



Process Monitoring IAN Agroparks in India

Transforum Report 2009

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Preface

This is the first report of the Transforum project Process monitoring agroparks international, which focuses on India and specific on the development of the IFFCO Kisan SEZ Nellore in the south of India. It contains an overview of process design and the content of the proposition of IAN agroparks in India for 2009. Learning points and organizational principles are not reported yet. The final report will be delivered in 2010. Without all the Wageningen UR and Yes Bank people involved in the IFFCO Kisan SEZ Nellore assignment there would be little to monitor for the authors of this report. We would like to thank them for their involvement and trust: Peter Smeets, Raju Poosapati, Arjen Simons, Madeleine van Mansfeld, Gopinath Koneti, Gopi Krishna Swarangi, Sunjay Subrahmanya Vuppuluri, Han Soethoudt, Jim Groot. Paul Bartels, Jan Broeze, Resie Oude Luttikhuis, Steef Buijs, Annelies Bruinsma, Jetty van Lith – Kranendonk, Michiel van Eupen, Janneke Roos – Klein Lankhorst en Leo van den Berg. We would also like to thank Sander Mager (the project manager from Transforum), the participants of the CCT Community of Practice Learning in Transition, Paul Kersten and Remco Kranendonk for providing us with feedback and advice. Of course the authors alone are accountable for the content of this report.

The authors, December 30th 2009

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1 Introduction

In the Indian state of Andhra Pradesh in the district of Nellore Indian Farmers Fertilizer Cooperative Limited (IFFCO) is developing an agropark¹, called: IFFCO Kisan² SEZ³ Nellore. Yes Bank Limited (YBL) and Wageningen University and Research Centre act as advisors and facilitate their assignors (IFFCO and until the summer of 2008 Greenport Corporation) in the development of the Agropark. The Agropark will be built on an area of 1800 acres (720 hectares) and will have intensive agri and livestock production systems, processing as well as warehousing and storage infrastructure. This development is part of a strategic proposition of YBL and Wageningen UR to initiate an Intelligent Agrologistic Network⁴ within India. This development in the district of Nellore is the first assignment the Consortium of Yes Bank and Wageningen UR obtained in India.

1.1 Objectives and central research questions

This report is the first result of the Transforum project Process monitoring IAN Agroparks India which focuses on of development of the agropark IFFCO Kisan SEZ Nellore, as part of an Intelligent Agro-logistic Network in South India and in more time in the rest of India. With this Process monitoring project Wageningen UR, Yes Bank and Transforum want to keep track of what is happening in the assignments and keep track of learning points so that actions can be taken to improve the project.

Wageningen UR, partly in cooperation with others, like Transforum, Innovation Network and KnowHouse, has been working on the concept op agroparks for at least 10 Years. Projects have been done for sites near Rotterdam, Amsterdam, the Venlo region, Changzhou, Terneuzen en Shanghai (Smeets, 2009). Learning experiences have been monitored and a PhD has been written about them (Smeets, 2009). The process monitoring of the IFFCO Kisan SEZ Nellore agropark will add to this knowledge base. At the same this knowledge base and the results of the process monitoring can be used to support the development of IFFCO Kisan SEZ Nellore.

The project has two objectives:

- I. To monitor and evaluate learning experiences of the development and implementation of the value proposition of IAN agroparks in India*
- II. To support the development of organisational principles for IAN agropark development in India and in other countries.*

Central Research Questions:

- I. How is the process of IAN Agropark development designed and how does the process evolve in practice?
- II. What are the characteristics of the actor (KENGi) network of the IAN Agropark development IFFCO Kisan SEZ Nellore?
- III. What are the learning points for the development of the IFFCO Kisan SEZ Nellore agropark and for future IAN Agroparks in India and elsewhere?

¹ The concept and definition Agropark will be elaborated in section 2.1
² Meaning 'farmer'
³ Special Economic Zone
⁴ See section 2.1 for definitions

IV. What are the generic organisational principles for IAN Agropark development?

In chapter 2 the concepts will be explained which are used for the IFFCO Kisan SEZ Nellore agropark. In chapter 3 the process design is elaborated. In general and more specific for the Nellore site. Remarks will be made on the social forcefield in which the development takes place. Chapter 3 also involves information on activities and results of the process so far. In Chapter 4 main learning points so far are reported. The generic organizational principles will be reported in the 2010 report for Transforum. Before we will go into those issues we will give some background information on the monitoring methods used.

1.2 Approach to Process Monitoring

The process monitoring provided information on object, subject and process (what, by whom and by what process). Two levels of monitoring were used in the research: an actor network analysis (forcefield analysis) and an analysis of learning points during the process of the development of IFFCO Kisan SEZ Nellore. These results were used as input for key stakeholders in India and the Netherlands.

The following characteristics can be defined of the form the foundation of the process monitoring:

- This project is about a *process* monitoring and -evaluation and not about *impact* monitoring and evaluation. The impact on objectives is of course very important: a process without substance has no direction. Objectives drive the participants and will change over time as the result of learning. These aspects of the objectives were part of the process monitoring.
- Process monitoring is a form of process evaluation, but with an *Ex Durante* approach. This means that monitoring and evaluation activities focus on what happens during the process; not before or after. Evaluations can be done for reasons of accountability, to learn about results, to learn about process management, and to merge learning and action. The process monitors did a lot which could be *called reflexive monitoring* in action (Mierlo et al., 2010). In addition to that also non participatory evaluations and expert roles were used, because this was explicitly requested by the process managers and because this was more feasible in a multi-cultural setting.
- The process monitoring was partly *Action Research*⁵; in the sense that the researchers played a role in designing organisational models for IFFCO Kisan SEZ Nellore. The project did not only study what was happening, but also provided feedback during the process. This was partly demand driven. Members of the Management Team of Wageningen UR and Yes Bank asked for reflection and for advice from the process monitoring team to continuously learn and adjust their working process. Process monitors also raised discussions themselves when they thought this was important for the process. The process monitoring team organized workshops in which tools developed by the Communication and Innovation Sciences group of Wageningen UR and the Athena Institute of the Free University of Amsterdam (Arkesteijn et al., 2009) were used in a moderated form.

⁵ "Action research combines theory and practice (and researchers and practitioners) through change and reflection in an immediate problematic situation within a mutually acceptable ethical framework. Action research is an iterative process involving researchers and practitioner acting together on a particular cycle of activities, including problem diagnosis, action intervention, and reflective learning." (Avison, Lau, Myers & Nielsen, 1999: 94)

1.3 Content of Monitoring

The process monitoring researched the planning and developing the IFFCO SEZ Nellore as part of the IAN and it focused on process and organization aspects. More precise:

- *Who*
 - o Who are involved?
 - o What are participants doing?
 - o What are their values, goals and priorities? What stories do they tell?
 - o What are their resources?
 - o How do they relate to and interact with one another (in terms of coalitions, resources and culture)?
- *What*
 - o What is being planned / developed
 - o What is happening in the process?
 - o What are the results in terms of value creation?
- *Process*
 - o How is the process designed
 - o How does the process evolve in practice
 - o What lessons do participants learn? How could these lessons be used for improvements of the process?

1.4 Data sources

The data for this report came from various sources:

- Interviews with stakeholders;
- Observations in meetings and workshops;
- Studying mails, reports and mind maps;
- Learning workshops which were organized by the process monitoring team;
- Feedback from key stakeholders.

2 The proposition of Agroparks and Intelligent Agro logistic Networks in India

2.1 The generic concept of agroparks

Building on Castells' vision of the Network Society, agroparks are described by Smeets (2009) as essential nodal points (space of places) in the worldwide flow (space of flows) of goods and people. Many people live in delta areas, near the sea. Those were traditionally the areas with good conditions for agriculture and for trade with the rest of the world. These areas are in many cases intensively populated and are the regions where the global trend of urbanization takes place. Therefore the total area of high productive land available for agriculture decreases. This is a challenge for agriculture because of the rapid growth of the world population (outside Europe and the USA). When nothing would change, food problems are to be expected. The concept of agroparks is rooted in the vision that *intensification and industrialization* of agricultural produce is the only way of coping with the challenges of urbanization on fertile soil (delta areas), population growth, sustainable development and providing the world population with good food products, based on their (changing) wishes (Smeets, 2009). An other often distinguished trend of *extensification and re-peasantization* (e.g. Ploeg, 2009) is, in this view, seen as not able to cope with these challenges.

What is an agropark? *"An agropark is a spatial cluster of agro functions and the related economic activities. Agroparks bring together high productive plant and animal production and processing in industrial mode combined with the input of high levels of knowledge and technology. The cycles of water, minerals and gasses are skilfully closed and the use of fossil energy is minimized, particularly by the processing of various flows of waste products and by-products. An agropark may therefore be seen as the application of industrial ecology in the agro sector. Agroparks are the outcome of a design process in which a new balance is sought between agriculture as it functions in global networks and the local environment of those same farms. It amounts to a system innovation, i.e. not just the innovation of agricultural production itself but also of other relationships among the stakeholders concerned. In this regard the concept of sustainable development occupies centre-stage as a set of objectives that are simultaneously concerned with a reduction in environmental pollution, greater economic return and a better working and living environment for the people concerned."*(Smeets, 2009: 21-22)

The concept of agroparks is part of the broader concept of metropolitan agriculture. *"This perspective is a bouquet of various ways of production that strengthen each other. Together, they constitute a strong base for production of sufficient variety of products, under conditions and forms that vary sufficiently to adapt to changing societal norms. The common factor in all these manifestations is their metropolitan character; they are all agricultural activities that fit in the metropolitan setting. A setting that is characterized by a high population density and a high pressure on space. This leads to very specific market opportunities, ranging from highly effective production to combinations of care and wellness that can only develop in such circumstances"* (www.transforum.nl).

2.2 Agroparks in India: Intelligent Agrologistic Network

Intelligent Agrologistic Networks, with agroparks and other components are believed to be a solution for the problems which are connected with the Indian agribusiness sector (encompassing the entire gamut of activities in agriculture, livestock, forestry, logging and fishing). Contributing to two-thirds of employment & one-fifth of GDP, the sector is crucial to the economy of India. About 43 % of India's geographical area is used for agricultural activity and the sector accounts 9 % of India's exports. Despite a steady decline of its share in the GDP, agriculture is still the largest economic sector and plays a significant role in the overall socio-economic development of the country.

Given this background, agriculture has always been a focus area for India's policy makers and the main thrust has been towards achieving food security for the nation. However, over the last decade, stagnation of both production and productivity has been witnessed. The Indian economy has been registering impressive growth aided by the growth in the manufacturing sector and impressive performance of the services sector particularly. But the growth trajectory for the economy could have been far better if the agricultural sector would have participated in this re-rating story. One of the main reasons for the lacking growth in the agribusiness sector has been the lack of scale in agribusiness activities and the acutely fragmented nature of land holdings in India. 60% of India's farmers are subsistence farmers (Smeets, 2009) who do not or hardly bring their produce into trade chains. What is traded to consumers is often bought directly by middlemen from the farmers and sold unprocessed to consumers (Smeets, 2009). Up to 30% of specific perishable produce harvests are wasted before they reach the consumer.

The primary reason behind the alienation of the agriculture sector in India's growth story, according to the Preliminary Assessment Report (Wageningen UR and Yes bank Limited, 2008) has been the stagnation or fall in public investment in agriculture since the mid-1990s and the resultant decline of the share of the agricultural sector's capital formation in the Indian GDP. The lack of investment into the sector has restricted the adoption of modern agricultural practices and in the present context, the use of technology has been inadequate and hampered by the lack of awareness of such (modern) practices, high costs and impracticality especially in the case of small land holdings. Major problems are bad infrastructure and a very small processing sector, which are, combined with the often very hot conditions, the main reasons for the loss of much of the produce. It is estimated that high value adding agro processing in India has been just around 2 per cent of the total agricultural produce and this has largely been attributed to the associated multi-dimensional problems of lack of assured raw material of required quality, lack of linkage between production and processing centres and lack of appropriate technologies. While India remains a net agricultural produce exporter, the country is enormously dependent on imports, as far as processed foods are concerned. While the supply side (both quantum and quality of production) and chain development has not been able to keep pace with time, the demand side trends have been quite attractive with changing consumer preferences which are fast catching up with those of the developed economies. There is thus a significant gap between the supply side and demand side of the agri value chain.

The consortium of IFFCO Kisan SEZ Limited, GPC and Wageningen UR and Yes Bank Limited believes that a transition is needed from a supply driven to a demand driven system. In this transition all parts of the chain will be transformed, from primary production through the various stages of transportation and processing, to final delivery to wholesale and consumer markets, at first nearby, but increasingly also reaching out to a national and even a global level. Such a transformation holds the promise of a vast increase of profits to all the participants, such as farmers, intermediate traders, processing industries, wholesale and retail organizations, exporters, service providers and financial institutions.

