# New challenges for City- and regional planning: Inner development of cities and regions for promoting sustainable development

## 1 Introduction

Spatial planning on regional level is witnessing a shift in its main emphasis. For several decades, the main task of regional planning was planning for urban growth. However, as a result of the changes in social, economic and spatial conditions that have occurred during the last few decades and those that are expected in the future, regional planning is forced to shift its emphasis to meet new challenges such as "inner development" of settlements („inner development" in this context means the mobilisation of brown fields, underused areas, former railway areas and vacant buildings for settlement purposes, inside the already settled area of cities and towns). We argue that this task represents a major aspect for planning in the future in many regions and cities in Central Europe. This paper discusses a key question, namely: "Which new tasks for regional planning arise from the changes in social, economic and spatial circumstances that lead to concentrating the spatial development of cities on the inner areas?" We attempt to answer this question in the context of "Stuttgart Region", which is a polycentric region consisting of a network of strong autonomous centres. With this case we intend to explore exemplarily the planning options for polycentric regions in an era when the main planning concern is not any more the planning for growth, but to maintain or to consolidate the existing stock or even planning under declining conditions.

Under these circumstances the major task of spatial planning on the regional level is to focus the limited resources in the region, to avoid consuming these resources through inter-municipal competition. Other viewpoints illustrate that under the above-described changing circumstances spatial planning in the future should emphasise inner development rather than urban growth. These points of view include, among others, the negative demographic trends, the limited public resources and attaining the economic and ecological limits of urban growth.

However inner development of settlements, as a result of the needed diminutive development steps can only be realised based on a strategy that represents guidelines for the handling of many single decisions. Without such a strategy, the whole development of the inner parts of settlements could fall in formalism and actionism. Consequently, regional planning faces the question of dealing with a large number of single, small development steps that are needed for inner development or for maintaining the existing stock. While in small- and medium-sized cities the overview about inner development potentials might be achieved and kept in the mind of a single person - without considering the danger of losing important information -, on the regional level it is only possible to achieve such an overview through the accumulated knowledge of many single actors. Such an overview on the regional level will consist of many tiny actions rather than of few large ones.

Using the example of the research project „Sustainable urban land management Stuttgart" (NBS) we will illustrate how such an overview about potentials as a base for inner development can lead to promoting inner development. This case covers different methodological, technical and organisational aspects. Based on this example it is made clear that inner development as a strategy could not only be realised on the local level, but that it should result from the coordinated planning on both local level and regional level.

On the contrary, some planners postulate that the overview about inner development potentials on the regional level, even in an abstract form, is neither practical nor possible. Against such a position we argue that it is only possible for the regional planning to make appropriate decisions if they are based on such an overview about inner development potentials in the sub-regions so as to set the direction of spatial planning according to it. This aspect will be demonstrated through the case study of "Sustainable Regional Settlement Management" in Stuttgart Region (RESIM) These examples demonstrate that such an overview is not only essential but also applicable using the modern tools of planning information systems that make use of the new information and communication technologies.

## 2 The research problem

In Germany, municipalities enjoy a very high level of self-government. These municipalities are independent and have the major responsibility regarding settlement development. The planning is initiated from the cities themselves. Higher planning levels can only influence the planning on the municipal level through funding specific projects or through inspecting the compliance of municipal plans with the goals of regional plans and state plans. In other words, the aspects that lay beyond the local interest can only be discussed while the region attempts to give a judgment on the land use plans that set the specific arrangements regarding areas inside the boundary of the municipality, typically in the form of urban growth. However, the regional planning authority can not reject definitely such municipal plans that do not conform with the goals of the regional planning. In this case, the highest planning authority can make the decision about such a plan. So what should be the role of regional planning to face the challenge of inner development of settlements, so that the whole region would operate as a harmonised system of “networked cities” and not as undersized individual cities in the competition with larger cities both on the national and the international level?

During the last two decades, the main shift in urban growth trend in Stuttgart Region is the increasing ratio of development inside the existing settlement structure relative to the urban growth on green fields in the outskirts, and the types of land use and density of these land uses. Today It is estimated that about 50% of the total development activities take place inside the urban agglomerations. This trend is increasing. This type of development consists of a large number of small projects, that are usually considered as not having regional significance compared to large projects. In such small projects the formal link to regional planning is missing. However, the accumulation of many of these small projects has a substantial weight. Meanwhile as a result of this large number of small-sized projects, the coordination effort that should be exerted is considerably higher than in traditional large development projects. Whereas keeping the overview about the development trends is essential to estimate when an adjustment in a specific infrastructure on the regional level would be needed to keep pace with the settlement development.

