



Reassembling the Archipelago of Workshops

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I. Introduction

The hollowing out of industry from the cities and the implied opportunities

During the ongoing industrial transition, economic and environmental reasons led to the hollowing out of industries and to the closing of factories in several industrial cities (Glancey 2016). The elimination of manufacturing from the cities took place in two stages. On the one hand, the urban producers were not able to keep up with the competition of the global market. Large companies which offshored in low-cost areas such as Africa, Mexico or China, produce massively, thus controlling a great part of the market share. On the other hand, a vast increase in the cost of land and its occupation by the real estate excluded manufacturing from the city as an irrelevant use for the market. The remnants of the industrial past are now being reused as corporate spaces, artistic hubs or cultural centers (Hill 2020). Consequently, the post-industrial cities have been transformed into service providers and landscapes of mass consumption, even though they are still connected to productive activities running an irreplaceable part of their economy from a distance. The bringing back of manufacturing in urban centers thus, stands as a chance of reversing this condition while it presents a range of benefits that remain mostly unnoticed. Creation of new jobs, waste management and social inclusivity are just a few of these benefits (Hill 2020). However, the reconsideration of the relationship between the industry and the city is not limited to thinking of what the place of the factory in the urban space is. It stands as an opportunity to reexamine from the start the whole concept of factory space and the production process taking place in it. The aim of this thesis is to set the separation of the manufacturing space and the city under reconsideration, to readdress their relationship and rethink the nature of the factory as a production space:

How could the affinity between the factory space and the urban space be redesigned?



Detroit Industry Murals, Diego Rivera, 1932-1933

II. Theoretical framework

The factory beyond its material purpose

Besides their economic confluence, production spaces have acted as social catalysts of radical changes. The 20th century Czech philosopher Vilém Flusser discerns the human as a maker from the human as a thinker by noting: “Production center or ‘factory’ is the characteristic of humans, what was once called man’s ‘reason for existence’ – by their factories you will know them.” (Flusser 1991). In that sense, the factory’s purpose extends far beyond the production of material goods. Its activity enters the realm of immaterial production, into which services, data, knowledge, values and ideas are also being produced. The production of goods (the material) derives from knowledge accumulation and processing (the immaterial) and vice versa. Material and immaterial production thus presents a strong binary which constitutes the prominent operation of the factory. However, the production of material and the immaterial in the factory today have been widely separated from each other. On the one hand, the production of knowledge takes place locked in labs, offices or academies, while on the other hand, the making process is delimited in the production halls through the repetitive motions of the factory workers.

Examples of cohabitation between material and immaterial production

The separation between the material and immaterial production today seems to be normalized. We can clearly perceive this by taking into consideration the strict institutionalization of production, knowledge and life. Goods are being produced in the factory, knowledge is formed in the educational space and life is being shaped in the domestic interior. It was after the 1st Industrial Revolution and the rise of capital, that the act of production as labor was widely separated from the other practices. Before that, a time-traveling in the past will manifest the cave as one of the first factories the human made. It was in the cave that the human was making series of identical tools following specific workflows in the same way a factory worker does (Colomina Beatriz 2016). In the cave, the human was a producer, a dweller and an educator of his own. In other words, domestic, industrial and cultural production were all active under the same roof. Due to the coexistence of these three practices, a human was also allowed to be a producer of its free time and creativity. The issue of alienation between these three practices in the factory has been highlighted by Cedric Price in his project, “The Potteries’ Thinkbelt”. In the project, Price encapsulates the nature of the cave, described above, in the form of a territorial architecture. Price designed a system into which the production of goods, knowledge and life were keeping up at the same pace (Lobsinger 2000). Through that project it was declared that the production of material and the immaterial fall into an unavoidable parallelism. A parallelism, that today goes mostly unnoticed because of the contemporary factory’s fortress-like nature.

The factory beyond its material purpose

Some other forms of alienation also emerge in the factory space throughout an attempt to pass to a completely automated production system. Despite that full automation presents important impediments related to the efficiency and adjustability of production in the markets changing needs, it gradually becomes more and more visible in the factory interior. As Nina Rappaport notes, automation leads on the one hand to the alienation between the blue-collar *and* white-collar workers (Rappaport 2015). On the other hand, automation delimits their possible actions throughout the production process in the form of mere repetitive moves. Work in the factory is more associated to the notion of labor as it was explained by Hanna Arendt, than of that of productive labor as posed by Marx (Arendt 1958). Labor in that sense, refers to the activity, through which the factory worker is completely detached, or alienated, from the product of its labor. The introduction of automation has also given birth to two types of factories that dominate the production network: The first type regards the occupation of the factory space by automated machines and the exclusion of the humans (Rappaport 2015). The completely automated factory transforms into a spectacular machine that acts as a marketing tool. It is made as such, in order to highlight the wonder of production process in front of the eyes of its visitors. The second type is the offshored factory, such as the ones located in Maquiladoras of Mexico or the Pearl River Delta in China. The offshored factory operates as a ‘black box’, for which we lack awareness of its interior processes. We can only perceive its outcome in the form of the produced item, be it a car, a tool or even a micro-organism. Finally, alienation extends even further to the way society is related to production space and its relation to the environment. Both for the automated and the offshore factory, society has no clue of the ways natural resources are being treated and the ways things are made. Couldn’t the spaces for manufacturing, especially during the current climate crisis, reestablish the society’s relationship with the environment and its resources? Could these spaces contribute towards achieving this purpose, not as designed extensions of the physical environment, but as the lenses through which we can better understand our surrounding and the materials it provides? Is there any better place for us to deeply perceive nature, than the workshops in which we mold our ambitions made out of primer matter such as steel, wood or soil...?

The invisible relationship between the production space and the urban space

Despite their phenomenal separation, production space and urban space are operationally connected with each other. Maurizio Lazzarato clearly refers to the active but also unintentional engagement of society in the production process through the means of communication (Lazzarato 1996). Society contributes to the formation of the product through the consumption of information and by unintentionally expressing the products’ desired characteristics. Society is thus an extension of the assembly line and the conception of the product in an invisible way. It shares many more attributes with the production process than the ones that are visible. However, this relationship between urban space and production space cannot be considered as “affinity” both essentially and metaphorically. In biology the notion of affinity is defined as the state of relationship between organisms or groups of organisms resulting in resemblance in structure or structural parts . Consequently, what makes their affinity possible is the relationship’s visibility, which in the case of urban and production space, goes completely unnoticed. In this regard, the affinity between urban space of society and production space could fall under further consideration.

¹Vocabulary, *s.v.* “Affinity”, accessed September 28, 2022, <https://www.vocabulary.com/dictionary/affinity>

The aim of this research is to examine how architecture could contribute to reevaluating the role of production space in the city and rethink its essential characteristics. Taking these into account, certain sub-questions arise:

- How could the role of the human as a domestic, industrial and intellectual producer be rethought through the design of the factory?

