

# NESTOWN: NEW ETHIOPIAN SUSTAINABLE TOWN

## A REAL LIFE EXPERIMENT

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### Abstract:

By 2030 almost five billion people or 60% of the world population will live in urban areas. Even though urbanisation can be considered a positive development there are also major challenges that have to be addressed – especially in Africa where cities are ill-prepared to absorb the large-scale migration from rural areas. The Ethiopian government has recognized these challenges and is supporting the development of new urban centres that would help diverting migration away from Addis Ababa, the overcrowded capital city. In this article we use the example of the New Ethiopian Sustainable Town (NEST) to illustrate how existing vital challenges in Ethiopia could be addressed by means of an interdisciplinary model of urban development.

**Keywords:** Nestown, Buranest, sustainable town.

### 1 Introduction

The founding of *Buranest*, the new Ethiopian town, was celebrated on June 27, 2010. The name is chosen by the local authorities. It is composed of *Bura*, the local kebele or territorial corporation of about 8000 inhabitants, and of *NEST*, the code for New Ethiopian Sustainable Town, a design for more than 20'000 inhabitants.

The new town *Buranest* was declared the *Amhara Model Town* by the regional government. It is situated close to *Yifag*, close to the Eastern shore of Lake Tana. and about 70 km north of *Bahir Dar*, capital of the Amhara Region where about 23 million people live, about a quarter of the Ethiopian population (fig. 1).

*Buranest* is a real life experiment with the goal of creating a *Self-sustaining Town*. This is to be achieved by transforming the highly dynamic relationship between the growth of the population, the cultivation of the territory and the settling in the landscape within the time of about half a generation. New capacities are to develop on the site which can re-establish and periodically renew the ecological and cultural equilibrium, which today is highly at risk.

The experiment is executed based on collected data, defined goals, commitments for the transformation and working hypotheses. All experiences will be recorded and serve in starting additional *Self-sustaining Towns* in Am-

hara. The laboratory for this experiment is shaped by three main elements:

the natural landscape on Lake Tana with its resources which have been culturally changed and in parts gravely depleted or lie fallow;

a farming population, sedentary or recently arrived, that only knows few promising forms of work, production and exchange for a sustainable future;

the area of a commons (10.6 ha), formerly used for grazing and now rededicated for building the first stage of the town for about 4000 inhabitants.

Two more urban centres – *Yifag* and *Adis Zemen* – are easily reached from *Buranest* so that a tripolar city of more than 100'000 inhabitants could develop relatively fast.