Regional planning has limited or no authority inside the settled area of the municipalities, which do have the planning autonomy in these areas. This situation is different in the case of urban growth, where the regional planning authority can interfere in the planning process. Under these circumstances, the coordinating role of the regional planning authority gets more significance, to harmonize the development trends in the sub-regions by avoiding disproportional urban growth in some sub-regions that might contradict the efforts of other sub-regions in promoting inner development. The regional planning has in this situation the possibility to actively support inner development by direct funding or by bundling the experience among the municipalities beyond their local boundaries. This role will get more importance if it is based on a clear vision and a strategy that considers the chances and the risks that are connected with Inner development. In this way, it would be able to cope with the exogenous and indigenous forces as well as with the changing circumstances.

### 2.1 Demographical factors

Similar to other post-industrial regions in Europe, Stuttgart region is facing a drastic demographic change in the coming few years as a result of the decreasing natural growth rate. Although due to immigration, this demographic change is not as strong in Stuttgart Region as in the eastern parts of Germany or Eastern Europe, three major aspects can be observed. In the first place, the migration trend requires an enormous effort to integrate the immigrants in the society, the demographic growth which is based on migration does not occur homogenously in the region. This migration is mainly focused on the economically stable central sub-regions. Secondly, the change in the age structure is immense as result of the increasing ratio of old people. Thirdly, there are extreme interregional demographic disparities. In some sub-regions the decline is immense. Regional planning should deal with this dynamics on the regional level.

### 2.2 Economic impacts of future development activities

Although the average economic situation for the municipalities of Stuttgart Region is not as critical as in other municipalities in Germany and Europe, the resources and the possibilities to act are declining. Consequently, all development activities are strictly evaluated according to the feasibility of their realisation. On one hand, inner development could have the advantage of reducing the investments in infrastructure which are essential for urban growth in the outskirts. On the other hand, there are many cases where inner development projects are afflicted with a high density of conflicts that result e.g. from the ownership situation and the ambiguity of site contamination. These conflicts are connected with high financial risks. Such a risk is not affordable for investors, and it also often overcharges public investments. Nonetheless, it is questionable if the continuous urban growth with the resulting dispersed urban structure is affordable regarding its direct and indirect financial, ecological and social costs, for example through public investments for establishing and running infrastructure and facilities as well as for the supply of goods and services for a very low density of demand.

### 2.3 Spatial restrictions of growth

The continuous urban growth is limited in many cases by natural restrictions that set the boundaries of growth. This aspect is evident in valleys where the urban growth in the past has already consumed most of the available land and most of the technical and traffic infrastructure is concentrated in the base of such valleys. Consequently, some municipalities have no more reserves for urban growth. In the other hand, growth is still possible in many municipalities at least from the physical point of view. However, regarding the ratio of the built-up area and transportation network to the open and green area, the further growth is apprehensively taking the planning and ecological aspects into consideration. Other municipalities do still have areas for urban growth, but their accessibility from the central parts of the region requires immense investments in infrastructure projects, and they usually cause conflicts and negative environmental impacts.


**Fig. 1 Structure of Stuttgart region;**
**Source: VRS, Regional plan, 2001**

In addition to this physical differentiation of sub regions, different dynamics could be characterized regarding the economic and demographic situation in these sub-regions.

- "Booming" sub-regions, where the intensive supply of jobs leads to a drastic migration and consequently to a rapid urban growth.
- "Stable" sub-regions, where a relatively low population growth rate is expected and enough work places are available. Inner development in these municipalities is adopted as no urban growth potentials are available in many cases.
- Declining sub-regions, where the development potentials inside and outside the settlement are not mobilised as a result of the lack of demand. Some of these municipalities attempt to attract new residents or investors by urban growth activities.

Based on these categories of growth dynamics, it is predicted that the expected different development rates will lead to increasing the disparities among these municipalities. Different planning approaches will be needed to deal with these different situations. From the spatial planning point of view, the development of the inner parts of cities should get priority over the urban growth. The limited number of available reserve areas in the outskirts of cities should be used in a sustainable way through a coordinated regional development process to achieve a high quality of development without negative influences on other sub-regions.