- In what way could production spaces be introduced in the urban space for the benefit of the social life of the city?

- What potential attributes design can offer in order to achieve the environmental, legislative and semiotic integration of the production space in the city?

- How could the boundaries between material and immaterial forms of production be blurred in a space that promotes their cohabitation?

The theoretical framework makes possible to identify the main theoretical themes of the research that could be further examined:

Thesis main theoretical themes

I. The factory beyond its material purpose

II. Material and immaterial cohabitations

III. Alienation and spaces for manufacturing

IV. Urban space – Factory space: An invisible relationship

These themes will be examined through the lens of a chosen industry. As opposed at the part 2C, the factory has so far stood at the intersection of natural and human environment. It's operativity, the items produced in it, are deeply bounded to the ways it counteracts with the natural world. This relationship remains hidden to the social realm. However, factories can afford new ways of intersecting the natural with the urban. The factory could be perceived as the space promoting material ecologies by being at the same time part of them. The gap between human and nature that factories could bridge extend in several aspects of their activity in the natural environment. However, what seems to raise a lot of question marks today regards our relationship with the forest. Forests, which have been completely detached from the human environment, still stand as a primary source of production for the society. At the same time, they are promoted as ideals for greening our artificial urban space. The "urban forest" today has become a compelling narrative used by urban planners and designers in their proposals, towards optimizing and "naturalizing" the city. The city thus, indeed gets greener, but our essential relationship with the forest remains distant. Forest products are constantly being used, but we have no clue of the processes that molded them. It is worth questioning here: Could the industry of the forest blur the limits between humans and nature? For that reason, I will investigate further the concepts posed at the theoretical framework, through the lens of wood, as a material extracted from the forest. I will thus be concerned with the examination of the architectural artifacts related to wood's flows and productive processing. The choice of the material and the timber industry related to it, guides the research towards the selection of a specific site.

The intervention site, Euboea, is a large island on the northeast of Athens and it presents a wide range of conflicting conditions. The character of the island is defined as an assemblage of "workshops" which are currently under degradation. During the early 21st century, the city of the island, Chalkida, experienced the closing of many of its factories which were providing jobs to a vast amount of its population. The cement plant, the Shelman timber

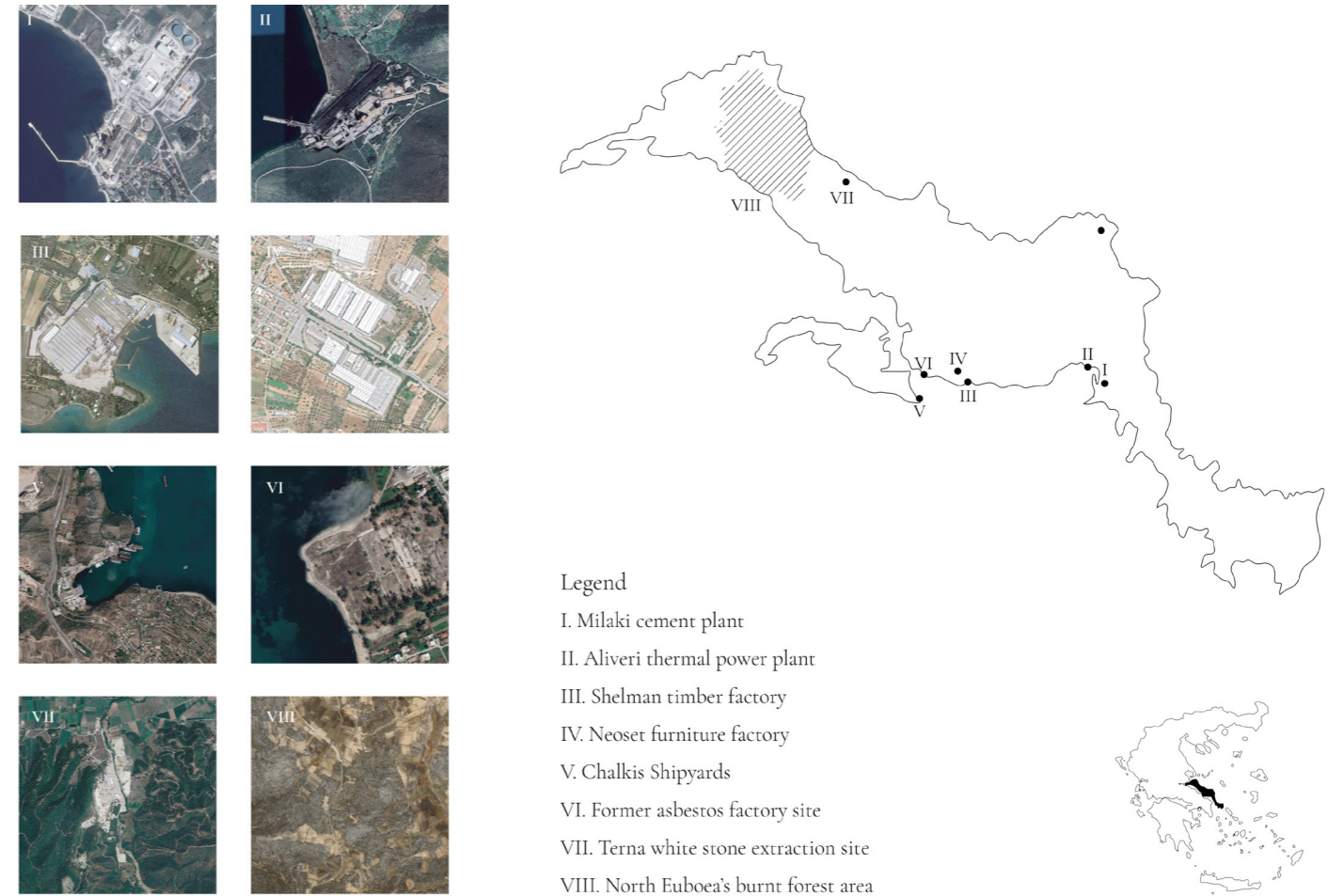


Figure 1. Euboea as a "workshop".

factory, the Neoset furniture factory, the Larko steel factory were only a few among the island's industries that were gradually hollowed out after 2010 due to economic reasons. The factory-scapes of the island became spaces of protesting against the closing of the factories. At the same time, the catastrophic wildfires during the summer of 2021 burnt 52,900 hectares of forests and arable land (Sargentis 2022). Before the catastrophic fires, 580 families on the island worked as resin producers and 80 families worked on logging (Sargentis 2022). In the aftermath of this destruction, the burnt forest stands as a blank canvas for different actors. On the one hand there are implications suggesting that the government wants to install wind turbines on the burnt areas. On the other hand, several people have changed their jobs in order to help the environment recover and treat the forest as a source of production. Several initiatives starting from universities and the local authorities aim at cultivating a culture of producing from the forest in order to protect it and maintain it (iefimerida 2022). Wood in that sense, a material extracted from the forest, constitutes a potential means of regenerating a culture of making on the island. Could it form a way of reassembling Euboea's archipelago of workshops?