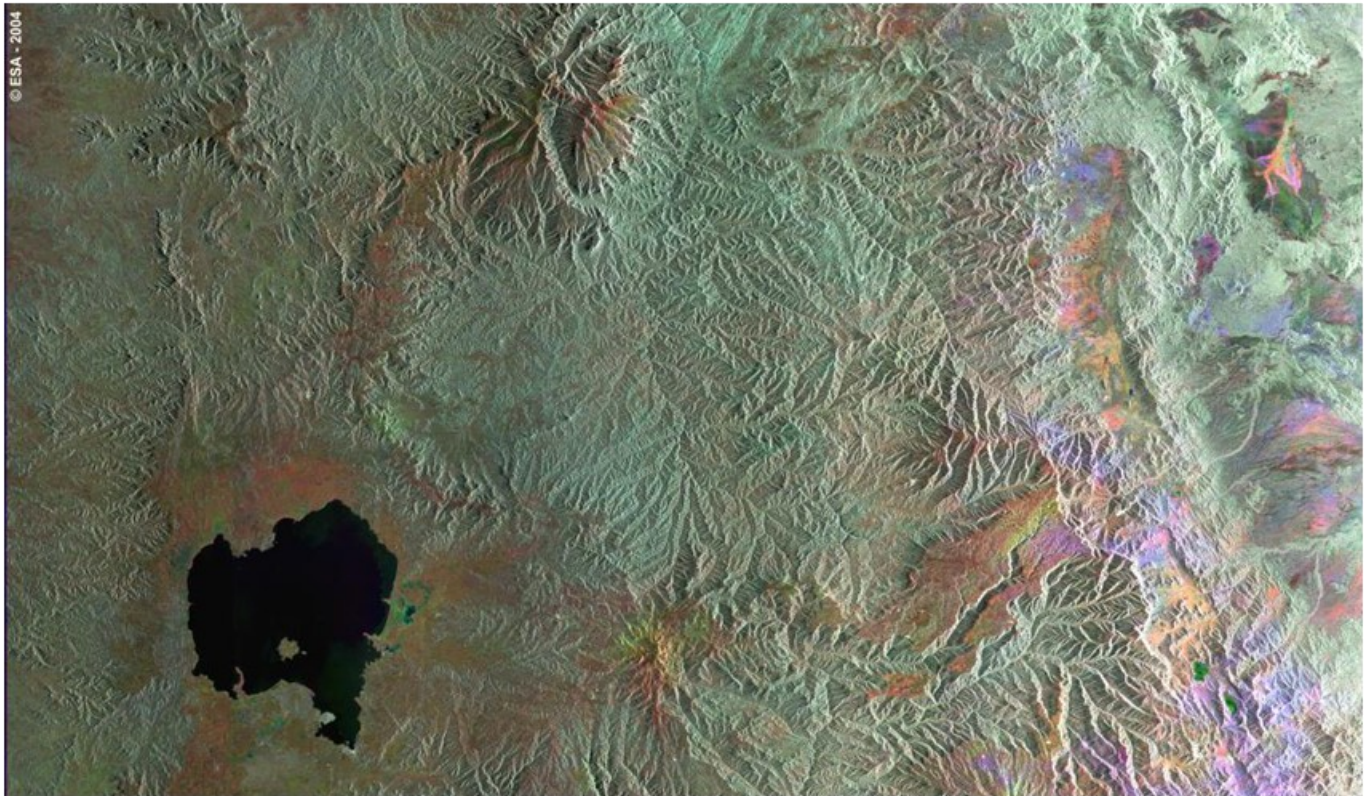
### Why build self-sustaining new towns in Ethiopia?

Building new towns will change the traditional single homestead lifestyle of the farmers. Urban living and urban agriculture will improve output, in quantity as well as quality, with the help of autonomous cooperation, technologically enhanced work, a diversity of trades and exchanges. Thus, everyday life, based on division of labour, can become differentiated and productive, reduce the pressure for migration and further solidarity across generations without harm for man and environment.

In addition, through building new towns a cyclically operated metabolism will be created in order to secure the long-term regeneration of the town environment which often is ecologically depleted and highly endangered. The adequate care for the metabolism of urban environments requires the transformation of traditional patterns of cultivation.

*Self – sustaining* describes the relationship between available regional resources and the resources that the region requires to meet its needs, such as water, food, energy and construction materials. Self-sustaining, however, encompasses more than a technical or technocratic feature: it encompasses cultural, social, economic, and political values and the exchange of knowledge, skills, and technologies, all requiring careful design and policy decisions.

Figure 1. Lake Tana, source of the Blue Nile



From a systems theory point of view, self-sustaining urban environments are a dynamic construct consisting of borders, dense or loose stationary stocks (e.g. congregation of people, buildings, waste or data storages), dense or loose flows (e.g. people, water, air, energy, goods, data) and processes that lead to the transformation of stocks, flows and other urban dimensions. A balanced system of exchange establishes an equilibrium between immigration and emigration, as well as exports and imports.

Approaching the term self-sustaining from multiple angles, a composite of solutions encompassing citizens, services, infrastructure, construction, transport, and energy production are intertwined.

Against this backdrop, the real life experiment *Buranest* is founded on basic characteristics of the local environment, decisive goals, commitments in the process of transformation and working hypotheses.

#### Basic characteristics of the local environment

The basic characteristics do not only apply to Ethiopia, but can be observed in most developing countries, with similar disadvantages and risks. We divided the basic characteristics into 8 great challenges that need to be addressed in the design of a self-sustaining new town in Ethiopia:

*Demography:* population growth averages around 3%. For Ethiopia's 80 million inhabitants this means an additional 2.4 million people per year.

*Ecology and Agriculture:* Soil erosion, deforestation, increasing livestock density, lack of technology to con-

trol for drought and flood and the shrinking size of arable land per inhabitant are threatening agricultural and environmental sustainability.

