

# Brick-collage

Uncovering the socio-technical reality of bricolage

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## Abstract:

Although everyday architecture has been integrated into architectural theory (Robert Venturi, Denise Scott Brown; 1972), the materiality of this architecture remains very much apart. In this text we will complete previous sociological studies on the subject of non-professional construction with a socio-technical study of the assembly process of various building systems in an incremental and expedient, resource-based process, which we will call bricolage. In this text we will see that the process of bricolage, although not comparatively advantageous, presents several advantages less present in architecture, namely a greater use value of space, repairability through a network of skill, and a cost-benefit advantage for housing. The object of this text is therefore to understand the bricolage process and what conditions impact negatively and positively this process, in order to integrate some aspects of bricolage to the broader work of architecture. It will be shown that bricolage relies on three main conditions. Firstly, on a sweat equity labor force that was rendered invisible. Secondly, on the availability of resources that are heavily conditioned by government policies. Thirdly, on generalized skill that relies on collective training and dissemination of information. This text therefore advocates for the recognition of bricolage as an important process through which construction is democratized.

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Disclaimer: This research is focused of the process rather than the product. In order not to focalize of the product of bricolage, which can vary greatly from one context to another, no representation of bricolage will illustrate this thesis. Similarly, in an effort to limit resources, this text will be printed in black & white with the simplest binding.

## 1. INTRODUCTION

### 1.1 Semantic issue of bricolage:

Although the word ‘bricolage’ has been widely used in theory and in less formalized writings, the etymological origins of the word tell a lot about the negative a priori that it implies. The word first came from XIV<sup>th</sup> century French technical military vocabulary, first ‘brigole’ later ‘bricole’. It corresponded to an Italian catapult with a pendulum motion<sup>1</sup>. This feature came to define a bricole which was later applied to other objects with an accidental motion such as a type of harness for horses or a tool for hunting<sup>2</sup>. With industrialization, the word was used more broadly to describe all the work that is done outside the factory. In the process, domestic work was heavily devalued as negligible and suboptimal. It was therefore appropriated by the working class as an element of identification. This was still the definition in use when it was first used in theory with Levi Strauss’s *La Pensée sauvage* (1962). Levi Strauss defined bricolage as a functional arrangement of preexistent and heteroclite elements<sup>3</sup>. Importantly the word ‘bricolage’ was not traduced in English in the 1966 English edition and therefore the English term of bricolage corresponds more to Levi Strauss’s definition than the French word which is broader and can define as much a product, a technique, and a method. In his text Levi Strauss opposes the engineer to the bricoleur, the former being constrained by the need for specific tools and materials, while the latter makes do with environment of proximity<sup>4</sup>. He presented the need to escape from a western gaze to qualify the work done in the global south. As Goody highlights in *The domestication of the savage mind* (1977), this approach remains very dichotomic and fails to see the

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1. Léglise, F. (2020). *La conception par bricolage comme art de la situation: Architecture, urbanisme, design*. [Phd thesis, Université Toulouse le Mirail - Toulouse II]. 31.

2. Ibid 32.

3. Ibid 33.

4. Lévi-Strauss, C. (1962). *La pensée sauvage*.

similarities between engineers and bricoleur<sup>5</sup>. This shows that although bricolage is etymologically defined pejoratively, efforts have been made to appropriate the term and shed light on an asserted underappreciated practice. This is not the case for the more direct translation of ‘tinkering’. This term came from repairers of tin utensils that migrated across Great-Britain<sup>6</sup>. These nomadic groups were marginalized and their labor was not well valued. Tinkering was later used such as bricolage in French to describe a leisure domestic activity of low importance and technical skill. This was exacerbated in Europe and the US in the 50s and 60s with the apparition of hobby bricolage, a highly consumerist market with large material shops such as Castorama and Leroy-Merlin, first in France and in the US and later across Europe<sup>7</sup>. This responded to a market of customization and presented a voluntary lack of means as a mean of personal pride through achievements that subvert expectations<sup>8</sup>. The practice was therefore democratized but made even less significant as a Sunday practice that didn’t respond to real needs but rather leisure. This is for example exemplified by the term ‘Système D’ that was used in the trench army and stood for making do with the limited resources on the front, D standing for ‘débrouille’. After the war it came to define in working class culture as mindset of autonomy in repair and construction. In the 1950s it was recuperated by a magazine which showed as much do-it-yourself tips as much as commercial advertisement for bricolage market with a broader public than the working class that resorted to it because of lacking means<sup>9</sup>. Other more recent words with other etymologies can be associated with bricolage such as ‘hacking’ which appeared in the 90s in the Silicon Valley to describe a playful craft first materially and later applied to informatics<sup>10</sup>. This word is also associated with crafts as it originates

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5. Goody, J. (1977). *The domestication of the savage mind*. Cambridge University Press.

6. Léglise, F. (2020). *La conception par bricolage comme art de la situation: Architecture, urbanisme, design*. [Phd thesis, Université Toulouse le Mirail - Toulouse II]. 37.

7. Ibid 65.

8. Ibid 65.

9. Reitz, L. M. (2016). *Assembler son quotidien sur la route: Une ethnographie de l’habiter mobile contemporain*. [Phd thesis, École Polytechnique Fédérale de Lausanne]. 187.

10. Léglise, F. (2020). *La conception par bricolage comme art de la situation: Architecture, urbanisme, design*. [Phd thesis, Université Toulouse le Mirail - Toulouse II]. 39.

from working with an axe. This shows that it is still a recent practice that continues to evolve. But most importantly it is a worldwide practice as there or similar terms, although with different roots and histories, in various countries: Jugaad (Tamil), Zizhu chuangxin (Mandarin), Gambiarra (Brazilian), Jua kali (Swahili), Ibdaa (Arabic)<sup>11</sup>. In this text, we will use ‘bricolage’ as a term that needs clarification but already has a basic literature. The term ‘bricolage’ is therefore used in the following text as a technical process rather than a pejorative characterization but it must be acknowledged that the pejorative etymology of the word makes it subject to harsh criticism.

## 1.2 A broad and unstructured research sector:

Since Levi Strauss’s anthropological definition, bricolage has been used in many different kinds of research: management studies (Baker, Miner & Eesley, 2003); (Baker & Nelson, 2005); (Leybourne, 2009); (Mumford & Micheal, 2015); administrative studies (Freeman, 2007); planning studies (Uzzell, 1990); (Innes & Booher, 1999); (Farah & Teller, 2012); pedagogic studies (Kincheloe, McLauren & Steinberg, 2011). In cultural studies, ‘social bricolage’ is understood as a form of proximity network. In the artistic field, bricolage has also been used closer to its materialistic definition. Artist used bricolage as a form of art brut, as Levi Strauss already suggests in 1962. (Bri)collage is also associated with the medium of collage<sup>12</sup>. The term has also been appropriated in design with, for example, the tin can radio, with an emphasis on responding to a need rather than esthetics<sup>13</sup>. This broad use in research can be explained by a constantly evolving definition and

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11. Ibid 40.

12. Ibid 118.

13. Ibid 199.

a palpable imaginary that it may evoke. However, in architecture, ‘bricolage’ has not been used, besides Colin Rowe (1984) in urbanistic studies, mainly to avoid its negative connotations in the field. We can however note that what we describe here as bricolage has been analyzed through research on self-help housing, which correspond to a type of housing program based of self-construction.

### 1.3 Advantages in literature:

Although there is little content on architecture theory of bricolage, most case studies have been made with a sociological lens. These researches tend to highlight three qualities that are present in bricolage: Firstly, a better use-value of the space. Secondly, an access to repairability. Thirdly, a cost-effectiveness.

The use-value of bricolage can be understood in opposition to a commodified market that corresponds to exchange value (Bossuyt, 2021); (Fields & Uffer, 2016). Rather than a product for sale, bricolage respond to the immediate needs of the users. The conventional market struggles to correspond precisely to the needs of users as “needs are infinitely complex”<sup>14</sup> as a non-storable, non-transportable, durable good, construction is subject to obsolescence<sup>15</sup>. This obsolescence is therefore tackled with the sale in a market, therefore prioritizing exchange value. This has resulted as observed by (Benedikt, 2007) in a progressive cheapening of construction as quality products in a market also demands additional efforts to convince the user. On the contrary bricolage is not made to enter a market of sale<sup>16</sup>. User satisfaction is statistically higher than in conventional construction: in a study on US self-help, users are more satisfied with the building quality at a rate

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14. Bossuyt, D. M. (2021). The value of self-build: Understanding the aspirations and strategies of owner-builders in the Homeruskwartier, Almere. *Housing Studies*, 36(5), 703.

15. Bosch, G., & Philips, P. (2003). *Building chaos: An international comparison of deregulation in the construction industry*. Routledge. 1.

16. Léglise, F. (2020). *La conception par bricolage comme art de la situation: Architecture, urbanisme, design*. [Phd thesis, Université Toulouse le Mirail - Toulouse II]. 71.

of 9.02 compared to 8.46 for conventional housing<sup>17</sup>. But self-construction also provides a feeling of accomplishment that can blur satisfaction “Rosenberg (2011, p. 16) suggests that self-expression may be compromised by fears of having a house that trades less favorably”<sup>18</sup>.

Secondly self-construction users have been shown to have a better capacity of repair<sup>19</sup>. This can be intuitively understood as they already acquired the skill and tools and have better information on the house they have built. Bricolage has also been described as an empowering process<sup>20 21</sup>. Through repair, the user can reappropriate an object or a space. This has been politically advocated first with De Certeau in *practice of everyday life* (1984)<sup>22</sup> where the author points out that people can occupy and appropriate a space and subvert long-term planning with bricolage. Today a similar movement advocates for a right to repair for all objects<sup>23</sup>. But on a less politicized stand, repair contributes to the valorization process of an object<sup>24</sup>. This changes radically the way we qualify a space as it can be transformed through repair and changes the means-ends logics. Values are therefore not static and repairability can be a way to change the program, the quality and/or the de facto ownership of a space. It has been argued that repair also shows human-technology relation that are hidden in externalized design<sup>25</sup>. This means that technical dependencies are palpable and this can lead the way to question labor and resources utilization. Ivan Illich in *tools for conviviality* (1973), argues that critically evaluating tools are essential for gaining autonomy as some tools reduce user agency<sup>26</sup>.

Thirdly, bricolage can be argued as a cost-effective measure to provide homes.

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17. Durst, N. J., & Cangelosi, E. J. (2021). Self-help housing and DIY home improvements: Evidence from the American Housing Survey. *Housing Studies*, 36(8), 1240.

18. Bossuyt, D. M. (2021). The value of self-build: Understanding the aspirations and strategies of owner-builders in the Homeruskwartier, Almere. *Housing Studies*, 36(5), 698.

19. Duncan, S. S., & Rowe, A. (1993). Self-provided Housing: The First World's Hidden Housing Arm. *Urban Studies*, 30(8), 1340.

20. Bronzini, M. (2017). Contested issues surrounding social sustainability and self-building in Italy. *International Journal of Housing Policy*, 17(3), 363.

21. Reitz, L. M. (2016). *Assembler son quotidien sur la route: Une ethnographie de l'habiter mobile contemporain*. [Phd thesis, École Polytechnique Fédérale de Lausanne]. 130.

22. De Certeau, M. (1984). *The practice of everyday life*. Univ of California Press.

23. Léglise, F. (2020). *La conception par bricolage comme art de la situation: Architecture, urbanisme, design*. [Phd thesis, Université Toulouse le Mirail - Toulouse II]. 61.

24. Houston, L., Jackson, S. J., Rosner, D. K., Ahmed, S. I., Young, M., & Kang, L. (2016). *Values in Repair*. Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems, 1403.

25. Ibid 1404.

26. Illich, I. (1973). *Tools for conviviality*. HarperCollins Publishers.

All statistical data on the subject concur at around 20% cost savings (Hamiduddin & Daseking, 2014): a study in south-east England in 1980 reports a 20-35% price difference, and 10-15% in France with the same method<sup>27</sup>. A study in Germany 15-20%, and in Norway, 15%. A more precise analysis in Rotterdam in the 1980, reports 25% cost saving for full self-construction, 10% for only interior, and 5% for design only<sup>28</sup>. This has been acknowledged at an international level for example by the Alliance for Progress<sup>29</sup>. This has been the main reason why self-help programs have been put in place in the global south. In a post-colonial context self-help has been argued to also respond to local cultural and economic development<sup>30</sup>. This has been for example observed in the perpetuation of the traditional Swahili house<sup>31</sup>. But critics point out that if self-building is cost-effective, it is only by not accounting labor costs. In fact, no grounded statistical study has been able to compare housing provision taking into account labor cost as a report of the British Centre for Housing Policy<sup>32</sup>. The new emerging studies on the subject start to look more precisely into how different self-construction is to conventional construction and shows that the share of material costs is significantly higher<sup>33</sup>. This shows that it responds to a different cost system that must therefore be analyzed more precisely and as a whole can be much cheaper than conventional construction.

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27. Duncan, S. S., & Rowe, A. (1993). Self-provided Housing: The First World's Hidden Housing Arm. *Urban Studies*, 30(8), 1337.