The concept of an Intelligent Agrologistic Network has been developed for India, adding to the previously developed concepts of agroparks and metropolitan agriculture. In terms of Castells (1996) agroparks are nodal points in the space of places. An Intelligent Agrologistic Network is proposed as a concept to serve the increasing demand for quality food in the metropolitan areas. Not as a hub for the wholesale market but as a supplier for modern retailers managing stores with cooling for perishable products (Simons et al., 2010). The concept of the Intelligent Agrologistic Network belongs to the space of flows (Castells, 2009). The basic functionality can be described by hubs and spokes. The hubs are:

- *Agropark*⁶: a cluster of agricultural and related non-agricultural activities. See definition in paragraph 2.1
- *Rural Transformation Centre* (RTC)⁷: location for collection of agricultural produce and where agricultural, commercial and social infrastructure will be present
- *Consolidation Centre* (CC): location for cross docking and order picking at store level for transport to metropolis. A specific type of CC is the *Export Centre*, which will be focused on export activities.

The hubs in this system are the transport flows between these components. Combinations of the three nodal types on one site are possible.

Figure 2.1 shows the IAN system in a graphical manner. The three nodal concepts will be explained further.

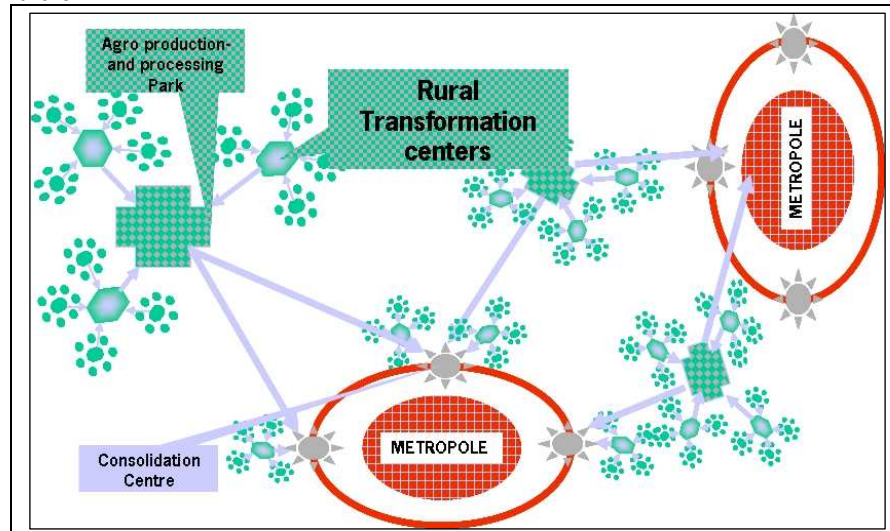


Figure 2.1 Functioning of an IAN (Smeets et al., 2010)

2.2.1 The IFFCO Kisan SEZ Nellore agropark

The reasoning behind the IAN concept is firstly to establish and develop the connections between the network of footloose agricultural production and processing chains and its surrounding landscape by carefully designing the water management, infrastructure and its landscape ecological connections of the site where the park is. In India critical success factors with respect to this include water in relation to temperature, soil quality and the maximum use of solar energy. Cooling is a critical challenge (Smeets, 20009) without affordable cooling glass houses will not be feasible. The second objective is to fit the five economic aspects of the Agropark (production, processing, trade, logistics and demonstration) into the specific local and rural economic environment, where the Agropark should be established. In India this means that focus is needed

⁶ Often mentioned as Agrifoodparks

⁷ IFFCO Kisan SEZ Ltd. has registered the name Rural Transformation Centre as a trademark.

on processing plants, logistics and trade because there is no shortage of primary products (Simons et al., 2010). Introducing processing for high value purposes, logistics and trade facilities would be quickest way to create surplus value. In second instance production facilities and demonstration and R&D facilities could be added.

The concept of an IAN provides geographical design principles. Firstly the location of the Agropark is critical and has huge impact on the economical and social environment. Generally Agroparks need a rich region serving as a 'catchment area' (Simons et al., 2010). The size of the region is important to reach the critical mass needed for full efficiency of the facilities of the Agropark. The number and distance from consolidation centre to its customers is critical. This means that Consolidation Centres need to cater to metropolitan markets (concentrations of at least 3 million inhabitants) and need to be located within a maximum of about one hour of the majority of potential customers in such a metropolis. The distance covered within an hour depends on the quality of the transportation (mainly road) infrastructure. For supplementary imported products a railway link or a link to an international airport or seaport is important. For export, the most important location factor is a seaport with regular container links to major ports around the world. For high value added perishable products, air transportation is also an option, either by dedicated cargo planes or by wide-bodied passenger planes.

The spatial clustering of different agro-production chains and the spatial combination of agro-processing and non-agro functions includes not only the production of food, feed, vegetables and fruits, but also of fuels fibres, fermented products, flowers, fragrances, flavours and functional foods and nutraceuticals. On implementation, the agropark would integrate channels to link the 'farm gate to the food plate' by the putting in place the desired agricultural practices, systems, infrastructure and technology to the farmers thus facilitating the availability of the desired farm produce to the demand side of the food chain. This guiding role of the demand side is an essential principle of agroparks. The IAN would not only serve to provide the integrated material supply linkage to the processing industry but also integrate farmers with the demand side of the agri value chain.

The concept of Agroparks is based on the following principles of sustainable development (IFFCO brochure):

- Environmental benefits through lower emissions, lower waste and precarious use of water
- Application of principles of industrial ecology, i.e. mutual use of waste and by-products
- Advantages of scale through industrial production and processing
- Reduction of fossil fuel use and veterinary risks because of reduced transport
- Improved animal health management and comfort thereby increasing production levels
- Independence from seasonality and land during the whole year of production cycle
- Enables chain transparency resulting in better quality management
- Improvement of farmers position as a preferred supplier
- Significant reduction of costs

The functionalities of an agropark contain production, processing, research and development, trade and social functions (like housing and agro tourism). Figure 2.3 provides the different functionalities of an Agropark in more detail.

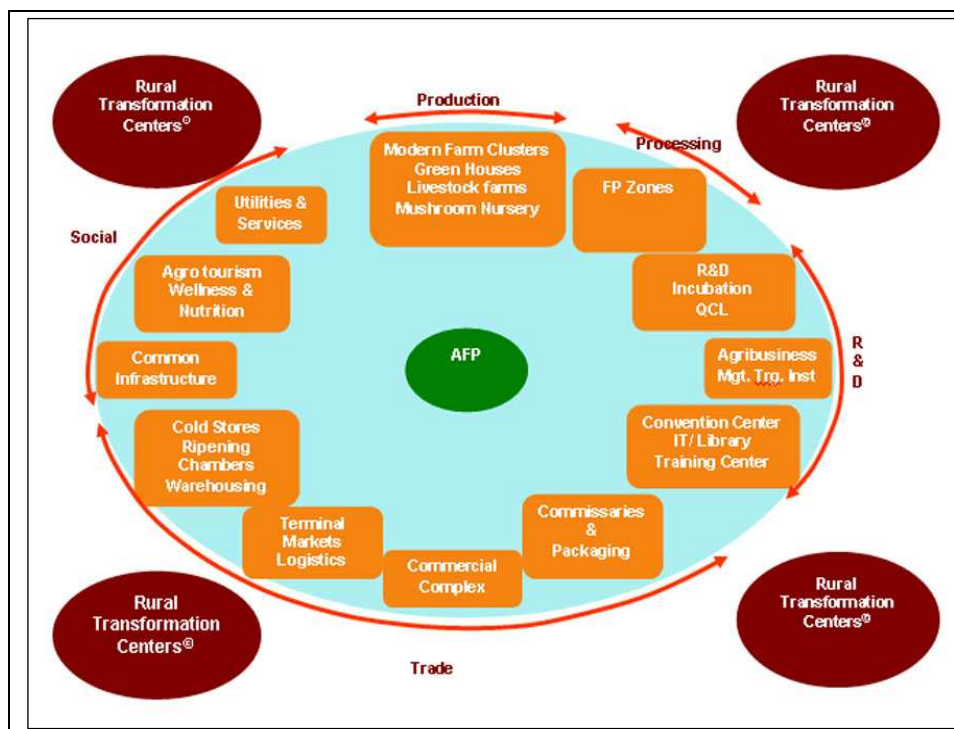


Figure 2.2 Functions of an agropark (Smeets et al., 2010)

2.2.2 Rural Transformation Centres

In addition to an agropark Rural Transformation Centres are envisaged. These RTCs are needed to collect products from the primary producers. There will be primary production on the agropark, but it is expected that extra inputs will be needed. From the RTCs products are either transferred to the Agropark for processing or sent straight away to a Consolidation Centre (CC); from where they will be distributed to customers such as supermarkets, restaurants and hospitals. The production of goods from farmers in the surrounding areas is to be governed by the RTCs, which will be steered by enterprises located on the agropark. RTCs also have the functionality to provide agricultural extension services to the attached farmers and to provide services so that they are able to deliver the right produce.

Next to the goals associated with production, trade and logistics, RTCs are also meant to transform agricultural practice and farmer wellbeing. RTCs aim at utilizing the existing resources in their catchment and creating sustainable livelihood opportunities for farmers within the context of the IAN (Van Mansfeld et al., 2010). It means addressing the overall needs of the rural people with a development approach to provide amenities and services. The RTCs would perform the primary function of collection of rural produce and several secondary functions targeted towards this transformation of rural livelihoods. An RTC development can provide income and generate facilities for sustainable agriculture and trade, as well as health and educational services to rural people; it can generate employment and empowerment for rural people, with promotion of rural entrepreneurship. Land use practice can be transformed towards a more sustainable future, inducing transformation from fragmented landholding to sustainable land use practices and land consolidation.

The RTC would also take up the primary function of warehousing the produce that is collected. It would house modern, temperature controlled storage facilities for commodities waiting for transport to Agropark or Consolidation Centres. There will be functionalities for cleaning, sorting

and grading of the commodities to prepare them for transport to the Agropark. Ample space is needed for the facilities for offloading, cross docking and short-term storage; and for sheltered and secure parking for vehicles bringing the commodities. Apart from the primary function of collection of rural produce, RTCs perform several secondary functions, many of which are geared towards increasing the efficiency, reducing substantially losses of agricultural produce, better quality control and greater (financial) benefits. All these functions may not be performed by every RTC but a careful choice of the required functions would be made after a thorough assessment of the demand in the region where the RTC is located. (Van Mansfeld et al., 2010). To summarize the rationale behind RTCs:

- RTC is a focal point of collection and production in the rural areas, primary as well as secondary production and pre-processing and services which are in need for change from supply driven to demand driven.
- To be able to answer to the required agri-innovations, the rural infrastructural and logistical gaps need strong attention. RTC development can provide income and generate facilities for sustainable agriculture and trade, as well as health and educational services to rural people; it can generate employment and empowerment for rural people, with promotion of rural entrepreneurship.
- Land use practice can be transformed towards a more sustainable future, inducing transformation from fragmented landholding to sustainable land use practices, mechanization and land consolidation.

The Infrastructure of a RTC would be the following:



Figure 2.3 Functionalities of an RTC (Smeets, 2010)

2.2.3 Consolidation Centres

Form Consolidation Centres (CC) produce will be distributed to customers such as supermarkets, restaurants and hospitals. Flow from Agropark and RTCs to CCs consists of homogeneous loads, arriving at regular intervals. Flow from a consolidation centre to customers consists of mixed loads of a composition that exactly meets the customer's needs which are delivered to order. Primary products from the region may be supplemented by either internal production on the premises of the CC or by products originating from the world market. In this way, year round delivery to customers as well as permanent occupation of processing and transportation facilities is guaranteed. Next to these consumer oriented CCs, there are Export Oriented Centres that work in much the same way, with one important difference i.e. output flows are homogeneous and normally depart at regular intervals, just as input flows arriving from collection centres. (Simons et al., 2010)

2.2.4 Orgware and Software

The previously mentioned concepts consider mainly the hardware aspects of IAN development. The consortium is fully aware that an IAN is also about organization (Orgware) and about humans (Software). These design aspects are also called: matterscape, powerscape and mindspace (Smeets, 2009) without attention to orgware and software, next to the hardware aspects, no IAN will be realized and it would not be able to function properly. All three the subjects are needed. In the figure below, it is stated what is understood with these concept.

