

Gradual Spatial Development of Town Expansion Schemes

—A Conceptual Framework**—

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The main ideas of a more development orientated town expansion strategy are to

- synchronize physical and socio-economic development processes,
- elaborate physical structures—open—to adapt future probable developments which are representend in scenario, and
- to reduce in a present situation according to limited resources the input for housing, transportation programmes etc., in order to achieve a maximum with a minimum of resources. Via development stages the present choosen measures are developed to a higher standard.

Before discussing the conceptual framework it seems necessary to point out shortly *the national and regional context of town expansion schemes*. In the last few years the newly industrializing countries have started to fortify their national development programmes in order to build up a more inner market orientated spatial structure and to overcome the weak points of export orientated structures mainly caused by colonial occupations. One important strategic element in this context are urbanization strategies. Based on different theoretical positions such as growth pole-, central-place- and corridor-development-theories, regional centres relief poles, medium and small centres up to rural service centres in the periphery are planned and in realization. At the same time some new industrializing countries started to built new capital cities or have already built them up. These urbanization strategies—which underline the relation between economic and urbanization development should be integrated into comprehensive regional development programmes, so that the other important relation—town and regional planning—is taken into consideration. Without

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any doubt, the realization of these different strategies will contribute to reduce regional disparities, to use regional resources and to improve the working and living conditions for the population in the regions. Furthermore, is to be attended, that regional migration flows will be directed from the metropolitan areas to regional centres, so that the growth of the large metropolitan areas can be reduced. Development processes can become manageable and planable. Increasing social costs can be avoided.

The restructuring process of an export orientated spatial structure into an inner market orientated underlines the recognition that the free market economic system does not automatically create equal and sufficient spatial structures, because the often attended metropolitan spread effects remain behind the estimations or are often compensated by countereffects. Only through strong governmental planning will a spatial decentralization policy can be supported and initiated.

In the frame of these spatial restructuring processes equal exchange conditions are the substitute for unequal exchange processes between nations as well as between metropolitan areas and regions, for instance on the basis of spatial work divisions between regions and metropolitan areas. The promotion of a settlement structure, following rather the rank size rule must be a further element of a decentralized urbanization policy.

These few remarks should be sufficient in order to explain the regional and national context of town expansion schemes as part of urbanization strategies. Besides this the national and regional context is an important factor to derive on the micro level development stages for town expansion schemes.

Planners who are engaged with the task to work out physical structures according to economic, social and political aims and programmes are faced among other with the question *to define development orientated urban structures*. This—as one important planning task among others—is of importance, because settlement schemes based on fixed values are static and do not *serve their purpose any more within a short term, when economic and social conditions are changing*. Physical structures designed under static points of view can only be adapted to changed socio-economic conditions by demolishing structures and investments. This is neither economically justifiable nor is it in line with the limited available means.

The *limited available* resources of the most industrializing countries are another reason why gradual development stages seem to be useful. In accordance with scarce means, it is proposed not to realize beautiful cities—in the eyes of architects or politicians—nor to develop cities under the point of view of contractors maximising their profit. Rather it is proposed

to realize in a first development stage programmes for housing, transportation, public facilities, which—reduce the input of resources and which can be improved step by step to a higher level—according to future economic development. In this way with present limited means a highest possible supply level can be attained for the population.

The main questions to be answered are how to *synchronize socio-economic and physical development processes* and how to adapt present planned structures to future developments. In general we understand development as a process of social and economic change. When we analyze socio-economic and physical development processes in the context of our question, we have to make some simple but important distinctions. Socio-economic develop-

