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Mapping for the 21st century urban agendas through the lens of super-diversity

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Abstract

This essay takes its origins from research the authors conducted in a four year partnership implementing the urban energy transition agenda in a series of sites for the Municipality of Amsterdam. The design process encountered a reality of social-ecological systems much more complex than what is represented in official abstract and isotropic maps. Standardization is prevailing at the expense of super-diversity. Therefore, based on their personal background and experience the authors initiate a brief excursus on the sense of the act of mapping and representing local communities through the lens of super-diversity, understood here as the infinite complexity of social-ecological systems. In the final part they postulate how maps should be approached to be truly effective towards nowadays pressing urban agendas.

Questo saggio trae origine da una ricerca condotta dagli autori per il Comune di Amsterdam. La partnership di quattro anni era rivolta all'implementazione progettuale della transizione energetica urbana in una serie di ambiti specifici. Il processo di progettazione ha incontrato una realtà di sistemi socio-ecologici molto più complessi di quanto rappresentato nelle mappe ufficiali, astratte e isotropiche. La standardizzazione prevale a scapito della super-diversità. Pertanto sulla base del loro percorso culturale personale e della loro esperienza, gli autori avviano un breve excursus sul senso dell'atto di mappare e rappresentare le comunità locali attraverso la lente della super-diversità, intesa qui come l'infinita complessità dei sistemi socio-ecologici. Nella parte finale postulano quali attributi dovrebbero caratterizzare l'atto del mappare, se ancora di mappe si può parlare, perché le mappe e altri mezzi di rappresentazione risultino veramente efficaci verso le sfide urbane odierne.

Keywords

Site design, Species of spaces, Inventive analysis, Relational scales, Super-diversity.
Progetto, Specie di spazi, Analisi inventiva, Scale relazionali, Super-diversità.

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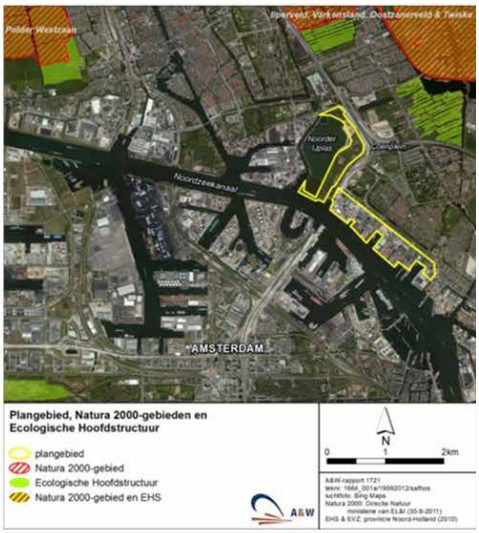
Current urban agendas challenge resides in the site design implementation of sustainability goals through a social ecological system approach, involving multiple and multi-species actors. The social-ecological systems framework was originally conceived by Elinor Ostrom to collect evidence on the variables and institutional arrangements enabling diverse local actors in governance strategies for common-pool resources (Ostrom, 1990). Petrosillo et al. (2019), Castán Broto et al. (2019) indicate social-ecological systems characterized by interdependent social patterns and ecological patterns. Some authors such as e.g. Alessa et al. (2008), Vervoort et al. (2012), Zhou et al. (2019) consider the landscape itself a social-ecological system. Very recently Wolsink (2024) defined renewable energy sources as a common-pool resource, in that direction some authors as Partelow (2018) already stressed the need of a social-ecological systems approach for the energy transition. In this paper authors will use the term social-ecological system (SES) to indicate either a concrete social-ecological system or a social-ecological system approach. Further the authors consider landscape as a result of different social-ecological systems governance, and sustain the thesis that the energy transition, as every other urban agenda challenge must be integrated in them (Stremke et al., 2022; Picchi et al., 2023).

In the 18th and 19th centuries maps became a necessary tool of government for new-born nations, discerning order and standards to societies (Corner, 2011; Schulten, 2012; Dorling and Fairbairn, 2013; Sletto, 2009). In 1959 French human geographers Juillard and Sorre, in an essay on migrations and people mobility, were affirming that the impression of people permanence in a nation is an "illusion" (1959, p. 407). Nowadays many sociologists consider the current worldwide societies, people mobility, flows, multiculturalism, transnationalism hardly fitting in the modern concept of nations (Grzymala-Kazlowska and Phillimore, 2017) which challenges the very raison d'etre of maps that we have become so acquainted with.

To describe these complex phenomena the sociologist Vertovec articulated the concept of super-diversity (2019). Among the several interpretations and applications on Vertotec's concept, Busch conceptualizes super-diversity as the increasing complexity of new social formations (2012). Some authors are questioning how to advance knowledge to support such new social formations (Grzymala-Kazlowska and Phillimore, 2017), for example Beck expressed the concern that while the world of diversity is changing radically towards super-diversity, we employ 'old maps' to orientate ourselves (2011). In this paper the authors sustain the thesis that approaching mapping through social-ecological systems can support the description of super-diversity, since SES frame-



work was conceived to enable multiple actors in governance strategies, yet those concepts are still rarely combined in literature: for example Barona et al. affirm that the cultural diversity and the increasing complexity of social formations can affect the governance of natural resources in our cities (2023).

The authors of this paper experienced Beck's concern (2011) during four years of design research conducted for the Municipality of Amsterdam, The Netherlands. The authors were training public officers of the Municipality on the site design implementation of the regional energy strategy, pushing them to think through a SES approach (Partelow, 2018). The site design implementation exercise literally could not afford the super-diversity among the several actors and stakeholders, so that participants realized that more local actors and stakeholders engagement would be needed to reach the different social profiles. For example in 2021 the exercise focused on the Amsterdam north harbor area, where a wind energy social cooperative was implementing the site design for seven wind turbines in the natural area of the Noorder IJ-plaas. While the constitution of the wind cooperative had been based on a strong participation program, engaging with very different targeted social formations, the design implementation was based on a purely quantitative spatial survey (distance of turbines from sensible areas) without involving landscape users (see research outcomes in Picchi et al., 2020, 2023) (fig. 1).