*Water & Health:* water resources are sufficient but unbalanced, health care insufficient with periodic outbreaks of illnesses.

*Energy:* producing heat by burning wood is inefficient and contributes to deforestation. Electrical power supply is essential and can increasingly be provided by the new hydro plants in the area. Energy potentials (geothermics, sun, water, wind) are underused.

*Schooling:* analphabetism lies around 60%, mostly for older inhabitants and girls. Higher education and technical training are scarce and often of poor quality.

*Working techniques, tools, machines and organization:* more than 80% of the population live on subsistence agriculture, with traditional, but inefficient tools, little mechanization, in single homesteads.

*Mobility:* physical strength of man and animal are mostly used for transport. Mobile communication and paved streets are rapidly extended. The numbers of trucks, bicycles and public transport are growing.

*Migration:* day labourers, whole families are looking for work or markets, settle informally at the edge of streets or under power lines, migrate to the next bigger city.



## Decisive goals

These challenges must be addressed by setting the right priorities: First of all there needs to be more public and private investment in agriculture in order to improve the quantity and quality of agricultural products and services. Second, investment in skilled labour needs to increase in rural and urban areas. It is crucial for endogenous development because it enables people to specialize in a particular craft that is in demand and build up local markets based on the division of labour and earn an income that may improve people's living condition and attract more investment. This again will help to reduce the push-factor of rural-urban migration and, at the same time, stimulate the mobility through trade and exchange.

## Commitments in the process of transformation

These goals can only be achieved through complex processes of transformation that assist people in their efforts to move from traditional towards habits of self-improvement that combine a better use of local knowledge with a readiness to adopt knowledge in efforts to improve local products and services. These processes require guidelines and commitments. For *Buranest* they are:

Active and autonomous participation of all stakeholders is guaranteed by bottom-up and top-down processes of realization, already involving the regional government and planning authorities as well as the local community and the individual farmers.

High rate of supply from locally available resources for local needs leads to marginal dependence on imported goods. This applies to building material, to energy as well as human resources like labour and knowledge.

Transfer of new technologies is provided, including education and advanced training. The new local technical and vocational school will be directly involved in the building process. The school is financed by the Amhara Development Association.

Production and innovation of value-added chains are derived from independently developed traditions and adopted technologies: planting of bamboo, production of building material, production of furniture, production of yarn, weaving or growing of grain, introduction of electricity, introduction of grain mill, milling grain for the neighbourhood, selling flour, setting up a bakery store.

## Working hypotheses

For the goal of self-sustainability we have formulated four working hypotheses: (I) the loop of urban practices, (II) the security in filling basic needs, (III) the increase of living standards for individuals and the group and (IV) the rules of urban cohabitation. In *Buranest* these hypotheses will be implemented step by step and are periodically evaluated if they help to achieve the goals.

## II: The loop of urban practices

*Buranest* becomes self-sustaining by creating an infrastructure that can be maintained and operated by the local people. It requires education and technical training of its inhabitants, the facilitation of local energy production and trade and exchange with other communities, as well as a balanced flow of basic natural resources within defined perimeters. Thus, *Buranest* means implementing the 4E: Education, Energy, Exchange and Ecology (fig. 4). They are the base and the driving force for the development of the town. Already at the outset, they are integrated in and adjusted to the life of the town and are used to enhance urban capacity building, i.e. the formation of vocational skills, economic and electronic exchange, mechanized and electrical power, re-cycling paradigms and practices.

The local economy of *Buranest* is dominated by Urban Agricultural Manufacturing. It is located within and on the fringe of the town, which grows, processes, and distributes a diversity of food and non-food products, using and reusing human and material resources, products and services found in and around that urban area. The hinterland in turn supplies the unprocessed harvest as well as human resources to the urban area. By integrating the rural people into the urban economy mobility and exchange is enhanced while permanent migration is reduced.