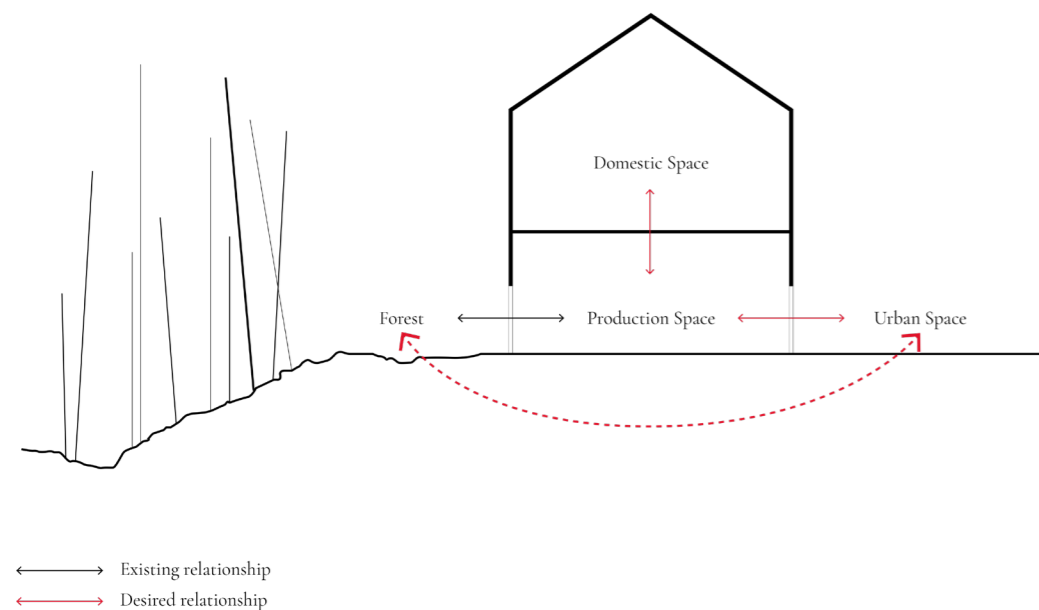
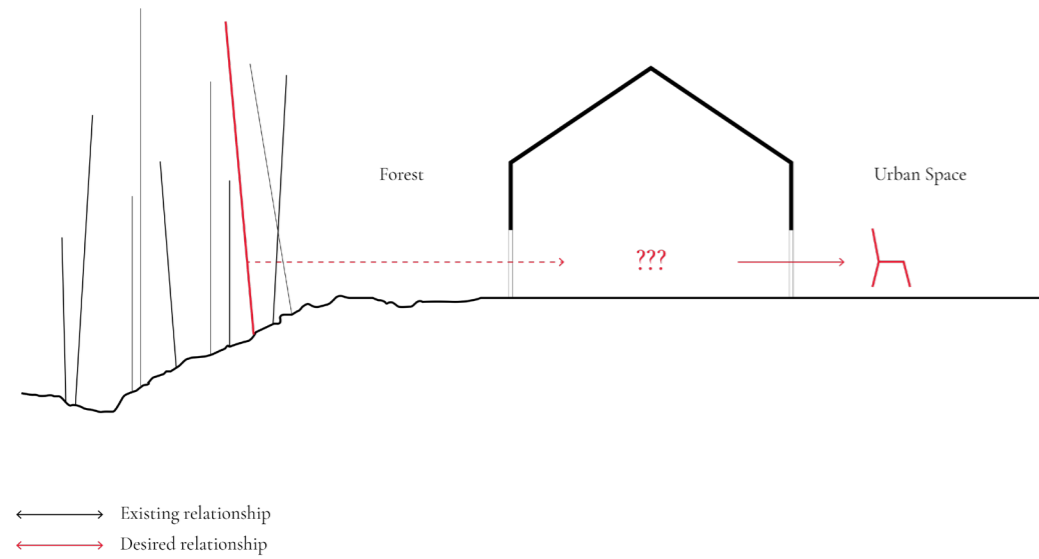


Figure 2. The wood workshop at the intersection between the urban space and the forest

III. Definitions

Affinity

The state of relationship between organisms or groups of organisms resulting in resemblance in structure or structural parts.

Archipelago of workshops

Modern auto plants combine the assembly line with spaces reserved for small, specialist teams; the auto factory has become an archipelago of workshops (Sennet 2008).

Assemblage ²

1. A sculptural technique of organizing or composing into a unified whole a group of unrelated and often fragmentary or discarded objects.
2. The aggregate of artifacts and other remains found on a site, considered as material evidence in support of a theory concerning the culture or cultures inhabiting it.

Factory ³

1. A building or group of buildings with facilities for the manufacture of goods.
2. Any place producing a uniform product, without concern for individuality.

Labor

Labor is the activity which corresponds to the biological process of the human body, whose spontaneous growth, metabolism and eventual decay are bound to the vital necessities produced and fed into the life process by labor. The human condition of labor is life itself (Arendt 1958).

Production ⁴

The process of producing commodities (= oil, metals, crops, etc.) or manufacturing goods to be sold.

Work

Work is the activity which corresponds to the unnaturalness of human existence, which is not imbedded in, and whose mortality is not compensated by, the species' ever-recurring life cycle. Work provides as "artificial" world of things, distinctly different from all natural surroundings. Within its borders each individual life is housed, while this world itself is meant to outlast and transcend them all. The human condition of work is worldliness (Arendt 1958).

Workshop ⁵

A small establishment where manufacturing or handicrafts are carried on.

Key terms, concepts, theories

Affinity, archipelago of workshops, assemblage, factory, labor, labor-intensive, production, post-industrial society, work, workshop

Practical references

- Nina Rappaport, *Vertical Urban Factory*
- Bruno Latour, *Reassembling the social*
- Edward Soja, *Thirdspace: Journeys to Los Angeles and other real-and-imagined places.*
- Arendt Hannah, *The human condition*
- Alvar Aalto and the organic architecture of pulp mills in Finland

² Collins, s.v. "Assemblage", accessed September 26, 2022, <https://www.collinsdictionary.com/dictionary/english/factory>

³ Collins, s.v. "Factory", accessed September 18, 2022, <https://www.collinsdictionary.com/dictionary/english/factory>

⁴ Cambridge Dictionary, s.v. "Production", accessed September 28, 2022, <https://dictionary.cambridge.org/dictionary/english/production>

⁵ Merriam Webster, s.v. "Workshop", accessed September 29, 2022, <https://www.merriam-webster.com/dictionary/workshop>

IV. Methodological framework

Production today could hardly be perceived as the local activity of groups of people extracting and producing in a specific region for their own survival. This applies to all kinds of industries, timber as well. Timber industry constitutes a global phenomenon shaping a complex network of relationships which creates a distinctive layer on the surface of the earth. However, this network is still associated to the individuals who collectively produce it. In order to address the research questions, there is a need for an approach that examines the interaction of timber's production space with society in all its different scales, from the scale of the globe to the scale of the individual. For that reason, the research is based on the development of three different scales of analysis, each associated with an architectural artifact defining its characteristics:

- *Macro-analysis – Cities*

- *Meso-analysis – Factories*

- *Micro-analysis – Workplaces*

Wood becomes the lens through which the different scales will be approached. The flow of the material, from its extraction from the forest to its processing in the wood workshops-factory will inform the different scales of analysis. Through the selection of specific case studies, I will try to understand how architectural artifacts related to the production of wood formulated material cultures at a local level. It will thus be possible to consider how production related to forest could be further examined in the case of Euboea, as an emerging production activity.