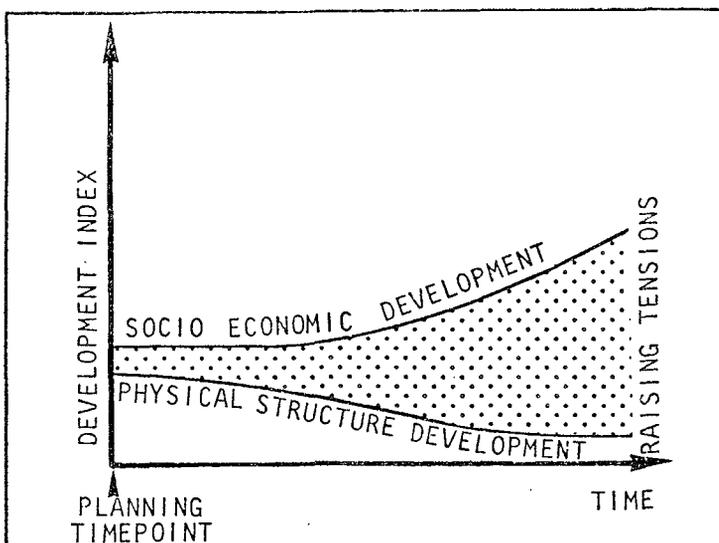


Fig. 1: Rising Gap between Physical Structures and Socio-economic Development Processes

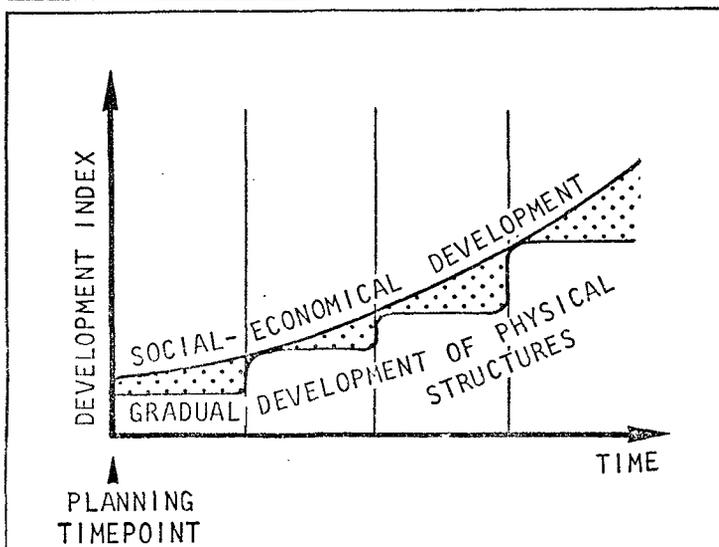


Fig. 2: Gradual Adaptation of Physical Structures to Socio-economic Processes

ment processes are characterized by a sensitive reaction when influencing factors are changing. On the contrary, physical structures are inflexible due to the simple fact that concrete is not changeable.

While socio-economic development—not in a continuous and cumulative way—as the oil crisis showed us—increases and new requirements on physical structures implies—are physical structures declining in time. This declining process can be reduced by improvement and modernization or forced by the commission of maintenance measures. These together leads to the consequence, that the gap between physical structure processes and socio-economic processes increases (Fig. 1) and the problem arises as it is visualized in Fig. 2, how physical structures—as an independent variable—can be adapted step by step to socio-economic development processes.

But how can we create adaptable physical structures to socio-economic processes, if our *knowledge concerning future socio-economic processes is limited and characterized by uncertainty* due to deficits and methods, information and last but not least, due to our limited possibilities to channel private enterprises in the direction we desire. This will get specially clear, when we notice that we:

- have to change our future estimations concerning economic development nearly every three months on the national level,
- are confronted with unforeseen impacts on sectoral projects and planning of today is often the subject of future planning,
- steadily correct our migration estimations and
- take future problems too late into considerations, because we are engaged to solve the present problems.

So in the context of a gradual development strategy our main task is to *reduce uncertainties* with

- forecast methods,
- better information systems,
- the organization of better connections between planners and politicians,
- the elaboration of scenarios, containing future probable developments under different assumptions,
- the development of instruments to channel processes in the desired direction,
- the fortification of planning and
- the implementation of repeated feedback processes between reality and planning in a

sense of continuous learning process.

But there will always be some uncertainty, which cannot be overcome even not through complex planning models—developed during the late sixties—or by a planning theory underlining the development orientated character of planning.

