



Rural-Urban Outlooks: Unlocking Synergies (ROBUST)

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Snapshot: Expressions of Urban – Peri-Urban – Rural Relationships

Regional eco-system bundling and balancing

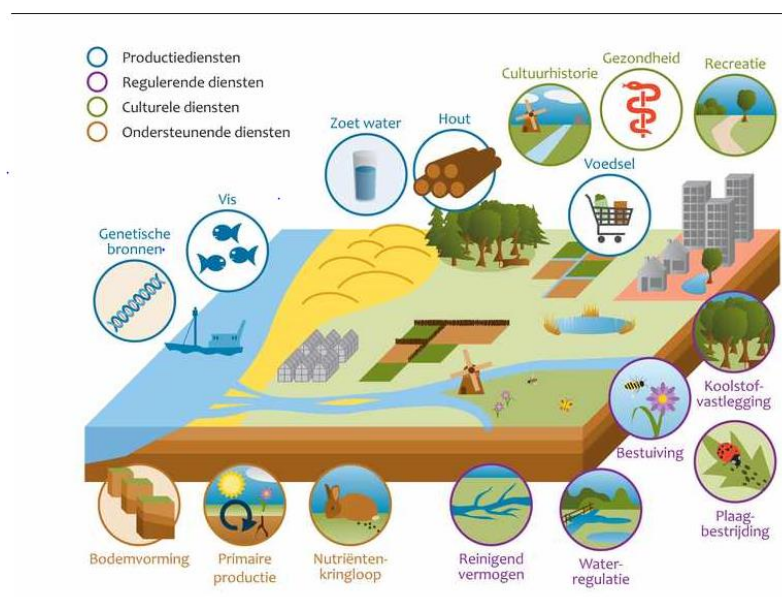
Ede, Netherlands

1. Brief Description

The provisioning of ecosystem services (ESS) is a topic that attracts specific attention in Ede due to the intensity of its regional agricultural sector, its associated confrontation with a serious and rather persistent set of (agri-) environmental problems and the specific vulnerabilities of its principle nature areas.

Rural ESS provisioning in Ede is concentrated in National Park Hoge Veluwe, with its combination of ESS as nature conservation, biodiversity, ground water infiltration, air pollution removal, recreational hunting, recreation, etc. Its variety of productive, regulatory and cultural ESS, however, is (partly) threatened by the strong concentration of intensive husbandry in the region.

Although more generally spatial re-balancing of rural ESS provisioning represents a crucial regional policy challenge in Ede which is difficult to isolate from agriculture's (future) ability to correct and mitigate current ESS unbalances.



2. Questions and/or Challenges

In response to prevailing imbalances in regional eco-system delivery, eco-economy inspired solutions (a return to multifunctional farming) as well as bio-economy and circular economy induced responses (see further) can be witnessed. This regional co-evolution of contrasting sustainability trajectories goes along with specific policy features, promises and limitations in terms of eco-system service delivery.

More recently, there is growing policy attention on urban ESS provisioning through, for example, urban biodiversity conservation and urban mitigation of extreme weather conditions that increasingly result from climate change.

For Ede municipality, the following questions are particularly important:

- > How to improve regional balancing and bundling of ESS provisioning?
- > How to strengthen regional rural-urban relations through ESS provisioning?

3. Main Insights

3.1. Indications of the application of the new concept of 'New Localities'

The topic of ESS is by its very nature imbued with boundary setting issues and problems, given the global dimension of climate change, agri-ecological problems, loss of biodiversity etc. Therefore, any perspective on ESS provisioning will have to deal with issues of boundary setting as problematised by the new locality approach. Starting from an ESS perspective, Ede participates in various localities, each having its specific administrative and institutional boundaries, which may be related to topics, such as nature conservation, biodiversity, renewable energy sourcing, valorisation of waste and rest-warmth, soil fertility concerns, integrated water management, cultural heritage, etc.

A detailed description of these multiple localities may go beyond the scope of this rapid appraisal, yet it is important to recall that regional provisioning of ESS services knows a long tradition of rigid land use function segregation (rural-urban, industrial-residential, agriculture-nature-leisure, etcetera). As the tensions, limitations and shortcomings of this segregation are manifesting themselves regionally in various ways, more integrated land use inspired perspectives are being actively explored (see also LL Ede's NEPA governance arrangement suggestion).

3.2. Insights related to the broad area of 'Smart Development'

Again, also ESS provisioning in Ede can't be isolated from Food Valley's dominant ideas on how to sustain global food systems.

Broadly, two contrasting positions can be witnessed in relation to eco-system provisioning:

- > Most dominantly present position in Food Valley starts from bio-based (input-output efficiency, high-tech and circular economy) thinking as guiding principles for sustainable development.
- > A sustainability trajectory that certainly shows interest in regional urban-rural synergy potentials through biomass-based energy plants, rural solar and wind energy projects, urban heating systems, making use of the rest-warmth of manure, surplus-based processing techniques, etc.

It is primarily technological engineering inspired thinking and acting, however, has less attention for or confidence in agriculture's capacity to contribute to ESS as nature, landscape, and biodiversity. This is contrasted with the second, agri-ecology inspired sustainability perspective, promoting multifunctional land use, farm-level bundling of ESS, direct food producer-consumer contact and novel agricultural, or perhaps better, rural professional identities.

This regional co-existence and co-evolution of contrasting ESS provisioning perspectives goes along with rather different ideas about the regional role of agriculture as rural-urban synergy driver. These diverging ideas among Food Valley's stakeholders makes regional ESS provisioning, balancing and bundling a sensitive and controversial topic in Ede's setting.