Towards addressing the complexity of each level, I will borrow the notion of “assemblage” and its counteractive opposites, namely disassembly and reassembly, as methods of examination on which the research will be based on. Assemblage refers to a unified composition of things that constitute fragments unrelated to each other. By disassembling through the means of mapping, diagramming and drawing (perspectives, plans & sections), I will examine the artifacts of each level and their connection patterns. It will thus be possible in the end to conclude at on which level and at what scale, reassembling the archipelago of workshops is actually possible.

Macro-analysis | City

At the Macro-analysis I will make an attempt to identify how certain factors affect the generation of wood productive activities in specific areas and what kind of socio-environmental consequences they cause. Through the selection of specific case studies, it will be possible to examine certain parameters using cartography as a tool. I will examine the practices and the artifacts needed towards processing the wood as a primer matter before and right after it enters the local networks. These networks consist of primary nodes that are linked to large producers and their interconnections. However, at the macro level I will not only analyze networks as layers defined by their primary nodes. I will also examine how they produce obstacles such as diseases, wildfires, illegal timber production, labor migration, unemployment and new urbanization patterns. Through the selection of case studies and the collection of data from geographical datasets, such as QGIS and google maps, this level aims at critical cartography, as a way of understanding local conditions of wood production.

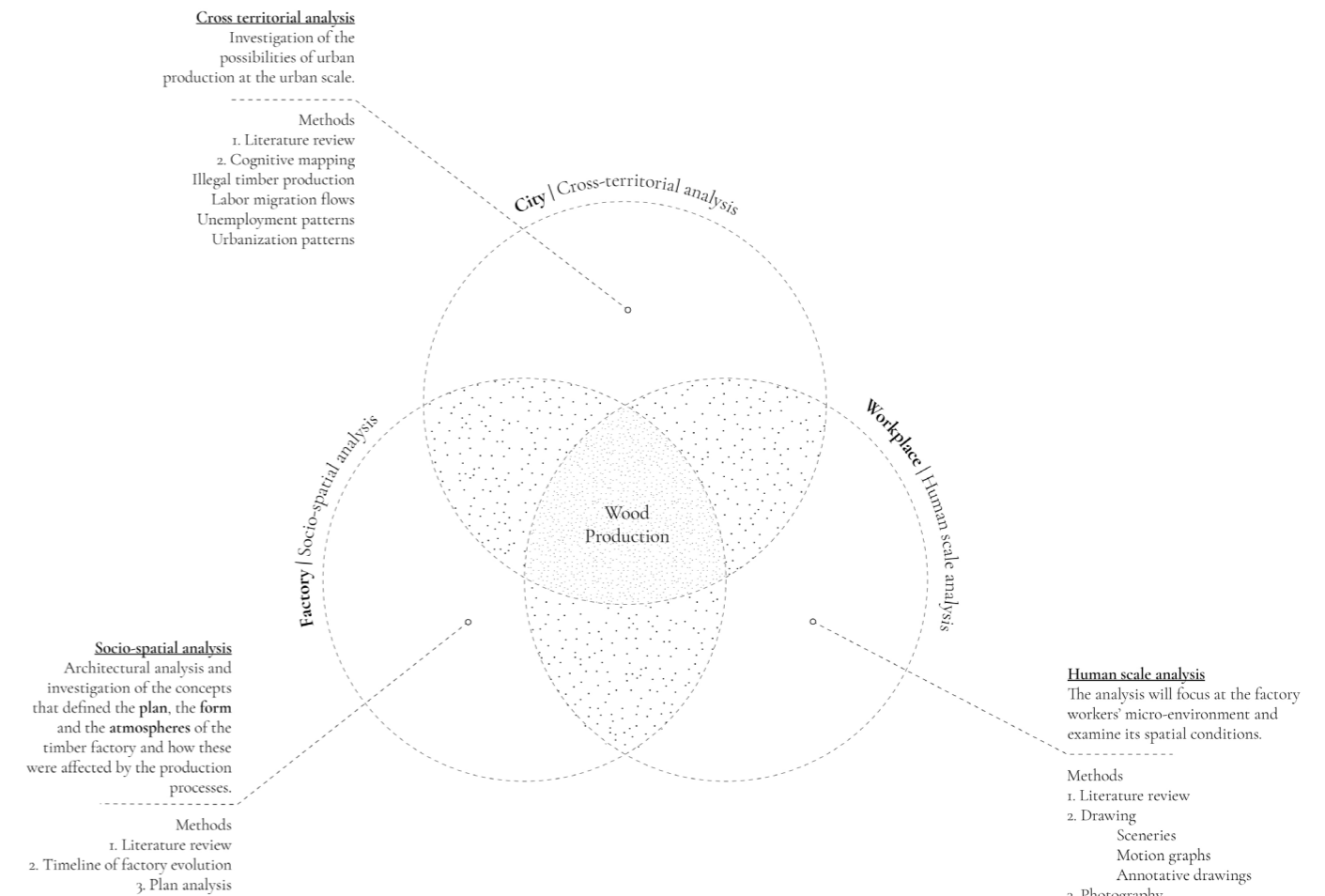


Figure 3. The diagram presenting the three scales of analysis for the research as interesting ensembles.