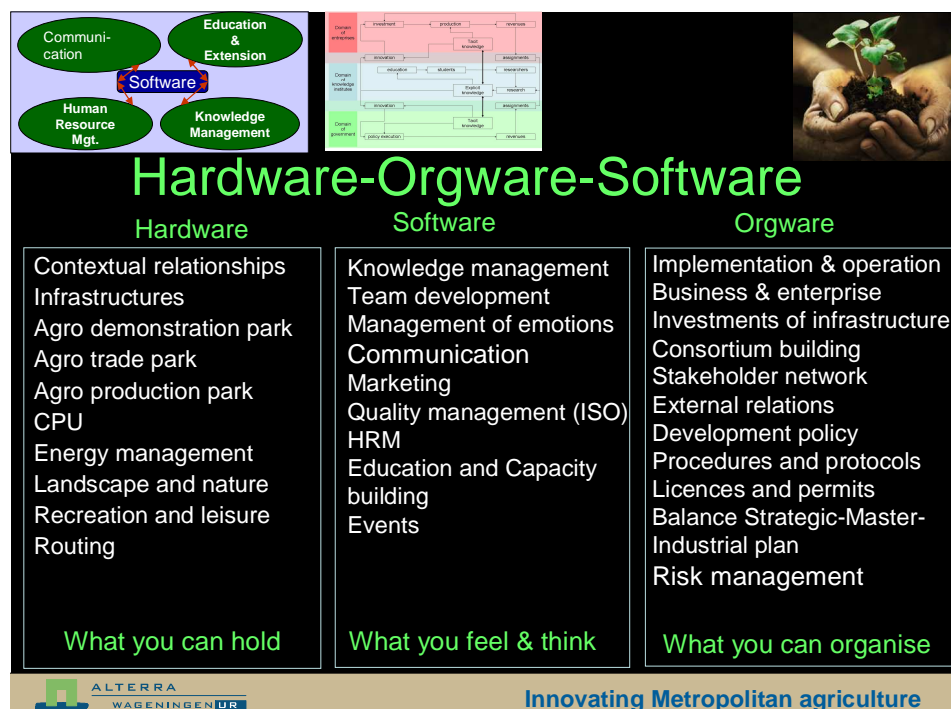


Figure 2.4 Hardware, Orgware and Software ((from presentation of Van Mansfeld on the International seminar on Innovating Metropolitan Agriculture, Beijing, October 23rd 2007)

2.3 The IFCCO Kisan SEZ Nellore proposition



Figure 2.5 Picture of the building of the wall (April 2009)

At IFCCO Kisan SEZ Nellore a combination of agropark and RTC is envisaged (Smeets, 2009). The IFCCO Kisan SEZ comes with a bundle of world class common infrastructure bundle conforming to international standards including internal roads, high quality rain harvest supported water supply, uninterrupted power supply, common operation, maintenance and management of security, logistics, ICT, etc. Moreover, the Agropark offers a framework of industrial ecology, managing waste and by-products thus significantly reducing costs.

The Mission of IFCCO Kisan SEZ Nellore is (Swarangi et al., 2009):

- To create world class infrastructure which supports efficient production and innovatively add value to agro produce, produced in the agropark or collected from the catchment area, in an integrated establishment of various agribusiness value chain components.
 - o To improve the agro-logistical network and connected trade, to market the products in India & abroad thus providing a healthier and safer food to demanding consumers, while delivering superior value to all stakeholders.
 - o To stimulate self regulation of the units of the IAN-network as within the different components of the units itself.
- To ensure seamless flow of communication between different stakeholders.
 - o To have an open continuous and transparent discourse on the developments with the key stakeholders.
 - o To realize planning of agropark and agro logistics and agro related rural transformation in an integrated, participative way.
- To ensure sustainable development
 - o To realize the integrated cluster concept of the total value chain of agribusiness, including the agro logistic network and the rural transformation in a sustainable way, based on principles of Integrated Water Resource Management (IWRM), embedded sustainable development in the regional context, landscape and culture and improving lives of all concerned.

- To reduce transport, CO2 emissions and fossil fuel use with spatial clustering of agricultural activities.
- To maximize benefits to multiple stakeholders.
 - To realize a system innovation in agriculture, that induces a paradigm shift in the total value chain and changes mutual relationships between all actors involved.

The IFFCO Kisan SEZ Nellore site is located in the southern part of Andhra Pradesh state in the district Nellore, 20 km north of the city of Nellore. IFFCO Kisan SEZ Ltd. (IKSL) owns this site of 1800 acres and is in Joint Venture with GreenPort Corporation (GPC). It is located between the metropolises of Hyderabad (5.4 million inhabitants), Bangalore (6.2 million inhabitants) and Chennai (6.6 million inhabitants). The nearest international airport is at Chennai. At 50 km the harbour of Krishnapatnam is being developed which is being transformed into a major harbour. The site of the agropark is located next to a major railway and a highway (the NH-5).

The catchment area is a strong source of various agricultural produce such as:

- Paddy (rice);
- Sugarcane and lentil;
- Fruits (mango, citrus, papaya, banana, and sappota) and vegetables (including tomato): 170 thousand Ha of Fruits and 30 Thousand Ha of Vegetables or close to two million MT of Fruits and 0.6 million MT of Vegetables;
- Aquaculture ('heart of Indian aquaculture');
- Poultry products and ;
- Milk;
- Sheep and goat.

Surrounding the agropark Rural Transformation Centres will be developed to source raw materials for the enterprises on the agropark.

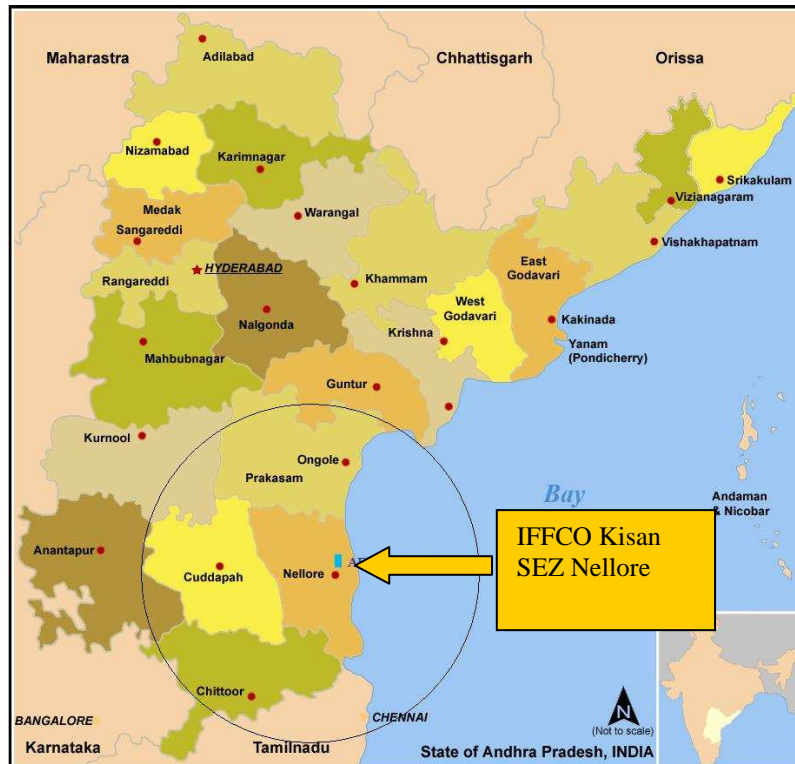


Figure 2.6 The location of the agropark in Andhra Pradesh and in India

IFFCO Kisan SEZ Ltd. (IKSL) states on its website the following advantages of opening business on the SEZ near Nellore:

Area	Advantages
Infrastructure bundle	<ul style="list-style-type: none"> ▪ World class internal roads, drainage, waste management, ICT etc ▪ Centrally managed infrastructure ▪ Common office space, ware housing facility etc
Industrial Ecology	<ul style="list-style-type: none"> ▪ Common processing of waste and by-products
Power	<ul style="list-style-type: none"> ▪ In-house power generation ▪ Supplementary power being planned with biomass and alternate energy sources.
Water	<ul style="list-style-type: none"> ▪ Assured water supply in different and specific qualities ▪ Planned to cover 3 consecutive years of drought ▪ Entire rain water harvesting has been incorporated in spatial design
Manpower	<ul style="list-style-type: none"> ▪ Skilled and semi-skilled available from surrounding locations ▪ Provision of social infrastructure to employees
Connectivity	<ul style="list-style-type: none"> ▪ Adjacent to NH-5 excellent connectivity ▪ 180 KM from International Airport and Sea port at Chennai ▪ 50 KM from Krishnapatnam sea port ▪ Railway siding within the park ▪ Airport coming up ten kilometres from the park
SEZ Status	<ul style="list-style-type: none"> ▪ Customs duty waivers and tax holidays ▪ Customs office within the park ▪ Exemption from customs duty for all plant and machinery imports ▪ Income-tax Holiday for up to 15 years <ul style="list-style-type: none"> - First 5 years 100% - Next 5 yrs 50% - Next 5 yrs up to 50% (subject to creation of reserves - No Capital Gains Tax on relocation to SEZ - Exemption from Minimum Alternate Tax to the extent of export profits - Indirect-tax exemptions - Customs duty, Excise Duty, Service Tax, Central / Local Sales Tax

Table 2.1 Advantages of investing in IFFCO Kisan SEZ Nellore (<http://www.iffco.nic.in/applications/IKSEZWeb.nsf>)

The ideas behind the concept of agroparks are described previous paragraphs of this chapter. On its website (<http://www.iffco.nic.in/applications/IKSEZWeb.nsf>) and in a brochure IFFCO Kisan SEZ Ltd. communicates what an agropark, an IAN, consolidation centres and Rural Transformation Centres are. The stories about the need for metropolitan agriculture match with the vision of Wageningen UR and YBL. IFFCO Kisan SEZ Ltd. communicates clearly that the principles of sustainability are of the essential to the agropark and also mentions the Cradle to Cradle principle. The Park will not from its start be full. A modular growth model is envisaged in which entrepreneurs will have the prospect of future expansion.

Because of its legal status as a Special Economic Zone the site of 1800 acres has a fence surrounding it. This fence has been finished in 2009 and was a major engineering work in itself. Work started in basic infrastructure, like roads. The SEZ will legally be foreign territory. The SEZ

status is meant by government to promote export and therefore the largest part of the products produces or processed should go to outside world. When selling produce from the agropark to Indian consumers, import tariffs could apply. It has to be decided whether exemptions could be made so that the SEZ could also be used to produce for the home market and therefore to bring world class food to Indian consumers.

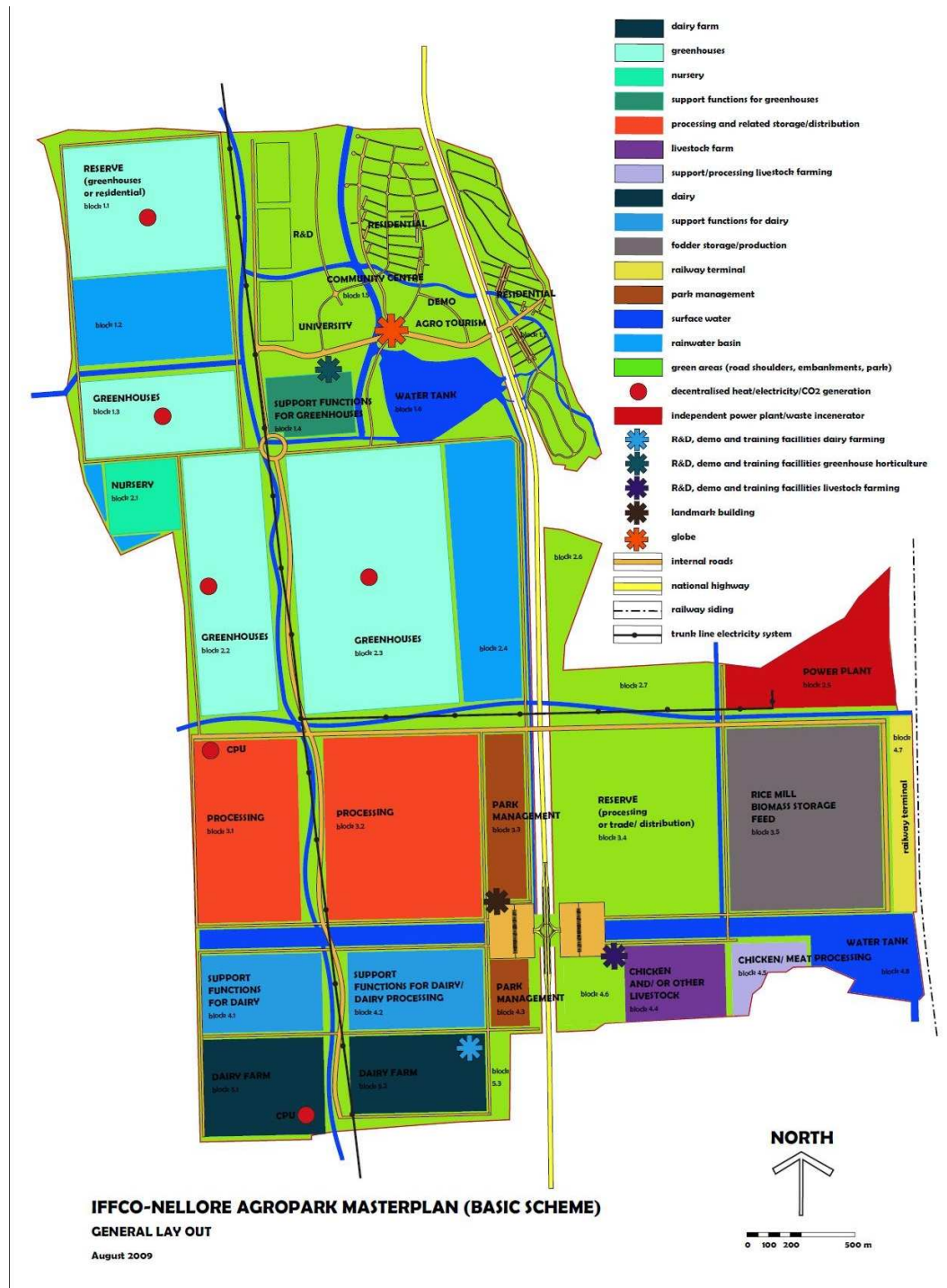


Figure 2.7 Preliminary masterplan August 2009 (www.iffco.nic.in/applications/IKSEZWeb.nsf)

The masterplan IFFCO Kisan SEZ Ltd. communicates to potential investors and other interested parties and is dated September 2009 is presented in figure 2.7. The different colours refer to the different functions of an agropark: production, processing, research and development, trade and social functions (like agro tourism). Energy production and reuse of energy and matter is also envisaged. The yellow line from south to north is the national highway. The brown area to the west of it will be the location of the park management buildings. The railway lies directly adjacent to the land lots on the eastern part. The green area in the north is the location for the residential functions, R&D, agro tourism and water storage.