Nevertheless the problem of *uncertainty and the degree of exactness* for a gradual orientated strategy can *become relative* because: first:

within a given physical structure permanent *individual development processes* on the household side as well as on the enterprise side take place. For example that households change their flats according to increased income or family size and flats are then used by others. Similar processes are to be observed on the enterprises side. Normally they are planned by individuals and need no 'official planning'. Contrary structural change processes—such as the exodus of enterprisers and households from the town centre to the urban fringe—mainly caused by increasing location disadvantages have to be 'officially planned'.

That means we have to make a distinction between individual processes and structural change processes, whereby a gradual development strategy concentrates on structural planning—which should stimulate individual processes.

second:

the necessity and the needed degree for a gradual development strategy can become furthermore relative by the fact, that some elements and systems of our towns are dated back more than a hundred years. Through a steady process they have been modified, improved and adapted to new conditions. New elements were integrated, old ones were melted. In the frame of growth processes—quantitative development—new town parts were created and took over functions which could not be integrated into old structures. So old structures lost old functions and got new, while the physical structure remained nearly the same. Furthermore the behaviour patterns have not been changed so rapidly during the socio-economic development, so that tension between old physical structures and new changed conditions is smaller than we might think. Sometimes, however, the conflicts are covered by insufficient adaptable compromises or unsuitable structures are supported by lower salary groups.

The inertia of old structures can be shown by the build up of our towns after the war. Although it was obviously that planning principles and living conditions have changed we rebuilt our towns in West Germany after the War under the conditions of shortages nearly in the same way as they have been before. Planned under static points of view they are

unchangeable and are 20 years later, the planning problem. This example shows, that past decisions determine present decisions and that physical structures have the tendency to be perpetuated and that *present necessities hinder future possibilities*. This has to be overcome by a development orientated gradual town expansion strategy.

Summarizing it means for a gradual development strategy:

first:

to concentrate the considerations mainly on urban *structure planning*—which allows and stimulates individual development processes.

second:

that the physical structure planning today refers to present necessities and knowledge but takes future possibilities into consideration. Different thinkable possibilities are formulated in the form of *scenario* which can be integrated into the present structure later when uncertainties are gone. Therefore, the present structure remains open. A definite decision concerning future possibilities in form of the scenario are not taken today. They also remain open.

third:

the structure planning is combined with *growth planning* step by step which future increased knowledge and future decreased uncertainties make productive. Today absolutely not thinkable future conditions—which cannot be integrated into former realized structures—are overtaken by new planned areas. So in some cases in former phases realized structures can get new functions in the future.

fourth:

A gradual orientated strategy also implies that at a given time a *development purpose can be stated but not immediately realized* because of restrictions like lacking resources. Therefore, it is proposed to reduce the input of resources for housing, transportation programmes, etc. and improve them step by step according to the socio-economic development. In this context the investments of one development stage are the basis for the next one.

The planning process—to work out a more development orientated physical structure—starts with the *definition of an initial present action programme*, based on definite information according to political aims and economic programmes, etc. The next step is to work out *scenario*. Under different assumptions a variety of future probable developments are formulated. They remain open, and represent future option.

