development of Budapest. (Manuscript, in Hungarian.), 1996.