In the discipline of landscape architecture, authors as Corner (2011) and Dixon-Hunt (2000) have been denouncing an excess of determinism in both knowledge and design phases over the last decades. Even constating that a quantitative, rational and neutral spatial survey can legitimize every future planning and decision, Corner (2011) generally assumes that maps are overestimated as safe tool since fallible or at least constructed on limited instruments, codes and conventions capable of detecting only part of the investigated reality, most is hidden, as Beck is questioning for super-diversity (2011). Further contemporary Geography looks with suspicion at purely quantitative approaches and recognizes the value of interpretation of possible hidden contexts and arguments (Dorling and Fairbairn, 2013). According to van der Vliet "a geography implies a representation of the world and implies a worldview" (2003, p. 257). The worldview is something that literature recognizes early in antique authors as Greek geographers: e.g. Strabo worldview

Fig. 1 - The evident scale mismatch in between the picture left (by the author) and the map right (source Bosch and van Rijn, 2012). On the left a hidden, invisible context: the nature developing and the social aggregation at the basement of a wind turbine in the Port of Amsterdam. On the right a map reporting that Cooperative wind turbines areas (in yellow) are far away from heritage polder landscapes (in green) and Natura 2000 sites (in red).

is the Pax Augustea (the peace period safeguarded by Emperor Augustus) and his geography highlights the idea that Romans were bringing peace, safety, infrastructures and development to societies.

Concluding this introduction, urban agendas design implementation requires more knowledge available for spatial designers through participatory research and more effective ways to map through social-ecological systems within a certain worldview (e.g. social constructivism and sustainable development). In order to contribute to the reflection on this contemporary challenge the authors will first develop a brief excursus on mapping to highlight some original inputs from the past. This is because literature suggests that the relevance of social-ecological systems and super-diversity has been prominent in former times thinking and practices. The excursus is not intended as a literature investigation yet as a dérive closed by the author's specific sensibility, personal background and experiences. In the final part the authors will render potential directions in mapping for but not limited to urban agendas. The authors were stimulated in conducting such excursus while researching by the Academy of Architecture at the Amsterdam University of the Arts in 2018-2022.

Excursus on mapping

The International Cartographic Association defines map as a "symbolized image of geographic reality, representing selected features or characteristics, resulting from the creative efforts of cartographers and designed for use when spatial relationships are of special relevance" (1995, p.1). Yet in a social-ecological systems (social-ecological systems) and super-diversity nexus perspective maps may be too selective and reductive in valuing the relevance of the spatial relationship.

The origins of mapping must be found in antiquity: Dueck (2012) and Fumagalli (2011) affirm that thanks to Roman and Greek authors as Ecateus from Mileto (6th century BC) or Strabo (1st century AC) geography was distinguished in a qualitative inquiry branch different from the quantitative one. The former was aiming at describing through written narrations places and societies, the latter was aiming at the places geo-localization. For example Van der Vliet (2003) writes that Strabo was focusing on "the interactions of human societies and their various ways of life and histories, with their natural, geographical environment" (p. 257).

Such qualitative inquiry on landscape and commu-

nities was frequently represented in mosaics in such a detailed and documented ways to be considered maps: the Nile mosaic, a late Hellenistic floor mosaic in Palestrina, Italy (120 - 110 BC), is a relevant example (Fig. 2). Haguet affirms that it can be considered a 'real map' as the names of the cities can be followed in an up-river direction (2018), from the Nibia to the delta. The mosaic shows those times social-ecological systems: economic activities, buildings, flora and fauna in multiple perspectives, a multi-species landscape.