## III: Secure fulfilment of basic needs, resource management in the public interest

Urban forms of living have always been based on public interest and the solidarity of many individual households that are integrated into the town. The inhabitants gain a secure chance for food and water, for example by cooperative production and storage. Resource management in the public interest of the town is able to provide food, health care, education, provision of materials, communication, transport, construction and maintenance of buildings and streets without outside help by local entrepreneurship. Certain services may be handled by private enterprise and further the competence in business organization. This includes the market and the management of electricity, garbage and sewage and recycling.

## IV: Increase of living standards, added value from co-operation

The site of *Buranest* was chosen by the regional authorities in collaboration with the local administration. It lies on higher ground, with no flooding in the rainy season, close to a paved road and a power line runs through it. Added value and the resulting increase in living standards can be gained from agriculture, husbandry, forestry, urban agriculture including fish farming, water management and health care and sanitation. Power supply and application, transport and communication, the production of tools and machinery, already started through start-up initiatives financed by a Swiss sponsor, also contribute, and not least construction and construction financing.

It is not intended to use any newly imported metal sheets or freshly cut wood for the construction of the living and working closes of *Buranest*. Therefore, even buildings of more than one story will be built without scaffolding and from locally gained materials like stone, pressed earth, waste, bamboo, grasses combined with industrial waste like tin cans, metal parts and with recycled imports like plastic containers, tires or cables. The lots with their buildings for living and working are designed in such a way that they can be adjusted to new needs by self-construction. Building is handled cooperatively: the private households receive a lot including a primary structure as a loan and are obliged to collaborate in the construction of the neighbouring buildings without compensation. They can dispose of their lot and building at the earliest when the second building is finished.

The building by the inhabitants themselves, the development of alternative materials like pressed earth help to increase competences and promotes trades like carpenters and electricians. In-kind contribution leads threefold to added value: private extendable living quarters, technical know-how and vocational qualification for further demand.

## V: Urban Charter & Townplan

How does a town emerge in Africa? It may start with a place in the shade of a tree. Here, people gather to devise their own history. Tree and town square mark the centre of the urban core. They embody the town charter as prepared by the town council and decided by the majority of the town's people.

Town charter and town core are the urban answer in Ethiopia to the never-ending and permanently extending settlements by the roadside. They represent the formal vs. the informal way of collective living. Formal living is complementarily structured in public and private legal realms and physically constructed by public and private space offering security of ownership and pride of achievement.

*Buranest* consists of three main areas (fig. 5). The areas of public institutions: town core with concentric ring roads and radial avenues; the town quarters with their closes; the hinterland with agriculture and forestry. The dimensions and proportions will allow all areas to change, become denser and adjust use and form so that changing needs can be met and the spatial quality of living stays intact at the same time.

The town core is the first place for the new town. It consists of the town square with 4 nuclei. This is where the interaction with the hinterland starts, the exchange of resources and products. The 4 nuclei mirror the activities which are required to build a town. The technical-vocational education and experience in the vocational school in nucleus 1 and the building experiments in the building yard in nucleus 2 are of particular importance (fig. 6).

The close and the dwellings are the pulsing spaces of

everyday urban life. They are built, equipped and enlarged by the inhabitants themselves. The pattern of the spatial lay-out is preset. It determines the area for vegetable gardening, the circular wall with storage, stables, shops and repair shops, the rows of houses with their domestic gardens, places for shared activities like sports and games, the infrastructure for building services and transport.

In the closes and dwellings the desired changes will take place, from traditional resource dependence to recycling by technical resource management, from uniform to diverse income production, from man or animal driven to mechanized labour, from wasteful and conventional construction to durable and sustainable construction out of local material.

## Concluding remarks

Planning and building a new town is based on centuries of experience and knowledge accumulation: outstanding larger and smaller examples are known in the Roman Empire, in Europe from the early Middle Ages, in the Americas from the 16. Century onward, in Africa and in India in the 20. Century.

Building a town is a process of learning by doing. The town remains unfinished, a product of learning and teaching by the young and the old, women and men, trial and error, building up and taking down. The town is a permanent workshop, a tools factory and storage of materials, energy production with repair services, exchange of goods and money, and, not least, participation of the inhabitants.