2.4 The preliminary value creation model of IFFCO Kisan SEZ Nellore

Based on information of interviewed members Wageningen UR and Yes Bank Limited team and on available written material the process monitoring team produced a value creation model of the IFFCO Kisan SEZ Nellore proposition. In figure 2.7 the value creation model is described.

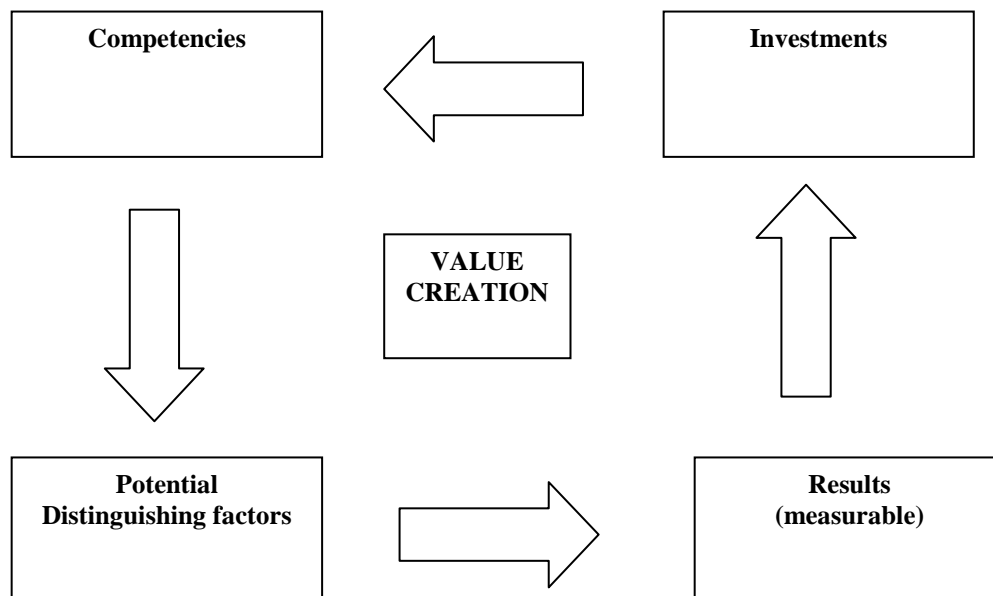


Figure 2.7 Value creation model (Source: LEI)

Potential distinguishing factors:

- Clustering of agri-production, -processing and consolidation;
- Located between three metropolises;
- Located next to major highway and railway and close to Krishnapatnam Harbour;
- Availability of governments subsidies and tax releases (SEZ);
- Part of an Intelligent Agrologistic Network, with RTCs for sourcing inputs;
- A sustainable agribusiness park, with re-use of energy and matter (industrial ecology);
- Modular growth model, with possibilities for growth of businesses on the site;
- Good living and recreational conditions;
- R&D, demo, training and education facilities;
- Qualified workforce;
- Landscaping.

Results:

- Profitable environment for innovative agribusiness enterprises;
- Zero negative impact on the environment;

- Contributes to farmer friendly regional development;
- Creation of employment possibilities;
- Better value realization by the key stakeholders viz. the producers (by way of assured off take through RTCs, of the high quality raw material as specified by the processors in the Agropark) and the consumers (safe and high quality food produced in an environment friendly way).

Investments:

- Financial investments in building facilities on the agropark, but also on the RTCs;
- Setting up a training and education system;
- Social infrastructure and commercial facilities at RTCs;
- Park management;
- Including present farmers and middlemen;
- Relation building with other stakeholders (governmental agencies, non governmental organizations, farmers, middlemen, etc.).

Competencies:

- Seeing and using the development as an opportunity (farmers, middlemen, entrepreneurs, governments, etc.):
 - o Farmers in surrounding areas who are willing to change crop patterns if needed by firms on the agropark;
 - o Supporting mode government employees and politicians;
 - o Cooperative mode entrepreneurs.
- Workforce qualified to work in a high technology integrated setting (hygiene, high tech machines, veterinary requirements, marketing, etc.).

3 Process design of IAN agropark development

3.1 General approach on process design of agropark development⁸

Central to the process design of IAN agropark developments in India is the objective to establish agroparks as part of an Intelligent Agrologistic Network (IAN), including Rural Transformation Centres (RTCs) and Consolidation Centres (CCs). These concepts, on which more can be read in chapter 2, constitute a discourse. A discourse according to Hajer (2004) is a comprehensive set of storylines which attracts actors and is a major driving force in the building of coalitions of actors. The agropark discourse is attractive to some actors and motivates them to participate in developing them. They team up and bring developments and projects in motion.

The main lesson from agropark projects in China was that it is very important to have strong local partners (Smeets, 2009). When doing projects outside of the Netherlands, it is only imperative that people who know the culture and know how to do things in their country are involved in the project. This means finding a local assignor with the requisite credentials and sharing the vision of creating a superior integrated system of producing food and finding a local knowledge party, which has added value for Wageningen UR, and the other way around. From the Greenport Shanghai project it was also learned that the assignor needs to be willing and able to pay for the work and willing to invest financially in the Agropark (Smeets, 2009).

A crucial understanding is that developing an IAN with agroparks in India means working on a *pioneering process*. Working on a pioneering process means doing three steps ahead and two backwards. It is not the question whether there will be setbacks; they are inevitable. Realizing agroparks as a part of IANs means, realizing system innovations (Smeets, 2009). These are by definition complex and can only be planned and controlled to a limited extent. Multiple innovations have to be developed and implemented in complex and unpredictable surroundings. There is a constant process of converging and diverging going on. Too much structure is damaging for the innovative potential of the process (see also Termeer en Kranendonk, 2008), too little could lead to chaos (see also Burnes, 2005). The challenge is to establish a suitable order in a dynamic environment, also called *bounded instability* (Burnes, 2005 after Stacey, 2003). Efficient functioning of flexible and light structures and open and quick information exchange is of the utmost importance in these circumstances (Burnes, 2005).

The second understanding is that working on IANs in India means working on a *process*. This means that the working process should be organized in a suitable way and that project planning only works for certain activities within the process. In the figure below it is stated what the difference is between these two:

⁸ This paragraph contains the general vision on how agropark design and implementation processes should be designed, according to knowledge workers who are actively involved in agropark processes. It is strongly based on Smeets (2009), De Jonge (2009) and Van Mansfeld (2009). These sources were recommended to get a better insight in the process design of the IFFCO Kisan SEZ Nellore development.

Differences in project and process management

	Project/blueprint planning	Process planning
goal	Goal clearly defined in time and space	Goal to be defined, will change during the course (eg think tank), goals can change
result	Results defined Events describable, predictable	Results open, High levels of complexity and uncertainty
phasing	Clearly defined phases, linear approach Emphasis on short term	Phases shift & repeat itself, iterative approach Mostly long term
steering	Containment: •Budget •Organisation •Time •Information •Quality/Quantity •Optimal solutions found by planners	Commitment •Team spirit, •Cooperation •Timing •Governance of relations •Quality • Optimal solutions identified by stakeholders in planning & implementation •Informal leadership evolves
approach	•Formal leadership •Deal is a deal •Direction •Measuring •Accountability •Timing •Hard tools: budgets, timeframes, procedures and protocols •Government has end responsibility	•Keeping the course •Facilitation •Learning, developing •Responsive, responsibility •Momentum •Soft tools: facilitation techniques, participation, dialogue, networking •Financial responsibilities shared



Innovating Metropolitan agriculture

Figure 3.1 Differences in project and process management (source: presentation of Van Mansfeld on the International seminar on Innovating Metropolitan Agriculture, Beijing, October 23^d 2007)

This is not to say there are no activities which could and should be carried out in the project mode. When deliverables and timeframes have become clear and people know what should be done, than plan wise approaches are feasible, but only to a certain extent, because the environment in which this happens is a highly complex and dynamic one. Plans, objectives and deliverables can and will be altered. Both the project and the process mode are needed in agropark development.

Participants in a process should be proactive and act according to the *mode 2* approach⁹. This means that people involved are open for new insights which will arise from the process, actively look for them and use them in the process. By working in this mode experts and other stakeholders are able to fine tune their knowledge and expertise to the precise challenge at hand. Unexpected events, like droughts or political developments, can and do happen. During the work new questions and challenges arise, which should be taken up to make progress. Mode 2 includes a *transdisciplinary* approach. It is not about agriculture, business development, process, energy, logistics, etcetera. As separate disciplines, but about combining all these disciplines. Above this not only scientific knowledge is relevant, but also practical (tacit) knowledge (see Peterson, 2008) of entrepreneurs, governments, non governmental organizations, etc. The combination of these different disciplines and organizational backgrounds creates synergy which leads to *new knowledge* (Regeer and Bunders, 2009) and system innovations. In system innovations, all kinds of changes should be taken up simultaneously.

The process design of agropark development also entails involving multiple stakeholders in design activities and working on sharing benefits with all of them. The principles of *co-design* and *KENGr*¹⁰ are often used in this context (Smeets, 2009). Co-design is a specific form of co-production or co-

⁹ See for instance Nowotny, Scott and Gibbons, 2001 or Regeer and Bunders, 2009

¹⁰ Knowledge Institutions, Entrepreneurs, Non Governmental Organizations and Governments, who together realize innovation.

creation of policy making (with specific attention to spatial design plans). Using a definition of Bekkers (2007): “*from each other dependent stakeholders, in a network, create a shared practice by shared sense giving which produces shared definitions of problems and resolutions.*” The KENGi approach concerns a wide spectrum of stakeholders, but the cooperation of knowledge institutions with entrepreneurs is a central one. What will be realized in an IAN is in the end decided by entrepreneurs. NGO’s and governments can influence this, but the entrepreneur will do the actual investments and has practical knowledge about the market and the chains in which they are active. Working on agroparks is also consultancy. It is about obtaining assignments by anchor investors and conducting assignments for them. Without an investor who is willing to invest to develop an agropark knowledge institutions can do little to actually develop one. Therefore an agropark development is understood to be *development planning* and not blueprint planning in which experts and/or governments make a plan and then explore whether there is any support for it. Co-designing with commercial stakeholders is thought of as essential for the designing and implementation of IAN agroparks because they have valuable knowledge and because some of them will be the stakeholders who will invest in the agropark.

De Jonge (2009) introduced the *dialogue approach*. In a dialogue process involved KENGi stakeholders, with different ‘voices’ together create designs and learn together (joint fact finding). The consortium of Wageningen UR and YBL have a toolkit of creative techniques for these dialogue processes; especially *open space* techniques. To communicate to stakeholders what is happening and inviting them to participate, road shows are organized. Essential characteristics of a dialogue process (De Jonge, 2009; in: Smeets, 2009):

- Ambition that goes beyond compromise;
- The involvement of experts, including ‘professional amateurs’, with a range of expertise, skills and practical wisdom, performing a ‘multilingual’ conversation using imaginative, graphical language, verbal, narrative language and the language of facts and figures, all with their own rationality;
- The creation of new insights through a design approach: the iterative process of creative imagination and reflective judgment, making design moves that integrate a wide range of expertise and interests and represent various levels of scale and detail;
- Participants have an open mind, allowing them to seize opportunities outside the ‘dialogue space’ as key players who can connect conceptual ideas to implementation power.

Smeets (2009) defines phases in a dialogue process:

1. Informal meeting and development of the social network of KENGi parties;
2. Formulating of a clear problem definition by this network. This requires a certain relativation of one’s own problems and ambitions. Not permanently, but to give other participants space for their perceptions and ambitions and to be able to formulate a joint problem definition. This will be easier if stakeholders perceive the problem to be urgent.
3. Joint fact finding. In this process it is not about letting others see how much you know, but especially to discover what other people in the network know and what they do not know.
4. The design phase. In this phase the cooperating network formulates future projects in a creative process. This can be projects which the stakeholders already were involved in. There has to be energy on these projects though. In many cases new projects emerge in new coalitions.
5. After the design phase realization and support generation are at stake. In this phase the projects are improved by conducting checks, by making business plans and financing them. Essential in this phase is that other people from the participating parties are getting involved. Those are the people who know how to develop projects. It can happen that projects have to be re designed, because they can not be realized.

These phases have feedback loops and will not always follow a linear pattern (first this, then that).