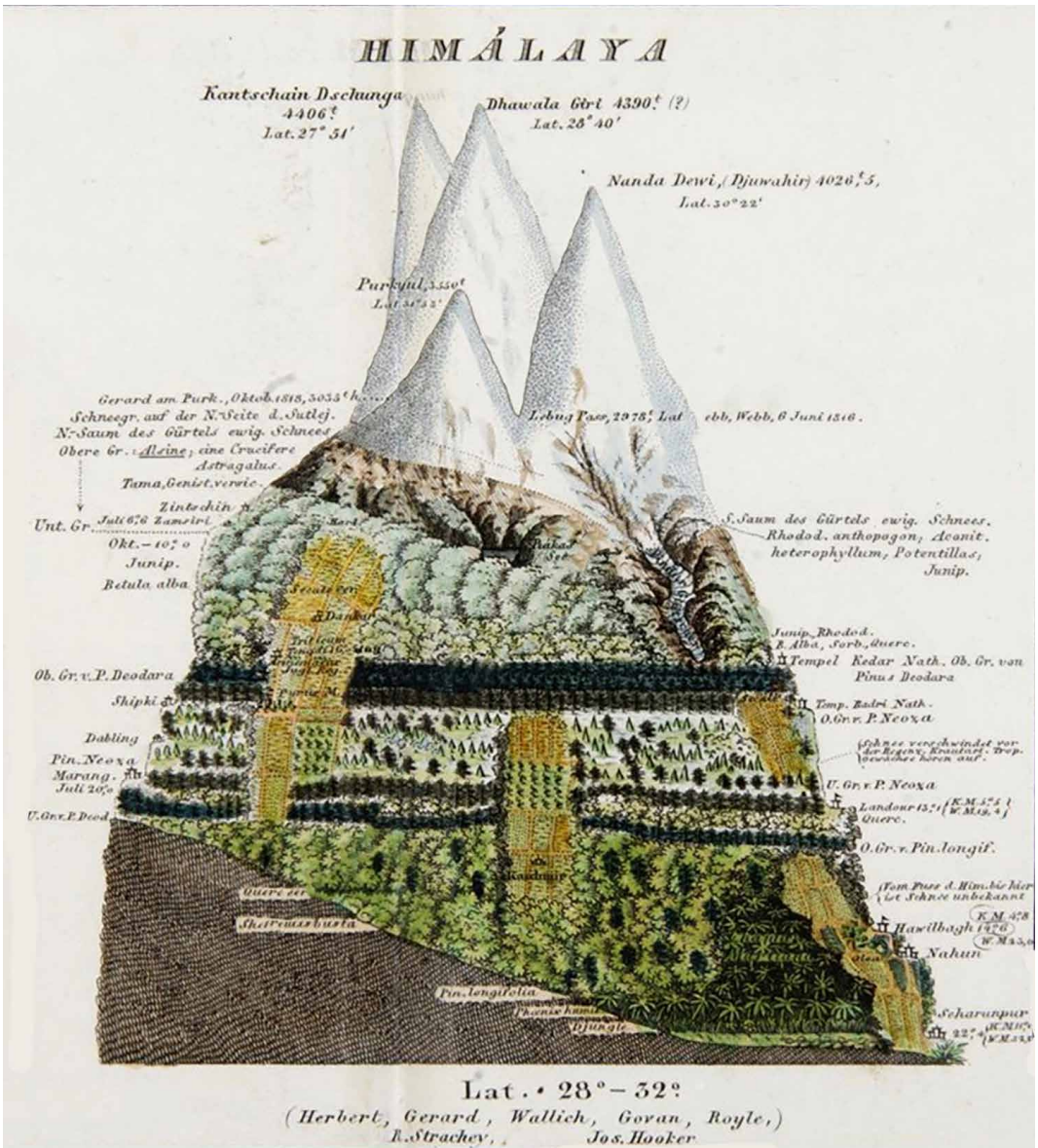
During the Renaissance and modern times cartographers recovered and developed substantive and procedural knowledge from the antique times thanks to manuscripts and maps safeguarded in monasteries. For example antique chronicles from authors as Erodotus, Strabo, Diodorus of Sicily, became a relevant source of information for maps compilations whenever direct knowledge on far places was not available. This fact effectively merged a written qualitative information on places, history and communities into map making for the first time in modern times (Haguet, 2018).

Later maps and representations of the novel explored worlds became a preliminary attempt to systematize the collected knowledge. Alexander von Humboldt used three-dimensional landscape maps and transects as a study tool to graphically represent, overlay and study the relationship between the geo-morphology, the landscape structure, the plants associations, the local community traditions and natural resources governance at multiple levels and relational scales. His book travel diary in the Equinoctial regions comprises sketched and annotated landscape maps and transects, nowadays still influential in spatial disciplines (Humboldt et al., 1833) (Fig. 3).

Recently the Irish geographer Anne Buttimer remarked that Humboldt "took the study of nature out of the laboratory" (2012, p. 28): he integrated the knowledge on the different landscape systems, from the single plant to the 'Cosmos'. Buttimer also notic-

Fig. 2 - A detail of the II century B.C. mosaic map of the Nile at the Sanctuary entitled to the Goddess Fortuna Primigenia in Palestrina (Italy). In a classic descriptive approach, the map represents the landscapes with the social-ecological systems along the Nile (photo by the author, 2020).

Fig. 3 - An example of Humboldt landscape maps in the form of landscape sections for the Himalya mountains. The image is extracted from a world map where the author opens zooms on the mountain chains, providing information at multiple levels using relational scales (Source: Berghaus, 1845, Physikalischer Atlas, vol. 5, plate No.1).



es that the graphic language in Humboldt's maps is set in 'relational scales', showing the relationship between the single element and the whole landscape (2012). Humboldt's interpretation of the interrelationships is intuitive and is inspired more by Goethe's humanistic way of studying nature, than the conventional natural science approaches with objective and verifiable generalizations. Goethe was emphasizing the knower and the process of discovery in the logic of surpassing the border between the knower and the object of knowledge set in modern science (Buttimer, 2012).

At this point the excursus will dedicate some more text to the twentieth century, when mapping incurred in different visions and approaches by geographers themselves, spatial planners, designers and artists. In the second half of the century Human Geography arose to contrast that excess of determinism previously mentioned (Escobar, 1997; Corner, 2011; Antrop 2000; Buttimer 2001). A relevant precursor in Human Geography was the French geographer Maximilien Sorre whose chronicles remind the work of antique geographers such as Strabo or, much later, Humboldt in the way facts are intuitively related and explained so that the reader can figure out the unity of the landscape. A peculiar complaint of human geographers is the lack of local community involvement in local context evaluations; they argue for a direct involvement of it in mapping activities: maps can operate violence on communities, imposing specific top-down worldviews (Sletto, 2009).

According to Antrop (2000), within human geography the importance of the subjectivity and the humanistic component of the observer and the nature of data influencing the geographic enquiry arose. Since the cultural turn in the 1970's, Geography has further drawn from theories emerging in literary criticism in order to advance mapping into a more people centered and philosophically critical realm, renovating the antique nexus to art, literature and philosophy. Cultural geographers have looked beyond their discipline to Post-structuralism, Marxist humanism, Phenomenology, Feminism, Postcolonialism, and other major currents in contemporary critical theory. Moreover, the theories of 'everyday life' of philosophers such as Lefebvre, de Certeau, and Foucault, frequently cited by designers, also fed human geographers' thinking (Peterson, 2014). Yet for Raffestin and Lévy (1998) human geography represents a simple going back to antique geography, a mix of geography and literature (p. 28), referring to human geography epistemology they talk about "la révolution qualitative contemporaine" (p. 26).