**Reference:** Website: NESTown.org

**Franz Oswald:** Professor of Architecture and Urban Design at ETH Zurich 1993-2003. Guest Professor at numerous Universities in Africa, Europe, Israel, USA

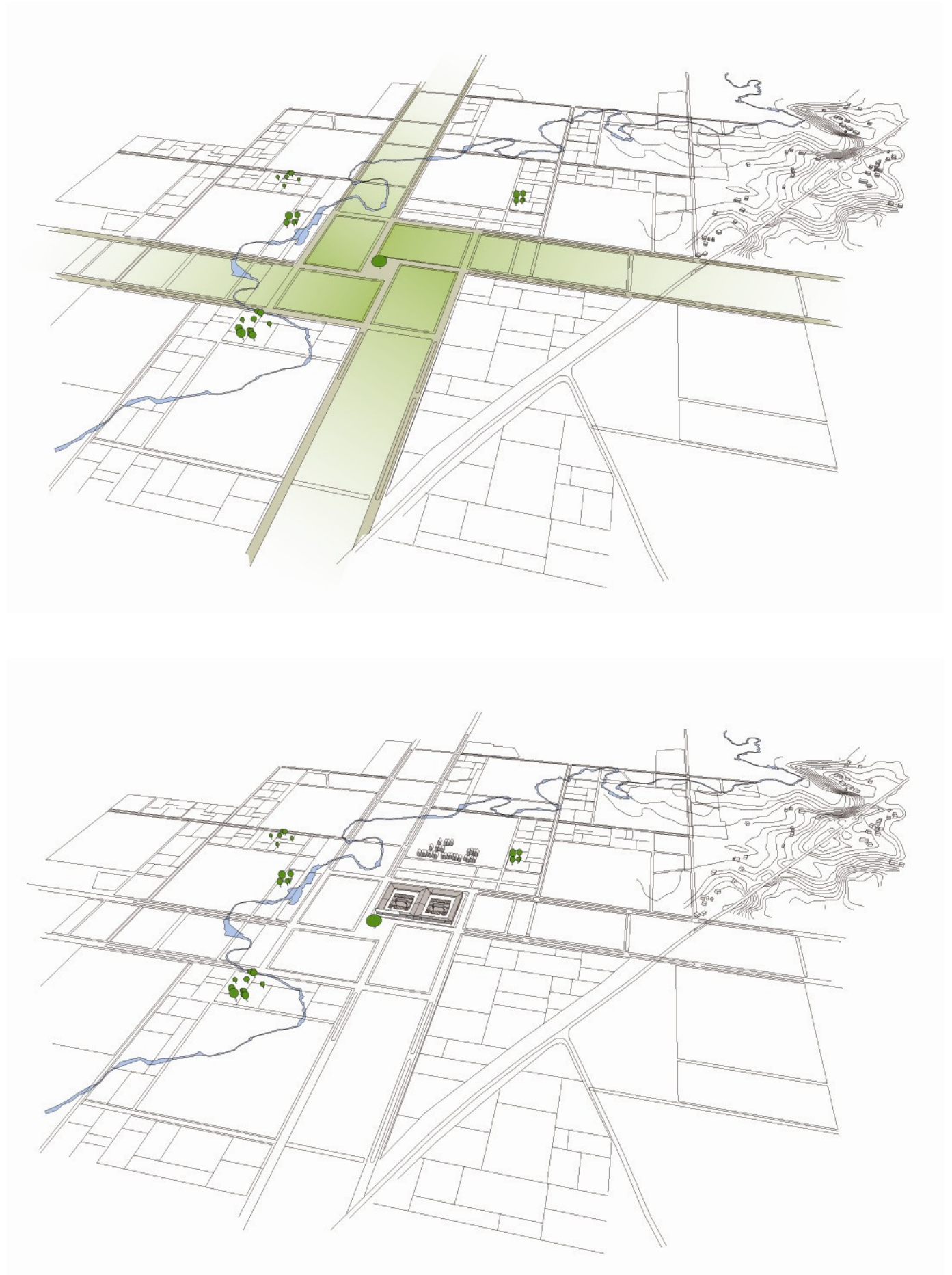
Since 1974, own office for Architecture and Urban Studies (AUS) in Bern CH. Projects, Buildings, Participatory Workshops and Studies in Urban Planning, especially on Urban Housing and City Development. Various awards, e. g. Deutscher Betonpreis für Wohnen der Zukunft.