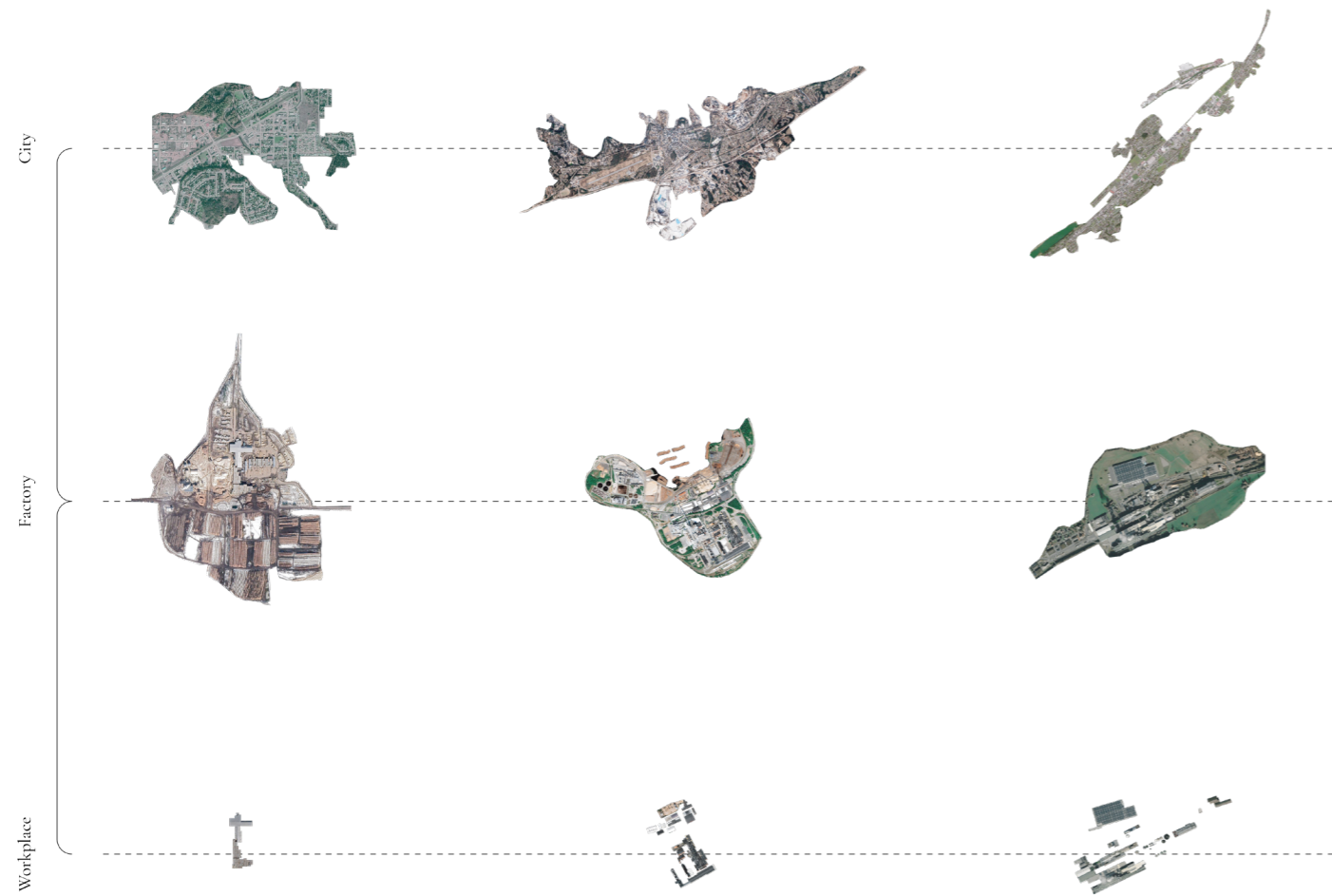


Figure 4. The three analysis scales expressed through architectural artifacts.

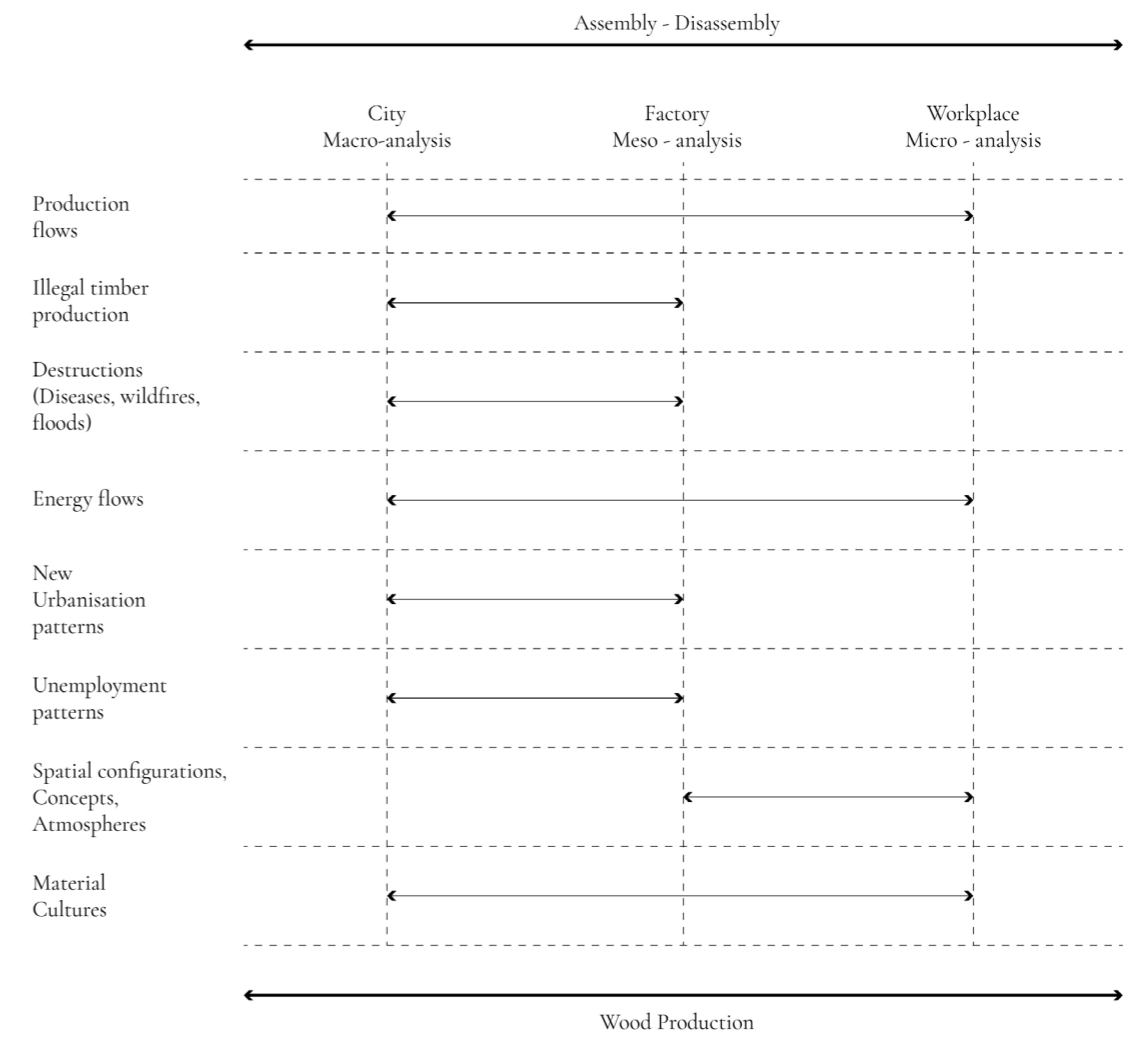


Figure 5. Scales' analysis navigator diagram.