Critical cartography emerged in spatial disciplines as a relatively recent way of knowledge acquisition among community development activists, artists, new media innovators etc. (Kim, 2015). With regards

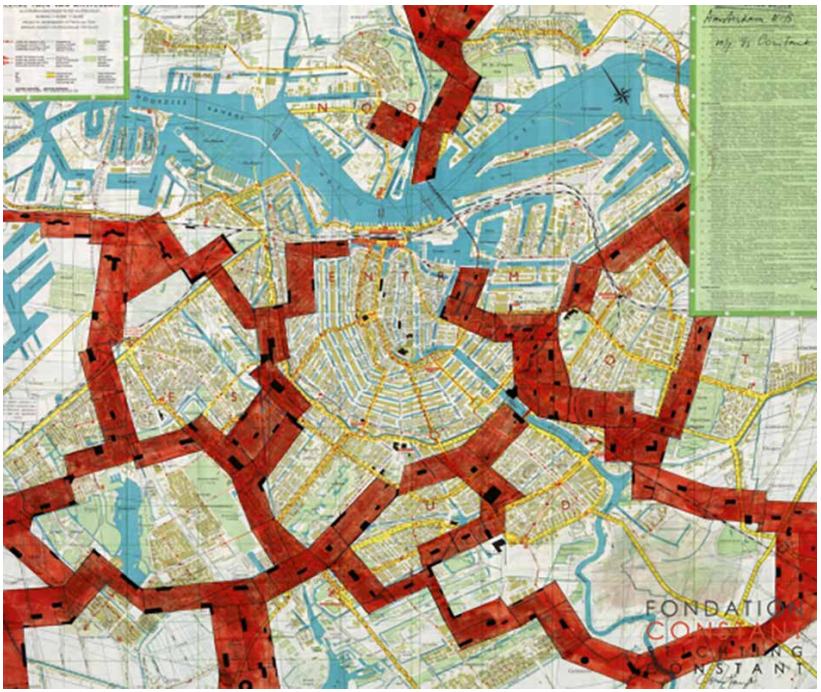


Fig. 4 - A map of Constant's new Baylon in Amsterdam (1963). Constant proclaimed the supremacy of the public space as the privileged means of unlimited freedom, inventiveness, playfulness and sociality (image credit Foundation Constant, Utrecht, The Netherlands).

to spatial planning and design, Kim defined critical cartography as "critical spatial ethnography" approach, when used by designers to get knowledge on the "socially constructed space" (2015, p. 218). The aim of critical cartography was to advocate communities through maps representing local knowledge resulting from participatory processes. Critical cartography's current legacy is certainly to have brought attention to the question of the pluralism, multiculturalism and increasing complexities of our societies. In turn Critical cartography found inspiration and raised similar ideas while describing analogous experiences in humanistic disciplines such as movie making, figurative and plastic art, philosophy, literature.

In art and philosophy, the drift mapping explorations (from French dérive) authored by Situationists artists such as the French Guy Debord and the Dutch painter Constant Nieuwenhuys deserve more attention. The drift mapping object are different landscape 'situations' and the feelings that those can generate in the inhabitant or visitor to trace alternative itineraries, therefore subverting the reading and the dominant regimes presented in the official urban maps. For example, Debord made a series of maps of Paris, actually developing a mental mapping of the city based on wandering (Andreotti, 2002; Corner, 2011).

In the new Babylon project, Constant applied the concept of Unitarian Urbanism developed within the Situationist group in reinventing the map of Amsterdam (Debord and Nieuwenhuys, 1958) (Fig. 4). Constant opened relevant questions on the individual freedom and use of the urban spaces which are not entangled in zoning and structuring according to functionalism and capitalism (Chase, 2015). A couple of years later at MIT, in Boston, Kevin Lynch was developing 'mental maps', also focusing on the individual perception of the urban spaces crossed by people (1960). Authors as Wood (2010) affirm that Debord, from the art side, and Lynch, from the urban planning side have been at the foundations of the 'individual point of view' applications in mapping, later at the base of the Psychogeography practice.

In literature writers that tried to present the pluralism of our cities through novel and experimental writing style deserve particular attention. Authors such as Georges Perec and Annie Ernaux are part of that critical cultural environment fed, similar to cinema and art, by the contemporary thinking of Lefebvre on the right to the city (1967) and once again Michel de Certeau valorization of pluralism and the everyday life (1974, 1980) (Peterson, 2014).

Perec was part of the Oulipo writers (Ouvroir de Littérature Potentielle, the workshop of potential literature), a group of writers looking for innovative narrative styles. Perec's book "Species of spaces" (1974) describes the city of Paris with the same curiosity for human relations with other humans and the urban space. In his book, the spaces are described per different spatial scales (from the room to the world). While the author spends many words in describing the smaller and quotidian spatial scales, his description of the larger scale spaces appears almost silly to demonstrate how unnatural it is to impose a top-down structure to the real world for functional purposes, based on numbers and conventions (Petherson, 2014). In doing so, Perec conveys a very precise message: we can know very well what is around us, how it works, while the upper scales are based on worldviews and conventions.

Addressing the conclusions of this excursus a clear difference, even contraposition between quantitative deterministic approaches and qualitative ones emerged in the 60's of the 20th century: the trust for determinism in mapping and planning started vacillating beneath new pressure coming firstly from critical thinking. Current times see large manifestations in re-exploring mapping approaches, still funded in critical human geography and art. In a very recent special issue titled "Art and Cartography: views from somewhere" Taien Ng-Chan et al. (2024) affirm that "Art challenges cartography to explore space as otherwise and in these challenges, we might find ruptures that lead to new possibilities for mapping somewhere (2024, p. 142). The author's concern is that some ways of representing places by artists are very effective yet may not be considered maps at all by cartographers.