Lecturer and international expert, jury member of competitions in Architecture and Urbanism; member of academic and scientific commissions; former Dean of the Faculty of Architecture at ETH Zurich; former Director of Institute for Local, Regional and National Planning (ORL) at ETHZ Zurich; former president of SCUPAD (Salzburg Congress of Urban Planning and Development).

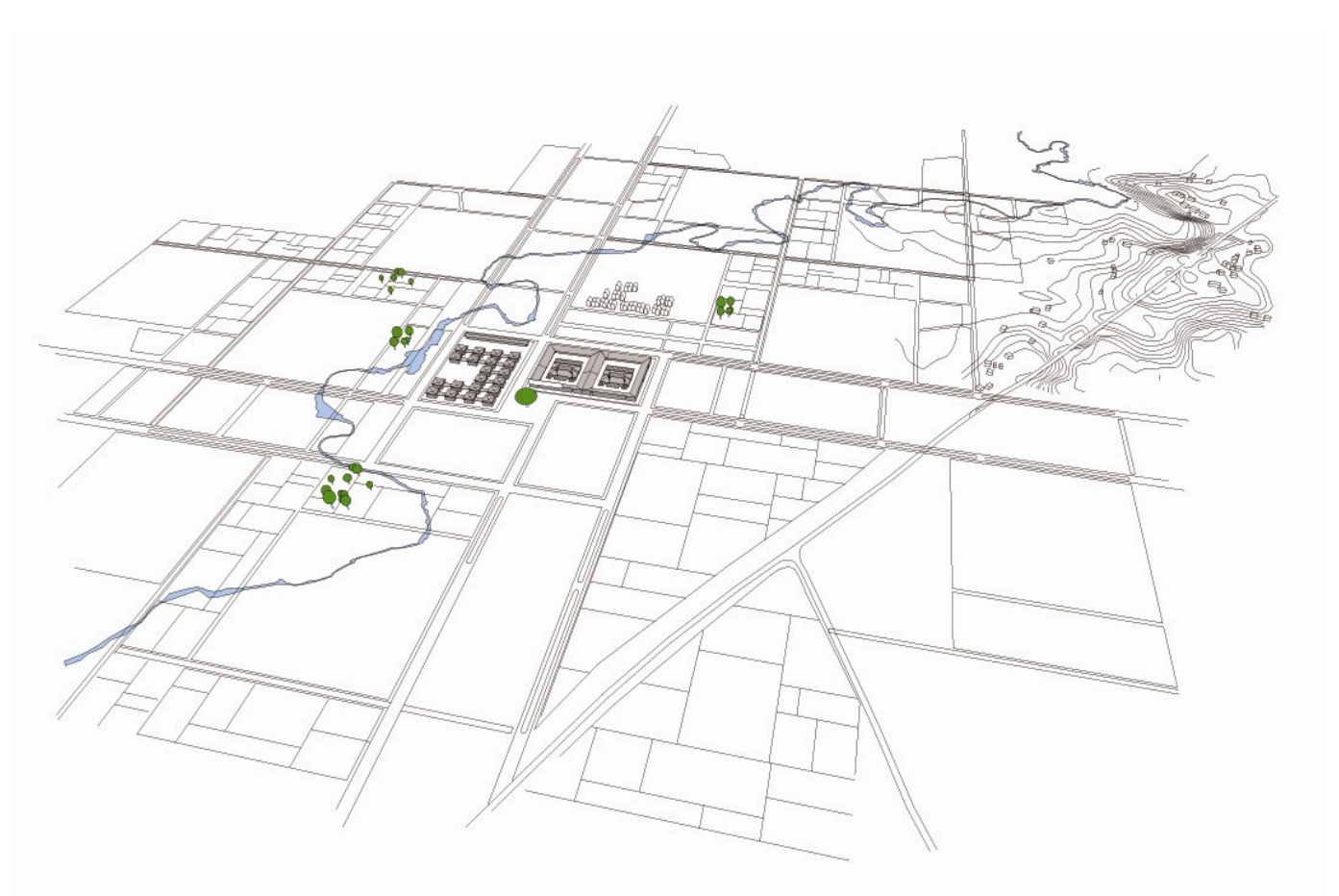
Numerous publications on: Architecture, Design and Teaching, Urban Design and Urban Planning; e.g.: "NETZSTADT – Designing the Urban" by Franz Oswald and Peter Baccini, (Basel, Berlin, Boston, 2003).