Based on these ideas we argue that inner development of cities as a method for spatial development is a sustainable strategy that reduces or mitigates the impacts of these predictable changes and sets the foundation for long-term functioning network of cities in such a region.

## 3 New challenges for regional planning

In a polycentric region as in Stuttgart Region, which has a relatively large number of efficient and independent middle-centres, the significance of coordinating single development activities on the regional level has been apparent. As in most of metropolitan areas in Central Europe, several generations of spatial planners on the municipal and regional level have been engaged mainly with coordinating the growth process, and in distributing this growth. Consequently, the planning instruments and processes were also oriented to urban growth.

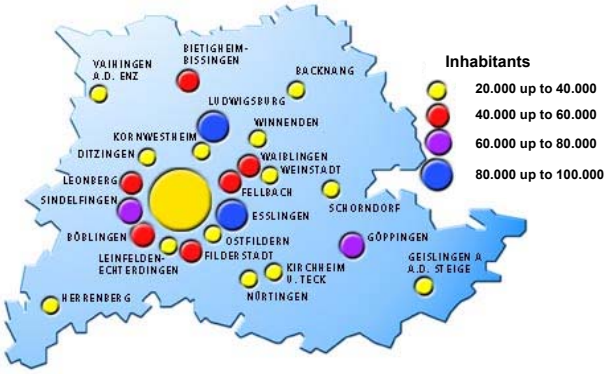


**Fig. 2 Centre structure in Stuttgart Region**
**Source: www.region-stuttgart.org**

Stuttgart Region has profited in the past from its polycentric structure and the small scale of its settlements. This has proven to act as an economically stabilising factor in stagnation times. But the competition among the centres in the region can only work positively if these centres are acting together as a network of cities. This aspect is even more significant taking into consideration the very dense distribution of these centres, so that the catchment areas of are intensely overlapping, which has been leading to an interweaved structure. Under these circumstances the regional planning authority can play an important role to mobilise the potentials that result from this spatial structure. In addition, regional planning in this case should take into consideration that the above mentioned changing conditions for spatial development, particularly the different kinds of resources restraints, do not lead to an excessive intra-regional competition which accordingly might hinder the collaboration in form of a regional network of cities.

Thanks to the economic prosperity, Stuttgart Region has overcome all the decline and stagnation phases during the last few decades. However, it is becoming apparent that Stuttgart Region should adjust itself to face the declining process especially regarding the unequal distribution of the future development. In addition, in the most important parts of the region the topography sets the limit for urban growth or makes new settlements unjustifiable from the planners point of view.

## 4. The methodology

Why is the question of the overview essential in this context? First, regional planning, under given circumstances, is concerned with a large number of smaller activities rather than with few big ones. Second, inner development activities are typically not implemented in a single long process of development. Such a development is connected with blockade situations that result from different conflicts that might need restarting the whole process, developing new concepts or waiting for the suitable opportunity to act. Consequently, the development process can only succeed if the large number of single activities, planning steps and decisions are governed by a guideline. Such a guideline is needed, to check if the followed direction of development is leading to the supreme goal, or if a reorientation is needed. This guideline is the strategy for action.

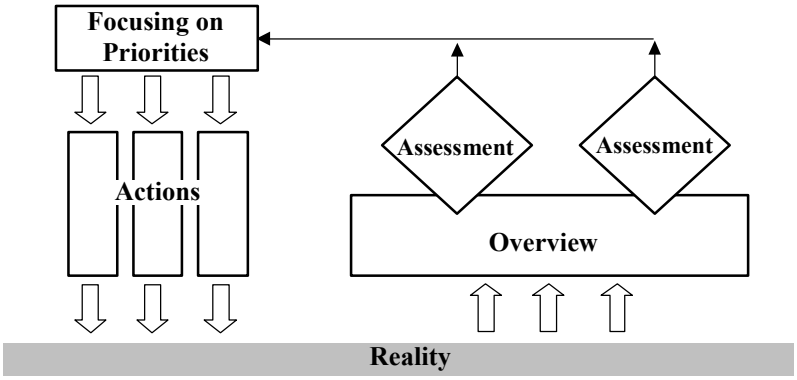


**Fig. 3 The relation between the overview and the strategy**
**Source: www.isl.uni-karlsruhe.de**

A strategy can be only formulated if it is based on a clear understanding of the options of action. In the case of inner development, this includes the overview about settlement potentials and their type, size and distribution, and the overview about available instruments and procedures that can be used to implement inner development. These two aspects represent an important base for formulating such a strategy. Based on such an overview it is possible to find out if the strategy of inner development is suitable for the planning area and might lead to the striven development or not.