28. Ibid 1338.

29. Harris, R., & Giles, C. (2003). A mixed message: The agents and forms of international housing policy, 1945–1973. *Habitat International*, 27(2), 177.

30. Harris, R. (1998). The silence of the experts: Aided self-help housing, 1939–1954. *Habitat International*, 22(2), 166.

31. Izar, P. (2022). Meanings of Self-Building: Incrementality, Emplacement, and Erasure in Dar es Salaam's Traditional Swahili Neighborhoods. *Urban Planning*, 7(1), 311.

32. Wallace, A., Quilgars, D. J., & Ford, J. (2013). Build It Yourself? Understanding the changing landscape of the UK self-build market. 32.

33. Celentano, G., Göswein, V., Magyar, J., & Habert, G. (2020). The informal city as a socio-technical system: Construction management and money distribution in the informal and upgraded communities of Bangkok. *Journal of Cleaner Production*, 256, 120142. 8.

## 2. METHODOLOGY:

While there is enough content to point out that there are some qualities to be found in bricolage, the process of bricolage itself remains by and large absent from sociological studies mainly focusing on the outcome and product of bricolage. In fact, Bangdome-Dery, Eghan & Afram (2014)'s study shows that there are significant institutional, economic, social, constructional, and architectural issues with self-help<sup>34</sup>. This text seeks therefore to give an insight into a socio-technical understanding, without romanticism, of bricolage and to understand better in which context is a self-building program preferable by understanding needs, capacities and limitations. This is a way to understand as Tim Ingold or Lucy Suchman suggest the changing social dynamics that are embodied in changing objects<sup>35 36</sup>. Because of the complexity of the subject, system thinking cannot account for all the subtleties. Therefore, different topics are presented here. This study looks at previous literature on the subject and identifies recurring themes. An evaluation of the literature and potential further research can therefore be made. To structure this text, arguments are organized by three main means of production, namely labor, resources and skill. This gives a materialistic understanding of the subject as a first step of a critical theory of bricolage. This is important as self-help programs have remained untheorized besides the work of J.F.C. Turner, R. Fichter, J. Habraken, N. Hamdi or H. Fathy and projects are only a case-by-case success<sup>37</sup>. The collected articles have been gathered through the google scholar search engine with the following keyword: 'bricolage', 'self-help', 'self-building', 'incremental', 'makeshift', 'informal'. The selected corpus of 35 articles [see fig. 1] varies in methodology and scope. It must be acknowledged that this study is based of English and French

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34. Bangdome-Dery, A., Eghan, G. E., & Afram, S. O. (2014). Overview of Self-Help (Self-Build) Housing Provision in Ghana: Policies and Challenges. *Methodology*, 4(6), 81.

35. Ingold, T. (2012) Towards an Ecology of Materials. *Annual review of anthropology*, 41, 427-442.

36. Suchman, L. A. (1987). *Plans and situated actions: The Problem of Human-Machine Communication*. Cambridge University Press.

37. Harris, R. (1999). Slipping through the Cracks: The Origins of Aided Self-help Housing, 1918-53. *Housing Studies*, 14(3), 301.

literature and therefore must be completed by further studies. This study aims to find similitudes in very different contexts and does not seek to undermine the particularism that are at play but rather find a grid of analysis that must be bend in a given context. It will be shown throughout this text that bricolage long associated with the global south is omnipresent in the western world. This text seeks to pursue a theorization of subaltern urbanism initiated by authors such as Roy (2011) but by pointing out the universal element that are not regionally defined<sup>38</sup>. The terminology of 'bricolage' is also problematic as it is a western concept that is as seen previously etymologically biased and does not necessarily correspond to other practices. It is however useful as a vessel currently employed loosely in theory to construct a solid definition of the term. This text will therefore end with a modernized definition of bricolage that corresponds better the material reality that we associate with this term.

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**38.** Roy, A. (2011). Slumdog cities: Rethinking subaltern urbanism. *International journal of urban and regional research*, 35(2), 223-238.

Authors	Date	Type of research	Scope	Theme
Anigbogu, N.A.	2002	Quantitative (survey)	Nigeria	Informal construction
Bangdome-Dery, A. & Al.	2014	Literature review	Ghana	Self-help
Bosch, G., & Philips, P.	2003	Quantitative	Europe	Deregulation
Bossuyt, D. M.	2021	Qualitative (survey)	Almere (Netherlands)	Self-building
Boustingorry, J.	2008	Historical	Castor (France)	Self-building
Bronzini, M.	2017	Qualitative (survey)	Senigallia (Italy)	Self-help
Candón-Mena, J. & Al.	2020	Qualitative	Marinaleda (Spain)	Self-building
Celentano, G. & Al.	2020	Quantitative	Bangkok (Thailand)	Informal settlements
Celentano, G., & Habert, G.	2021	Mixed	Nairobi (Kenya)	Informal settlements
Dafeamekpor, C. A. & Al.	2022	Literature review	Holistic	Self-help
De Castro Mazarro, A.	2015	Historical	Latin America	Incrementalism
Díaz-Parra, I. & Al.	2024	Mixed (comparative)	Latin America & Spain	Self-help
Droste, C.	2015	Quantitative	Germany	Self-building
Duncan, S. S., & Rowe, A.	1993	Quantitative	Europe	Self-help
Durst, N. J., & Cangelosi, E. J.	2021	Quantitative	US	Self-building
Hamiduddin, I., & Gallent, N.	2016	Qualitative (survey)	Germany	Self-building
Harris, R.	1991	Quantitative	Toronto (Canada)	Self-building
Harris, R.	1998	Historical	International organizations	Self-help

**Fig 1.** (1/2) Table of case studies reviewed in this thesis

Harris, R.	1999	Historical	Europe	Self-help
Harris, R., & Giles, C.	2003	Historical	International organizations	Self-help
Houston, L. & Al.	2016	Qualitative (survey)	US, Uganda & Bangladesh	Repair
Izar, P.	2022	Ethnographic	Tanzania	Self-building
Jimenez, E.	1982	Mathematical analysis	Holistic	Self-help
Kraff, N. J. & Al.	2022	Mapping	Europe	Poverty housing
Laine, M. & Al.	2020	Qualitative (survey)	Finland	Collaborative Housing
Léglise, F.	2020	Historical	Holistic	Bricolage
Moatasim, F.	2019	Historical	Islamabad	Informal
O'Brien, D., & Carrasco, S.	2021	Quantitative	Chile	Site-and-services
Reitz, L. M.	2016	Qualitative	France	Nomadic self-building
Sanga, S. A., & Mselle, J.	2018	Literature review	Holistic	Informal construction
Sigaud, M.	2017	Qualitative	France	Self-building
Wakeman, R.	1999	Historical	France	Self-building
Wallace, A. & Al.	2013	Policy recommendation	UK	Self-help
Ward, P., & Chant, S.	1987	Literature review	Holistic	Self-help
Ward, P. M.	2019	Historical	US	Self-building

**Fig 1.** (2/2) Table of case studies reviewed in this thesis

### 3. LABOR:

#### 3.1 Forms of labor:

To understand the labor structure of bricolage, one must first understand that bricolage does not apply wage labor. Instead, the work of bricolage is done through sweat equity. This can take many forms but at its core this can be understood as a substitution of paid labor with work. This means that in many cases a number of work hours can be directly converted to a certain cost. For individuals working alone these calculations are not necessary but as soon as there is a group structure, a conversion rate is established. For example, in the self-construction program of the castors in south-western France, a certain regulation established a minimum of 600 work hours, and through a contract the quantity of sweat equity and wage labor can be decided<sup>39</sup>. In most cases, self-builders still employ conventional construction methods, for more technically sophisticated or riskier tasks. In the aforementioned case, a Bayonne program of around 100 houses hired up to 6 full-time specialized workers<sup>40</sup>. In self-help programs Duncan & Rowe (1993) distinguish 6 different forms of provision for self-help: private sector construction company, contracted out developer, direct labor institution, contracted out institution, self-building and self-promotion<sup>41</sup>. This shows that although self-help program is directly associated to self-building in many cases wage labor is present. They note that there are two types of gains in construction, development and production and self-building keeps both gains while self-promotion only gains development gain in other forms of provision these gains are externalized. In their study of informal settlements in Bangkok, Celentano, Göswein, Magyar & Habert (2020) note that 18% self-build,

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**39.** Boustingorry, J. (2008). *Des pionniers autoconstructeurs aux coopérateurs: Histoire des Castors en Aquitaine* [Phd thesis, Université de Pau et des Pays de l'Adour]. 121.

**40.** Ibid 116.

**41.** Duncan, S. S., & Rowe, A. (1993). Self-provided Housing: The First World's Hidden Housing Arm. *Urban Studies*, 30(8), 1333.

and 35% self-manage<sup>42</sup>. This data may fluctuate greatly with location, but it is important to keep in mind that self-building does mix with conventional construction provision and there is no neat separation. This makes classification for statistical research difficult.

It can also be difficult to see the underlying labor when labor comes from the informal sector. Little information on the structure of informal labor has been made. Fagana (2000) shows, in Nigeria, that it is structured differently: heterogeneous output, blurry worktime, vertical hierarchy, on the job skill acquisition, engagement in multiple activities<sup>43</sup>. While there are important issues with informal labor structure, it prevails in many places as it responds to several points: Unstable employment rate and high worker turnover; low or stagnant wage rates; absence of job ladders; low production technology and labor intensiveness; difficult job management<sup>44</sup>. McFarlane (2012) suggests that connections of formal and informal urbanism create more flexible and adaptable outcomes<sup>45</sup>.

These studies begin to show that labor structure in bricolage is more complex than we may think. We can therefore understand bricolage labor is a spectrum that goes from total self-construction to self-provision, where the main characteristic is the presence of sweat equity. This hinders research as labor structure and the amount of sweat equity imbedded in this form of housing make quantification of work and cost complicated. In addition, there is no study, that the author is aware of, that describes the labor structure in Europe of bricolage for poverty housing. In a geographic study of poverty housing in Europe, Kraff, Wurm & Taubenböck (2022) reports that 32% correspond to rough, mobile or makeshift shelters<sup>46</sup>. While

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**42.** Celentano, G., Göswein, V., Magyar, J., & Habert, G. (2020). The informal city as a socio-technical system: Construction management and money distribution in the informal and upgraded communities of Bangkok. *Journal of Cleaner Production*, 256, 120142. 6.

**43.** Fajana, S. (2000) *Functioning of the Nigerian Market*. Labofin and Company.

**44.** Anigbogu, N.A. (2002). An appraisal of the Nigerian construction industry informal labour market. *Journal of Environmental Science*, 6(1), 97.

**45.** McFarlane, C. (2012). Rethinking Informality: Politics, Crisis, and the City. *Planning Theory & Practice*, 13(1), 89–108.

**46.** Kraff, N. J., Wurm, M., & Taubenböck, H. (2022). Housing forms of poverty in Europe—A categorization based on literature research and satellite imagery. *Applied Geography*, 149, 102820. 6.

nothing proves that these building are made through bricolage, it can be assumed that conventional construction does not build these forms shelter. The intersection of informal and formal construction with a western scope must therefore be studied further.

### 3.2 Group structures:

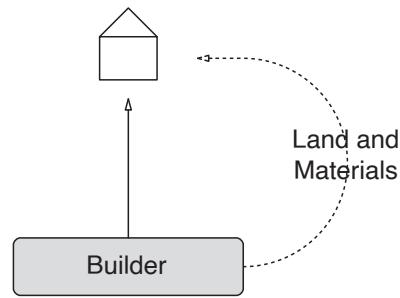
Since construction is a complex process, in many cases bricolage is aided by a group. ‘Supported self-build’ refers to a third party that provides training or land. This can take the form of a public authority, a non-profit or private developers<sup>47</sup>. This is one form of group structure but in most cases self-building is a communal process that is not so much about the ‘self’. Self-building is perceived as “an individualistic consumption choice”<sup>48</sup> with goals of customization and costs. But all case studies tend to show some form of network. In its report on the subject, the British Centre for Housing Policy, distinguishes 5 group models that have been observed in the UK, some that have existed for a long time, others more recent that have not been studies or evaluated: Co-housing (a community-based model where construction is one task among other and not all participate in construction, goals are mainly of building a community); Eco-development (a community-based model that participates first and foremost in the design, goals are mainly about sustainability); Self-build for rent (a group scheme with a contractual amount of labor to be provided in exchange for training through an organization); Sweat equity group model (a less formalized group that set a number of workhours to reduce building costs); Community land-trust (a non-profit organization that responds to

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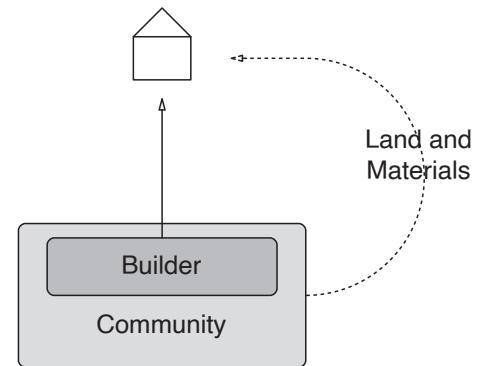
47. Bronzini, M. (2017). Contested issues surrounding social sustainability and self-building in Italy. *International Journal of Housing Policy*, 17(3), 355.