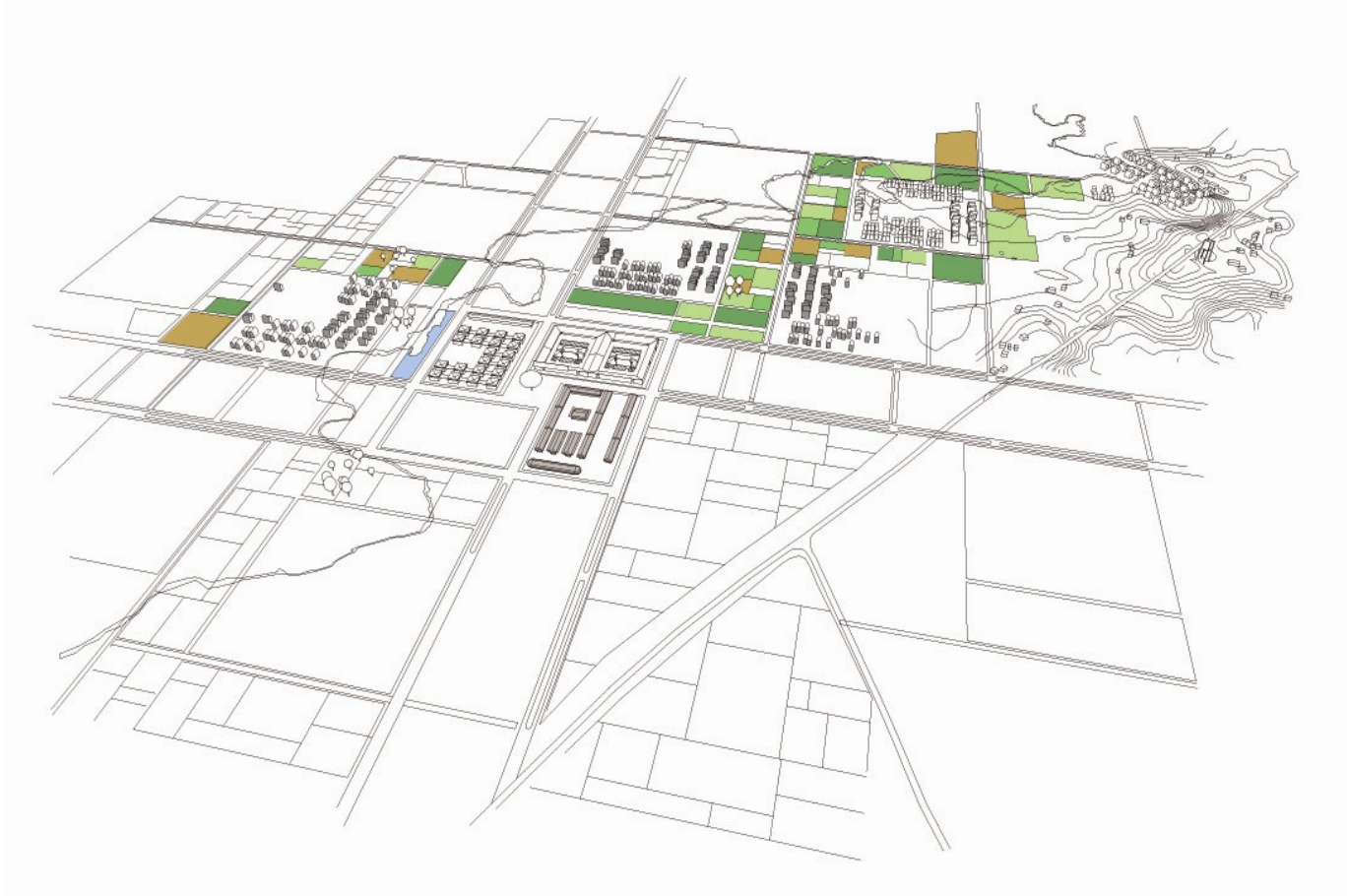
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Fig. 2: – NESTOWN model—phases of town development