As the conditions and circumstances are continuously changing, it is essential to check regularly if the adopted strategy is still the right one, and if the implementation of the activities is progressing. This could be done in a regular assessment of the situation that includes the experiences that are gained from the implementation and the new knowledge that is achieved from actualising the overview. Hence, strategy and assessment of the situation that is based on a robust overview represents a methodical unit that can be used to deal with the tasks of inner development.

## 5 Examples

The first example in this paper demonstrates how this process and the proposed methodology were implemented on the municipal level in Stuttgart city. This project has proved that a robust overview about inner development potentials can serve as a supporting instrument for promoting inner development.

The second example demonstrates the interim result of the attempt to establish an overview about the alternatives for action on the regional level. This includes inner development potentials in all the municipalities in the region as well as the possible instruments and procedures to achieve an essential prerequisite for an active support for the implementation of inner development by regional planning.

### 5.1 The case study of Sustainable Land Management in Stuttgart City (NBS)

The project “Sustainable land management in Stuttgart” “NBS” consists of three main parts:

- Getting an overview about inner development potentials.
- Setting a Planning Information System (PIS) to keep this overview up-to-date.
- Preparing a strategy and concepts for mobilising these potentials and for demonstrating possibilities of action on the municipal level.

**Stuttgart City**

Stuttgart city, as one of the major industrial centres in Germany, has witnessed a rapid urban growth in the second half of the 20th century. This urban growth was initiated by the industrial boom during the 1950s and the 1960s, and in the services sectors in the decades after that. The resulting growth in job opportunities led to a corresponding increase in population. This economic and demographic growth has led to an intensive increase in the residential and production areas. This growth, in the form of urban sprawl, took place to a large extent on green fields on the outskirts of the city, leading to more demand on private passenger vehicles and hence to more pressure on the road network.

However, since 1970, Stuttgart is witnessing a negative demographic development. In addition, economic growth, as indicated by the total employment, is witnessing negative development since 1990. These developments were accompanied by economic, technical and operational changes in the industrial, infrastructure and services sectors. This has been resultingin the formation of large abandoned or underused sites. To a large extent, these sites are located inside the city in the catchment areas of public transportation systems.

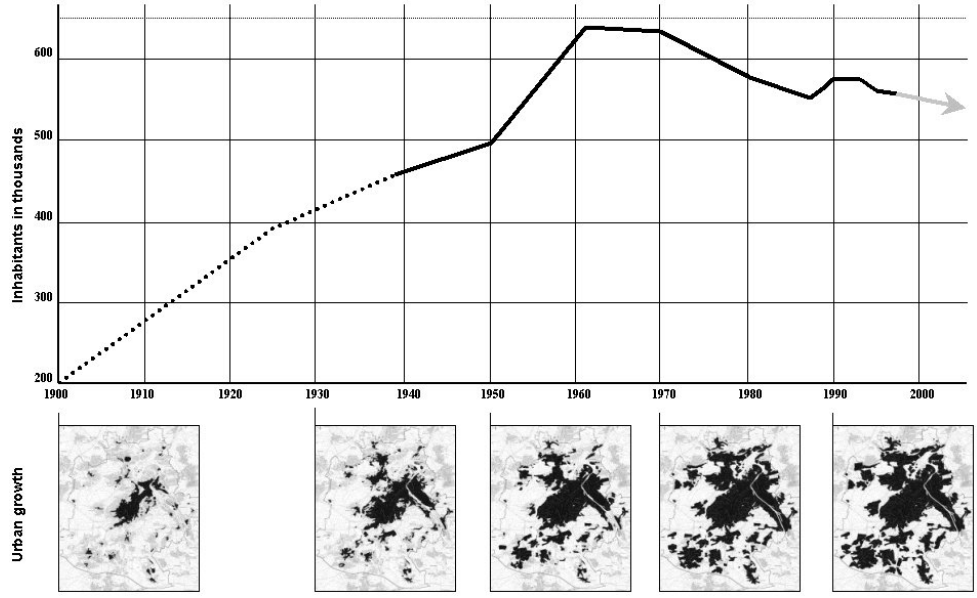


**Fig. 4 Demographic and urban growth in Stuttgart City since 1900**
**Source: Elgendy 2003**

This growth trend can - for several reasons - not continue in the same way as it did:

- Stuttgart is located in the Neckar valley and is surrounded by mountains.
- This topographic situation limits the air circulation in the valley, which represents a restriction on high buildings regarding the defined air corridors.
- From an economic point of view, it is apparent that the extensions of the agglomeration add high costs for maintaining the infrastructures in form of roads, public transportation or technical infrastructure such as water supply or sewage networks.

- If the population growth continued in this dispersed pattern, the density would decrease. As a result of this low density, the costs of public transportation would not be feasible. In turn, this might lead to increasing the use of private vehicles leading to traffic jams and an increase of the polluting emissions.

**Inner development as a strategy in Stuttgart City:**

Facing these facts, Stuttgart Land Use Plan 2010 (FNP 2010) adopts inner development of the city as a strategy for sustainable urban development. FNP 2010 in Stuttgart presents a vision of Stuttgart as a compact, urban and green city. This concept is aimed at overcoming the negative effects that resulted from the rapid urban growth, avoiding the expected unwished outcomes of the high consumption of green fields and at the same time guiding urban development in Stuttgart to sustainability. Contrary to the earlier rates of land-consumption, FNP 2010 estimates only the consumption of 130 hectare of new land during the plan period in the coming 10 to 15 years. This amount of land consumption is equal to the consumption of land in one year during the 1960s. To meet the afore-mentioned estimated annual consumption, the rest of the land should be developed inside the city with a ratio of 4:1 for inner development.

However, formal planning instruments are usually limited in supporting the inner development of cities. Planning laws were prepared for the times of urban growth and are mainly oriented towards building in the outskirts of the city and not for the redevelopment of internal reserves of the city. One of the main steps to implement the strategy for inner development is getting an overview about inner development potentials in the city. Then, based on this overview, it will be possible to identify priority areas and to develop a strategy for developing these potentials. NBS is aimed at developing the needed overview about the inner development potentials in the urban agglomeration of Stuttgart. NBS is considered an instrument for supporting the efforts of the city for promoting inner development.

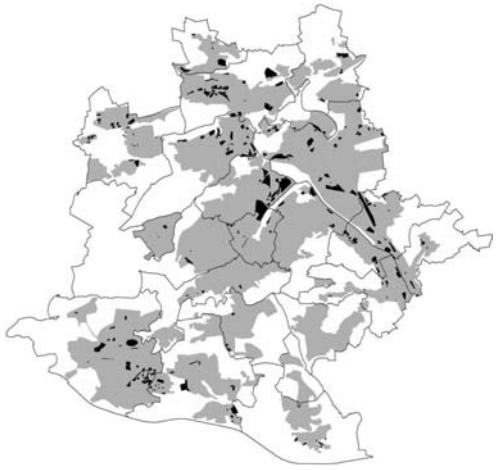

**Fig. 5 Inner development potentials overview (NBS, December 2002)**

By the end of December 2002, using the information platform that was developed for this purpose, more than 300 areas were identified as inner development potentials. The total area reached more than 500 Hectares, which equals the total area needed for development in Stuttgart at least for the coming 10 years. The project NBS has shown empirically how sustainable inner development on the municipal level can be promoted as a continual task. Stuttgart city has got a modern instrument in the form of an information platform that facilitates keeping and updating the overview about inner development potentials and activities. Although the project is implemented in a medium-sized city, the results are applicable for smaller cities, as the information platform does not require specific technical infrastructure. Meanwhile the fields of actions that are proposed are similar on the municipal level. However, it is apparent from this project that the success of inner development on the municipal level requires a strong coordination and involvement of the regional level.