At the meso-analysis the research will reconsider the relationship between timber industry and urban space through two lenses: The production buildings as defined by the production processes and the societies as defined by the later. This level refers to the scale of the community and its relation to the local, timber related, productive activities. Historically, the factory as a production space has been largely defined by the production processes it facilitates (Aureli 2011). The materials and their transformation require spatial configurations that reflect the buildings' form, concept and atmospheres. In that sense, delving into the ways the production processes can change, implies the reconsideration of the production building as a whole. However, *the factory has also be defined by the societies working in it*. Production is not defined in distance from the agents conducting them. They are indispensable from the workers as a society of producers. Taking these into account, at the Meso-analysis level, I will dive into the affinity between the wood producers and the urban society as two connected entities. There will be an attempt to unravel the hidden overlaps between the two groups and examine their affinity through the wood production process. Instead of highlighting the differences between the machine space and the urban space, the research will define the immaterial values and principles that architecture could manipulate in order to reestablish their relationship.

The research will choose specific architectural case studies, through which local communities are activated by the production of wood. The criteria for the selection of the case studies will be based on the following concepts:

- Locality
- Material culture production
- Natural resources proximity

The aim of the examination of the case studies is the analyze of the principles that turn the factory, the wood as processed material and the labor taking place behind it turn into generators of material cultures. The study of these principles will be achieved through the making of diagrams and drawings illustrating the case studies' annotative, functional, symbolic and ecological qualities as assemblies of multiple parts. These principles could later inform the design project. I will be able thus, to perceive how these principles and values contribute to the reestablishment of the machine space's relationship with society, both through the production process and the building facilitating it.

This level of analysis comprises also the study of the factory as a building typology. The issue will be further investigated from a historical point of view by understanding the concepts that have shaped timber factories so far. In that way I will examine how the production space, as a space devoted to the production of goods, knowledge and life could be approached.

Micro-analysis | *Workplace*

In this level the analysis will be concerned with the anatomy of labor through the process of production and the distinction between labor and work. In this level I will zoom in the micro-environment of the woodworker, be it a lumberjack, a furniture maker or a carpenter. The research will zoom in the special conditions this microenvironment presents. Several cases of representation of the production space in the history of art, architecture and engineering eliminate intentionally the human figure from the production process, focusing thus on the machine as the ultimate maker (Corwin 2003). In contrast to this norm, the research will focus on the essential relationship of the machine and the worker, as it reemerges in a new way through the occurrent technological developments (Marina Otero Verzier 2018). The workers' environment, as a toolset physically arranged in space has an immediate effect on the body and the mindset of the factory workers, but it can also be affected by them. The



Figure 6. Overviews of sawmills' automated landscapes in four of the most productive countries in timber industry.

examination will take place through an analysis of the types and genealogy of labor in the history of production spaces for wood, towards rethinking of human both as an intellectual producer and as a producer of things (homo faber). The main purpose of the analysis is to understand through the examination of case studies, the forces that could allow the cohabitation of material (in the form of produced goods) and immaterial (in the form of knowledge, ideas, values and culture) forms of production under the same roof.

In the mid-18th century Diderot described the production spaces' atmosphere, form and function through the drawing of 2000 plates depicting interiors, objects and the events of production taking place in them. Diderot's representations appear as disassembles of production spaces that enhance our understanding of them. The compact and tight interior of the factory becomes readable throughout its decomposition to its parts. Diderot's disassembly technique stands as a reference for the research. I will examine the case studies through the drawing of inventories presenting the variable realities of the working environment towards reconsidering their reassemble.