3.3. Other insights that could be relevant for further work

As emphasized in the previous, this second topic can't be isolated from Ede's Urban Food Policy initiative. By observing how both topics interact, it may become possible to have deeper insights about regional attempts to assemble rural-urban-synergy webs and their accompanying prospects, limitations and barriers. As will be argued later, this also goes for our third snapshot suggestion.

4. Data Sources and Indicators

An enormous variety of meaningful quantitative and qualitative datasets are available for Ede's ESS profile, of which (so far) the following indicators have been distilled. Again, see below for a tabular impression of its most telling outcomes and section 5 for an overview of most important references.

- > National and Regional eco-system service profiles and challenges [1, 2,3,4,19, 21, 22,23,24, 25, 26,28,30]
- > Regional typical nature + cultural values [9, 11, 12]
- > Regional agricultural income support levels and percentage of agricultural land with high nature value in comparison to other Dutch regions [27]
- > Regional agricultural soil characteristics and soil quality issues and measures [18,31]

- > Regional agri-environmental problems and emission levels [5,6, 10, 15, 17]
- > Regional soya import dependency of animal production [20]
- > Regional climate change and energy transition challenges [7, 14,29]
- > Regional water sourcing and management characteristics and challenges [8, 14,16]

Table 1 Data Indicators	1= Ede Municipality, 2= Food Valley, 3= Gelderland, 4= Other locality	In comparison to the Netherlands as a whole
Rural/ Urban Area Ratio in 2017	6.9 (1)	n.a.
Agriculture /Forestry and Nature Area Ratio in 2017	0.66 (1)	n.a.
Expansion of urban area in the period 2006-2015	284 ha (1)	n.a.
Loss of agricultural area in the period 2006-2015	351 ha (1)	n.a.
Intensity of agricultural land use	High (1)	Higher
Manure surplus in kg phosphate in 2014	7.2 million kg (1)	Higher
Nitrate-losses in agriculture	?	Higher
Level of particulate matter emission (in kg /year /km ²)	916 (1)	Higher
Level of greenhouse gas emission originating from agricultural activity (in kton Co ₂ -equivalents) in 2014	5,111 (3)	Higher
Level of ammonia emission (in kg/year / km ²)	5408 (1)	Higher
Soya import dependency of pork production (in gram per kg pork)	300 (national figures)	Similar (?)
Soya import dependency of poultry production (in gram per kg poultry)	600 (national figures)	Similar (?)
Soya import dependency of beef (in gram per kg beef)	300 (national figures)	Similar (?)
Percentage of renewable energy sourcing in 2017	4.3	Lower (?)
Manure-surplus based renewable energy generating initiatives	Various initiatives in progress, albeit mostly surrounded by location finding issues	Strongly present
Biomass-based renewable energy generating initiatives	With 2 biomass plants, sources by regional organic waste material, Ede is a national	Strongly present

	frontrunner in sustainable house-heating systems	
Agricultural subsidy level per ha (exclusively pillar 1 payments)	Historically high due to intensity of agricultural production	Higher
Percentage of agricultural land with High Nature Value	Low	Lower
Estimated total eco-service service value in Nature Park Hoge Veluwe	€10,750,000	n.a
Highest monetary valorized eco-system services in Nature Park Hoge Veluwe	Recreation, ground water infiltration and particular matter air filtration	
Ability to valorize nature and landscape value through leisure and tourism	Traditionally strongly present	Stronger
Scenario's for solar and wind energy contributions to climate neutral energy sourcing in 2050	Ranging from 650 till 840 ha of solar panels (2) Ranging from 45-73 windmills (2)	-
Regional Principle <u>Urban</u> eco-system concerns	Particular Matter filtration, water retention and heat reduction during peak periods, others?	-
Average <u>rural</u> housing price in 2017 for property taxes	€337,000 (1)	n.a.
Average <u>urban</u> housing price in 2017 for property taxes	€206,000 (1)	n.a.

5. Critical Appraisal of Data Use

Notwithstanding national and regional burgeoning info on ESS, it is important to notice that overall info shed little light on its accompanying and associated rural-urban interaction. Comprehensive insight in how regional rural-urban interaction affects ESS provisioning and vice-versa, does require much more sophisticated cost-benefit methods than currently available. The latter is also partly due to the simple fact that it will have to deal with the complexity to assess and compare the pros and cons, vulnerability and resilience of ongoing bio- and eco-economy based initiatives from various angles.

As we realize that the elaboration of such sophisticated cost-benefit methods clearly surpasses the ambition of ROBUST, we propose to concentrate on identify and sharing a set of initiatives where ongoing ESS (re-) balancing or (re-) bundling has positive impacts in terms of regional strengthening of rural-urban interdependencies.

Thus, a set of initiatives that may be grounded on different sustainability lenses but simultaneously (partly) embraced as vehicles and leverages for rural-urban synergy building.

In the specific setting of Ede, this encompasses a broad variety of initiatives, such as urban biomass energy plants sourced by rural organic waste material, agricultural use of urban industrial rest-warmth or conversely, manure-surplus processing based urban energy provisioning, wind, solar and geothermal based renewable energy sourcing, integrative water management, farmer-led collective action with the aspiration to strengthen agriculture's ESS bundling capacity in different ways, etcetera. Ideally, such a multiplicity of initiatives will be shared, compared and complemented with other expressions of ESS bundling and balancing with clearly visible rural-urban interaction components.

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