### 5.2 The case study of "Sustainable Regional Settlement Management" in Stuttgart Region (RESIM)

In Stuttgart Region one of the key challenges for regional planning is to manage intra-regional migration, to avoid uncoordinated land use on the green fields as a result of the demand for cheap land. To face this challenge, the regional plan of Stuttgart Region applies quantitative management to solve this problem which includes approaches to guarantee an efficient and sustainable land use. However, the demographic trends and the resulting shrinking process, which was delayed by the economical prosperity, will start sooner or later in certain parts of the region. To meet some precautions for mitigating the negative impacts of this foreseeable perspective, the strategy of inner development combined with defining focus areas for settlement and the cooperation between the municipalities in the region can play an important role in this context. The experiences on the municipal level have shown that without a regional strategy the success of these effort soon reaches its limits.

The decision to follow a certain strategy needs an overview about the status of the relevant area. As such an overview is often missing on the municipal level, getting the overview on the more complex regional level is even more difficult. Nevertheless this regional overview is essential to compare urban growth with the inner development possibilities and to concentrate actions and investments in social and technical infrastructure where they are most efficient. Getting the overview about these potentials requires bundling many separate pieces of information from many sources, especially from the municipal planners (or the mayor in smaller municipalities).

During the pilot phase of the project, three different enquiry-methods were tested: a) areal photo analysis; b) interviews with municipal planners and c)an online platform.

However, results of these tests have shown that without face-to-face meetings with the municipal planners, many potentials might not be recognized. Based on this experience, a method to enquire inner settlement potentials on the regional level is proposed. In this method a compact attributes catalogue is proposed, to concentrate on main issues that are important for the regional overview and to guarantee an efficient enquiry process while integrating all points of view and the knowledge from all actors. A web-based planning information system (PIS) is developed to collect, structure, present and update the collected information. This PIS provides the possibility of a continual update and assessment. It also allows importing information from other resources (eg. from the information platform of NBS-Project). Furthermore, this PIS provides the possibility of decentralized work to allow the municipal planner to update the information directly. It should also be open to a wide spectrum of users while protecting information that is confidential.

#### Stuttgart Region

To get a picture about Stuttgart Region, the following table represents a comparison among different regions in Germany regarding demographic structure, settlement structure and economic indicators.

| region | area | inhabitants in 1000 | work places | GDP per settlement area for industrie | residetial floor area per inhabitant | settlement area for industrie per inhabitant | work places per 1000 inhabitants |
|---|---|---|---|---|---|---|---|
| | (2001) | (2001) | (2001) | (2000) | (2000) | (2000) | (2000) |
| | [km²] | IH | WP | [€/m²] | [m²/IH] | [m²/WP] | [WP/1000 IH] |
| Rhein-Main | 4.867 | 2.705 | 1.156.748 | 1.881 | 39,5 | 46,3 | 428 |
| Stuttgart | 3.654 | 2.634 | 1.071.793 | 1.276 | 38,6 | 64,0 | 407 |
| München | 5.504 | 2.483 | 1.105.653 | 2.731 | 39,5 | 35,3 | 445 |
| Unterer Neckar | 2.242 | 1.128 | 424.481 | 804 | 41,0 | 98,5 | 376 |
| Hannover | 4.365 | 1.415 | 510.244 | 862 | 41,3 | 89,8 | 361 |

**Table. 1 Regional comparison**

**Objectives of the project RESIM:**

Aiming at setting a strategy that promotes sustainable development in Stuttgart Region, the Project RESIM has the following objectives:

a. Getting an overview about inner development potentials:

- Development of an enquiry-method for the regional level.
- Enquire settlement potentials.
- Development of a web-based overview about the potentials.

b. Exploring the tools and instruments that support this strategy

- Exploration of innovative tools and instruments for implementing “inner development”.
- Adaptation of these tools according to the specific requirements of Stuttgart Region

c. Setting a strategy for Stuttgart Region

- Based on the overview about inner development potentials and the available tools and instruments a strategy should developed.
- Identification of focus areas for inner development and areas for pilot studies.

**Enquiry of inner development potentials**

As mentioned above, two approaches were tested to establish an overview about Inner development potentials: areal photo analysis and on-site interviews with the municipal planners. During the on-site interviews different approaches were used:

- On-site interview in single municipalities, with mapping of the potentials on a paper-map. Then, digitalising them in a GIS and complementing this from the areal photo.
- Interviews to link existing PIS with the regional PIS (e.g. Stuttgart City)
- On-site interviews with several municipalities together, using the PIS to input the potentials directly.