An important part of this approach is that the activities '*designing*', '*decision making*' and '*support generation*' should not be mixed. In all the activities the KENGi parties have to be involved, but probably but not necessarily with different persons. A Chief Executive Officer (CEO) or a District Collector can participate in design processes. What is important is that the rules of engagement in a design process are based on creativity and creating a common vision and not on power, decision making or aiming at maximizing ones own interests. This is challenging in a country with a hierarchy based culture (Hofstede, 1980). By and large this is a new way of making plans for the Indian context¹¹. The clear separation of activities also means that when the decision makers will take decisions, the information and designs they need to do their job should be available to them. Not only hardware information, but also orgware and software. The vision also has to be communicated in the language of the decision makers and on the moment they need it.

3.2 The process and the process design of the IFFCO Kisan SEZ Nellore proposition

3.2.1 The road to Nellore

Wageningen UR and Yes Bank Limited (YBL) have entered a strategic cooperation agreement in 2005 for developing integrated Agroparks as an innovative solution theme for transforming the traditional fragmented farming system in India to an intensive, demand-driven, high-value & sustainable agribusiness. Yes Bank Limited¹² is one of the key actors involved in the conceptualization of the Agropark initiative in India and for the IFFCO Kisan SEZ Nellore site in particular, along with its strategic partner Wageningen University and Research Centre (Wageningen UR) from The Netherlands. YBL is committed to the holistic development of the agribusiness sector and has constituted a dedicated Food & Agribusiness Strategic Advisory & Research division (FASAR) which houses industry experts & sector analysts with the appropriate educational background in agriculture to service the specific requirements for catapulting growth of the Agri sector. FASAR has been active in advising both the central and union Agricultural Ministries in developing inclusive growth models in Agri infrastructure.

Wageningen UR¹³ is one of the most reputed institutes in the world in agriculture, housing centres of excellence such as Alterra, (which is the Netherlands research institute for the green living environment and offers a combination of practical and scientific research in a multitude of disciplines including spatial planning & agriculture and has since 2000 been involved in the development of Agroparks in various locations in China¹⁴ and the Netherlands¹⁵). Food & Biobased Research is another centre of excellence in Wageningen UR, (into supply chain management and development of food processing technologies).

The strategic cooperation agreement between YBL and Wageningen UR was formalized through the signing of a Memorandum of Understanding (MoU) in September 2005 in Amsterdam. Specifically the MoU elaborates the scope & nature of association between YBL and Wageningen UR for implementing Agroparks in the Indian context. While YBL was to offer its expertise to Wageningen UR on matters relating to preparation and content of Business plans, regulatory environment, market expectations and funding scenario for the Agropark projects in India, Wageningen UR was to bring in its international expertise of planning & implementation of Agroparks.

On September 12th, 2005, a workshop on Integrated Agroparks was organized jointly by YBL & Alterra, Wageningen UR at the Royal Netherlands Embassy in India to sensitize stakeholders (key

¹¹ It is also not so common in the Netherlands. Examples do exist, but it is not common practice.

¹² www.yesbank.in

¹³ www.wur.nl

¹⁴ Shanghai and Changzhou (Smeets, 2009)

¹⁵ Rotterdam, Amsterdam, North Limburg and Terneuzen (Smeets, 2009)

government & corporate representatives) on the Agropark concept & benefits accruable to the key stakeholders, farmers and consumers and also to gather their feedback on the way forward to implement the project. The workshop concluded with participants involving in detailed discussions & presentations on product mix and specific opportunities & threats involved in implementation of the Agroparks across locations in India.

The next milestone in the evolution process came in the form of the MoU between YBL and Alterra, Wageningen UR and Indu Projects Limited on 24th July, 2007. Indu Projects Ltd. is an end-to-end solutions provider in infrastructure headquartered in Hyderabad, India (www.induprojects.com). The MoU broadly specified the roles and responsibilities of Indu Projects Ltd and YBL and Alterra, Wageningen UR (henceforth referred to as the Wageningen UR Consortium) as joint developers of Agro Parks in India. While Indu Projects was to be responsible for identification & procurement of the Project Land, undertaking the construction & development of Agro Park & other project related costs, the YBL-Alterra Consortium will be responsible for developing the concept & will act as knowledge partners & facilitate in identifying the investors & equity partners for the Project. Indu Projects established GreenPort Corporation (GPC)¹⁶ as the vehicle to develop agroparks in India. GreenPort was being positioned as a global brand that offers world class infrastructure facilities for the various stakeholders of the agri-business value chain. On 20th December, 2007 YBL-Wageningen UR Consortium formalized its association with GreenPort Corporation (GPC) in the form of a MoU. This MoU nullified the previous agreement between Indu Projects and YBL-Wageningen UR Consortium and defines GPC as the joint developers of Agroparks in India, along with YBL-Wageningen UR Consortium, with the same roles and responsibilities as had been formulated earlier for Indu Projects Ltd. In the MOU dated 24th July, 2006. The rationale was to have GPC the dedicated agri subsidiary of Indu to take the position of Assignors in place of Indu Projects Ltd.

The next milestone achieved was the formalization of the association between IFFCO (Indian Farmers Fertilizer Cooperative Limited) and GPC by their signatories by way of a Term Sheet in Delhi in July 2008. IFFCO became involved because preliminary studies made clear that the best location for a first agropark in South India would be a site 20 km north of the city of Nellore, in the State of Andhra Pradesh. IFFCO owned that site. IFFCO is an India wide farmers cooperative; with a strong position in the fertilizer industry. IFFCO's mission is *"to enable Indian farmers to prosper through timely supply of reliable, high quality agricultural inputs and services in an environmentally sustainable manner and to undertake other activities to improve their welfare"* (www.iffco.nic.in). IFFCO is constituted by 38,155 IFFCO societies and 55 million farmers. IFFCO considers the interests of its farmers as its core business.

On 1st August, 2008, YBL-Wageningen UR Consortium made a master plan proposal to IFFCO with an aim to providing strategic & project advisory services for the implementation of integrated Agropark in the IFFCO Kisan SEZ, Nellore. This was accepted on 5th August 2008 by IFFCO, which business unit IFFCO Kisan SEZ Ltd. (IKSL) would be the leading partner in a Joint Venture (JV) with GPC. IKSL would be the leading partner in this JV when this shall be established.

3.2.2 Actor network analysis

IFFCO Kisan SEZ Ltd. (IKSL), GreenPort Corporation (GPC) and their advisors YBL and Alterra, Wageningen UR formed a consortium in which they are working on the realization of their shared vision of an agropark as part of an Intelligent Agro logistic Network. This is part of a strategy to upgrade Indian agriculture and agribusiness practices. The consortium can therefore also be seen as a *discourse coalition* (Hajer, 1994). They have a shared vision of what should be realized and how to achieve this (see chapter 2), communicated this with the outside world (see for example <http://www.iffco.nic.in/applications/IKSEZWeb.nsf>) and conduct activities to realize their vision. The

¹⁶ See www.greenportindia.com for more information

consortium members all added content and meaning to the evolving story of the IFFCO Kisan SEZ Nellore agropark. Key participants often interacted with one another and engage in discussions on how to take steps in the IFFCO Kisan SEZ Nellore development.

The connected organizations partly already had a history with the concept of IAN agroparks. Wageningen UR for example has a portfolio of more than 10 years of conducting agropark related assignments. A successful agropark in India could be used to help the debate on Agroparks in the Netherlands, where the concept as publicly understood, is considered controversial by a significant part of the population of the Netherlands and by certain scientists, politicians and interest groups (Smeets, 2009). YBL-FASAR also has done other directly relevant work on Modern Terminal Markets and on Indian agribusiness in general. IFFCO is an Indian wide cooperation of farmer cooperatives and is since its founding involved in upgrading agricultural practices by providing and producing of fertilizers for its members 55 million farmers. GPC had less a background in agriculture, but as an infrastructure developer its mother organizations Indu Projects knew how to develop large complex projects.

The actor network was characterized by inter-dependencies between stakeholders. No one could decide what will happen alone. The partners had different capabilities and knowledge so that cooperation was mutually beneficial. IFFCO for example is a powerful company and would be able to develop a SEZ alone, but not an agropark and that is what they want and what they communicated to their network. Some participants were more deeply involved than others. The assigners were the primary stakeholders. They are the organizations which, with the support of YBL and Wageningen UR, are setting up the development and are doing investments. IFFCO is the major assigner and owns the land, GPC is the minor partner, but has expertise in infrastructure development and knows how to attract investors. They were dependent on each other but have other interests as well. IFFCO has a strong reputation of being a well lead organization with good connections to farmers. They are seen as well equipped to realize large scale infrastructure developments. On top of that IFFCO had secured the land on which the agropark will be developed. IFFCO and GPC counted on the YBL - Wageningen UR consortium to assist them by providing knowledge and vision and by bringing in their network of entrepreneurs and other agents. For both of them the development of an IAN agropark is a new business line. IFFCO is not fully depended on Wageningen UR and YBL. PriceWaterhouseCoopers (responsible for legal advice concerning the SEZ status) and an engineering firm (responsible for building infrastructure) also do parts of the work.

The consortium had dependencies to other stakeholders as well. This was and is foremost the case with entrepreneurs. If no entrepreneurs will set up business at the site it can not be successful. IFFCO and GPC could invest all they want, but in the end they will also need others entrepreneurs to set up projects in the Agropark and run these projects well so as to establish the success of the agropark in the overall context. The entrepreneurs were not only seen as potential investors, which is of course an important role, but also as partners in co-designing the agropark. Some Dutch entrepreneurs were involved from the start and shared their knowledge with the advisor and also engaged with IFFCO. Wageningen UR has long term relations with the Dutch ministry of Agriculture, Nature and Food Quality and has an interest to involve Dutch entrepreneurs. In 2009 many Letters of Intent were signed by assigners, but no one decided yet to start a business on the SEZ. That will be a major challenge for 2010 and onwards. It should be possible: the Nellore region is known for its innovative businessmen and farmers. A prerequisite for this would be that a business development team would be established at the ISKL office in Nellore, which was not present yet. Wageningen UR and Yes Bank did organize entrepreneur visits to Nellore.

An example of dependencies with governmental stakeholders is that IFFCO has been allotted the land by the government of the state of Andhra Pradesh. The concepts used are in line with state and union policies. The Indian government for example set goals to realize *megafoodparks* and wants an economic growth of 4% a year in Indian agriculture. An other example is that agricultural laws in India govern everything from input and output prices to off take, as well as storage, trading and marketing norms. Obtaining the required permits is very important to actually develop business

at the SEZ site near Nellore. Governmental regulatory bodies are important in providing or withholding permits and by providing enterprises with subsidies and/or limited tax obligations. There are many possible incentives (both direct and indirect) which can be availed by the entrepreneurs who want to begin business on the site. The agropark is already envisaged as a special economic zone (SEZ). The Government is not to be construed as a single stakeholder. The primarily relevant national Indian stakeholders are: Ministry of Rural Development, Ministry of Commerce, Ministry of Food Processing, Ministry of Agriculture and National Cooperative Development Corporation. Within the Ministry of Agriculture a distinction can be made in: National Horticulture Board / National Horticulture Mission, Department of Agriculture & Cooperation, Department of Animal Husbandry, Dairying & Fisheries and Small Farmers Agribusiness Consortium. The IFFCO Kisan SEZ proposal was considered and agreed in principle in the 20th Meeting of Board of Approvals (BoA) of Ministry of Commerce & Industry, GOI on 2nd January, 2008. The National Highway Authority and the Ministry of Transportation also have an interest in the development. The state of Andhra Pradesh is also an important stakeholder, who originally provided the land to IFFCO. The Collector of the district of Nellore also had a stake in the agropark development, because of its location in the district of Nellore.



Figure 3.2 The first stone on the site as shown by the CEO of IKSL Mr. Rajashekharaiiah to visiting entrepreneurs in 2009

The stakeholder network in which the development of IFFCO Kisan SEZ Nellore was being developed was not a static one. The process of the development can be perceived as an initiative in which a few stakeholders started the initiative, but in which the network has been continuously expanding. Without further involvement of KENGi stakeholders a system innovation could not be realized. The role of stakeholders in the process could also change. Governments and NGOs were for instance not intensively involved yet in the designing of the AP. They were nevertheless, informed and on crucial moments, gave their support. For example, in the laying of the first stone ceremony. Societal non governmental organizations are not really involved yet. Their interests are also important for IFFCO Kisan SEZ Ltd. and governments and they want to take up to protect the interest of the farmers (Smeets, 2009). There were some contacts with societal non governmental organizations and farmer leaders though. For setting up RTCs and for building a training- and educational network YBL and Wageningen UR people were connecting with societal organizations (and with education, training and extension organizations). The IFFCO Cooperative Societies (the member organizations who together constitute IFFCO) are being involved. They were seen as the

anchor investors for the Rural Transformation Centres, but they could importantly also play a role in creating societal support. Societal organizations, like the IFFCO Cooperative Societies could play a major role in arranging societal support or opposition for the Agropark, the RTCs IAN and the entrepreneurs on the site. The consortium has the benefit that the land was already owned by IFFCO. The example of the planned factory of Tata in West Bengal, where the Tata Nano car would have been produced is a clear example. A massive resistance movement came in to existing and the factory plans were withdrawn. When you need to acquire land in India, things become difficult because of the fragmented structure of land use. In Nellore some opposition arose from adjacent villages, because some villagers and farmers originally perceived the development as a threat. After some alterations of the plans the opposition decreased. Many farmers were also interested in taking part in the agropark development. Some resistance from middlemen is also a possibility. Current agribusiness chains in India are built around these middlemen. The IAN agropark will probably compete with these chains, although there are also benefits envisaged for middle men who can be integrated in the re-engineered and efficient chain of the Agropark. New chains where they could be engaged in will be opened. They will probably not be able to stop the agropark as long as it will be beneficial to farmers, because of the influence of farmers on Indian politics. A majority of the voting population of India is farmer. Having beneficial effect for these farmers therefore is of major importance.