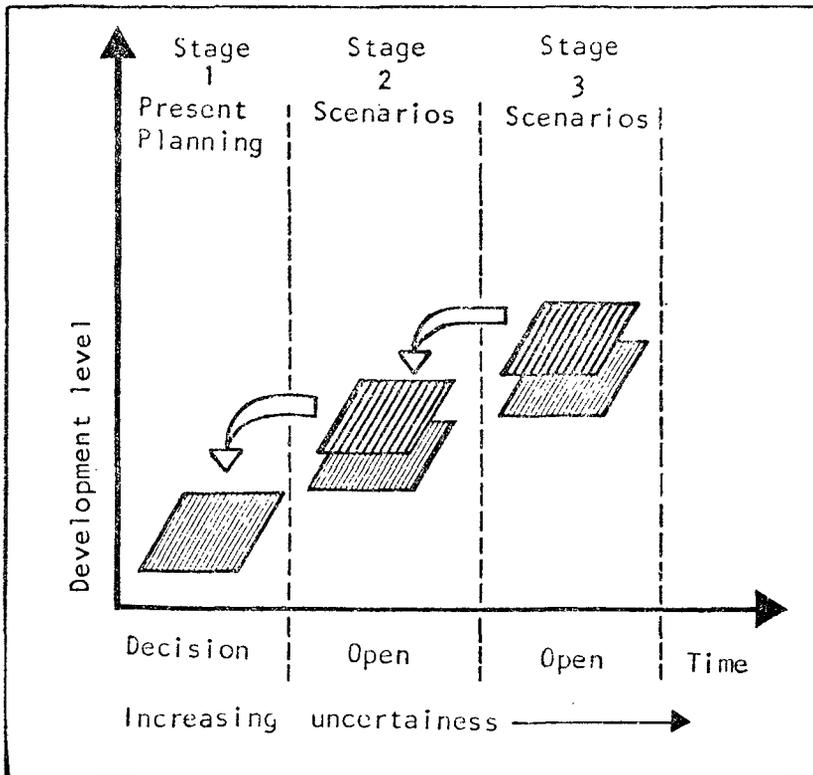


Fig. 3: Integration of Future Probable Developments—Represented in Different Scenario—into Present Planning Structures

Particularly the scenario contains statements to different time points concerning—qualitative development,

such as rising income, new technologies in production, multiplier effects, rising employment rates, decreasing work time, new transportation and information technologies. According to probable future spatial behaviour pattern, new spatial demands and needs are analysed and derived just as the regional context of the town. The reduction of resources are also analysed and formulated within the scenario.

—quantitative growth,

connected with qualitative development comprises mainly different forecast methods for elements, and the analyse of their spatial consequences.

Scenarios can be worked out with the help of different methods like brain-storming, experts enquiries (planners, economists, sociologists, politicians, technicians) up to analogic conclusions. The present programme of action and future developments—formulated within the scenarios—are the basis to develop physical structures.

Consequently the result of the design process is no more describable in a plan which determines the beginning and the end of development in one plan. Instead, according to the scenario a lot of plans are developed (Fig.3). The plans of the various developments are super-imposed and summarized into a comprehensive development plan.

This *processes* can be *described* in several ways:

—for instance as the development of a regional small centre to a medium sized centre and then to a regional major centre according to central place theory.

This is one possibility among others, to work out development stages. As it is visualized in Fig. 4 the *inner centre structure* and the rank of a town can be developed from a small centre to a regional major centre through different steps. The existing centre 1, will be built up to a centre 2, 3 and later to centre 4. In every stage of the development the planning is open for future development just as the point of implementation. The development process is accompanied by growth processes (quantitative development) in order to realize, among others, the necessary target population to the qualitative development. In Fig. 4 the horizontal flashes represent the growth while the vertical arrows represent the qualitative development.

—A modification represents Fig. 5. On the contrary to Fig. 4 development stages are mainly defined in a more *additional way*. New centres and new town units are added, step by step, to present structures according to the development process.

—There are a lot of other ways to development stages, for instance, according to *economic development processes*. Starting with a key project in an initial phase and planning the pertinent social and technical infrastructure, can a second step be defined by economic multipliers and supported projects. This can lead to a third phase characterized by a self-sufficient and self-sustaining growth of the town.

—Similar stages can be defined for the *urbanization of rural* areas, one of the most important questions in newly industrializing countries. Starting with the improvement of villages within a community, in a second stage one village can be developed to a rural service centre. In a third stage

—depending on the distance between the villages—they can be build up to a regional centre, providing several communities. The sequence of the development stages is of most importance for the planning success.

—The same principle is also suitable to *improve step by step existing residential areas* according to the socio-economic progress. In comparison with the often practised