To establish the overview about inner development potential in Stuttgart Region, interviews with about 80 planners on-site are necessary. The interviews started in a pilot-phase in March 2004 with 4 municipalities. The second phase with 20-25 municipalities took place in April 2004. The remaining parts of the region should be completed till October 2004. Proceeding in more than one session guarantees the implementation of the experience and feedback that are gained during the interviews.

The attributes collected during the enquiry-process are limited to the basic ones, to ensure an abstract overview on the regional level. This allows the development of a strategy which supports making decisions during the daily work. However, on the municipal level more detailed information is needed. It is planned to implement a “internal-area” with specific attributes for the municipalities. This guarantees that the PIS can also be used as a working tool especially for those municipalities, which today are not working with any type of digital tools within the planning department (usually smaller municipalities < 5000 inhabitants).

**Areal photo analysis**

The first comparisons of the results of the on-site interviews with the result from the areal photo analysis show, that so-called “not yet realised outbound development potentials” can be appropriate monitored with the “areal photo analysis-method”. For inner development potentials, the on-site-enquiry can be completed with results of the areal photo analysis. Therefore, a feedback from the municipal planner is needed to avoid mistakes. This feedback can be organised via the web-based PIS and doesn’t need a second on-site-meeting.

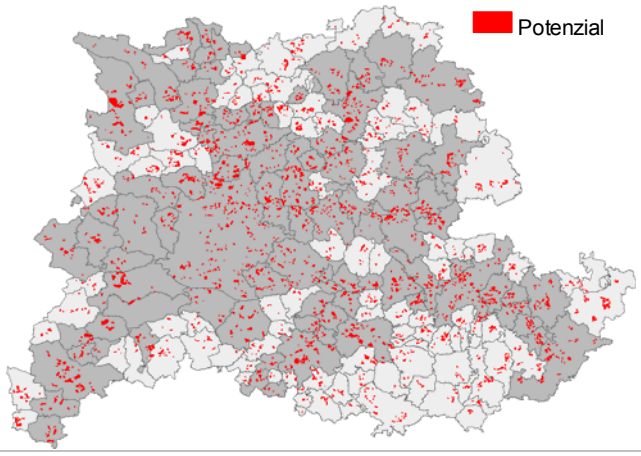


**Fig. 6 Results of the areal photo analysis**

## Web-based planning information systems

The overview about inner development potentials on a regional scale must be organized in a way that allow a decentralized enquiry and continual update by the actors in charge in the municipalities. These two pre-requisites define the requirements for development and implementation of the web-based PIS. The following basic criteria are also essential:

- Different overview-levels: municipality, region and public.
- Different levels of abstraction e.g. the regional overview is limited to basic-information
- Open system: to allow import and export of information with existing GIS, CAD, Office and database software
- Stand-alone system without specific programmes.
- Online-input of spatial information

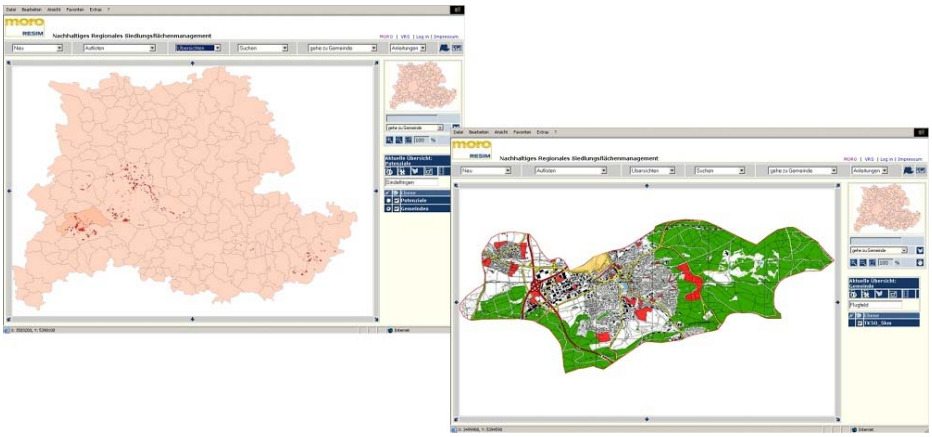

**Fig. 7 Screenshot of the information platform of the project RESIM**

## Tools and instruments

German regional planning authorities are in disadvantage compared to the more powerful municipal authorities. This represents an obstacle in establishing a strategy for promoting sustainable regional settlement development. Therefore, there is a vast need for exploring how existing instruments can be used more efficiently and which new instruments could give regional planning the required power to promote inner development. While the number of instruments and methods that are currently discussed is immense, not all of them are suitable for the situation in Stuttgart Region, taking into consideration the characteristics of the region and the overview about inner settlement potentials.