48. Bossuyt, D. M. (2021). The value of self-build: Understanding the aspirations and strategies of owner-builders in the Homeruskwartier, Almere. *Housing Studies*, 36(5), 698.

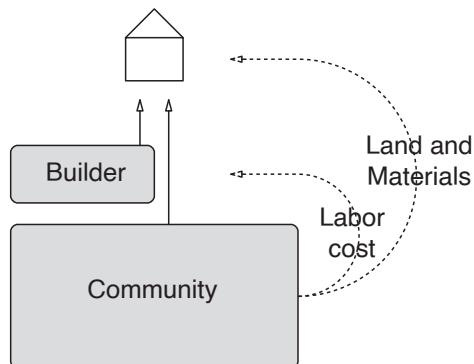
1. Independant self-builder:



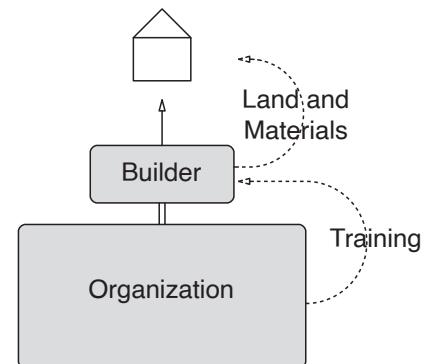
2. Cohousing:



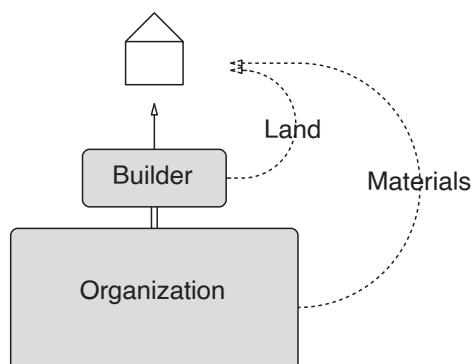
3. Eco-development  
(self-provision):



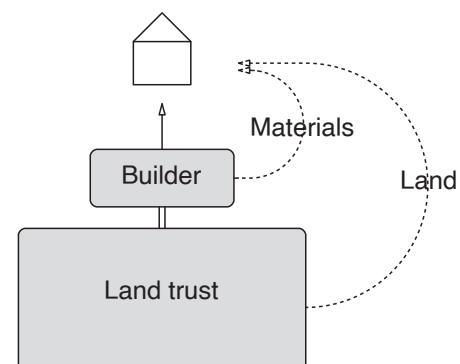
4. Self-built for rent:



5. Sweat equity group:



6. Community land-trust:



**Fig 2.** Diagram of the different labor organization based on Wallace, A., Quiggars, D. J., & Ford, J. (2013). Build It Yourself? Understanding the changing landscape of the UK self-build market. 38.

the needs of a community through the separation of land and build costs)<sup>49</sup>. These groups can therefore be more or less formalized. For example, the castor projects in France, mentioned previously, are highly formalized in an effort to become a major form of provision in a post-war context. The association represents an important juridic entity and intermediary with the state. The association buys materials and land. The ownership procedure is long and usually lasts longer than the construction. Workers that enter the association, must pay rent until the cost of materials and land is paid back with this rent<sup>50</sup>. Only then, do they obtain a property title. The association has ownership of buildings until labor and costs arrive at a set level. Even the worker unit is controlled with a team of 10 workers and a paid technical assistant that support the group<sup>51</sup>. But other self-building project are much less institutional and rely of mutual aid. This is the case of truck nomadic self-builder, in the sociological study of Reitz (2016). The author points out that even in a living unit that is very much individual, construction and repair is a communal activity that relies on a network<sup>52</sup>. This help is not immediately transactional and corresponds more to mutual aid mechanism<sup>53</sup>. In the Spanish city of Marinaleda, a formal municipal law established a system of self-building similar to the castor, but cooperation was made also without direct interest through voluntary work. This work has crucial to start the project before guarantying fundings<sup>54</sup>.

Groups are in fact quite essential for self-builder who engage in bricolage for economic reasons. Access to land, resources and tools are difficult individually<sup>55</sup>. For land and resources, groups allow for a better bargaining power and can secure commercial agreements and bulk provision<sup>56 57</sup>. Without an economy of scale, materials cost are significantly higher. Moreover, this is also the case for shared

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49. Wallace, A., Quiggars, D. J., & Ford, J. (2013). Build It Yourself? Understanding the changing landscape of the UK self-build market. 38.

50. Boustingorry, J. (2008). *Des pionniers autoconstructeurs aux coopérateurs: Histoire des Castors en Aquitaine* [Phd thesis, Université de Pau et des Pays de l'Adour]. 102.

51. Ibid 111.

52. Reitz, L. M. (2016). *Assembler son quotidien sur la route: Une ethnographie de l'habiter mobile contemporain*. [Phd thesis, École Polytechnique Fédérale de Lausanne]. 227.

53. Ibid 258.

54. Candón-Mena, J., Domínguez, P., & MacFarlane, T. (2020). Self-build housing schemes in Marinaleda from the perspective of Ostrom's concept of self-governance in common-pool resource situations. *An International Journal for Critical Geographies*, 19(3), 692.

55. Duncan, S. S., & Rowe, A. (1993). Self-provided Housing: The First World's Hidden Housing Arm. *Urban Studies*, 30(8), 1341.

56. Hamiduddin, I., & Gallent, N. (2016). Self-build communities: The rationale and experiences of group-build (Baugruppen) housing development in Germany. *Housing Studies*, 31(4), 366.

57. Sigaud, M. (2017). *La pratique de l'auto-construction comme base de mise en place d'une société conviviale*. [Master thesis, Université Grenoble Alpes]. 14.

tools such as in the case of FabLab's<sup>58</sup>.

However, group structures tend to have an exclusionary effect as Hamiduddin (2015) suggest. It is argued that community groups select members and tend to have a preference for similar, younger and wealthier profiles. Besides, in group meeting concessions have to be made<sup>59</sup>. This can lead some users in pursuit of more customization to individual construction.

The case studies on bricolage have analyzed very well in which way, people group together and mutualize for economic and social reasons. However, no quantitative information accounts for the proportion of bricolage that resort to groups. This is especially important as groups have more visibility and can appear statistically greater than they are. It is interesting to note that in all group structure present in this study, none question the building individual ownership. A further study must verify this correlation to examine if all model of self-building rely on ownership.

### 3.3 Political appropriation:

As seen previously, bricolage is a practice that has always been heavily politicized even in theory. Bricolage may represent a way in which workers can cease the means of production in the construction industry. In many cases neoliberal policy aimed at speculating on housing have caused affordability problems and people opt to bricolage for resistance<sup>60</sup>. But even before the current housing crisis, housing has been politicized and bricolage used as a militant form of housing. In post-war France, a severe housing crisis has led left wing militants

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**58.** Léglise, F. (2020). *La conception par bricolage comme art de la situation: Architecture, urbanisme, design*. [Phd thesis, Université Toulouse le Mirail - Toulouse II]. 86.

**59.** Hamiduddin, I., & Gallent, N. (2016). Self-build communities: The rationale and experiences of group-build (Baugruppen) housing development in Germany. *Housing Studies*, 31(4), 377.

**60.** Dafeamekpor, C. A., Adjei-Kumi, T., Nani, G., & Kissi, E. (2022). Criteria for Assessing Self-Help Housing Projects Affordability: A Critical Literature Review. *Journal of Real Estate Literature*, 30(1–2), 24.

to fight for a ‘right to housing’. This took many forms such as a squatter movement, self-build barracks and self-build association like the castor or Emmäus<sup>61 62</sup>. This crisis was made worse by a state total control of housing provision undermining other actors, and a prioritized allocution of public funds to building repair mainly of the upper-class<sup>63 64</sup>. In 1945, the MRU (ministry of reconstruction and urbanism), under pressure, passed an ordinance giving a right to requisite vacant buildings for homeless households. Although not really applied in practice, this gave legitimacy to the squatter movement<sup>65</sup>. It was around the same time that Emmäus youth hostel changed into a shelter for homeless people and started to build illegally but legitimately with the support of radio mediatization<sup>66</sup>. The castor projects, first developed around Bordeaux and later applied all over France, also started as an ‘illegal’ project that was later formalized. This French example shows that various forms of self-building were put forward as a direct action against a housing crisis, but in other contexts, it has been used as well to seek autonomy, anti-professionalism, anti-institutionalism or anti-consumerism. This is for example the case people who opt for mobile housing by choice, aiming for material emancipation<sup>67</sup>. And outside the European context, one notable example can be the FUCVAM coop program in Uruguay that has been described as having a strong social-catholic and anarchist ideology with objective of fighting against gentrification<sup>68</sup>. Self-building groups are particularly politicized displaying at the same time communal and individual identity.

But this narrative has been criticized as bricolage has been a practice that has since been democratized to the middle-class and represents according to Picard (2017) 25 billion euros per year only in France. With such a large market, political

61. Boustingorry, J. (2008). *Des pionniers autoconstructeurs aux coopérateurs: Histoire des Castors en Aquitaine* [Phd thesis, Université de Pau et des Pays de l'Adour]. 11.

62. Wakeman, R. (1999). Reconstruction and the Self-help Housing Movement: The French Experience. *Housing Studies*, 14(3), 355.

63. Harris, R. (1999). Slipping through the Cracks: The Origins of Aided Self-help Housing, 1918-53. *Housing Studies*, 14(3), 297.

64. Wakeman, R. (1999). Reconstruction and the Self-help Housing Movement: The French Experience. *Housing Studies*, 14(3), 357.

65. Ibid 359.

66. Ibid 363.

67. Reitz, L. M. (2016). *Assembler son quotidien sur la route: Une ethnographie de l'habiter mobile contemporain*. [Phd thesis, École Polytechnique Fédérale de Lausanne]. 141.

68. Díaz-Parra, I., Candón-Mena, J., & Zapata, C. (2024). Round Trip Policies: Housing and Self-Management, from Europe to Latin America and Back Again. *Antipode*, 56(2), 452.

identity can be quite marginal and may not reflect the broader process of bricolage. It is also important to acknowledge that lower-income groups may find it hard to engage in bricolage because of the price of material and tools<sup>69</sup>. As one British study points out:

“The majority of individual self-build projects are detached houses, built by older, relatively affluent households. The sector is characterized by a wide range of property styles, but many builders opt for relatively conventional designs.”<sup>70</sup>

While the desire to be cost-effective is still prevalent, bricolage has been utilized mainly to respond to new desires and customization<sup>71</sup>. In Germany as well, Baugruppen programs have been put forward as an innovative mean of housing provision but has also harshly been criticized in an article as “middle-class pro-active gentrifiers”<sup>72</sup>. This is in part due to the fact that Baugruppen members must show financial proof to obtain permits therefore excluding more precarious members<sup>73</sup>. It is also argued that people who engage in bricolage do so not necessary for political reasons but first and foremost for economic reasons<sup>74</sup>.

Going back to the case of castor housing, studies on the initial programs in south-western France show repeatedly that gaining municipal, state or even the Church (as the program was initiated by a priest) support was difficult mainly for ideological reasons although all parties had a similar political inclination<sup>75</sup>. State support was only made possible by the personal involvement of the ministry and conditional to the fact that regulation and technicians must control the process and with a limit of 60 houses. Municipal support was so low that the first program had to build a water

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<sup>69</sup>. Léglise, F. (2020). *La conception par bricolage comme art de la situation: Architecture, urbanisme, design*. [Phd thesis, Université Toulouse le Mirail - Toulouse II]. 88.

<sup>70</sup>. Wallace, A., Quilgars, D. J., & Ford, J. (2013). Build It Yourself? Understanding the changing landscape of the UK self-build market. 26.

<sup>71</sup>. Sigaud, M. (2017). *La pratique de l'auto-construction comme base de mise en place d'une société conviviale*. [Master thesis, Université Grenoble Alpes]. 13.

<sup>72</sup>. Droste, C. (2015). German co-housing: an opportunity for municipalities to foster socially inclusive urban development?. *Urban Research & Practice*, 8(1), 79-92.

<sup>73</sup>. Hamiduddin, I., & Gallent, N. (2016). Self-build communities: The rationale and experiences of group-build (Baugruppen) housing development in Germany. *Housing Studies*, 31(4), 376.

<sup>74</sup>. Bronzini, M. (2017). Contested issues surrounding social sustainability and self-building in Italy. *International Journal of Housing Policy*, 17(3), 361.