3.2.3 Phases in the IFFCO Kisan SEZ Nellore development

Five phases can be distinguished in the IFFCO Kisan SEZ Nellore agropark development:

1. *The Initiation of the master plan phase.* In this phase the development was started with a preliminary assessment report.
2. *The feasibility study and preliminary assessment phase.* In this phase YBL and Wageningen UR carried out studies to advise GPC on where they would want to start its first agropark development. In this phase relevant trends and concepts also were described. The site for the first masterplan assignment became IFFCO Nellore. Because of the land ownership position of IFFCO this meant that the main assigner became IFFCO and GPC became the minor assignor. This phase ended in August 2008, with the decision that IFFCO and GPC would form a Joint Venture. The last studies for this phase were completed in March 2008. From March to August was a period in which negotiations took place between Wageningen UR, YBL, IFFCO and GPC. IFFCO created a business unit IFFCO Kisan SEZ Ltd. which went into joint venture with GPC as the leading partner.
3. *The masterplanning phase.* This phase started in the summer of 2008 and has not ended yet. This phase is mainly about concept operationalisation and about discovering what is possible and feasible at the site. Much of the work was done by Wageningen UR and YBL. IFFCO was especially involved in obtaining permits and securing the land near Nellore. The reports contain advice which gives input for decision making by IFFCO Kisan SEZ Ltd. and GPC. This phase also involves having workshops and discussions with entrepreneurs and the two assignors. Other stakeholders (governments and societal organizations) are mainly informed and sometimes consulted at this stage.

In the master planning phase team were established of Yes Bank Limited and Wageningen UR employees:

- *Management Team.* in this team the strategic context of the Nellore projects was being managed, including communication with the outside world and with team members. The members of the management team sometimes were also involved in one of the other teams.

- *Masterplan Team*: this team was involved in the master planning work; including technical experts.
- *RTC Team*: in this team people participated who work on defining and selecting of the RTCs.
- *IAN Team*: in this team chain analyses and market analysis were being done
- *GIS¹⁷ DSS¹⁸ Team*: in this team work was being done on the development of a GIS which will be of use when developing and managing the IAN, with agropark and RTCs.

During this phase new teams emerged: Entrepreneurs Team, Business Planning Team and Training and Education team. For a large extent existing of Management Team members, but especially on the Yes Bank Limited side also of other consultants.

In table 3.1 it is reported what general milestones and deliverables were attached to the masterplanning phase.

	Milestone	Deliverable
1.	Initiation of the master plan phase	➤ Preliminary assessment report
2.	Delivery of conceptual master plan with zoning and basic infrastructure, network, RTC locations	➤ Vision report on general principles Agro park ➤ IAN/GIS-Decision Support Systems and Rural Transformation Centres reports ➤ Underpinning and visualizations on structural elements, production, processing, trade and demonstration and the generic functional schemes ➤ A spreadsheet with estimates on investment costs for different Agropark components. ➤ An illustrated brochure, containing a summary of these deliverables, aimed at potential investors ➤ A process plan for the preparation and organization of the investors' mission. ➤ Internal reports on continuous monitoring and evaluation of the working process
3.	KENGi co-operation mission	➤ A visit of Dutch KENGi-network participants matchmaking with Indian counterparts and together participating in design workshop aimed at IAN-Nellore ➤ Letters of Intent (Lols) on further co-operation ➤ Draft project reports (available at the start of the mission)
4.	Delivery of final master plan and designs of structural elements and scenario's along with	➤ Report on Design and visualization of optional elements

¹⁷ Geographic Information System

¹⁸ Decision Support System

	optional elements	<ul style="list-style-type: none"> ➤ Design and underpinning (calculations) on scenario's & 3D-visualisation ➤ Monitoring and evaluation (redesign on proposals on process whenever necessary) ➤ Arranging for Road shows ➤ Discussions with strategic investors and also bilateral talks (ex. The province of Limburg, Province of Venlo etc.) ➤ Report on Market linkages Nellore; feasibility on market demand and logistics and network structure between APN metropolises, markets and RTCs in Bangalore – Chennai – Hyderabad region ➤ GIS-decision support system Knowledge base for Decision support system for agropark design phase and implementation phase ➤ Report on suitability and general outlay of RTCs around Nellore, its individual lay outs and design and process design of implementation process ➤ Draft business planning
5.	Final business plan & Detailed Project Report, including business plan on park management and on optional elements and the final blueprints of structural elements	<ul style="list-style-type: none"> ➤ Commercial demo ➤ Business Plan on Park Management ➤ Business plan on optional elements ➤ Blueprint on structural elements <p>Final Blue prints of the structural elements</p>

Table 3.1 Milestones & Deliverables Masterplanning phase

4. *The implementation phase.* In the summer of 2008 IFFCO started building a wall around the site. The wall has been built. The decisions made in this phase will decide whether IFFCO Kisan SEZ Nellore will be a full operational agropark or not. Roles are shifting and new organizational structures of advisors and assignors came into existence. The role of Wageningen UR and YBL will become less central and mainly be that of advisors and hand holders to the assignors who will have to play a more prominent role (in business development). The assignors have to revert to the entrepreneurs on the price of the land, approvals in place, ancillary infrastructure (including water and power) that they are willing to provide to the entrepreneurs. For this goal IFFCO Kisan SEZ Ltd. opened a website (<http://www.iffco.nic.in/applications/IKSEZWeb.nsf>) and a brochure. IFFCO Kisan SEZ Ltd has also formed an engineering team with an office in Nellore. To facilitate the start of this phase new teams have been established consisting of advisors and assignors. In one team, on RTCs, it was also planned that someone from a societal non governmental organization would be active as transformation manager. In this phase, government authorities could play a supportive role by providing permits and providing

incentives to entrepreneurs who are willing to invest. IFFCO was already active in obtaining these permits.

At the end of 2009 one could also speak about a pre-implementation phase. Not all the master planning work had been done yet, but already work was being done for the implementation phase.

5. The management phase. After the realization the park should be managed by park management and by the different entrepreneurs on the SEZ themselves.

3.3 Produced results

3.3.1 Overview

Multiple Letters of Intent (Lols) were signed by entrepreneurs in 2009 (Indian and international entrepreneurs). In the summer of 2009 Letters of Intent were submitted by consortia of entrepreneurs for allotment of about 820 acres of land. With others entrepreneurs advanced talks are being held. At the moment of the writing of this report (December 2009) no final decisions on investments were made yet. Intentions to invest had to become reality yet. The tangible results are therefore limited until now. The wall has been finished. That was a major operation in itself. Some basic infrastructure (roads, water ways, etc.) was built in 2009. It was not feasible yet to build more than basic infrastructure which will be needed anyway, because the first movers have yet to make final deals with IFFCO Kisan SEZ Ltd. A no-regret infrastructure development plan exists. Those building activities can be done. For other building activities concrete plans by entrepreneurs are needed. In 2010 it will become clear what the results will be of these deliverables. Entrepreneurs are interested to do actual investments, which should become reality to make the potentials of the IFFCO Kisan SEZ Nellore agropark a success. In what choices will be made in the implementation phase one can evaluate whether the agropark will be a full fledged agropark and why these choices are made.

As stated in paragraph 3.2 the work until now has focused on masterplanning and preliminary assessments. This produced a number of conceptual reports, which form the foundation for the implementation phase. In table 3.2 the deliverables which were produced are shown by milestone:

	Milestone	Deliverable
1.	Initiation of the master plan phase	Preliminary assessment report.
2.	Delivery of conceptual master plan with zoning and basic infrastructure, network, RTC locations	<ul style="list-style-type: none"> ➤ Vision report on general principles Agropark. ➤ IAN/GIS-Decision Support Systems and Rural Transformation Centres reports. ➤ Underpinning and visualizations on structural elements, production, processing, trade and demonstration and the generic functional schemes. ➤ A spreadsheet with estimates on investment costs for different Agropark components. ➤ An illustrated brochure, containing a summary of these deliverables, aimed at potential investors.

		<ul style="list-style-type: none"> ➤ A process plan for the preparation and organization of the investors mission.
3.	KENGi mission co-operation	<ul style="list-style-type: none"> ➤ A visit of Dutch KENGi-network participants matchmaking with Indian counterparts and together participating in design workshop aimed at IAN-Nellore. ➤ Letters of Intent (Lols) on further co-operation. ➤ A visit by Israeli and Dutch entrepreneurs and Indian counterparts in Hyderabad participating in workshops. ➤ Visits by individual entrepreneurs. ➤ Visit by Spanish delegation on the possibility of installing windmills.

Table 3.2 Produced Deliverables December 2009

Much has been done in the IFFCO Kisan SEZ Nellore process till now. In annex 1 a short oversight will be given which provides background information to table 3.2 in this chapter.

4 Preliminary learning points on process and organization of agropark developments in India

4.1.1 Reflection on the process in practice

The development of IFFCO Kisan SEZ Nellore was generally in line with the design principles which were formulated for the IFFCO Kisan SEZ Nellore development. The design principles which were translated in deliverables were guiding to the work of Wageningen UR and YBL and although there were some slowing downs, compared with the original planning, they were generally realized according to plan.

Concerning the process design some remarks can be made. For one the IFFCO Kisan SEZ Nellore development was partly in a process and partly in a project mode. Deliverables and phases were agreed on and time slots were attached. At the same time the process of the development was to some degree open for new insights and adaptation of plans. Research and other knowledge activities were conducted to make decisions possible on what the operational goals would be and how to achieve them. IFFCO requested information on how to proceed. Many professionals working on the development acted proactive and were looking for opportunities. The development therefore was a mix of process and project modes. The process design principles of transdisciplinarity, co-design and dialogue could be recognized in practice. Formal scientific knowledge and practical knowledge of entrepreneurs (including IFFCO and GPC) and civil servants were combined. Especially some entrepreneurs did recommendations for modelling on the IAN. Co-design by using the dialogue approach could also be recognized in the actual process. Multiple workshops were organized in which participants could actively put in their perspectives and visions and could decide themselves on what they would want to take up in the future. Because there were no investors yet, they also could not give input from that role to the design activities yet. Some entrepreneurs did share their vision and knowledge though.

Developing an IAN agropark means realizing a system innovation. Multiple innovations on hardware, orgware and software in one connected scheme are necessary. Are the social conditions there to realize a system innovation? To a certain extent they are. There is quite some variety in the consortium and the current KENGi network (in types of organizations, types of knowledge, types of perspective, types of capabilities, etc.), there are functioning order generating rules, there is much reflection going on, there is a healthy amount trust and to some extent a shared identity. This all could improve though. One challenge is to deepen and broaden the involvement of the KENGi network for instance. Especially on field level where the actual operational decisions will be made and the concrete building activities will take place. It is also imperative that potential investors are interested to participate in the process and take up activities in and surrounding the SEZ.

4.1.2 Learning points

The following learning points can be defined based on our research in 2008 and 2009:

- 1. The IAN agropark proposition in India needs to be promoted further by:**
 - Interesting entrepreneurs to invest in logistics, Collection Centres and Rural Transformation Centres and getting the first movers;
 - Developers going for the proposition and not for the short term gains. This also means being patient, and making investments to assist first movers. Small term gains can be

very important for the communication with farmers and governments, but it should be considered whether they damage the IAN agropark proposition;

- Involving many KENGi stakeholders in the development of agroparks, the IAN and the RTCs and using their co-design potentials. This should be done at different levels. Between top management people, but also on grass root level and with farmers;
- Having a stable partnership between assignors and advisors is needed, with a commitment to continue partnerships;
- Letting governments profit from the development and communicating this;
- Building good relations with farmers and middlemen.

2. Acquiring of entrepreneurs needs a further push. Needed is:

- Expanding the KENGi network of the consortium with Indian and international entrepreneurs with investment power (financially);
- All participants understanding the cultural differences when international and Indian entrepreneurs interact;
- A clear strategy for selecting RTC-entrepreneurs is needed;
- Expansion of the business development team, because they are essential for the actual business development. This means that other skills than engineering (especially commercial skills in business development) should be further developed;
- A clear strategy on how to do matchmaking missions when competing parties are present;
- The developer of an agropark being directly involved in matchmaking and acquisition of investors.

3. A Communication strategy is essential, consisting of

- A consistent story told by all people of the consortium;
- Tailor made communication to different stakeholders;
- Using communication with stakeholders to improve the designs (dialogue and co-creation);
- Actively inform interested stakeholders and potential investors so that they are able to participate when willing or able.