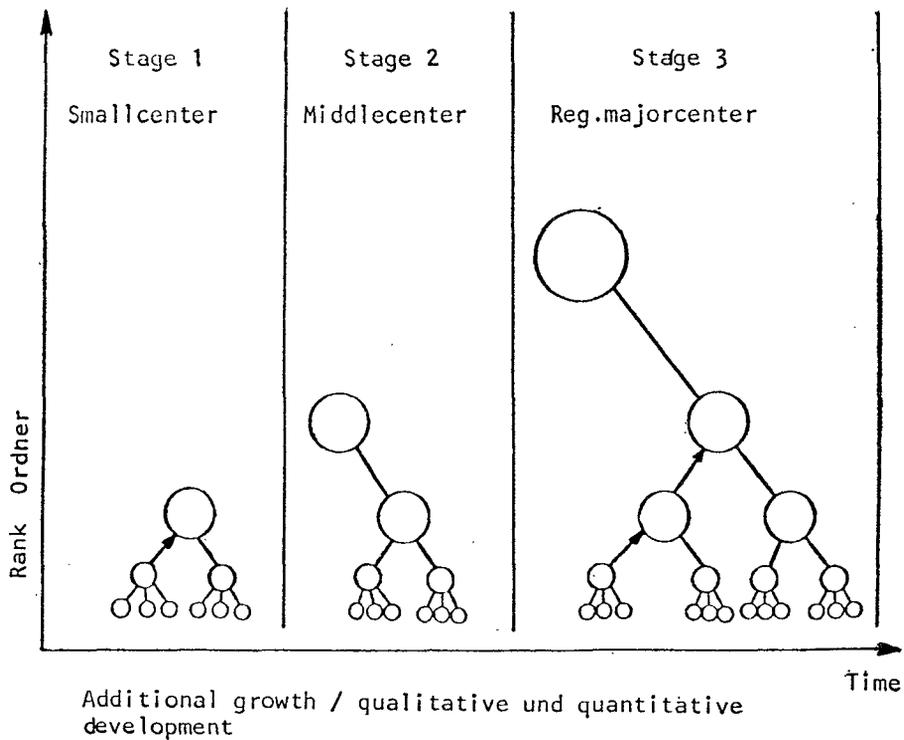
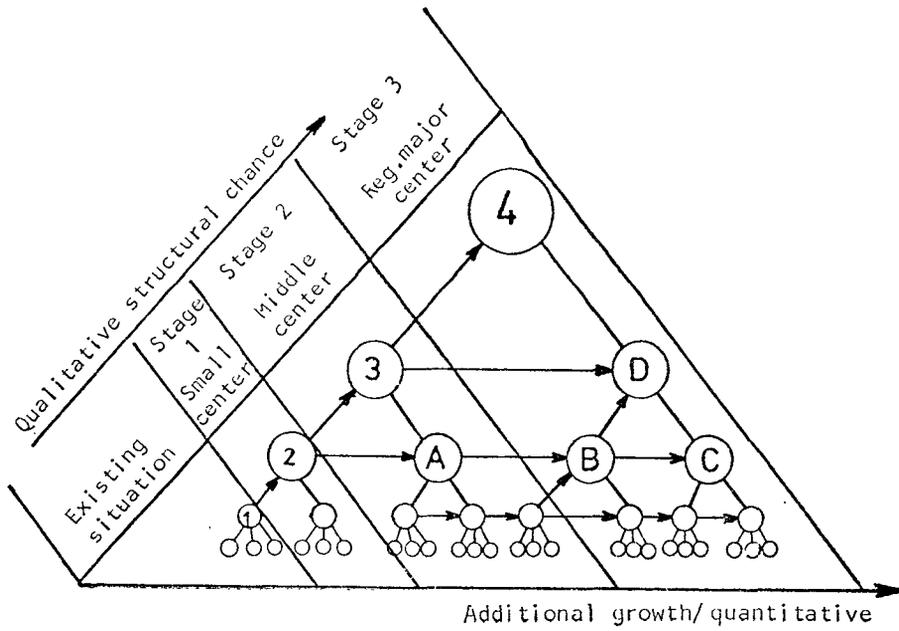


Fig. 4,5: Development Stages of a Town Extension

total demolition this way shows great advantages.

There is no general way existing to define general development stages. In every cases they have to be defined and derive from local and regional conditions as well as from programmes, scenario and aims to be achieved. Some elements of the translation of development stages into physical structures are visualized in a rough sketch (Fig. 6). According to local strategic points the development starts in the initial phase with linear structures. In the following stages the centre structure is changed, and according to the financial situation housing, working places and public services are improved and added. Due to increasing employments, higher income and a growing population the physical structure is transformed into a grid system. The combination of qualitative development and quantitative growth processes stimulates growth and change process into spatial dimension (Fig. 7).