<sup>75</sup>. Boustingorry, J. (2008). *Des pionniers autoconstructeurs aux coopérateurs: Histoire des Castors en Aquitaine* [Phd thesis, Université de Pau et des Pays de l'Adour]. 34.

tower as the communist mayor didn't want to connect to the water network and delayed administrative processes<sup>76</sup>. This shows that beyond the political rhetoric self-building is criticized by all groups as it is not easy align it to a specific ideology and prejudice prevail. In his article Harris (1999), argues that self-help has been used by the complete spectrum of ideologies, for example and opposite of previous examples, in the colonial homestead act in the US<sup>77</sup>. The author argues that self-help is in itself politically weak and is "in opposition, at least in appearance, to the building industry, which were the main critics of these policies." Furthermore, it has been argued that self-building is very much dependent on conventional supply chains and therefore does not really present an alternative to capitalist modes of production in addition to clashing with top-down planning and regulations<sup>78</sup>.

These critics tend to join with critics of participation such as Markus Meissen's *The nightmare of participation* (2010), describing how participation has limits and organization is undermined, or Sargisson (2012) arguing that coops form 'intentional communities' that are don't reflect a general appreciation of coops<sup>79</sup><sup>80</sup>. No study, that the author knowns of, has shown advantages for self-builder in having ideological identity, but one can suppose advantages in favor as much as against, namely political consciousness and opposition.

### 3.4 Division of labor and internal injustice:

As we have seen previously, bricolage takes many forms more or less relying on sweat equity. Some studies show that there is a significant difference between self-provision and self-building. Duncan & Rowe (1993) talks of a 'white-collar

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76. Ibid 47.

77. Harris, R. (1999). Slipping through the Cracks: The Origins of Aided Self-help Housing, 1918-53. *Housing Studies*, 14(3), 301.

78. Bossuyt, D. M. (2021). The value of self-build: Understanding the aspirations and strategies of owner-builders in the Homeruskwartier, Almere. *Housing Studies*, 36(5), 703.

79. Miessen, M. (2010). *The nightmare of participation*. Sternberg Press.

80. Sargisson, L. (2012). *Fool's gold?: Utopianism in the twenty-first century*. Springer.

sweat equity' that englobe promotion, financing, land obtention, planning, building permission or administrative work<sup>81</sup>. For self-promoters this in itself represents enough work, but for self-builder, this is an extra charge that tends to be neglected and less accounted for. In Norway, a third of self-managed houses only engage in white-collar sweat equity, leaving the less valued tasks to the construction market. In Nigeria, in an informal economy, a middleman does the managerial work and links employee and employers and tool lenders<sup>82</sup>. As a result, the white-collar role tends to reinforce vertical hierarchy.

But we can also point out that bricolage may have a gendered issue as Duncan & Rowe (1993) shortly mentioned<sup>83</sup>. Indeed, self-provision policy are oriented mainly toward families and can reinforce gender roles inside the family. This has been observed in the castor housing as women, do not participate in construction<sup>84</sup>. But this observation can be generalized as not all people can contribute physical labor and time. Lone parents with children and elderly people cannot participate as much<sup>85</sup>. A study of health and homeownership also shows that sick or disabled people can't engage in maintenance and repair which might in turn reduce housing quality<sup>86</sup>. Sick people also have more issues in getting a mortgage as they can't guaranty finance and are more prone to discrimination for access to financing<sup>87</sup>.

Additionally, migrant worker, are less likely to have access to a group and the economic advantages that come with it. It has been proved (Connolly & al. 2019) that migrant workers are less presents in labor unions and are therefore less protected<sup>88</sup>. It is particularly difficult as migrants tend to be understood in a transnational space where communal identity is not shared by many<sup>89</sup>. Bilecen

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<sup>81</sup>. Duncan, S. S., & Rowe, A. (1993). Self-provided Housing: The First World's Hidden Housing Arm. *Urban Studies*, 30(8), 1337.

<sup>82</sup>. Anigbogu, N.A. (2002). An appraisal of the Nigerian construction industry informal labour market. *Journal of Environmental Science*, 6(1), 99.

<sup>83</sup>. Duncan, S. S., & Rowe, A. (1993). Self-provided Housing: The First World's Hidden Housing Arm. *Urban Studies*, 30(8), 1342.

<sup>84</sup>. Boustingorry, J. (2008). *Des pionniers autoconstructeurs aux coopérateurs: Histoire des Castors en Aquitaine* [Phd thesis, Université de Pau et des Pays de l'Adour]. 97.

<sup>85</sup>. Duncan, S. S., & Rowe, A. (1993). Self-provided Housing: The First World's Hidden Housing Arm. *Urban Studies*, 30(8), 1341.

<sup>86</sup>. Easterlow, D., Smith, S. J., & Mallinson, S. (2000). Housing for Health: The Role of Owner Occupation. *Housing Studies*, 15(3), 374.

<sup>87</sup>. Ibid 380.

<sup>88</sup>. Connolly, H., Marino, S., & Martinez Lucio, M. (2019). Immigrants and trade unions in the European context. The politics of social inclusion and labor representation.

<sup>89</sup>. Castellani, S., & Roca, B. (2022). Bricolage in labor organizing practices: Spanish and Italian migrant activists in Berlin. *Journal of Industrial Relations*, 64(1), 5.

& Barglowski (2015) point out that migrant workers get social protection through family, and community rather than unions<sup>90</sup>. But within a family the cost of self-building is significantly higher.

“Just as the informal sector is not a solution to unemployment, so self-provided housing is not a direct answer to housing disadvantage.”<sup>91</sup>

In the global south self-help has been pushed as an economic mean to respond to housing. It has been argued that self-building is more responsive to housing crisis than centralized housing<sup>92</sup>. But it is important to understand that it is not a solution for all and measured must be put in place to prevent inequalities. Surprisingly no study has analyzed this issue beyond a short comment. This is important as these problems reinforce social injustices and can also exist in conventional construction.

### 3.5 Housing access for low-income:

Low-income groups have little opportunity for access to homeownership. Some public housing programs have aimed in that direction but it is expensive. In regions where these expenses are less prominent, bricolage can be the only option. Gonick (2015) notes that in Spain poverty housing are caused by an important real estate pressure. Brown (2007) also argues that self-build is the only affordable means of housing access for some families in an expensive region. This is therefore avoidable by limiting speculation but it can also be the "[...] only method whereby the lower income groups could obtain a permanent home of so high a value."<sup>93</sup> For many households this means more quality and more space

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90. Bilecen, B., & Barglowski, K. (2015). On the assemblages of informal and formal transnational social protection. *Population, Space and Place*, 21(3), 203-214.

91. Duncan, S. S., & Rowe, A. (1993). Self-provided Housing: The First World's Hidden Housing Arm. *Urban Studies*, 30(8), 1344.

92. Ibid 1345.

93. Lashley, T. O. (1953). Barbados. In *Summary of the Proceedings of the Aided Self-Help Housing Seminar-Workshop*. 48

than what they could obtain on the housing market. Several studies show the importance of homeownership for low-income groups as a financial asset and safety net<sup>94 95</sup>. According to the CAHF (Centre for Affordable Housing Finance Africa), 80% of income go toward housing in sub-Saharan Africa. This shows that housing holds wealth and particularly for those have not much else<sup>96</sup>. Interestingly some studies have shown that bricolage is not only a product of use value but self-builder also consider speculative value as they build their homes<sup>97</sup>. In Toronto, self-builder even started a form of small-scale contracting, reselling the product of their labor and building with acquired skills their new house<sup>98</sup>. This goes to show that although bricolage is not made to be sold, the wealth it represents is for low-income group essential.

Policy of self-help have been aimed at responding to impoverished groups. In 1931, in Germany, unemployed workers were resettled with enough land for subsistence farming, under a homestead act<sup>99</sup>. In Detroit, worker housing has been provided mainly though self-build<sup>100</sup>. But even without a clear policy, in rural Andalusia, self-construction with families and social network was common as no housing industry was really developed<sup>101</sup>. In the US-Mexico border, self-help ‘colonias’ have been documented as migrant can’t access conventional market<sup>102</sup>. In the case of castors, initially the program was aimed at factory workers, but over time this shifted to a middle-class housing, notably civil servants<sup>103</sup>. This shows that self-building is first made out of necessity. Surveys addressed to self-builders show that economics plays more importance than self-expression<sup>104</sup>. While Burgess (1977) argues that self-help is cheaper only because of sweat equity and not absence of profit margins, low-income groups are willing to spend time and labor for it, especially

94. Easterlow, D., Smith, S. J., & Mallinson, S. (2000). Housing for Health: The Role of Owner Occupation. *Housing Studies*, 15(3), 382.

95. Harris, R., & Giles, C. (2003). A mixed message: The agents and forms of international housing policy, 1945–1973. *Habitat International*, 27(2), 176.

96. Dafeamekpor, C. A., Adjei-Kumi, T., Nani, G., & Kissi, E. (2022). Criteria for Assessing Self-Help Housing Projects Affordability: A Critical Literature Review. *Journal of Real Estate Literature*, 30(1–2), 26.

97. Bossuyt, D. M. (2021). The value of self-build: Understanding the aspirations and strategies of owner-builders in the Homeruskwartier, Almere. *Housing Studies*, 36(5), 708.

98. Harris, R. (1991). Self-Building in the Urban Housing Market. *Economic Geography*, 67(1), 1–21. 20.

99. Harris, R. (1999). Slipping through the Cracks: The Origins of Aided Self-help Housing, 1918–53. *Housing Studies*, 14(3), 291.

100. Harris, R. (1991). Self-Building in the Urban Housing Market. *Economic Geography*, 67(1), 1–21. 4.

101. Díaz-Parra, I., Candón-Mena, J., & Zapata, C. (2024). Round Trip Policies: Housing and Self-Management, from Europe to Latin America and Back Again. *Antipode*, 56(2), 457.

102. Durst, N. J., & Cangelosi, E. J. (2021). Self-help housing and DIY home improvements: Evidence from the American Housing Survey. *Housing Studies*, 36(8), 1233.

103. Boustingorry, J. (2008). *Des pionniers autoconstructeurs aux coopérateurs: Histoire des Castors en Aquitaine* [Phd thesis, Université de Pau et des Pays de l'Adour]. 231.

104. Duncan, S. S., & Rowe, A. (1993). Self-provided Housing: The First World's Hidden Housing Arm. *Urban Studies*, 30(8), 1341.

when they are unemployed. A micro-economics study, has shown that there is a direct causality between unemployment rate and self-building<sup>105</sup>. It is argued here that self-help makes sense only when personal wage rate is lower than market labor prices. In other words, self-building is only profitable as long as hired labor is more expensive than what we value personal labor. While this is intuitive, another study has shown that the market doesn't respond to very low-cost housing and that there is a 'self-build threshold' under which profit for contractors or speculative builder is too low<sup>106</sup>. This has been proved statistically as there is threshold gaming appearing just above this line. Its important to see here that this applies to self-builder by need rather than by choice and therefore doesn't reflect all self-builders.

There are several historical examples and quantitative data that support that self-building has been a practice for low-income groups and that respond to pressures and conditions that are slightly different from the conventional market. There isn't however, in our corpus, a study of the long-term effects of these forms of housing on households. For example, maintenance and repair can be assumed to have an important economic effect and therefore may open a more nuanced understanding of self-help for low-income groups.

### 3.6 Long term labor:

Time is of course an important component of bricolage. First of all, it can be a luxury that not all have. There is a tradeoff in using one's time and taking the time to learn and produce<sup>107</sup>. In case studies of collaborative housing, some people are more prone to invest time in the project, due to work situation: freelance,

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<sup>105</sup>. Jimenez, E. (1982). The economics of self-help housing: Theory and some evidence from a developing country. *Journal of Urban Economics*, 11(2), 211.

<sup>106</sup>. Harris, R. (1991). Self-Building in the Urban Housing Market. *Economic Geography*, 67(1), 1–21. 4.

<sup>107</sup>. Jimenez, E. (1982). The economics of self-help housing: Theory and some evidence from a developing country. *Journal of Urban Economics*, 11(2), 206.

<sup>108</sup>. Laine, M., Helamaa, A., Kuoppa, J., & Alatalo, E. (2020). Bricolage in Collaborative Housing in Finland: Combining Resources for Alternative Housing Solutions. *Housing, Theory and Society*, 37(1), 111.

flexible hours, part-time,...<sup>108</sup>. This shows again that there is an unequal access to bricolage. In some cases, workers have to spend their hard-earned time off, making it difficult as well as unhealthy. Others with more flexibility adapt their work situation around this lifestyle. For example, truck nomads in Reitz (2016)'s study alternate periods of repair and maintenance and periods of full-time work<sup>109</sup>. This difference in how much time can be provided for bricolage, can also explain why some prefer hired labor although economies can be made by self-managing. In fact, skill level is not the first reason why people avoid bricolage as previous experience is not correlated to output<sup>110</sup>. Many underestimate the skill and time required and start such a project. Although self-provision and self-building can take very different time to be completed, some studies have tried to measure the average time spent on building. Rowe (1991) notes that a Canadian self-build program requires 6-9 months with all leisure time allocated; Harms (1982) measure 2000 to 2500 hours spread between 1.5 to 2 years, in west Germany; Harloe and Martens (1990) highlights that there is a maximum of 1100 hours per year for full-time worker. In Mariana, workers have 450 mandatory days of labor that they can replace by a hired builder at a set price<sup>111</sup>. In an Italian coop self-help housing, each household had to provide 900h of labor plus organization time<sup>112</sup>. This goes to show that self-building is a long process that is more subject to abandonment in case of financial or physical accident. The recognition and measure of time spent can therefore be a way to evaluate not just productivity but also prolonged risks. This recognition of time can also be important for self-building for full-time workers. In early 1930s Berlin, in a rare case, workers were able to bargain with Siemens, and earned two paid days a week to build their home<sup>113</sup>.