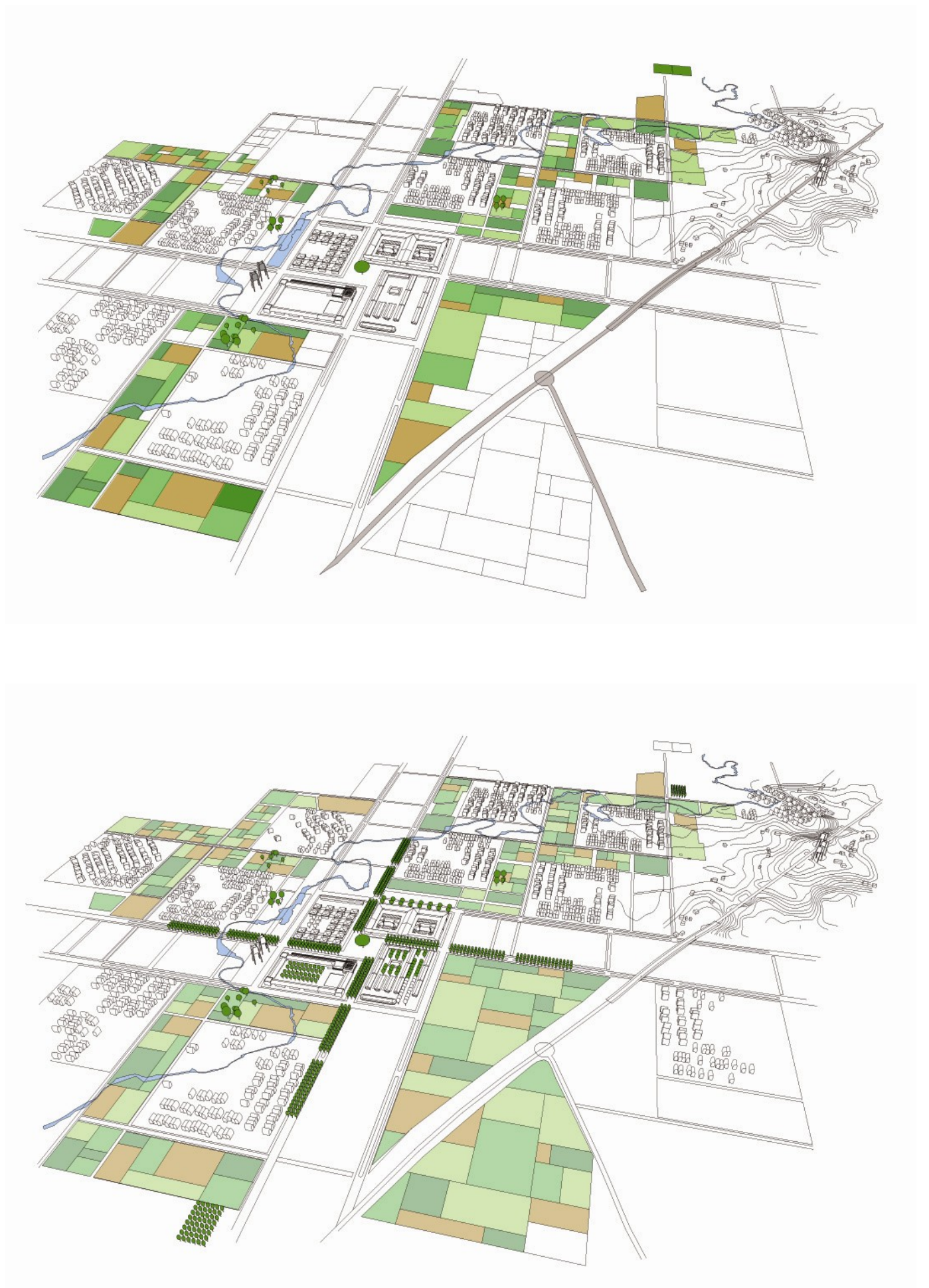




Figure 3. BURANEST town plan - NESTOWN model adapted to real site