Socio-economic development stages are *realized* for instance *within the physical structure* by: multipurpose use of public facilities, displacements of function, improvement of housing, transportation systems and road networks, expanding public and private facilities, summarize several units to one unit, reserved areas within and outside the towns by the use of instruments of planning, up to the definition of a transition use for areas. An element of the gradual development strategy is the reduction of inputs.

Supposing that one planning objective is to minimize investments and to maximize required necessities and—that the available resources are limited to achieve goals—it is proposed to reduce the input of resources by the realization of elements and systems such as housing, transportation, public services etc. According to the development process they have to be improved *step by step in time*. The elements and systems are divided into development stages (Fig. 8) within the reduction of the input will be performed. The development stages represent qualitative and quantitative savings of resources which are to be eliminated in the course of time. The first development stage initiates development under the condition to satisfy basic needs, the last one a presumable high standard. The last stage is relatively undetermined in order to have a scope for unforeseen events. The second as well as further possible development stages are intermediate stages.

The reduction of the input of resources is aimed to save means under the condition that the functions are limited but functionally are secured. This strategy can be referred to different approaches such as basic needs, standard reductions, minimizing of resources etc. Through the adaption of intermediate technologies and mixed technologies levels. But

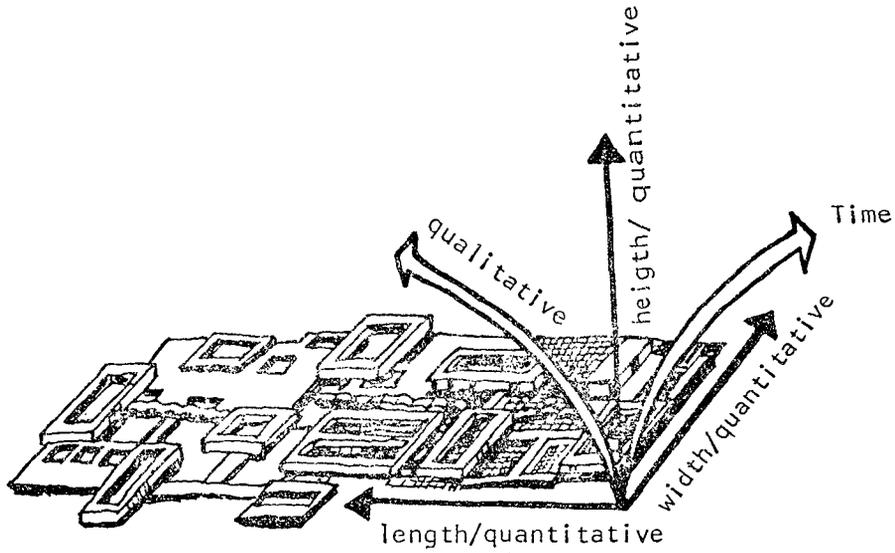


Fig. 6: Development Stages of Physical Structures

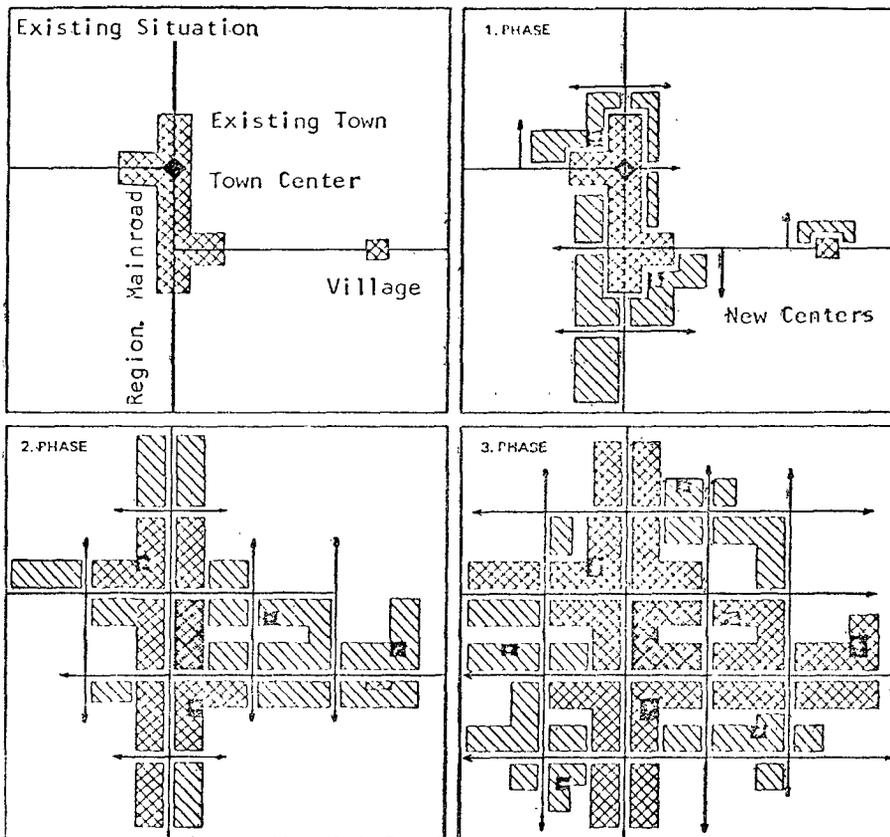


Fig. 7: Dimension of Growth and Development

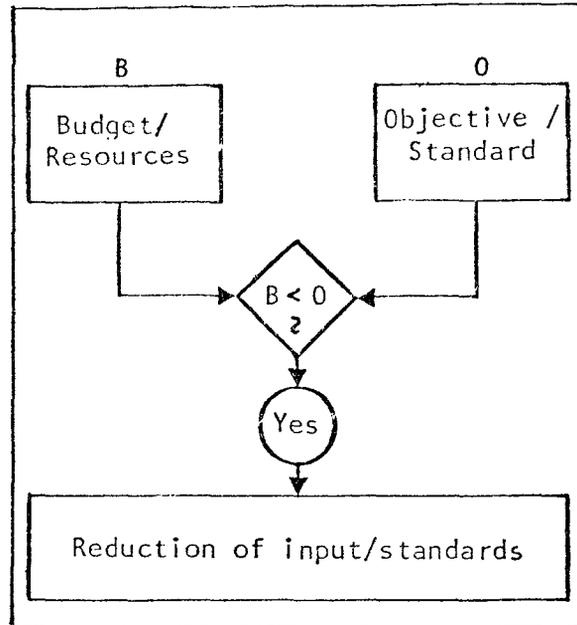


Fig. 8. In a search and feed back process is proposed—in order to realise with a minimum a maximum—to reduce the input in a first development stage. Present necessities and future possibilities are synchronized in a way that a present realised element can developed step by step according to the economic development.

contrary to the normal way, these strategies represent now an intermediate stage and not a final and static solution. In order to overcome supply problems, programmes for the lower and higher income class have to be seen in connection, and possibilities of reduction of resources have to be analysed and realized for different social groups. Otherwise there is no hope to improve the life conditions basically for all.

To determine the *economic advantages*, the present value will be figured out. The decision principle will be adopted to choose that alternative—immediate realization of high standards or gradual development orientated strategy which has the lowest present value. Additional costs have to be taken into consideration because the gradual development requires preaccomplishments which are the basis of the investments of the next period, effects of rationalization cannot be wholly utilized, and costs due to demolishing and loss of material are in some cases incurred.