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<sup>109.</sup> Reitz, L. M. (2016). *Assembler son quotidien sur la route: Une ethnographie de l'habiter mobile contemporain*. [Phd thesis, École Polytechnique Fédérale de Lausanne]. 138.

<sup>110.</sup> Jimenez, E. (1982). The economics of self-help housing: Theory and some evidence from a developing country. *Journal of Urban Economics*, 11(2), 219.

<sup>111.</sup> Candón-Mena, J., Domínguez, P., & MacFarlane, T. (2020). Self-build housing schemes in Mariana from the perspective of Ostrom's concept of self-governance in common-pool resource situations. *An International Journal for Critical Geographies*, 19(3), 686.

<sup>112.</sup> Bronzini, M. (2017). Contested issues surrounding social sustainability and self-building in Italy. *International Journal of Housing Policy*, 17(3), 360.

<sup>113.</sup> Harris, R. (1999). Slipping through the Cracks: The Origins of Aided Self-help Housing, 1918-53. *Housing Studies*, 14(3), 292.

But most importantly, bricolage can also show a potential for long-term construction and incrementalism. While this may pose new issues, such as guarantying safety, incrementalism can better adapt to resources and be more democratic. One must not necessarily amass capital to build but can do so over a long period progressively arriving to a more qualitative building. This has been observed in US self-construction, first relying on fast solution and more expensive solutions such as trailers and mobile-home and then with a more solid house that remained for a long time unfinished<sup>114</sup>.

Overall, research on labor duration has focused on measuring and lacks qualitative data to understand how, users live in unfinished houses or whether long term construction is perceived as flexible or constraining.

### 3.7 Risk taking:

Although self-building can be considered as a democratization of building, construction presents several health risks. Workers are exposed to slipping, falling, being crushed, electrical hazards and toxic substances<sup>115</sup>. This implies taking preventive measures with regulation. But it has also been shown that self-employment, and by extent bricolage, can cause stress issue<sup>116</sup>. Similarly, homeownership and the responsibility that come with it can also act as a stress factor (Burrows, 1998; Nettleton, 1998; Nettleton & Burrows, 1998). There are reasons to be skeptical of bricolage if these health risks are not taken seriously. In the various groups self-build programs, some form of regulation was put in place to avoid risks. Some tasks are also left to trained professional as risks are simply too high.

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<sup>114</sup>. Durst, N. J., & Cangelosi, E. J. (2021). Self-help housing and DIY home improvements: Evidence from the American Housing Survey. *Housing Studies*, 36(8), 1233.

<sup>115</sup>. Bosch, G., & Philips, P. (2003). *Building chaos: An international comparison of deregulation in the construction industry*. Routledge. 7.

<sup>116</sup>. Ibid 205.

But bricoleurs are also subject to financial risks. In Bosch & Philips (2003) article on deregulation in the building industry, it is argued that in the UK where self-employed worker represent 50% of the workforce, they are particularly unprotected. Insurance costs are higher, compensation lower and while flexibility can present an advantage this has been led to longer working hours and lower revenue<sup>117</sup> <sup>118</sup>. Simply put self-employers lose all their wage bargaining benefits and have no institutional protection<sup>119</sup>. A similar observation is made by Naik (2009) for informality. There are low levels of labor organization in informal economy and contractual agreements with formal guarantee are absent. Sanga & Mselle (2018) list many other research on informality that have shown an absence of formal employment (Wells, 2007; Mitullah & Wachira, 2003; Owusuua, 2012; Lukiyanto, Setiawan, Troena, & Noermijati, 2015) and Jason (2008) has made evident the link between informality and lack of wage protection<sup>120</sup>.

Overall, one of the main critics of bricolage resides in the fact that there is a shift of risks from institutions to users. The increased interest in bricolage can therefore reflect more neoliberal tendency:

“self-help has seemed to some critics only an opportunity for neoliberal politics to release the cost of social housing among many different actors and for the State to abdicate to its redistributive role.” <sup>121</sup>

This is particularly problematic for the more vulnerable who need financial support and that austerity measure might suppress. This can raise questions of ‘responsibility dumping’<sup>122</sup>. As J.F.C. Turner, one of the first advocate of self-help

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<sup>117</sup>. Ibid 20.

<sup>118</sup>. Ibid 42.

<sup>119</sup>. Ibid 202.

<sup>120</sup>. Sanga, S. A., & Mselle, J. (2018). Informal Construction Practices as Knowledge Incubators: A Conceptual Framework. *Business and Economic Research*, 8(1), 28.

<sup>121</sup>. Pecoriello, A.L. (2013). Housing front line: The self-production of Habitat. Planum. *The Journal of Urbanism*, 27(2), 66.

<sup>122</sup>. Abenia, T., Chénin, M., Dell, C., Duperrex, M., Estevez, D., Howa, M., & Léglise, F. (2021). Une architecture performative. Perspective. *Actualité en histoire de l'art*, 2, Article 2. 70.

says in *Housing by People*: “The obligation to build your own house could be as oppressive as being forbidden to do so”<sup>123</sup>.

Interestingly one can also note that architecture has tried to respond to self-help housing, PREVI housing in Chile, Mexacali project in Mexico, Aranya project in India, or even on paper such as the plan Obus in Alger of Le Corbusier, but it can be argued that the incremental dimension is always limited by the contractual and time-restricted role of the architect. Therefore, it is a product that is made to accommodate change but the change is not made by the architect. In the case of the acclaimed PREVI housing project, De Castro Mazarro (2015) argues that the disappearance of the initial project can be interpreted both as a success and a failure as appropriation does take place but progressively the concepts of the architects are erased<sup>124</sup>. On another level the acclaimed work of Lucien Kroll, Mémé has also been criticized by Geert Bekaert for having an aesthetic of accidentality. This goes to show that architects who engage in incrementalism can only mimic in the limited time of their contract the effect of long-term change.

One of the famous examples where this is particularly clear is the awarded project of Aravena’s Elemental, in northern Chile that has gained so much success that 12 programs and 2.045 homes have used this same model<sup>125</sup>. This project aims to relocate migrants that have self-build their homes with scrap materials from a nearby shipping port. To do so with limited means, the architect builds half the surface of each home and imagine that self-builders will complete the rest. In fact, users did participate and completed the rest of the houses. But Boano & Vergara-Perucich (2016) criticize a neo-liberal approach that aestheticizes poverty

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123. Turner, J. F. C. (1977) *Housing by People: Towards Autonomy in Building Environments*. (1st ed.). Pantheon Books. 169.

124. De Castro Mazarro, A. (2015). *The Challenge of Time-Based Design Strategies: Learning from Latin American incrementalism*. 68.

125. O’Brien, D., & Carrasco, S. (2021). Contested incrementalism: Elemental’s Quinta Monroy settlement fifteen years on. *Frontiers of Architectural Research*, 10(2), 3.

and reproduce inequalities. In fact, the informal construction parts are very heterogenous and reflect inequalities. O'Brien & Carrasco (2021)'s article also shows that while Elemental had delimited a zone where informal construction is possible of 72m<sup>2</sup>, in reality, up to 252m<sup>2</sup> can be observed as construction also covered ventilation shafts and public space and an added floor. This has direct consequences on the structural integrity, ventilation and light. In many ways the informal part of the project was very similar to the settlement that it was meant to replace. Even the materiality that given that nothing was made to change it still came from the same shipping port<sup>126</sup>. This shows that the architect does not have control over the evolution of the building and such core-housing initiative don't affect how informal spaces are built. The responsibility of finding, buying, assembling and using materials are left to the users and while the initial project of Elemental is qualitative, the responsibility of the degradation of spatial qualities ultimately falls on the user that was not properly helped.

This shows that choice, responsibility and participation are all linked in bricolage and projects that engage in bricolage must keep an eye on this issue. This also shows that we need to measure post-occupancy on a long term to understand how successful a project is. For architecture, this shows that a more complete understanding of building evolution can help evaluate good from bad spatial evolution.

### 3.8 Lack of visibility:

While it is assumed that bricolage is a marginal process of construction, statistical studies have shown that it represents a significant proportion of housing.

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126. Ibid 23.

127. Duncan, S. S., & Rowe, A. (1993). Self-provided Housing: The First World's Hidden Housing Arm. *Urban Studies*, 30(8), 1334.

Duncan & Rowe (1993) report that in 1980, 23% of Canadian housing is self-provided; 12% in Stockholm is self-provided, including 10% self-built; 30% in Île-de-France is self-provided<sup>127</sup>. In America, Durst & Cangelosi (2021) report that a third of houses were self-built in 1949, especially in rural areas where the percentage is 8 times higher than in central cities<sup>128 129</sup>. In France, Sigaud (2017) finds the percentage of 7.6% of self-builder in 1984<sup>130</sup>. And more recent data in the UK, reports that it represents 12.000 homes per year in 2013, representing approximately 7.6% of new housing stock<sup>131</sup>. While these numbers aren't showing that self-building is generalized in any way, they do attest that it is a practice worth exploring particularly considering it has remained by and large untheorized and no policy have been made in that direction.

We can only see glimpses of legal recognition for example in the case of the highly formalized castor program. The association employed a form of labor called 'apport-travail' giving a value for labor that can replace capital. In 1951, the 'apport-travail' has been recognized into law<sup>132</sup>. This helped legitimized the association and most importantly gain access to public funds. While the castor movement proclaimed to be opposed to top-down state housing, they still desired state recognition and presented themselves as the main countermodel of housing besides HLM housing. More recently also in France, the ALUR law of 2015, started a process of recognition of alternative modes of habitation, permitting for example nomadic households, access to credits<sup>133 134</sup>. While it is a first step, a structured public policy that goes beyond criminalization or recognition of unconventional housing is necessary to properly assist the statistically significant that it represents.

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<sup>128.</sup> Durst, N. J., & Cangelosi, E. J. (2021). Self-help housing and DIY home improvements: Evidence from the American Housing Survey. *Housing Studies*, 36(8), 1234.

<sup>129.</sup> Ibid 1237.

<sup>130.</sup> Sigaud, M. (2017). *La pratique de l'auto-construction comme base de mise en place d'une société conviviale*. [Master thesis, Université Grenoble Alpes]. 16.

<sup>131.</sup> Wallace, A., Quilgars, D. J., & Ford, J. (2013). Build It Yourself? Understanding the changing landscape of the UK self-build market. 15.

<sup>132.</sup> Boustingorry, J. (2008). *Des pionniers autoconstructeurs aux coopérateurs: Histoire des Castors en Aquitaine* [Phd thesis, Université de Pau et des Pays de l'Adour]. 23.

<sup>133.</sup> Reitz, L. M. (2016). *Assembler son quotidien sur la route: Une ethnographie de l'habiter mobile contemporain*. [Phd thesis, École Polytechnique Fédérale de Lausanne]. 325.

<sup>134.</sup> Sigaud, M. (2017). *La pratique de l'auto-construction comme base de mise en place d'une société conviviale*. [Master thesis, Université Grenoble Alpes]. 64.

But some studies have also pointed out an erasure of self-building in history only acknowledging self-help in the global south reinforcing the problematic rhetoric of western progress. For instance, after the 1<sup>st</sup> and 2<sup>nd</sup> world war, self-building has been widely used across Europe, but not recognized as a real model of reconstruction<sup>135</sup>. In 1904, the ‘our home loan fund’, the first self-help program, was made in Sweden and has been a model repeated in Europe before being reproduced in the global south<sup>136</sup>. In the UK, a plot-landers movement occupied small unused agricultural parcel to self-build shacks and progressively turn them into permanent residences<sup>137</sup>. They were criticized for ‘changing the landscape’ and soon made illegal. From 1942 to 1975 Canada aided self-builder with financial, legal and technical assistance through their “Build Your Own Home” (Schulist and Harris 2002). Since then, a lot of experts in international organization such as the UN and USAID have promoted self-help for the global south, which was not necessarily applied<sup>138</sup>.

One of the reasons why, this form of labor does not get a proper recognition might be because of the domestic space in which it occurs. Besides directly asking practitioner, it is hard to understand how much time and effort has been made. This has been the cause of frustration for some as even within a community, the work behind an object is not comprehended<sup>139</sup>. In many cases, the fact that labor is done during time off has associated it to a recreational activity. While some do engage in bricolage first and foremost for leisure, it still is a productive activity. In fact, the design elements are easily recognized while most of the labor is technical<sup>140</sup>.

Another reason why bricolage is not properly recognized is its impossibility to

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<sup>135.</sup> Harris, R. (1999). Slipping through the Cracks: The Origins of Aided Self-help Housing, 1918-53. *Housing Studies*, 14(3), 282.

<sup>136.</sup> Ibid 283.