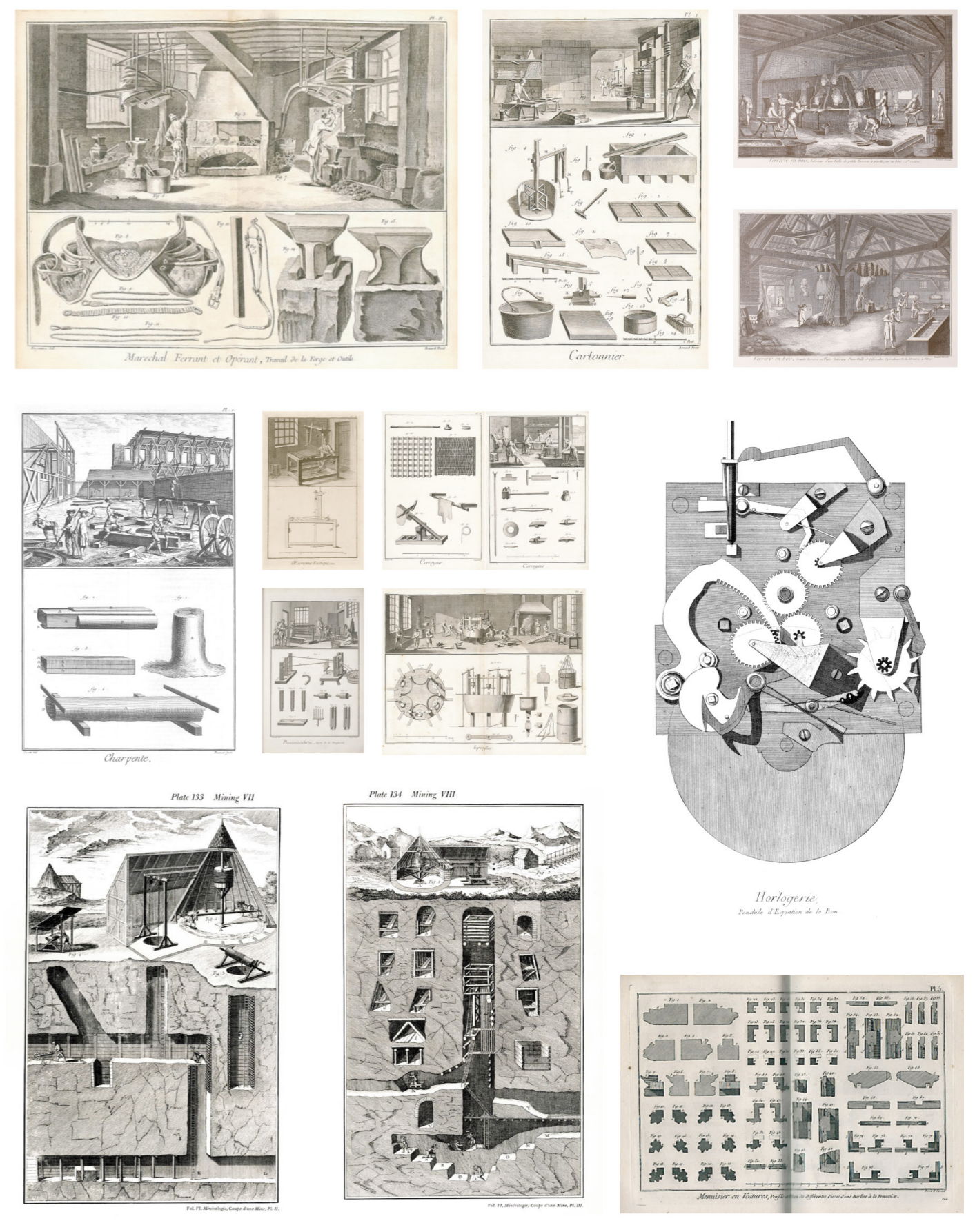
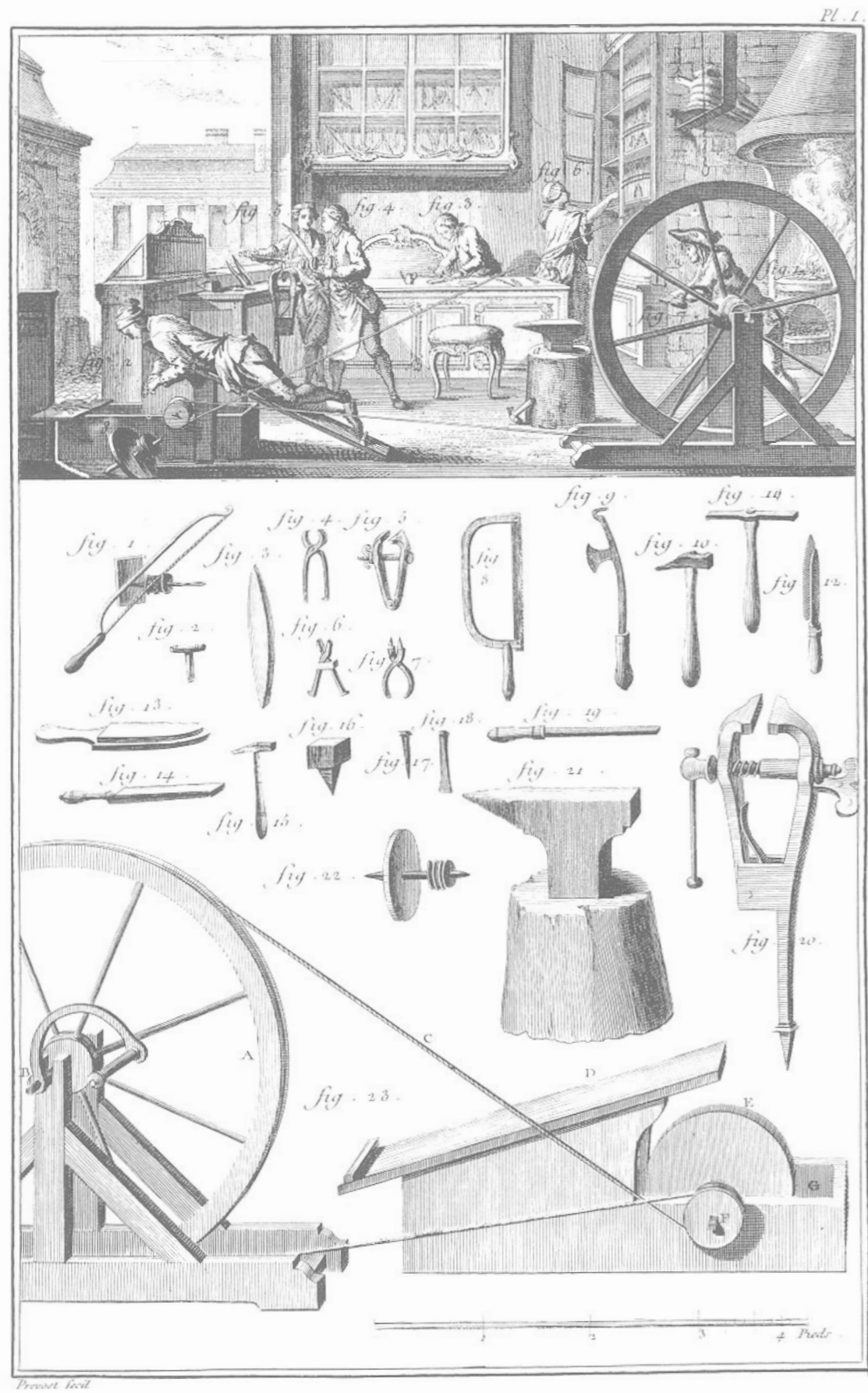


Figure 7. Diderot's encyclopedia as a way of disassembling the workshop material configurations in order to represent its spatial, functional and atmospheric qualities.

V. Expected outcomes

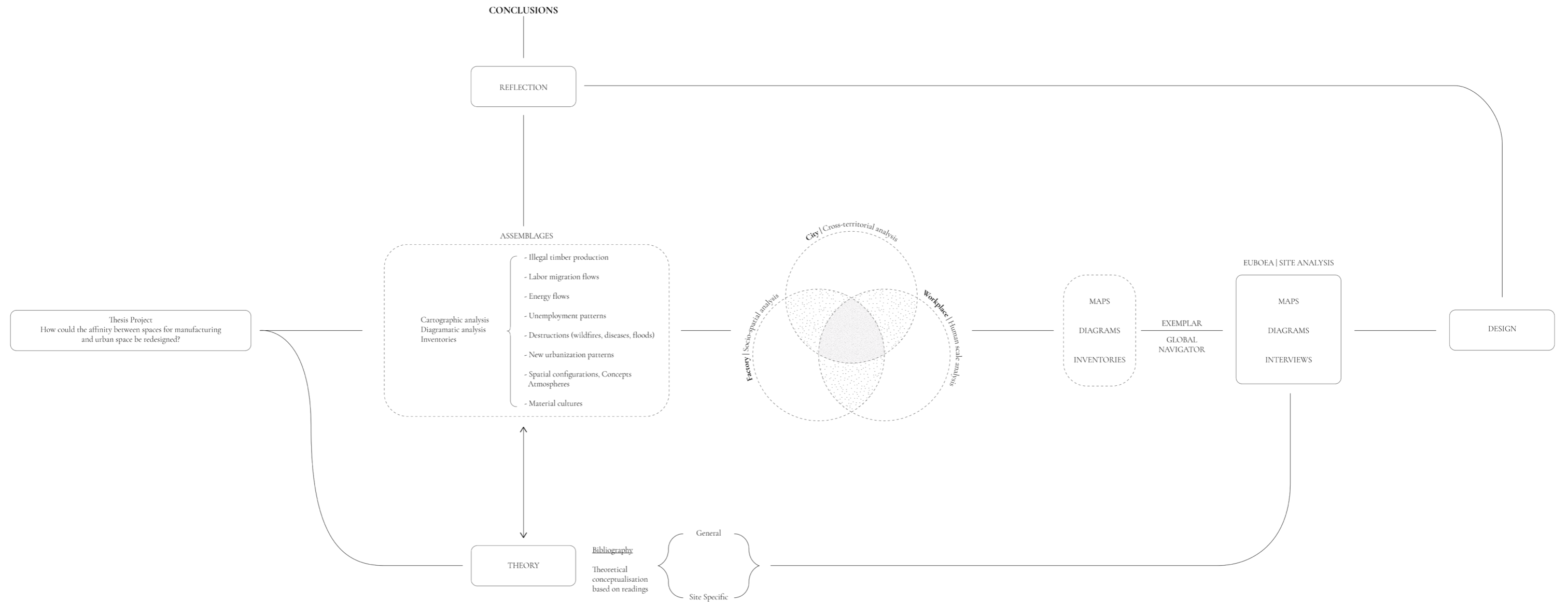


Figure 8. Methodology flowchart

From the scalar analysis I expect to shape a foreground that will further enrich the examination of the intervention site in different levels. Forest industry never intensively existed on the island of Euboea. Resin collection was the primary extraction activity from the forest before the wildfires. Consequently, I expect that through the investigation of the different case studies I will be able to shape a toolset of examples, where wood industry stood as a main source of material and immaterial production. This toolset will act as an informative example for the case of Euboea.