The advantage of the gradual development depends essentially on the factor “*i*” and other factors which determine “*i*”. With an increasing “*i*”, i.e., rapidly increasing rates of productivity and/or high interest and low inflation rates, the breakeven point is soon

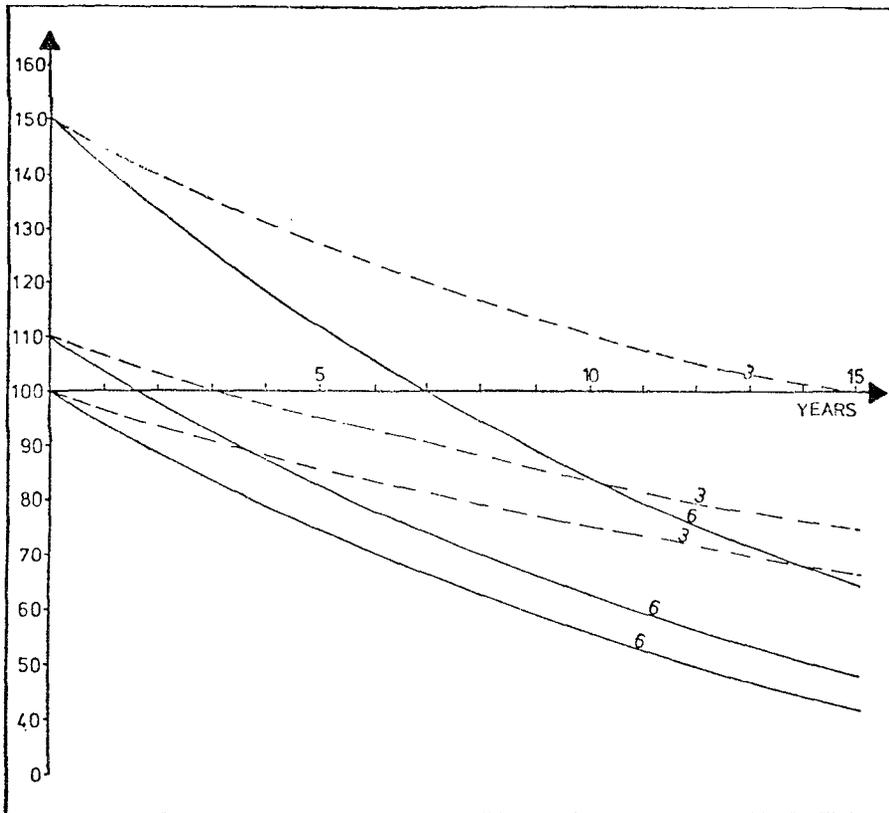


Fig. 9: The course of the diminishing present value under different i factors (6%, 3%) and under different supplementary costs of the gradual development strategy (10%, 50%) in their effect on the breakeven point.

$$\sum_{i=1}^3 PVC_{DE_i} = C_{DE_1} \cdot a + C_{DE_2} \cdot (a+b+c)(1+i)^{-n} + C_{DE_3} \cdot (b+c)(1+i)^{-m}$$

$$\sum_{i=1}^3 PVC_{D_i} \leq C. \text{ Where in PVC is the present value.}$$

reached, but will be considerably delayed if the factor “ i ” decreases in the case of high inflation rates. If the breakeven point is not at all reached, the gradual development is uneconomical. In Fig. 9 it is shown that the additional costs of the development orientated alternatives have an important impact on the results. By simple examples it is possible to show for costs increases of 10% and 50% how the breakeven point will be delayed.

Contrary to the external factors such as inflation and interest rates, which cannot be influenced by settlement and housing planning, it will be all the more important to minimize the internal cost causing factors like preperformances, effects of rationalization, material and demolishing costs. The determination of the advantages of alternatives can be

gained by an economic computation. This method is restricted, because social and economic rationality are not congruent. Often economic rationality is understood as a vehicle for maximizing the profits by minimizing the present values so that the social consequences are not taken into consideration. This becomes particularly evident in the case of high inflation rates to which the parameters of the decision rule react sensitively so that the immediate realization is favoured.

Further decision criteria have therefore to be deduced from the origin of the development orientated strategy and integrated in the decision process such as:

- highest possible supply level,
- advantages of adaptable structures,
- utilization of human resources, development of self-initiative and self-determined development and self-reliance.

It is obvious that such a gradual development approach requires considerably more planning and monitory efforts than the usual master plan and zoning approaches. But increased planning time and planning efforts can be justified by overcoming shortcomings, to realize with limited resources a maximum. Apart from this, planning costs represents just a small fraction of the possible saving so that it seems worthwhile to go on thinking in these direction.