<sup>137.</sup> Ward, P. M. (2019). Self-Help Housing. In A. M. Orum, The Wiley Blackwell Encyclopedia of Urban and Regional Studies (1st ed., pp. 1–6). Wiley. 2.

<sup>138.</sup> Harris, R., & Giles, C. (2003). A mixed message: The agents and forms of international housing policy, 1945–1973. *Habitat International*, 27(2), 168.

<sup>139.</sup> Reitz, L. M. (2016). *Assembler son quotidien sur la route: Une ethnographie de l’habiter mobile contemporain*. [Phd thesis, École Polytechnique Fédérale de Lausanne]. 217.

<sup>140.</sup> Ibid 225.

be cartographed. First, it has been argued that spaces of informality are ever changing and highly subjective to a certain definition of informality<sup>141</sup>. In addition, information on informality is limited. In an Indian case study of Hyderabad, Lavigne & Dufresne (1988) show the difficult access to information about informality. Some have tried to represent these spaces in Slum atlas, or Atlas of informality but these approaches are limited by a typological approach that reduce bricolage to a certain typology looking only at the material outcome and not the process<sup>142</sup>. As a counter example we can note here that the castor housing do not presents themselves as a self-build space.

The consequences of this lack of visibility of labor have not been studied but one can expect that work-related conflicts and injustices are hidden and unable to get a proper resolution.

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In general, research on bricolage labor has mainly focused on the political ideology and group organization of labor, neglecting in the process the more blury intersection between bricolage and labor duration, bricolage and informality, bricolage and risk, or bricolage and internal division of labor. There is a need for a more thoroughly understanding of labor as sweat equity is at the core of bricolage and changes all the principles of how labor is organized for construction, in terms of time, group organization, but also risks.

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<sup>141</sup> Reitz, L. M. (2016). *Assembler son quotidien sur la route: Une ethnographie de l'habiter mobile contemporain*. [Phd thesis, École Polytechnique Fédérale de Lausanne]. 306.

<sup>142</sup> Kraff, N. J., Wurm, M., & Taubenböck, H. (2022). Housing forms of poverty in Europe—A categorization based on literature research and satellite imagery. *Applied Geography*, 149, 102820. 3.

## 4. RESOURCES:

### 4.1 Barriers for self-building:

A number of barriers can and have been listed for self-building. A study on self-help affordability lists issues with the following criteria: financing, land access, building quality, control and regulation, building costs, location, infrastructure, and social<sup>143</sup>. All these issues show once again the need to tackle self-building at its material roots allowing it to have a proper access to building supplies, infrastructure, financing to ensure a good outcome. In the Bangdome-Dery, Eghan & Afram (2014) study on self-help in Ghana, the author lists all factor having an influence on self-building and while some such as land ownership, experience, motivation and financial capacity are related to the self-builder, most show a network of actor that ultimately affect the outcome. [see figure 4]

Here to develop further we will show other research that have pointed out financial, material and social barrier that may limit or degrade self-building.

In the case of financing, people who engage in self-building have fewer financial needs than conventional construction as costs are lower. Self-providers have borrowed 10-20% less on mortgage<sup>144</sup>. However, what they do have to borrow is limited by banks who consider self-building riskier for several reasons: failure to control costs; delays; limited demand; regulatory requirements; inadequate finance; inability to value incomplete or unique properties<sup>145</sup>. In addition to that workers insurance is often not applicable and therefore access to loans restricted<sup>146</sup>. This means that self-builder needs to rely of their own financial resources which puts them at risk in the case of an accident or financial difficulties especially on a long

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**143.** Dafeamekpor, C. A., Adjei-Kumi, T., Nani, G., & Kissi, E. (2022). Criteria for Assessing Self-Help Housing Projects Affordability: A Critical Literature Review. *Journal of Real Estate Literature*, 30(1–2), 38.

**144.** Duncan, S. S., & Rowe, A. (1993). Self-provided Housing: The First World's Hidden Housing Arm. *Urban Studies*, 30(8), 1340.

**145.** Wallace, A., Quilgars, D. J., & Ford, J. (2013). Build It Yourself? Understanding the changing landscape of the UK self-build market. 18.

**146.** Sigaud, M. (2017). *La pratique de l'auto-construction comme base de mise en place d'une société conviviale*. [Master thesis, Université Grenoble Alpes]. 65.

term project<sup>147</sup>.

For materials, location is important. One study ties self-building in suburban regions to the costly access to land in more central areas<sup>148</sup>. This constrains materials provision and make it more dependent on existing infrastructure. In informal settlements in Nairobi, these same constraints have been observed by Celentano & Habert (2021). There, a whole neighborhood has been self-build depending on a limited number of small shops for materials. These shops have been built in proximity to road infrastructure<sup>149</sup>. In such a context, material choices are limited by delivery rather than construction method. It is shown that for example, Corrugated sheets are chosen for their storability, weight, availability and construction time<sup>150</sup>. This is an example that takes place in a dense environment but similarly to rural area in western countries, the market is less developed and choices of material is limited. The supply chain in informal construction also tends to have more intermediaries and manufacturers just as much as international aid does not reach all actors<sup>151</sup>. Where materials do not attain self-builder or for cost reason, material can be recuperated under the condition that there are people who discard.

But there are also social resource barriers. For instance, bricolage can be improved with aid or training from experts which require a network and which can be geographically heterogeneous. In group bricolage, the collaborative process can be laborious and limit the feasibility of a project if not managed properly<sup>152 153</sup>.

Because of all these constraints, it can be said that self-builder fall victim to what is present and lacks real agency. Sufficient studies have proved that self-building is a complex process with several issues, we must now compare in details how it

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<sup>147</sup>. Ibid 59.

<sup>148</sup>. Harris, R. (1991). Self-Building in the Urban Housing Market. *Economic Geography*, 67(1), 1–21. 14.

<sup>149</sup>. Celentano, G., & Habert, G. (2021). Beyond materials: The construction process in space, time and culture in the informal settlement of Mathare, Nairobi. *Development Engineering*, 6, 100071. 11.

<sup>150</sup>. Ibid 15.

<sup>151</sup>. Ibid 14.

<sup>152</sup>. Laine, M., Helamaa, A., Kuoppa, J., & Alatalo, E. (2020). Bricolage in Collaborative Housing in Finland: Combining Resources for Alternative Housing Solutions. *Housing, Theory and Society*, 37(1), 114.

<sup>153</sup>. Bronzini, M. (2017). Contested issues surrounding social sustainability and self-building in Italy. *International Journal of Housing Policy*, 17(3), 367.

Factors	Sub-factors
Self-builder	Ownership of land property Level of knowledge on building regulation and laws Level of experience in house construction Level of knowledge on cost saving measures Motivation to own a home Level of household financial capacity
Development and planning regulation	Inadequate resources among regulatory bodies Level of bureaucracies in transactions Lawlessness and apathy among staff Communication gaps among regulatory bodies Overlapping roles and responsibilities among regulatory bodies Level of cost of permit transaction Inadequate public education by regulatory bodies Level of infrastructure provisions and access Inadequate decentralized offices of regulatory bodies
Land and tenure	Cumbersome land acquisition procedures Lengthy periods to acquire land Lengthy title registration period Inadequate zoning on land use Rising cost of lands Lack of infrastructures in peri-urban areas Lengthy conflicts litigation on lands
Finance and cost	Lack of mortgage schemes for low moderate households Poor access to finance Poor financial planning Inadequate finance in the system for housing High cost of labor High cost of building materials Inadequate cost estimates Re-works because of poor quality of works Poor financial planning Litigation cost Cost from waste of building materials Cost of consulting building professionals

**Fig 3. (1/3)** Main and subfactors affecting self-build housing programs delivery in Ghana.

Source: Bangdome-Dery, A., Eghan, G. E., & Afram, S. O. (2014). Overview of Self-Help (Self-Build) Housing Provision in Ghana: Policies and Challenges. *Methodology*, 4(6).

Building planning and design	Inadequate pre-design planning
	Level of participation in design process
	Level of consultation of professionals for design
	Architects's assumptions of design adequacy of self-building
	Generalization of design requirements
	Lack of interest of architects to take up self-building
	Self-builders assumptions of design adequacy of self-building
	Level of society's influence on self-building
	Quality of design details on technology choices
	Quality of building materials employed in building
	Quality of formwork for insitu construction activities
	Level of knowledge on cost saving construction technologies among work force
	Quality of workmanship
	High cost of alternative construction technologies
	High proliferation of conventional construction methods
Material and equipment	Poor local materials industry
	High cost of most building materials affected by importation
	Level of availability of alternative building materials
	High transport cost of materials to site
	Level of on-site wastage of materials in use
	Level of thievery of materials by workers
	Quality of storage provisions for materials
	Hire cost of hiring equipment
	Shortage of equipment
	Unskilled equipment operators
	Equipment breakdown
Labor	Quality of skilled labor employed on self-building
	Lack of a credible artisanal recruitment system
	Lack of organized artisanal groups
	Lack of on-site supervision of works
	Workforce absenteeism
	Unstable cost of labor
	Lack of labor management techniques by self-builders
	Level of labor availability both skilled and unskilled

**Fig 3. (2/3)** Main and subfactors affecting self-build housing programs delivery in Ghana.

Source: Bangdome-Dery, A., Eghan, G. E., & Afram, S. O. (2014). Overview of Self-Help (Self-Build) Housing Provision in Ghana: Policies and Challenges. *Methodology*, 4(6).

Project supervision and management	Level of planning
	Inaccurate project cost estimation
	Erratic on-site construction activities
	Level of coordination of project stakeholders
	Quality of on-site management of construction activities
	Level of communication between project stakeholders
	Level of evaluation of project progress
	Self-builder's over influence on construction activities
External	Effects of subsurface conditions such as high water table
	Whether impact on construction works
	Environmental restrictions
	Effects of social and cultural factors
	Unavailability of utilities
	Changes in government laws and regulations
	Force majeure in the form of war, riot, strike, earthquake

**Fig 3. (3/3) Main and subfactors affecting self-build housing programs delivery in Ghana.**

Source: Bangdome-Dery, A., Eghan, G. E., & Afram, S. O. (2014). Overview of Self-Help (Self-Build) Housing Provision in Ghana: Policies and Challenges. *Methodology*, 4(6).

differs from conventional construction to find practical ways of adapting existing supply chains and institutions to support better bricolage.

#### 4.2 State responsibility:

While many actors can have an impact on self-help, state support is the main lever of action. Housing policy exist in all countries and many chose to criminalize informality. In *Housing by people*, J.F.C Turner, gives as an example the case of the superbloque housing project in Caracas<sup>154</sup>. This project aimed to relocate squatters to a government funded housing. This has unplanned effect of attracting work and caused a worse housing condition because of the need to house migrant workers. But deciding to destroy and rebuild informal settlements has also been proven to have detrimental effect on the social and economic network, which can't be rebuilt easily in addition to the moral cost of relocating people<sup>155</sup>. But as a whole even without directly criminalizing informality, top-down approaches undermine the importance of bricolage in housing provision<sup>156</sup>. Even when self-help programs are made, government support is rare. In a study of Ghanaian self-help, 95% of self-help housing is made with no intervention of the government<sup>156</sup>. In Harris (1998)'s paper, it is shown that while in Latin American bricolage is omnipresent, no national policy has been put forward<sup>157</sup>.

As Harris & Giles (2003) synthesizes, government have three main options for housing: directly building cheap housing; help users build and access land; affect the housing market<sup>158</sup>. They argue, that while the first option may seem the most obvious, it is also the most expensive and hasn't been able to provide housing for everyone in the global south. Indeed, public housing often has much higher

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154. Turner, J. F. C. (1977) *Housing by People: Towards Autonomy in Building Environments*. (1st ed.). Pantheon Books. 45.

155. Ibid 96.

156. Izar, P. (2022). Meanings of Self-Building: Incrementality, Emplacement, and Erasure in Dar es Salaam's Traditional Swahili Neighborhoods. *Urban Planning*, 7(1), 318.

157. Harris, R. (1998). The silence of the experts: Aided self-help housing, 1939–1954. *Habitat International*, 22(2), 179.

158. Harris, R., & Giles, C. (2003). A mixed message: The agents and forms of international housing policy, 1945–1973. *Habitat International*, 27(2), 174.

standards, imported materials and can be unsuitable to tropical climate or cultural norms. This has made public housing particularly expensive in these contexts and unable to house low-income groups. Since the 1950s international organization have advocated for self-help in all countries that can't provide public housing cheap enough to be accessible for all their population<sup>159</sup>.

The term 'self-help' was first coined by J. Crane in 1948 with the important prefix 'aided'. Aided-self-help was therefore meant to constitute a form of aid rather than a laissez-aller policy. But over time self-help has been developed often without the aid. This was led Bangdome-Dery, Eghan & Afram (2014) to distinguish aided self-help from unaided self-help and institutional self-help. This last one corresponds to the previously presented group structures that support self-help without necessarily being supported by the state<sup>160</sup>. In aided self-help, government can aid in many ways: financial support for land, materials or tools, but also provide technical assistance, advice, building standards and publications<sup>161</sup>. One example could be the *Handbook for village workers* that has been published precisely for this purpose<sup>162</sup>. No self-help program has however looked at all these previously listed actions, but rather a selection which might explain varied results. For example, the provision of brick making machines with technical assistance and training has no effect on land, labor or administrative issues.