As previously mentioned with regards to spatial planning and design, mapping soon became a tool for quantitative and analytical/relational survey for design (Corner, 2011). The adoption by quantitative mapping of geographic information systems and automatic cartography exacerbated a certain determinism in spatial disciplines denounced by authors as Corner (2011) and Dixon-Hunt (2000). Computational mapping, based on input and output data through methods as Spatial Multi-Criteria Analysis demanded to algorithms strategic decision making and plan-

ning (see e.g. Geneletti, 2019), yet this requires a major effort in selecting criteria easy quantifiable, and causing in resulting maps more disconnection from the reality of social-ecological systems and the super-diversity, due the scale mismatch and the lack of effectiveness for design implementation. Simultaneously, academics from landscape architecture continue advancing tools of automatic cartography to better integrate qualitative data related to perception (see e.g. Steinitz, 2023).

In the "Agency of Mapping" (2011) Corner affirms that "mapping is never neutral, passive or without consequence; on the contrary, mapping is perhaps the most formative and creative act of any design process, first disclosing and then staging the conditions for the emergence of new realities" (p. 90-91). The aspect of non-neutrality and need for an early interpretation in mapping appears crucial to Corner (2011). Landscape architecture schools too are even more paying attention to the knowledge phase, the fieldwork, the walking in the landscape and the map making (see e.g. Doherty, 2018). Authors in landscape architecture stress now the need for more indeterminacy and inventiveness in mapping beside automatic cartography, in order to better advocate the everyday life of people, the super-diversity we live in, and the complex social-ecological systems. The inventiveness finds a relevant reference in Bernard Lassus in 1989: "The inventive analysis consists in going beyond first ignorance, with its feelings of absence or disorganized accumulations, in order to approach the site in its singularity" (p. 57). For Lambertini, maps are a powerful tool to re-invent the landscape, to switch to new interpretations and confer new categories of meanings. Lambertini's motto is "re-invent the map" (2015)[1]: her relevant work in education on the mapping of the 'species of spaces' (2011, 2013) is originally inspired by Perec. Lambertini affirms that "Perec suggestions for exercises to read the reality, by referring to the Bernard Lassus design glossary, can nowadays be considered as a useful experiment of inventive analysis (2011, p. 153) (translation of the author). 'Species of Spaces' is a fluid and evolving way to relate dynamic and continuously developing urban spaces, considered as a constellation of multi-species habitat. The species term refers on purpose to Linnaeus evolution theory, the language of the plants and animal species. Mapping the species of space of urban spaces becomes a necessary exercise useful to respond to pluralism.

In a recent book authors Aït-Touati, Arènes and Grègoire highlight this multi-species habitat perspective. Similarly to authors on super-diversity the book "Terra Forma" talks about a contemporary times crisis of the representation of the world which is in a transition phase (2019, p.7). The authors pro-

pose an alternative way of representing the landscape - a ground point of view -: "we tried to go back to the weight and the materiality of the earth, to identify those dynamics activated through the living organisms" (2019, p. 51) (translation by the authors). The Aìt-Touati, Arènes and Grègoire approach is descriptive and aims at representing those dynamics of living organisms, the specific points of view that are lost in the purely scientific mapping, in the aerial point of view which we should try to abandon (2019 p. 51). The authors mention the tree as an example of a living organism rooted in a specific point of the world, exploring the world below and above the ground (Fig. 5). Concluding this brief excursus, the description is at the foundations of mapping, yet objective and deterministic approaches are no longer considered effective in describing past and present times 'super-diversity'. Approaches based on critical thinking and cartography appear effective in raising 'multiple points of view' in the narration of the community; 'relational scales' appear effective to evidence and study the relations in between the different point of views, between the individual and the global, to not encounter scale mismatches. The narration itself is hardly fitting in pre-conceived mapping systems and the 'inventive mapping' and any other form of arts inspired description, whether graphic or written, appear promising in pre-figuring the thousands potential relations. Walking and writing in support of mapping should better engage with and explain reality. From this excursus the authors draw three main ideas for mapping, more precisely three attitudes of mapping: representing the point/s of view; adopting relational scales; adopting inventiveness. In the following part the authors will discuss the three main attitudes.

Tentative implications for mapping

While researching on the design implementation of the Regional Energy Strategy North Holland Zuid in Amsterdam, the authors spatial inquiry, both in research and education, focused on very diverse open

Fig. 5 - An image in the book "Terra Forma, manuel de cartographies potentielles", representing a living organism, connecting the single point of view to the whole world (2019, p. 53).

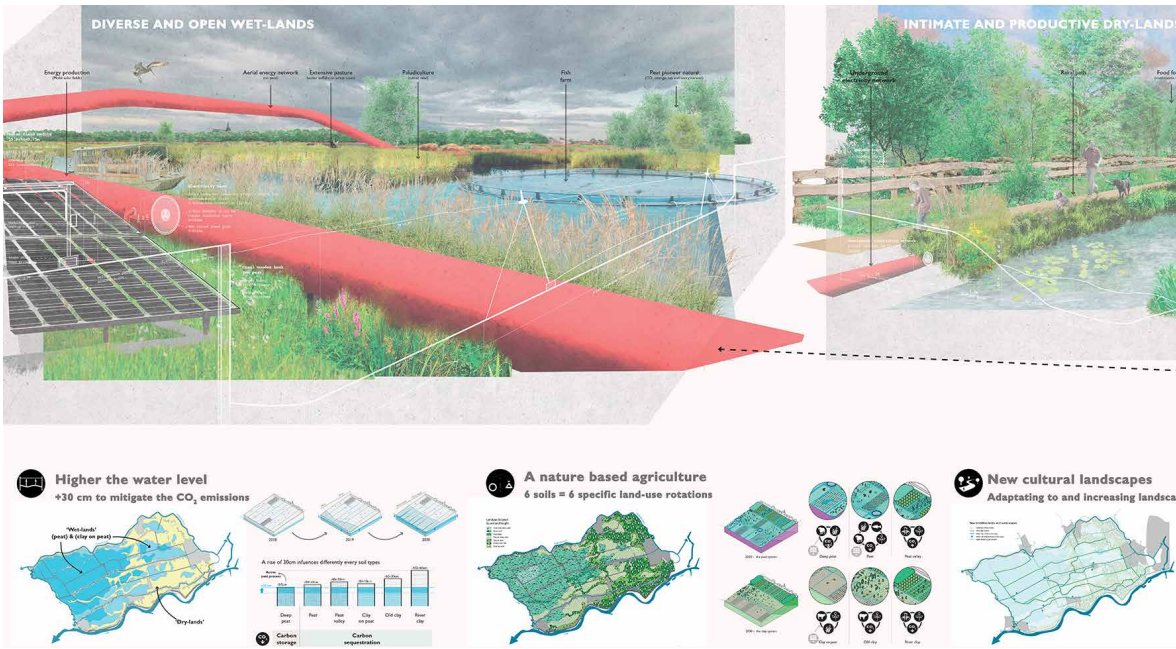
spaces and societal and ecological contexts, such as vacant and abandoned spaces or marginal areas along the infrastructure, allotment gardens associations, community gardens: those urban spaces are frequently rich in social-ecological systems on which the renewable energy development can generate positive effects in the landscape transformation, e.g. an energy community generating its own energy in a community garden, by satisfying multiple individual aspirations for the everyday landscape and energy demand.