The research of the wood industry, through the examination of case studies in their different scales, will inform my general understanding of the network of wood production and the events taking place in it. It will thus be possible to position the case of Euboea in the global context and consciously elaborate on it as an intervention site. Does an industry need to be massively productive in order to exist and benefit a local community? Matters of scale such as this, will be answered through this level of analysis. The different scales of analysis will also stand as an exercise, a methodological apparatus for the analysis of the site of Euboea during the design stage. It will then be possible to conceptualize the findings of the research

as a foreground for the design. I will thus be able to answer on the “how” and “why” timber industry is possible to provide a new productive field on the island.

The case of Euboea is characterized by the gradual generation of industry and its sudden decline. However, this decline seems to be more phenomenal than actual. What is really implicated behind the closing of the factories is the transmutation of Euboea’s industrial character in different forms. The shock of the wildfires turned the focus of the state, the NGOs and the communities to the care about the forests and to their potential productiveness. Forest industry is manifested as a potential form of production on the island. The materials extracted from the forests, wood among them as a primary one, provide paths for their processing and the generation of material cultures on the island. Wood processing and production facilities in the form of sawmills, pulp mills, furniture factories, wood workshops or other wood-relevant manufacturing spaces, could become the new making spaces of the island enriching the local economy and culture. The timber factory, in its broader sense, could stand in-between the city and the forest, the industrial and the urban spaces, the industrial and the urban society, bridge the gap and achieve their affinity.

VI. Bibliography

Arendt, Hannah. *The human condition*. Chicago: The University of Chicago Press, 1958.

Aureli, Vittorio. "Labor and Architecture: Revisiting Cedric Price's Potteries Thinkbelt." *Log*, 2011: 97-118.

Colomina Beatriz, Wigley Mark. *Are we Human? Notes on a archaeology of design*. Lars Muller Publishers, 2016.

Corwin, Sharon. "Picturing Efficiency: Precisionism, Scientific Management, and the Effacement of Labor." *Representations*, 2003: 139-165.

Flusser, Vilém. *The Third Rail*. 1991. <http://thirdrailquarterly.org/villem-flusser-the-factory/> (accessed September 2022).

Glancey, Jonathan. "Architectural Review." *Notopia: The post-industrial hollowing out of cities is a tragedy for civic identity*. June 3, 2016. <https://www-architectural-review-com.tudelft.idm.oclc.org/archive/notopia-archive/notopia-the-post-industrial-hollowing-out-of-cities-is-a-tragedy-for-civic-identity> (accessed October 5, 2022).

Hill, Adrian V (ed.). In *Foundries of the Future: a Guide to the 21st Century Cities of Making*, by Teresa Domenech, Birgit Hausleitner, Adrian Vickery Hill, Han Meyer, Alexandre Orban, Víctor Muñoz Sanz, Fabio Vanin and Josie Warden Ben Croxford. Delft: TU Delft Open, 2020.

Hutton, Jane. *Reciprocal Landscapes: Stories of material movements*. Oxon: Routledge, 2020.

iefimerida. August 2022. https://www.iefimerida.gr/oikonomia/mia-dasiki-koinsep-sti-boreia-ey-boia?fbclid=IwAR2_5zIk3tFVELBQdDwQfB_a5Rva6TOB9OPHrJMmmSvoFnHjwWwwDMUwqSU (accessed September 2022).

Lobsinger, Mary Louise. "An Architecture of Performance." *Daidalos: architecture. art. culture: issue 74, Diagrammania*, October 2000: 22-29.

Marina Otero Verzier, Marten Kuijpers, Klaas Kuitenbrouwer, Ameneh Solati, Ludo Groen, Víctor Muñoz Sanz, Grace Abou Jaoudeh, Emma Paola Flores Herrera, Chris Zogopoulos, Merve Bedir, Jason Hilgefort, Junwe. "Het Nieuwe Instituut." *Automated Landscapes*. 2018. <https://automated-landscapes.hetnieuweinstituut.nl/en/https%3A/automated-landscapes.hetnieuweinstituut.nl/research/automated-landscapes-pearl-river-delta> (accessed October 15, 2022).

Murelato, Maurizio. "Immaterial Labor." In *Radical thought in Italy: A Potential Politics*, by Michael Hardy Paolo Virno, 133-148. University of Minnesota Press, 1996.

Rappaport, Nina. *Vertical Urban Factory*. New York: Actar Publishers, 2015.

Sargentis, G.-F., Ioannidis R., Bairaktaris I., Frangedaki E., Dimitriadis P., Iliopoulou T., Koutsoyiannis D., Lagaros N.D. "Wildfires vs. Sustainable Forest Partitioning." *Conservation*, 2022: 195-218.

Sennet, Richard. *The Craftsman*. Yale University Press, 2008.

Young, Liam. "A Place for Everything: Ben Roberts: Amazon Unpacked." *Architectural Design*, February 2019: 44-47.

Space Caviar. *Non-Extractive Architecture: On Designing Without Depletion*. Cambridge, MA: The MIT Press, 2021.

Ibañez, Daniel, Jane Hutton, and Kiel Moe. *Wood Urbanism: From the Molecular to the Territorial*. Barcelona: Actar, 2019.

Wark, McKenzie. *Molecular Red: Theory for the Anthropocene*. Verso, 2016.

Wall, Ed, ed. *The Landscapists: Redefining Landscape Relations*. Wiley, 2020.

Douglas, Ian, David Goode, Michael C. Houck, and Rusong Wang, eds. *Handbook of Urban Ecology*. New York: Routledge, 2011.

Bender, Thomas. "Reassembling the City: Networks and Urban Imaginaries," In *Urban Assemblages: How Actor-Network Theory Changes Urban Studies*, edited by Ignacio Farías and Thomas Bender, 303–23. London: Routledge, 2010.

Latour, B. (2005b) *Reassembling the Social: An Introduction to Actor-Network Theory*. Oxford: Oxford University Press.