5 Closing remarks

In this report an overview has been given on concepts, process design and results of the work so far on the development of an IAN Agropark at the IFFCO Kisan SEZ site near Nellore. The process is now in the master planning- and the pre-implementation phase. Much communication with KENGi stakeholders has taken place until now, when implementing the agropark these contacts will intensify. The coming year it will be the time to examine how much business interest this proposition will attract and under what conditions. When it becomes clearer what will be realized and can it be assessed whether and why this will be profitable in terms of People, Planet, Profit and whether and why it will become a real system innovation.

Literature

Alterra, Wageningen UR & Yes Bank Limited, 2008. *Preliminary Assessment Report on IFFCO Kisan SEZ- Nellore & Consolidation Centres*.

Arkesteijn, Marlèn, Barbara van Mierlo en Cees Leeuwis (2009). *Reflexive monitoring and evaluation*, draft article. In preparation.

Burnes, B. (2005) *Complexity theories and organizational Change*. The International Journal of management Reviews, vol 7. Issue 2, 73-90

Castells, M., 1996. *The rise of the network society*. Blackwell, Cambridge.

Hajer, M.A. (1994). *The Politics of Environmental Discourse. Ecological Modernization and the Policy Process*. Oxford University Press, Oxford.

Hofstede, G. (1980) *Motivation, Leadership and Organization: Do American theories apply abroad?* Organizational Dynamics, Summer 1980, AMACOM

IFFCO Kisan SEZ Ltd. & GreenPort Corporation, 2009. *IFFCO Kisan SEZ –Nellore. Creating India's first Agribusiness based Special Economic Zone*.

Nowotny, H., P. Scott, M. Gibbons, 2001. *Re-Thinking Science: Knowledge and the Public in an Age of Uncertainty*. Polity Press, Cambridge.

Mansfeld, M. van, etc., 2010 Agropark IFFCO Kisan Nellore: Rural Transformation Centres. Wageningen UR & Yes Bank Limited. In preparation.

Mansfeld, M. van, 2007. Process oriented planning for Greenport Shanghai Agropark: Multi level, multi sector, multi actor, multi culture. Presentation for the *International seminar on Innovating Metropolitan Agriculture*, Beijing, October 23rd 2007

Mierlo, B. van, B.J. Regeer, M. van Amstel, M. Arkesteijn, V. Beekman, J.F.G. Bunders, T. de Cock Buning, B. Elzen, A.Ch. Hoes, C. Leeuwis, 2010. *Reflective Monitoring in Action. A Guide for Monitoring System Innovation Projects*. Wageningen University / Free University of AmsterdamL Wageningen / Amsterdam.

Peterson, C.H. (2008) *Transformational Supply Chains and the "Wicked Problem" of Sustainability: aligning Knowledge, Innovation, Entrepreneurship and Leadership*, Michigan State University"

Ploeg, J.D. van der, 2009. Transition: contradictory but interacting processes of change in Dutch agriculture. In: Poppe, K.J., C.J.A.M. Termeer & M. Slingerland, 2009. *Transitions towards sustainable agriculture and food chains in peri-urban areas*. Wageningen Academic Publishers, Wageningen. P. 293-307.

Regeer, B.J. & J.F.G. Bunders, 2009. *Knowledge co-creation: Interaction between Science and Society. A transdisciplinary approach to complex societal issues*. RMNO, Den Haag.

Roos-Klein Lankhorst, J., M. van Eupen, G. Koneti, 2010. *Design of the Geographical Information System / Decision Support System for the Intelligent Agroparks Network of India*. Wageningen UR and Yes Bank Limited. In preparation.

Smeets, P.J.A.M., 2009. *Expeditie agroparken. Ontwerpend onderzoek naar metropolitane landbouw en duurzame ontwikkeling*. Wageningen.

Smeets, P. J. A. M., S. Buijs, M. Van Mansfeld, A. E., Simons, K. Chakravarthi, R. Poosapati, R. Olde Loohuis, H. Jansen, J. Broeze, H. Soethoudt, P. Bartels & G. Koneti (2010.). *Agropark IFFCO Kisan SEZ Nellore. Conceptual masterplan*. Alterra, Agrotechnology & Food, Yes Bank, Wageningen, New Dehli. In preparation.

Simons, A., H. Soethoudt, P.J.A.M. Smeets, V.S. Sunjay, 2010. *Intelligent Agrologistic Network. Towards building an efficient supply chain for Agropark Nellore*. Wageningen UR & Yes Bank Limited. In preparation.

Stacey, R.D. (2003) *Strategic Management and Organizational Dynamics: The challenge of complexity*. Harlow FT Prentice Hall.

Swarangi, K., M. van Mansfeld, G. Koneti, P. Smeets, A. Simons, S. Buijs, R. Poosapati & K. Chakravarthy, 2010. *Agropark IFFCO Kisan SEZ – Nellore. Vision Report*. Wageningen University and Research Centre and Yes Bank Limited, Wageningen. In preparation.

Termeer, C.J.A.M. en Kranendonk, R.P., 2008. *Governance of regional innovations towards sustainability*. Paper for the EGPA conference, 2008.

Wageningen UR and Yes Bank Limited, 2009. *Conceptual masterplan for Rural Transformation Centres*. September 2009.

Annex 1 Background information on activities for the development of IFFCO Kisan SEZ Nellore

1. Feasibility Study

In the Feasibility study YBL and Wageningen UR made a scan to advise GPC on where it would be feasible to start its first agropark development. Relevant trends in agriculture and in the economic development of India and the IAN Agropark concepts were investigated. Sites in Amravati (Maharashtra), Kolar (Karnataka), Palmaner (Andhra Pradesh), Punganuru (Andhra Pradesh), Nayadupeta (Andhra Pradesh), Puduvoyal (Tamil Nadu), and IFFCO Nellore (Andhra Pradesh) were investigated for their potentials. The selected site for the masterplan assignment became IFFCO Nellore.

2. Preliminary Assessment Report

This preliminary Assessment Report delivered the results of the feasibility and preliminary research, design and planning of IAN Agropark IFFCO Kisan SEZ Nellore, in Andhra Pradesh, India. This report includes the concepts and development principles of Intelligent Agro logistic Networks, containing Agro parks, Consolidation Centres and Rural Transformation Centres, design principles, modelling and reasoning behind natural resource management, the financial feasibility and risks, a site analysis of Nellore, and the pre-assessments of possible lay-out and design of the Agropark IFFCO Kisan SEZ Nellore.

3. Masterplanning agropark IFFCO Kisan SEZ Nellore

3.1 Content of masterplan

During a mission of Wageningen UR experts to India in the first week of April 2008 the preliminary design had been reworked into a first draft for a master plan. This was produced by a working team made up of Yes Bank Limited experts together with the visiting Wageningen UR experts, and in close consultation with representatives from initiators GPC and IFFCO. After their return to The Netherlands the Wageningen UR experts finalized this first version of the master plan design. Major characteristics of this first master plan version were the following:

- Most of the site is designated for development (about 2300 from total 2780 acres);
- A total of 240 acres of support functions is included on-site (R&D, demo, university, residential area, agro-tourism; these are centred on the existing and to be expanded water tank in the north-western part of the site);
- The major part of the site is taken up by production functions and trade/logistic functions surrounding a central processing zone;
- Trade/logistic functions are located between highway and railway, with direct links to these major interstate transportation infrastructures;
- Production and processing functions are located to the west of the highway, also including park management and CPU;
- Both parts of the site share a main entrance from the highway and are mutually connected by a flyover over the highway.

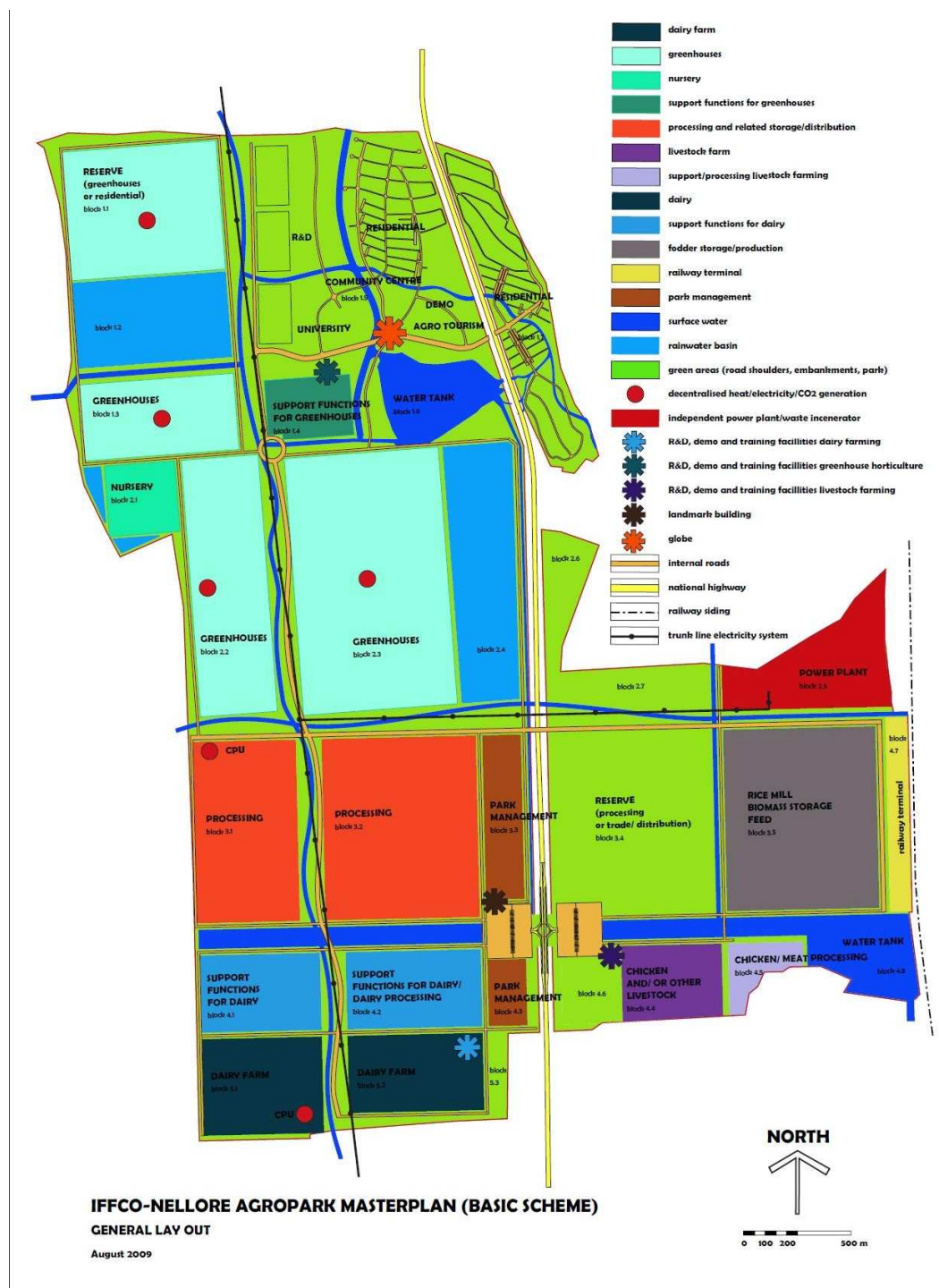


Figure 1 Preliminary masterplan (www.iffco.nic.in/applications/IKSEZWeb.nsf)

This finalised first version of the master plan was discussed by IFFCO, GPC, Wageningen UR and Yes Bank Limited resulting in a number of comments. The most fundamental comment was that a larger part of the site first had to be kept as reserve. Only 1500 acres should be developed as Agropark. The new designs were discussed with the IFFCO-management during their visit to The Netherlands at the end of June, with the following outcome:

- The whole 2800 acres site could be developed for Agropark functions, for which an 'ideal design' has to be made; support functions (240 acres of R&D, etc.) needed not be located within the site but could be transferred to an outside area that is to be acquired additionally for this purpose
- The railway siding should not branch off from the main line at a right angle, but should run parallel (with the need for additional internal transport to the railway)
- The fly-over should be shifted to a more northern position
- The existing water tank should not be enlarged; instead a second water tank should be located in the low lying south-eastern corner of the site
- The power plant should be located directly to the east of the highway, outside the Agropark proper

Based on these requirements an entirely new design was made, including a proposed area to be acquired for support functions to the north of the site. The new design was discussed with the GPC Agropark project manager visiting The Netherlands in the first week of August 2008. Based on his communications with IFFCO representatives during the last few weeks, he stated to re-introduce the reserve area and to include R&D functions within the site again. This would mean a return to the second version. During the masterplanning phase the plans have been revised more than 10 times. When discussing with assignors and with entrepreneurs, new insights were obtained and the design evolved. The entrepreneurs workshops in Hyderabad (April 2009) were important in that respect. Afterwards Letters Of Intent were obtained and they were used as input in the masterplanning.