To pursue in this objective, as well as for other urban agendas objectives, designers need to construct their own site-specific maps by exploring and investigating first the available space for the installation of renewable energy technologies, then the existing social-ecological systems and the local community super-diversity (Picchi et al., 2020, 2023). Relevant attitudes of mapping are: representing the point/s of view; adopting relational scales; adopting inventiveness.

Representing the point/s of view

To gain plural knowledge for the site design implementation of sustainability goals in urban agendas, the inquiry needs to focus on the multiple individual points of view. An ethnographic approach which considers the community as a 'collective' point of view on desires and objectives for the future is not functional when ethnicities are fragmented in social-ecological systems in transition, based on new social patterns, future challenges and individual aspirations (Berg and Sigona, 2016). In current times the main and most diffuse tool of critical cartography is participatory mapping aiming at registering everyday landscape values through participatory processes (Crampton, 2009; Grêt- Regamey, 2013; Mathieu et al., 2010; Spyra et al., 2019; Picchi et al., 2020). Participatory mapping may not be effective in the time of super-diversity, if not approached through open ended questions and based on a listening of individual stories.

Inspired by Humboldt, Sorre pays attention to the individuals, introducing the term human ecology: it is



necessary to study individual human beings as we study the individual plants in ecology, yet the centrality of the individual can emerge only when we embrace both the scientific and humanistic approach. Perec teaches us the patience to observe the urban spaces by listing what people do around (Nordholt, 2008). Aït-Touati et al. (2019) suggest mapping should start representing the terrain individual point of view, as art and literature did through different forms of representation half century ago.

Participation should be based on open events with walking experiences and where individuals can narrate their stories and aspirations through 'World Cafès' approaches (Löhr et al., 2020). A specific lens, a shared worldview, as a sustainability objective, a creative and pragmatic environment can facilitate the crossing of different yet overlapping individual dimensions. The form of representation may not be just a map, but a mix of different forms of representations, as in Aït-Touati et al. (2019), including written narrations, as in antique geography, composed sections representing different living organisms and their sphere of influence at different level, an abacus of the landscape characterizing compositions and elements, further temporary performances and use of space, safeguarding super-diversity as added value in the input data (Fig. 6).

The desired outcome is to collect as much as possible inputs to address the further definition of current social-ecological systems functioning, actors and the ecosystems.

Adopting relational scales

While gaining plural knowledge on the site design implementation of urban agendas, scale mismatches between different levels may cause difficulties in relating multiple social and ecological formations.

The available maps at local level and the site social-ecological systems, are not sharing the same representation scale (Picchi et al., 2023). Critical cartography aims to structure the pluralism of present days reality: relevant to make our landscapes development the most effective according to local aspirations (Council of Europe, Art.2, 2000).