Over time, self-help, has fallen out of favor for more direct support in the form of site-and-services, advocated mainly by J. Habraken<sup>163</sup>. This policy ensured the proper construction of building or infrastructure such as 'wet-core' for WASH<sup>164</sup>. While core-housing seemed promising, results didn't prove its efficacy and in the

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<sup>159.</sup> Harris, R., & Giles, C. (2003). A mixed message: The agents and forms of international housing policy, 1945–1973. *Habitat International*, 27(2), 183.

<sup>160.</sup> Bangdome-Dery, A., Eghan, G. E., & Afram, S. O. (2014). Overview of Self-Help (Self-Build) Housing Provision in Ghana: Policies and Challenges. *Methodology*, 4(6), 81.

<sup>161.</sup> Duncan, S. S., & Rowe, A. (1993). Self-provided Housing: The First World's Hidden Housing Arm. *Urban Studies*, 30(8), 1342.

<sup>162.</sup> Harris, R. (1998). The silence of the experts: Aided self-help housing, 1939–1954. *Habitat International*, 22(2), 175.

<sup>163.</sup> De Castro Mazarro, A. (2015). The Challenge of Time-Based Design Strategies: Learning from Latin American incrementalism. 71.

<sup>164.</sup> Ward, P. M. (2019). Self-Help Housing. In A. M. Orum, The Wiley Blackwell Encyclopedia of Urban and Regional Studies (1st ed., pp. 1–6). Wiley. 5.

1970s the World Bank soon abandoned this policy in favor of an ‘enabling policy’<sup>165</sup>. This change was so fast that Harris & Giles (2003) argue that there have only been two policies: self-help and enabling and other options were never put in place at a large scale<sup>166</sup>.

Enabling which is still the main policy today, corresponds to affecting the housing market. This neo-liberal policy hoped to boost through housing delivery also other parts of the economy, but results have been criticized for mainly supporting a selection of the economy and only the private sector<sup>167 168</sup>. Harris & Giles (2003) also criticize the implementation of this policy as a result of the personal beliefs of economist D.A. Turin at the time head of the ECA in the same way that self-help was a policy as first initiated and supported by one man: J.F.C Turner<sup>169</sup>. Turin aimed for construction industry to become more efficient and he saw self-help as only a temporary solution. However, nothing has properly proved either argument. Harris & Giles (2003) also point out that enabling policy could have been the product of domestic lobbying in Britain and the US, as international construction companies can expand their market through enabling<sup>170</sup>.

Understanding better what are the different options for a government can allow us to value self-help not only as an option with some advantages and limitation but also compare in which cases it is most-effective. In fact, no option should fully be embraced without comparing with alternatives.

In the following section we will present several case studies to show how diverse self-help provision has been.

First, we can note that some self-help has only looked at land, for example ‘open

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<sup>165</sup>. Harris, R. (1998). The silence of the experts: Aided self-help housing, 1939–1954. *Habitat International*, 22(2), 184.

<sup>166</sup>. Harris, R., & Giles, C. (2003). A mixed message: The agents and forms of international housing policy, 1945–1973. *Habitat International*, 27(2), 183.

<sup>167</sup>. Celentano, G., & Habert, G. (2021). Beyond materials: The construction process in space, time and culture in the informal settlement of Mathare, Nairobi. *Development Engineering*, 6, 100071. 3.

<sup>168</sup>. Bangdome-Dery, A., Eghan, G. E., & Afram, S. O. (2014). Overview of Self-Help (Self-Build) Housing Provision in Ghana: Policies and Challenges. *Methodology*, 4(6), 80.

<sup>169</sup>. Harris, R., & Giles, C. (2003). A mixed message: The agents and forms of international housing policy, 1945–1973. *Habitat International*, 27(2), 180.

<sup>170</sup>. Ibid 178.

development plot' programs have left a perimeter for informal construction to be made without legal persecution<sup>171</sup>. While land is a significant cost for self-builders, this raises the question of interpersonal land relation. Public space is therefore only what is left out and could over time disappear. A 1923 Ghanaian program tried to assist dispossessed people by providing land and building materials but no funding was allocated which in turn only made land available<sup>172</sup>. In 1920s Stockholm, the municipality started to acquire land massively and launched the 'Hem gen om eget arbete', *homes by your own labor*, plan. This program gave at limited costs land for building co-ops<sup>173</sup>. This plan was very successful in delivery but it also had ideological restrictive problems as it only accepted male wage-earners with families<sup>174</sup>. In 1930, Sweden enlarged this program to the whole country with the tenant-owner act which built a legal framework and permitted fundings for co-ops. Vogel & al. (2016) reports that about 50% of all multi-family buildings in Sweden are owned and operated by cooperatives, with Norway the highest percentage in Europe<sup>175</sup>. In Germany since the 1970, several projects of self-building have been made under the name 'baugruppen'<sup>176</sup>. This form of politically engaged co-op, has been able to receive public land at a minimal cost such as in the city of Freiburg, where the municipality kept land for baugruppen<sup>177</sup>. In north America, libertarian ideology matched with homestead policy. This policy, helped by the large territory that was gained, aimed at providing all Americans land to self-sustain and make land more productive. But ultimately this policy has seen a lot of critics. First it was allowed by the confiscation of native land and has been the support of 'manifest destiny' ideology that sought to reach western cultural hegemony. But other critics, such as Catherine Bauer have also pointed out that homestead policy have a

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<sup>171</sup>. Harris, R. (1998). The silence of the experts: Aided self-help housing, 1939–1954. *Habitat International*, 22(2), 180.

<sup>172</sup>. Bangdome-Dery, A., Eghan, G. E., & Afram, S. O. (2014). Overview of Self-Help (Self-Build) Housing Provision in Ghana: Policies and Challenges. *Methodology*, 4(6), 78.

<sup>173</sup>. Harris, R. (1999). Slipping through the Cracks: The Origins of Aided Self-help Housing, 1918-53. *Housing Studies*, 14(3), 289.

<sup>174</sup>. Ibid 290.

<sup>175</sup>. Díaz-Parra, I., Candón-Mena, J., & Zapata, C. (2024). Round Trip Policies: Housing and Self-Management, from Europe to Latin America and Back Again. *Antipode*, 56(2), 451.

<sup>176</sup>. Bronzini, M. (2017). Contested issues surrounding social sustainability and self-building in Italy. *International Journal of Housing Policy*, 17(3), 357.

<sup>177</sup>. Hamiduddin, I., & Gallent, N. (2016). Self-build communities: The rationale and experiences of group-build (Baugruppen) housing development in Germany. *Housing Studies*, 31(4), 368.

segregationist effect, isolating poorer workers and stripping means of assembly<sup>178</sup>. In post-independence Tanzania, the socialist government owned all the land and self-help programs have been put in place with the intent of supplying land to house people in need of housing but this program has not come through or at least at the desired scale mainly for organizational reasons<sup>179</sup>. In Italy although self-help has low public support as it is associated with spontaneous housing during the post-war housing crisis, some initiatives have tried more recently to put it in place<sup>180</sup>. In Marche, Tuscany and Veneto, local projects have been launched with municipal support on public land<sup>181</sup>. However, these programs remain negligible especially since they are in opposition to national directives on planification. Recently, in 2011, the UK passed a 'housing strategy' with a section that planned to double the number of self-built housing<sup>182</sup>. Since this top-down ruling has been put in place, municipality under the National Planning Policy Framework (NPPF) have been required to consider self-build areas<sup>183</sup>. While we have no evaluation of the success of this policy, we can note that this is an important shift government thinking, not solely relying on public housing. By and large land provision policy tends to extracts themselves from the complexity of the building process reducing self-help to a matter of land. These programs are therefore primarily state led and have not always been able to concretize perfectly on the ground for contextual reasons. One way of going about understanding a more complete self-help land policy might be as suggested by Candón-Mena, Jaime & MacFarlane (2020), to look at E. Ostrom's common-pool resource theory. Ostrom argues that community organize themselves to protect certain resources with rules without completely forbidding extraction. In fact, there is a limited land resource that can be locally

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<sup>178</sup>. Harris, R. (1999). Slipping through the Cracks: The Origins of Aided Self-help Housing, 1918-53. *Housing Studies*, 14(3), 293.

<sup>179</sup>. Izar, P. (2022). Meanings of Self-Building: Incrementality, Emplacement, and Erasure in Dar es Salaam's Traditional Swahili Neighborhoods. *Urban Planning*, 7(1), 309.

<sup>180</sup>. Bronzini, M. (2017). Contested issues surrounding social sustainability and self-building in Italy. *International Journal of Housing Policy*, 17(3), 357.

<sup>181</sup>. Ibid 358.

<sup>182</sup>. Wallace, A., Quiggars, D. J., & Ford, J. (2013). Build It Yourself? Understanding the changing landscape of the UK self-build market. 11.

<sup>183</sup>. Ibid 54.

organized by rules, sanctions and conflict resolution system to ensure its viability, without relying on top-down intervention.

Other policies have opted for facilitating material means. In Colombia, a builder led program called ‘Accion Social’ has organized cooperative that can buy bulk construction materials and bargain on local supply chain<sup>184</sup>. In the suburbs around Paris, starting in 1920, ‘lotissements’ were self-built<sup>185</sup>. These shacks often in very bad condition, were considered the shame of Paris. The author argues that the Sarraut law planned to permit improvement of these districts through infrastructures and services. However, no funds were allocated and the communist majority refused to engage in anything other than state housing. In post-civil-war Greece, a ‘self-sheltering’ program focalized on provision of construction materials with administrative backing<sup>186</sup>. This reconstruction plan has been very successful although critics point out that it has caused unequal building quality and rapid urban sprawl. On the outskirts of Lima, Peru, the self-administered city of El Salvador, has been an informal settlement since its origin. Without destroying its fabric, a world bank program has built infrastructure as a site-and-service policy<sup>187</sup>. This initial aid has considerably improved the quality of the city, which has since been formalized by the government. While material and infrastructure supply policy are rare, these examples seem to be quite successful. Further analysis might be necessary to account the effort that have been made to make these policies happen.

The most indirect and expensive form of support is financial support. Interestingly, in 1922, the Soviet Union tried self-help co-ops before having a single policy of public housing. The ‘On the right to build’ plan gave free lots and 2% financing

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<sup>184</sup>. Harris, R. (1998). The silence of the experts: Aided self-help housing, 1939–1954. *Habitat International*, 22(2), 179.

<sup>185</sup>. Ibid 285.

<sup>186</sup>. Harris, R. (1999). Slipping through the Cracks: The Origins of Aided Self-help Housing, 1918-53. *Housing Studies*, 14(3), 297.

<sup>187</sup>. De Castro Mazarro, A. (2015). The Challenge of Time-Based Design Strategies: Learning from Latin American incrementalism. 71.

to co-ops. Sweat equity accounted for 1/5 of construction cost<sup>188</sup>. In America, the Mutual self-help housing technical assistance grants of the Housing Act of 1949, has subsidized families in the form of a mortgage in which labor represents 65% of the payment<sup>189</sup>. No proper study, the author is aware of, has shown the efficacy of these policy, which might be limited especially considering the total responsibility of self-builder for the construction process and quality.

Some policies have aimed to ensure technical expertise. In 1918, in Germany, with a dire housing crisis, squatting and 'wildsiedlungen' appeared. Under public pressure, the government issued some material provision programs and technical assistance for self-construction<sup>190</sup>. Architects were put to the task of ensuring building quality. Erst May, for example choreographed self-construction in Neustadt, Upper Silesia. In Brazilian favellas, 'mutirão' correspond to a community that self-builds through mutual aid<sup>191</sup>. This initiative has been supported by the government. Training and technical assistance is therefore provided through these groups. As a whole, no study has evaluated technical support but we can expect it to be expensive as it requires technicians and time, but the benefits can be quite clear. Diffusion of technical information is studied for international aid programs that have to communicate differently with local construction industry, but in the case of self-help similar efforts can be made to facilitate understanding outside the profession. However as noted by Dafeamekpor, Adjei-Kumi, Nani & Kissi (2022)'s article, in some cases, technical services are avoided by self-builder as it is associated with additional costs<sup>192</sup>. This means that technical support must be mandatory or clear communication must be made to ensure a public adhesion.

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188. Harris, R. (1999). Slipping through the Cracks: The Origins of Aided Self-help Housing, 1918-53. *Housing Studies*, 14(3), 283.

189. Durst, N. J., & Cangelosi, E. J. (2021). Self-help housing and DIY home improvements: Evidence from the American Housing Survey. *Housing Studies*, 36(8), 1235.

190. Harris, R. (1999). Slipping through the Cracks: The Origins of Aided Self-help Housing, 1918-53. *Housing Studies*, 14(3), 286.

191. Sigaud, M. (2017). *La pratique de l'auto-construction comme base de mise en place d'une société conviviale*. [Master thesis, Université Grenoble Alpes]. 18.