The difficulty in the discussion about these methods and instruments emerges from the lack of knowledge about the fundamental possibilities of action. Without an overview about the settlement potentials within the special sub-regions the importance of the single instruments can't be realised. During this project it was possible by combining the results of both overviews (inner development potentials, tools and instruments) to find new conclusions of how to act and what is needed therefore. One of the main challenges for the investigation for new tools and instruments is the broad variety of disciplines involved, e.g. legislation, funding, technical implementation, state and federal frameworks, providing service and consultancy for municipalities and coordination of regional and state planning.

These tools and instruments, as far as they are relevant to regional planning, can be sorted into the following main categories:

- Coordination of planning and realisation of projects:
  - Intra-regional, among municipalities and region
  - Interregional (region to region) representing the regional perspective and particularly the perspective of municipalities located near to the regional border
- Communication about potentials, experience, conflicts:
  - Expertise exchange within the region
  - Representation of municipal and regional interests within the discussion on new regulations to limit urban growth
- Supporting municipalities within planning processes for inner development:
  - Funding opportunities
  - Representation of municipal and regional interests within the discussion on new regulations to limit urban growth

**Developing a regional strategy**

Following such a strategy on the regional level requires focusing on main aspects. The question where to focus and invest can be answered through the regular assessment of the situation. The results of assessment can be discussed, evaluated and the limited financial resources can be focused on promising projects. The combination of the overview about tools and instruments plus the overview about inner development potentials is the foundation for defining the options of actions. In addition, the overview provides very important and reliable quantitative arguments for a discussion in professional and political circles.

The aim of the last phase of the project will be the development of a strategy out of these options. This will allow further strategic action for the regional planning in cooperation with the municipal planning to promote and realise a sustainable urban development. Taking into consideration the increasing uncertainties about the future trends, giving priority for Inner development is a reasonable strategy. However, one of the main results of the studies in Stuttgart Region is that there will always be a need for urban growth in some parts of the region. Three cases must be considered:

- Restrained high quality urban growth for those parts of the region where no possibilities for inner development are available. However, such an urban growth must be compatible with existing infrastructure and with the difficult topography in some areas of the region.
- Promoting inner development with coordinated limited urban growth within the catchment area of important axes of inner development potentials
- Tuning the requirements between neighbouring regions as well as with superior planning levels to achieve a coordinated settlement development in border areas.

This strategy must meet the different requirements that result from the different spatial structures within the region. There will be a need for a wide variety of tools and instruments so that regional planning can act on different fields of work both endogenous and exogenous. Therefore one of the main tasks while developing a strategy will be to find appropriate tools and instruments to meet these requirements

## 6 Conclusions

The two case studies demonstrate that inner development is a strategy that is suitable for future tasks for planning on the municipal and regional levels. They show, that this strategy is essential for a sustainable development especially for regions that consist of an organized network of autonomous cities. The project “Sustainable Land Management in Stuttgart City” (NBS) exemplifies that the strategy of inner development is important on the municipal level and has to be practiced by the municipal authorities. Such a strategy has to be founded on an overview about the options for action.

A second important conclusion is that this strategy on the municipal level requires cooperation from regional planning in coordinating and supporting municipal efforts in promoting inner development and reducing urban growth on green fields. This role of regional planning is essential especially in regions where central sub-regions have reached the maximum of urban growth, as in Stuttgart Region. This role is investigated in the case study of “Sustainable Regional Settlement Management” in Stuttgart Region (RESIM). The first experiences in Stuttgart Region illustrate that a simple structured planning information system is required as the backbone to achieve the needed overview. It is also evident that establishing such an overview on the regional level is possible.

In general, these two examples demonstrate that inner development as a strategy on different planning levels is a reasonable approach for spatial development under the changing circumstances and for promoting sustainable development.

## 7 Literature

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