Site design implementation can actively or passive-

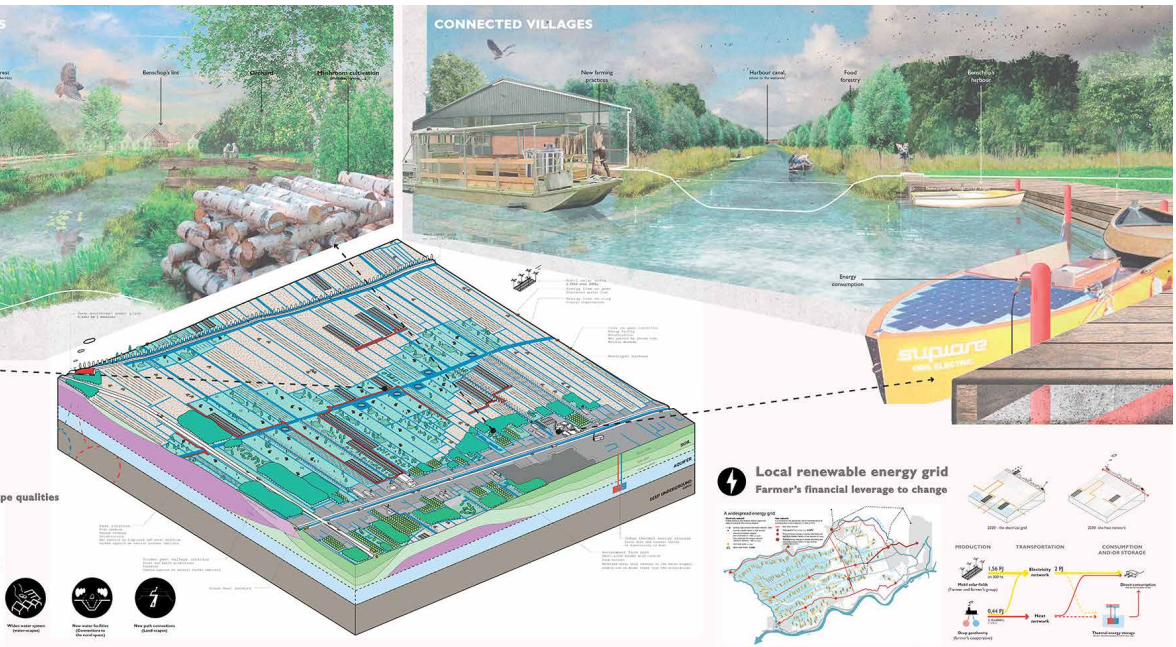


Fig. 6 - An example of representing the points of view in a design studio supervised by authors in the scope of the research METRO at the Amsterdam Academy of Architecture. The transept shows the multiple point of views for a strategy of land reclamation in the Lopikerwaard area in Utrecht, resulting from local participation: from the subsoils to the creation of new ground, the strategy is based on multiple points of view. Everyone counts: the farmer who is generating electricity for the city while taking care of the land; the different tree species that grow and produce biomass for generating new ground; the cows producing milk on the new pastures for the kids that will go there recreating and so one; all the points of view on this piece of land are represented and interconnected to make the 'local' and the 'Cosmos' cooperate in diversity (Alignet, 2018)).

ly involve different social-ecological systems at different spatial scales and levels, this is why scale mismatch occurs (Padt and Arts, 2014): for example while the energy potential is calculated at a larger spatial scale and level (e.g. the region solar potential per land use is represented at 1:50.000), the interrelated social and bio-physical phenomena at site implementation level can happen at smaller spatial scales and different levels and need higher representation scales. Pluralism must be processed to inform the designing process (Popa et al., 2015) through the adoption of 'relational scales': a mix of scales and levels adopted in the reality representation and able to approximate the relationships incurring between different social and ecological formations, and yet we could not be able to cover the full spectrum of different points of view. The desired outcome is to have maps representing multiple levels at different representation scales and highlighting the physical and intangible relations between the different social-ecological systems (fig. 7).

Adopting inventiveness

To gain plural knowledge on the site design implementation of urban agendas the mapping should be representing multiple points of view and set at relational scales. Relational scales need an inventive effort in the way relations among multiple points of view can be recognized, represented and valued through a specific worldview and by attributing them future values and meanings in specific social-ecological systems: at this stage the designer's interpretation becomes unavoidable and mapping

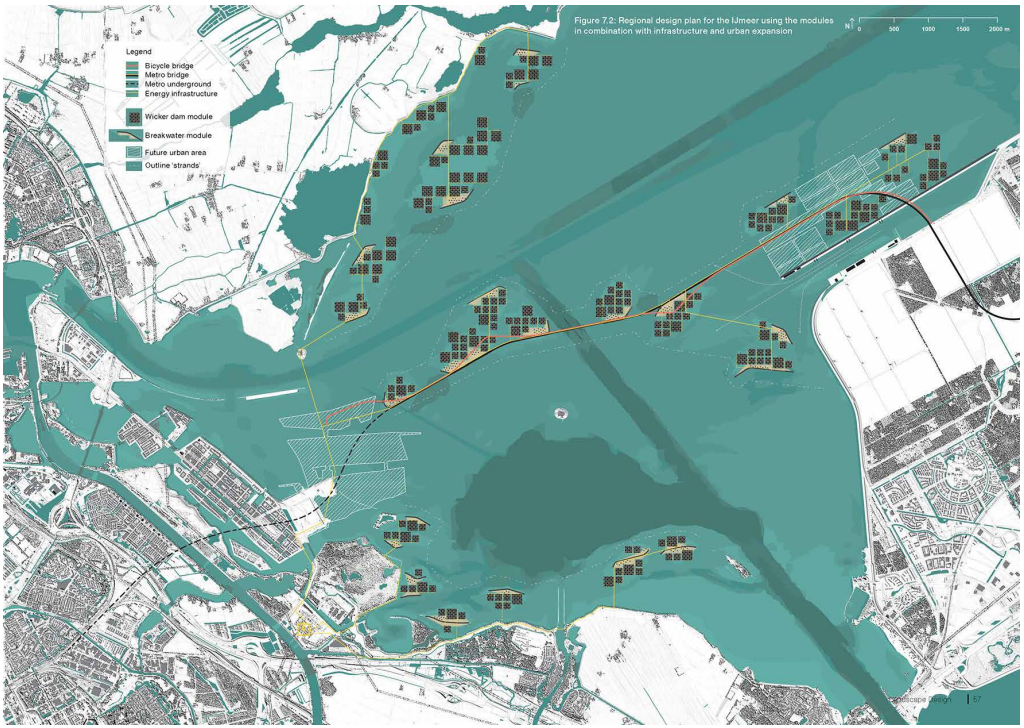


Figure 7.2: Regional design plan for the IJmeer using the modules in combination with infrastructure and urban expansion

Fig. 7 – An example of relational scales in a MSc thesis supervised by authors in the scope of the research METRO at Wageningen University. On top a map representing a floating solar energy development in the inner sea of Amsterdam. The solar energy potential is expressed for the entire area yet this is calculated site by site. Each site development is based on the social-ecological system the photovoltaic system will be in relation with, therefore represented at a higher scale (image below). The solar panels mounting structures are baseline for the development of new land and habitat by the deposit of the inner sea drugged terrain. The relations are studied at different levels, for multi-species habitat, and at different times, aligning to an ecosphere temporal dynamic. The single bird is related to the inner sea energy potential in relational scale maps and other forms of representation (de Boer, 2020).

turns into a creative process itself (Corner, 2011; Lassus, 2006; Lambertini, 2013; Picchi et al., 2020). This generated knowledge must unravel the relational spaces of new social patterns where the site implementation of the urban agendas can take place effectively.