The last version of the masterplan so far (September 2009) describes what agricultural commodities would be feasible. This includes green houses, chicken/goat sheep farms, dairy farms, a rice mill, processing plants, warehousing, power utilities, park management and a non processing zone with a campus (residential and university), demo facilities and agro-tourism. It is envisaged that the land use will develop over time. It will be a phased development. Ultimately the entrepreneurs who want to lease land and start operating their business (in accordance with IFFCO Kisan SEZ Ltd.) on the agropark will decide what they will do on the land and how they will develop their activities.

A major issue is the energy production on the agropark. As stated before sustainable use and reuse of energy in the form of a Central Processing Unit is an important component of an agropark. The CPU concept is part of the masterplan design, but there will also be other power plants. Besides, there will be more than one CPU. The option to use sea water for cooling has been left, because of the high expenses connected to it. The preferred choice for energy supply is as follows (rounded figures) in the report on the Masterplan, September 2009:

It was researched that the following major water infrastructures are needed:

- Rooftop rainwater harvesting structures (on all greenhouses plus 100 ha additional roofs);
- Distribution system for 4 water qualities: rainwater, drinking water, grey water and black water;
- Rainwater tanks with a total capacity of approximately 2.0 million m³;
- Raw water tank for drinking water production of 1 million m³;
- Drinking water reservoir of 30,000 m³;
- Water treatment plant (capacity in the order of 15,000 m³/day);
- Decentralized water purification systems (total capacity approximately 1,000 m³/day);
- Provisions to harvest condensation water from the processing and cooling facilities.

3.2 Park management and business models

IFFCO Kisan SEZ Ltd. and Greenport Corporation will manage the park management of the agropark in a Special Purpose Vehicle. The park management authority will lease out the land to

entrepreneurs, who will be required to confirm to rules. These rules will have to do with landscaping aspects, but also with participating in the Central Processing Units.

Two business models are considered, which distinguish themselves in the relation between the SEZ and the RTC's:

- *Structure 1:* The Special Purpose Vehicle formed by the IFFCO Kisan SEZ Ltd., along with Greenport Corporation would take up the development and operation and maintenance (O&M) of the SEZ as well as the RTCs.
- *Structure 2:* The Special Purpose Vehicle formed by the IFFCO Kisan SEZ Ltd., along with Greenport Corporation would take up only the development and operation and management of the SEZ but the RTCs would be owned by a separate company created for that purpose.

4. Operationalisation of the RTC concept and selecting the potential RTC locations

Various studies have been done in 2008 and 2009. The main results are listed below. This gives a first overview. Much information is from the Conceptual Masterplan RTC (September 2009). On other important document is the report from January 2009 (Van Mansfeld et al., 2009). In these studies the general concepts were operationalized. How would an RTC actually look like in the Nellore region? What infrastructure is actually needed? Are farmers willing to change their land use and agricultural practices? Are they able to make the transition? What entrepreneurs are willing to start business at the SEZ and who needs an RTC for the collection of raw materials for their activities at the SEZ? More has been done, than only the studies.

4.1 Hardware aspects

The various materials which are available in the catchment area of Agropark Nellore that could be procured through the RTCs are:

Crops:

- Fruits: Mango, Lime, Sweet orange, Sapota, Pineapple, Guava, Banana, Papaya, Pomegranate, Water melon, Custard apple, Tamarind, Amla, etc.;
- Vegetables: Tomato, Onion, Chilli, Beans, Cabbage, Coriander, Curry leaf, Potato, Carrot, etc.;
- Beetroot, Sweet pepper, etc.;
- Field Crops: Paddy, Groundnut, Gram, etc.;
- Medicinal and Aromatic Plants: Turmeric, Lemon grass, Aloe Vera, Asparagus, etc.;

Animal husbandry products:

- Chicken;
- Dairy;
- Aquaculture – marine and fresh water;
- Goat;
- Sheep.

Organic waste and by-products (biomass) for fodder and energy production:

- Rice straw and rice husk;
- Biomass crops;
- Fruit wastes and residues;
- Oilcakes (fodder);
- Leafy residues crops.

Primary criteria for selection of locations of RTCs are:

- Raw material supply strength;
- Connectivity/ accessibility;
- Climatic Conditions;
- Agropark entrepreneur/investor perspective;
- Procurement target;
- Transformation feasibility.

These criteria have been studied for the 20 locations and lead to the following six sites to be selected for RTC development (from a list of 20 locations); each with a label (kind of produce) attached to it (Wageningen UR and Yes Bank Limited, 2009; Conceptual Masterplan for RTC):

1. *Chittoor*: Chittoor is the district headquarter and also a prime location logistically. It is equidistant from two large metros, Chennai and Bangalore. This is the region for procuring processing variety of mango like Totapuri. Apart from this, tomato (non-processing variety), tamarind can also be procured. There is a good perspective and potential in transforming “farmers” to cultivate vegetable crops.
2. *Kodur*: Kodur is the most horticulturally rich location in South Andhra Pradesh. There are variety of fruits and vegetables grown in and around this location. This location is selected for mango, banana, papaya and other fruits. Potential exists for transformation to other fruits and vegetables.
3. *Gudur*: Gudur is one of the largest Acid lime markets in India and selected mainly for acid lime procurement. There is good scope to encourage the existing farmers to increase the area under cultivation. Though at present the area is decreasing, it is mainly because of the discouraging marketing environment.
4. *Ulavapadu*: This location is well known for fresh mango and sapota. This location is ideally located on NH-5 and nearer to Agropark.
5. *Kavali*: Kavali is very close to the Agropark and a suitable location for various activities like dairying, poultry, vegetable cultivation etc. It has been observed that farmers are enterprising and can grow variety of crops as per the demand from Agropark. Many farmers are already diversified from paddy to tomato, floriculture etc. Extension and training services are also being planned to be delivered from this location.
6. *Ongole*: Ongole is known for its dairy strength, good breeds of animals apart from tomato, sweet lime etc., This location is selected for encouraging local entrepreneurs for dairy activities and for offering extension and training services.

For each potential RTC it was investigated what kind of infrastructure would be needed. In a later phase more of the 20 studied sites could be selected than these 6. Just as with the agropark, the entrepreneurs who are located on the agropark will decide whether they need an RTC and to what requirements. In certain Letters of Intent interest and need for RTC's were mentioned. This is used as input for the search for RTC locations.

The selection of the potential RTC's was based on studies and field visits from 2008 onwards. In these activities there were already meetings with government officials and NGO's to get them informed and asking them for their advice. An important part of this was the use of participatory methods. In June 2009 a workshop was held Nellore for dairy and allied RTCs and in April for chicken RTC's. A preliminary RAAKS study was used as an input (see Giesen, 2009 for more information). The facilitation technique chosen for this workshop was an adjusted open space technology and the overall design (process architecture). See Giesen (2009) for more information. The developed structure in 2009 to develop the RTCs is that there is one RTC team, which exists of two members of IFFCO, two members of Greenport Corporation, one member of Yesbank, one member of Alterra and one local party. Each RTC will have his own development team, which is supported by the central RTC-team.

4.2 Software aspects

The software aspects of an RTC deal with the transformation power the RTC can induce within the rural areas where procurement of raw materials can take place. Extension, education and training as well as communication are essential to induce the required transformation and preparations for this have been part of the work on RTC's. Contacts have been established with nongovernmental organizations, educational institutes and with companies who also carry out training courses.

4.3 Orgware: RTC business models:

The following orgware requirements were defined for RTC's:

- Land: Land should be owned by IKSL + GPC consortium for tight control on the RTC administration and to make future scope for expansion. In the event of land being not available for sale, consortium should look at leasing the lands and making the owner of the land as one of the equity partner in the RTC. Either way, it is suggested that RTCs should not be developed on a land owned by third parties;
- Common infrastructure: Roads, electricity, general administration, security, water, sewage, warehousing, and collection centre are some of the examples of common infrastructure. These components have common use for all occupants of RTCs and should be managed by a general authority like consortium itself or any such responsible body. Within common infrastructure, there are components like warehouses (including cold storages), collection centre, water supply are some components which need regular maintenance and have commercial feasibility. Such components can also be outsourced for regular maintenance;
- Individual units: Agri-clinic, seeds, pesticides, and fertilizer shops, soil testing labs, schools, hospitals, food courts and other social infrastructure components are classified as individual units as they can be run in isolation of other RTC components. These units also can be run by independent entrepreneurs from the local region thus increasing the potential rural employment.

Irrespective of the Agropark developer's role in RTC development, entrepreneurs on the agropark have to ensure a strong linkage between RTC and Agropark for various operational conveniences. Below are listed a few examples of such arrangements.

- Service level agreements between suppliers of raw material from RTC to Agropark;
- Mutual interdependency: In the event of Agropark investor not having his own supply chain, he can depend on RTC supplier for such raw material. This relationship should be strong enough to sustain long term smooth flow between two entities. Bilateral equity participation in Agropark and RTC operations is one such example to have mutual interdependency;
- Strategic and financial tie-ups for various funding options;
- Equity participation: Agropark developers may consider equity participation in some of the individual units (Agri clinics, warehouses etc) to encourage young entrepreneurs;
- Entrepreneur engagement: Active scan of the RTC region should be done to identify, motivate and help young entrepreneurs to set up individual units in RTC.

5. Attracting entrepreneurs

It is essential for the development of the IFFCO Kisan SEZ Nellore that entrepreneurs will be willing to take up business at the agropark, the RTC's and in the IAN. Therefore employees of Yes Bank Limited and Wageningen UR communicated with entrepreneurs in their network and invited them for field visits and discussions. From November 2008 visits from interested entrepreneurs have been organized. Indian, Dutch and Israeli entrepreneurs have visited the site, had discussions and meetings. With each other, with advisors, but also directly with IFFCO and GPC. The results of this are the signed Letters of Intent. Until December 2009 no final contracts were signed on investing by entrepreneurs on the IFFCO Kisan SEZ Nellore agropark.

6. Intelligent Agrologistic Network

The IAN work in 2009 focused on the question: can we establish viable food supply chains and networks in the Indian arena? And if so how do we attract and support entrepreneurs to contribute to this? (Simons et al., 2009 & two expanding reports in November 2009) To answer these questions a comprehensive market study was done for Chennai. It delivered a total consumption profile for Chennai for all food products in kilograms and spend money including seasonal variations per person per income level. Furthermore it did study the market shares of different formats in the wet markets, the moms and pops shops, the upcoming retail chains and all out-of-home formats in combination with the underlying trends. On a generic level it was established that both upgrading individual supply chains as well as establishing and operating new production, trading and logistical networks are in every sense viable investments. On the level of a typical entrepreneur in-depth instruments were developed to support him in evaluation/validating his business model for the Chennai market. This was done for the tomato and the poultry meat entrepreneurs in the context of their specific supply chain as well as the overall network they have to operate in. This is a crucial, in this study acquired competence that can be utilized to attract and facilitate also other possible entrepreneurs.

The IAN team researched the demand side of consumption trends in urban India and of urban Andhra Pradesh, Tamil Nadu (Chennai) and Maharashtra (Bangalore). AC Nielsen (NCAER study 2006-2007) described for instance the basic diet of Chennai inhabitants. Export-import product-market combination analyses were done. For mango, dairy, marine products, animal products, fruits and vegetables, ghee/butter oil, cheese and skimmed milk powder. Other analyses have been done on:

- Sourcing of agricultural raw material (fruits and vegetables, paddy, milk, poultry);
- Mapping of principal agricultural residues and agro-industry by-products;
- Key factors affecting post harvest handling of agricultural produce (horticulture, dairy, aquaculture, poultry);
- Government incentives and schemes.

A large part of the IAN work consisted of IAN-modelling. Simons et al. (2009) studied development of IAN models based on 'investment/profit space' analysis. This involved a comparative study of cost price between a specific IAN scenario and that of existing supply chain. The absolute profit/loss in the proposed new IAN scenario was estimated based on simulation of target market size and price level. This approach was used to simulate IAN models for fruits and vegetables (taking the example of tomato) and poultry. These models can be replicated for a number of other fresh products thus providing the relevant reference point for investors not only to get insight in the current Indian situation but also to identify the best opportunities available Scenario analysis. This model studies are based on information of Yes Bank Limited on the current chain situation.

7. Training and education

A vision was made on how to train and educate the future workforce of the IAN, with agropark and RTC's. For this purpose discussions are held with ngo's, universities, government agencies, entrepreneurs, etc. There was no final report yet in 2009.

8. GIS decision support system

The objective of the Geographical Information System (GIS) and Decision Support System (DSS) is to support the design, development and management of the Intelligent Network of Agroparks in India by offering a wide range of available data and model results in its spatial context, finally resulting into one integrated system. In 2008 it was elaborated how this GIS-DSS should take form. The objective of the Geographical Information System (GIS) and Decision Support System (DSS) is to support the design, development and management of the Intelligent Network of Agroparks in

India by offering a wide range of available data and model results in its spatial context, finally resulting into one integrated system. The support can be given on three different levels:

1. For the design of a network of agroparks in India (and maybe other countries);
2. For the design of an individual agropark (e.g. the Nellore agropark) and it's network of Rural Transformation Centres (RTCs) and Consolidation Centres (CCs);
3. For a dynamic support of the development and exploitation of an individual agropark (e.g. the IFFCO site near Nellore).

For more information: Roos-Klein Lankhorst, Van Eupen and Koneti, 2009.