For example during a workshop organized in 2015 by the Benetton Foundation, Treviso, Italy, Lambertini and Picchi made a reinvention of the existing map of the former military area in Volpago, as a powerful and imaginative tool to add a new 'landing genius-loci' (Pizzetti, 2002) to the explored landscape. By adding new names, meanings and conferring new imaginative and semantic categories to the existing spaces, the map assumes on purpose the graphic design typical of the 'marvel gardens' of the 17th and 18th centuries to highlight the individual experience, so attributing to former military spaces new meanings in the domain of the garden imagery. At the centre of this map's re-invention there is the individual walking experience and perception (Fig. 8). The inventiveness aims to show the multiple potential of relationships between individuals and their everyday landscape, as human geographers do for the past and the present. Aristotle in the chapter 9th of the Poetics book recognize this as a prerogative of Poets compared to that of historians and geographers as Erodotus, to map the unknown potential.

Concluding in 'inventiveness' resides the prerogative of mapping as designing itself for urban agendas. Inventiveness facilitates inclusion and relations, from the individual to the society and the global sustainability goals, safeguarding and exploiting the challenges of super-diversity. Inventiveness safeguards the two other attributes of representing the point/s of view and the adopting relational scales. Art teaches us that transitions are first a cultural challenge, then a technological one. Art and literature continue to inspire approaches for inventive mapping, from antique times to the 'avant-garde', the site will slightly suggest them, patience is needed. In a 1967 letter to Pietro Porcinai, Carl Theodor Sørensen wrote: "It seems to me tragic that our professions, whose duties nowadays are huge and relevant, are so poorly related to art [...] Maybe in the future it will be better. In my old school I saw more ingenious persons than I did expect" (Archive Porcinai, 2019).

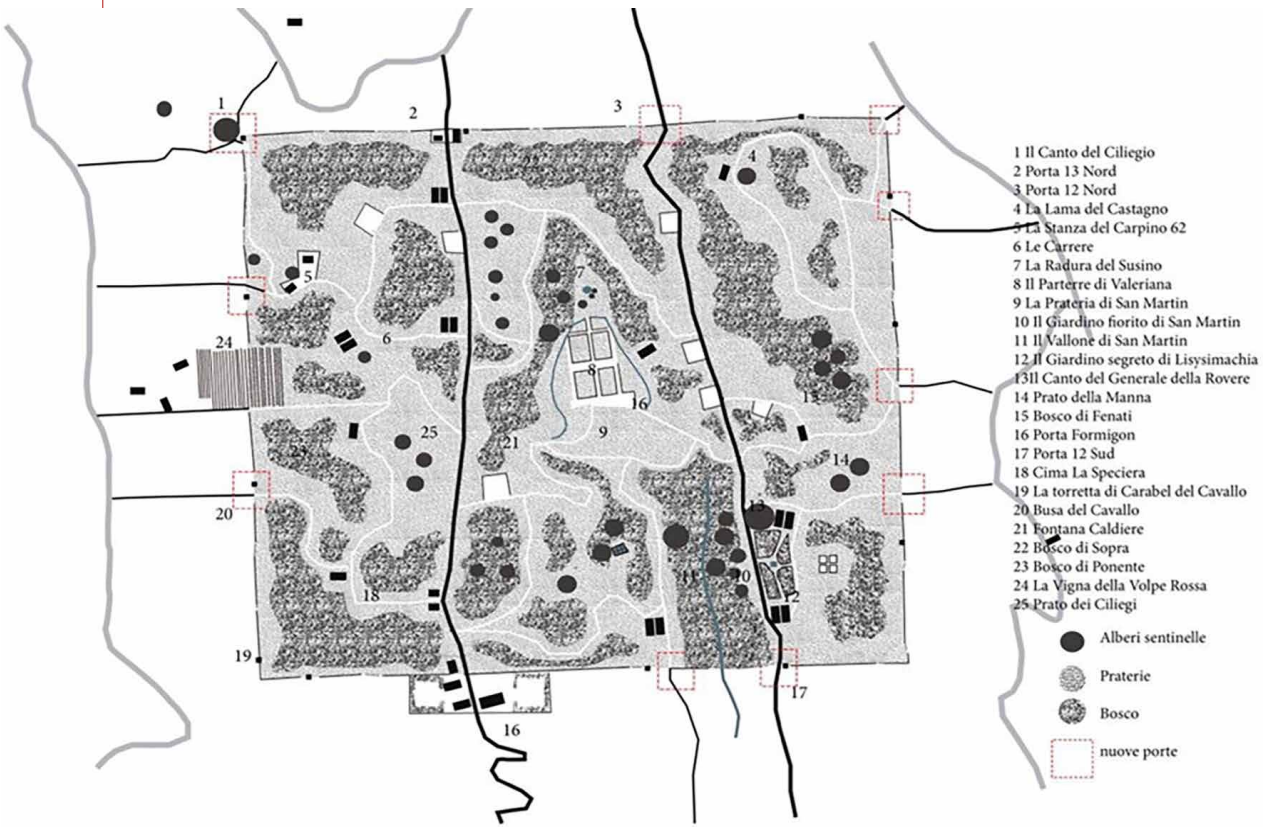


Fig. 8 – The map shows the reinvention of a former military area map in the Province of Treviso, Italy. This was drawn during a workshop organized by Benetton Foundation in June 2015. The numbers represent the different former military spaces to which the authors attributed new meanings coming from garden imagery categories: those are an exemplification of the representation of the multiple perception of the landscape users (Lambertini and Picchi, 2015)..

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Note

[1] From the lecture series held at IUAV, Venice, during the academic year 2015-2016

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