192. Dafeamekpor, C. A., Adjei-Kumi, T., Nani, G., & Kissi, E. (2022). Criteria for Assessing Self-Help Housing Projects Affordability: A Critical Literature Review. *Journal of Real Estate Literature*, 30(1–2), 41.

Although not perfect, some policies show a more complete understanding of the situation with a support that covers most of the issues self-builder may be presented with. One such case is the self-help program of the Red Vienna in 1920. Indeed, before gaining recognition for its public housing program the municipal government supported self-help through materials, technical assistance, services, land provision and low-interest financing<sup>193</sup>. This plan was quite successful although most of the construction was made in the outskirts of the city, in Lobau, and land planification led to very isolated cottage housing. Soon critics and especially, Otto Bauer, the political leader of the party, argued that cottage housing boxed women and distracted workers<sup>194</sup>. Although the success of the policy was heavily downplayed, by 1923, on ideological ground a public housing policy was preferred. Another very complete self-help program was the castor program in France, that managed without clear political support and access to bank loans, to obtain land, technical support, and subsidization<sup>195</sup>. First land was obtained at a cheap price with the Church under the condition of building a church, then by formalizing and complying with state ministry of reconstruction, they obtain state funds<sup>196</sup><sup>197</sup>. Although made first and foremost as a measure of control, the state imposed technicians, including an architect who was responsible for the masterplan<sup>198</sup>. Another interesting program was the FUCVAM program in Uruguay to fight for gentrification and desertification of the city centers on Montevideo<sup>199</sup>. This plan depended heavily on state support. Public land inside the city was allocated to co-ops, technical assistance and financial support are also subsidized. This policy has been very successful and has been copied since in other Latin American countries. And lastly, a recent PAV policy has been put in place in the city of Mariana in

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<sup>193</sup>. Harris, R. (1999). Slipping through the Cracks: The Origins of Aided Self-help Housing, 1918-53. *Housing Studies*, 14(3), 288.

<sup>194</sup>. Ibid 287.

<sup>195</sup>. Boustingorry, J. (2008). *Des pionniers autoconstructeurs aux coopérateurs: Histoire des Castors en Aquitaine* [Phd thesis, Université de Pau et des Pays de l'Adour]. 43.

<sup>196</sup>. Ibid 48.

<sup>197</sup>. Ibid 105.

<sup>198</sup>. Ibid 33.

<sup>199</sup>. Díaz-Parra, I., Candón-Mena, J., & Zapata, C. (2024). Round Trip Policies: Housing and Self-Management, from Europe to Latin America and Back Again. *Antipode*, 56(2), 452.

Andalusia and has been let by the municipality. To avoid land cost, land for self-building is maintained by the municipality<sup>200</sup> <sup>201</sup>. But also, after completion a non-speculative agreement protects the cost of living<sup>202</sup>. In addition to this municipal direct implication in the self-building project, funds from the province and municipal council funds are allocated to technical support, machinery and tools<sup>203</sup>. This includes skilled worker and two municipal architects. They have designed the masterplan and made a prototype that was built multiple times<sup>204</sup>. However, we can still criticize this project for being too site specific to be applied somewhere else. In fact, the high unemployment rate and previous uncertified building skill due to part time jobs, make this project particularly easy to implement<sup>205</sup>.

In general, we can understand that policy have been led by state-level, municipal-level, or by association but in rare cases can we find a complete policy that tackles all the problems of self-help. Little has been made to control the supply chain and infrastructure in self-help programs although it represents an important component especially in terms of costs. As noted by Greene & Rojas (2008) and Gilbert (1992) there is a link between availability of infrastructure and affordability. This is particularly important in the global south where material supply depends mostly on imported goods. However, a subsidized material policy may have limited effect if the supply of paid or unpaid labor is limited<sup>206</sup>. Importantly there is little to no observation on the efficacy of these policy or on the ground monitoring. The few studies that do critically analyze the process have a sociological approach relying on interviews. Data should be made to complete these analyses. Although there are examples where the state does contribute actively to bricolage, by and large, these policies have been incomplete and shown little engagement.

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**200.** Candón-Mena, J., Domínguez, P., & MacFarlane, T. (2020). Self-build housing schemes in Marinaleda from the perspective of Ostrom's concept of self-governance in common-pool resource situations. *An International Journal for Critical Geographies*, 19(3), 690.

**201.** Laine, M., Helamaa, A., Kuoppa, J., & Alatalo, E. (2020). Bricolage in Collaborative Housing in Finland: Combining Resources for Alternative Housing Solutions. *Housing, Theory and Society*, 37(1), 113.

**202.** Sigaud, M. (2017). *La pratique de l'auto-construction comme base de mise en place d'une société conviviale*. [Master thesis, Université Grenoble Alpes]. 86.

**203.** Candón-Mena, J., Domínguez, P., & MacFarlane, T. (2020). Self-build housing schemes in Marinaleda from the perspective of Ostrom's concept of self-governance in common-pool resource situations. *An International Journal for Critical Geographies*, 19(3), 685.

**204.** Sigaud, M. (2017). *La pratique de l'auto-construction comme base de mise en place d'une société conviviale*. [Master thesis, Université Grenoble Alpes]. 82.

**205.** Candón-Mena, J., Domínguez, P., & MacFarlane, T. (2020). Self-build housing schemes in Marinaleda from the perspective of Ostrom's concept of self-governance in common-pool resource situations. *An International Journal for Critical Geographies*, 19(3), 695.

**206.** Jimenez, E. (1982). The economics of self-help housing: Theory and some evidence from a developing country. *Journal of Urban Economics*, 11(2), 224.

Program	Location	Form of public support				Main critics
		Land	Infrastructure	Financing	Technical support	
Homestead act	US (1862)	X				Lack of means of assembly for workers; Colonial ideology
'Homes by your own labor' act	Stockholm (1920)	X				Only through coops, more aimed at middle class workers
Housing Construction Act	Vienna (1920)	X	X	X	X	Poor land planning; Lack of means of assembly for workers and women
Sarraut law	Paris (1920')		X			No political backing; no funds
Self-build Siedlung	Germany (1920')				X	[No critics yet]
'On the right to build' act	Soviet Union (1923)			X		Not followed through
Open-development	Ghana (1923)	X				Dis-involvement
Tenant-owner act	Sweden (1930')	X		X		Only through coops, more aimed at middle class workers
Housing act	US (1949)			X		High cost
Castor housing	France (1950')	X	X	X	X	No political support; Highly standardized
Self-sheltering	Greece (1950')		X			Urban sprawl
Ujamaa Villages	Tanzania (1960')	X				No large scale program
F.U.C.V.A.M.	Uruguay (1970')	X		X	X	Only through coops
Baugruppen	Germany (1970')	X				Only through coops, more aimed at middle class workers
Accion Social	Colombia (1980')		X			Dependant of preexisting groups
Mutirão	Brazil (1980')				X	Dependant of preexisting groups
P.A.V.	Marinaleda (1981)	X	X	X	X	High public subsidization; Highly standardized
El salvador city	Lima (1990')		X			No change in building fabric
Independant initiatives	Italy (2010')	X				Non conformity to national plan
Housing strategy	UK (2011)	X				[No critics yet]

**Fig 4.** Synthesis table of aided-self-help programs mentionned (Source: Author construct from litterature)

#### 4.3 Division of land:

While a bricolage project on appearance has nothing to do with land. Examples show that this form of housing does take a lot of land and can be very detrimental to the environment. One reason might be that low-rise construction presents less risks, but there can also be an incentive to divide land in parcels for organizational reasons. As shown in Dafeamekpor, Adjei-Kumi, Nani & Kissi (2022)'s article, land organization is key for self-help housing programs<sup>207</sup>. In fact, such as in the case of Marinaleda or of the castor, the architect's masterplan, but even without the presence of an architect, land division has important consequences. This division of land can also cause inequality and spatial segregation. As shown previously participation isn't always open to all and in some cases gender issues are at play<sup>208</sup>. In the case of colonias in the US-Mexico border, property developers buy large agricultural land without any infrastructure and divide it and sell it at a profitable price to migrant self-builders<sup>209</sup>. This shows that self-builder may lose the bigger picture by focalizing on gaining individual land and this neglects the need for public land. In the case of Marinaleda, one solution to this issue is the collectivization of land and an attribution to a house only after the work<sup>210</sup>. In that way mutual aid labor is executed with the same motivation as for building one owns home. In the case of Almere, a recent self-building program, an initial masterplan was with different models of self-building and public spaces and for each plot a 'plot passport' was made with technical recommendation and site specification<sup>211</sup>. In this case the organization by plot was important to provide technical expertise and guaranty a better-quality construction.

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**207.** Dafeamekpor, C. A., Adjei-Kumi, T., Nani, G., & Kissi, E. (2022). Criteria for Assessing Self-Help Housing Projects Affordability: A Critical Literature Review. *Journal of Real Estate Literature*, 30(1–2), 28.

**208.** Boustingorry, J. (2008). *Des pionniers autoconstructeurs aux coopérateurs: Histoire des Castors en Aquitaine* [Phd thesis, Université de Pau et des Pays de l'Adour]. 97.

**209.** Ward, P. M. (2019). Self-Help Housing. In A. M. Orum, The Wiley Blackwell Encyclopedia of Urban and Regional Studies (1st ed., pp. 1–6). Wiley. 2.

**210.** Díaz-Parra, I., Candón-Mena, J., & Zapata, C. (2024). Round Trip Policies: Housing and Self-Management, from Europe to Latin America and Back Again. *Antipode*, 56(2), 452.

**211.** Bossuyt, D. M. (2021). The value of self-build: Understanding the aspirations and strategies of owner-builders in the Homeruskwartier, Almere. *Housing Studies*, 36(5), 707.

While there is not much information on how land is divided and why, or how linked bricolage is to the land that is available, this theme is important to develop as this can explain whether all the land that is provided is used or whether some form a land preservation does take place. It is also important to develop models of self-building that do not rely on individual detached housing. Research on division of land is therefore crucial to understand how a project can have less destructive bricolage.

#### 4.4 Supply chain:

In Bosch & Philips (2003) article, the authors point out that the construction industry is a particularly turbulent industry with a lot of turnovers<sup>212</sup>. The fact that construction company have to work in different geographies and depend of a demand for construction that has ups and downs, makes it particularly unstable. In many countries, prefabrication therefore helps delocalize construction to manufacturing<sup>213</sup>. But in turn this can also make construction industry more dependent on other sectors of the economy. In the case of bricolage, a shift to manufacturing could be detrimental to bricoleurs as they would have a limited say in the conception unless they gain bargaining power. While no article in our selection has pointed out the link between kit-building and manufacturing, some case studies particularly in post war US point out that manufacturing company have seized an opportunity to control the whole market of self-construction with kit-building. This shows a problem of interconnectedness of the supply-chain and the users. In Behera, Mohanty & Prakash (2015)'s paper on construction

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**212.** Bosch, G., & Philips, P. (2003). *Building chaos: An international comparison of deregulation in the construction industry*. Routledge. 167.

**213.** Ibid 6.

supply management, it is stated that there are phases in construction: conception, procurement, installation and winding up. These steps tend to harm construction as procurement is only done after conception and in general tasks are divided in short-term objectives. This shows that supply chains are highly organized. In Bankvall, Bygballe, Dubois & Jahre (2010)'s paper it is suggested that construction supply chain would be more efficient by being interconnected and adapting to other actor's needs. This means that a private sector completely closed off to the rest of the supply might be less efficient than an open planning with other parts of the construction. In the case of bricolage, users should be more involved in the supply-chain. No research that the author is aware of, present how users can be involved in the supply-chain.

While direct involvement in with the industry is rare and limits itself to bulk-provision and storage, some projects have tried to find alternatives with discarded resources. In the case of the castors in France, one program used machefer, an output of coal heating, that was discarded in the region, to make roads<sup>214</sup>. In another project an 'enduit batard' has been developed as an economic alternative to plaster with what was on site. While these are small and almost insignificant innovation, these show that bricolage has been able to question the supply of material and find local links for example with a different industry that discards. This same phenomenon of localized reuse has been observed in informal settlements in Celentano & Habert (2021)'s paper on Nairobi. Here a second-hand material market exists and does not need any formal structure<sup>215</sup>. Only through mouth-to-mouth communication, each deconstruction is executed in order to resell materials. However new construction cannot be fully supplied by scrap materials. Second-hand market is

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<sup>214</sup>. Boustingorry, J. (2008). *Des pionniers autoconstructeurs aux coopérateurs: Histoire des Castors en Aquitaine* [Phd thesis, Université de Pau et des Pays de l'Adour]. 193.

<sup>215</sup>. Celentano, G., & Habert, G. (2021). Beyond materials: The construction process in space, time and culture in the informal settlement of Mathare, Nairobi. *Development Engineering*, 6, 100071. 12.

mainly used for minor work such as repair or additions. In his book *Rikimbili* (2009), the designer, E. Oroza, looks at repair shops in Cuba and shows that it involves a lot of technological hybridization<sup>216</sup>.

While still dependent on conventional construction supply-chains, the little technical information on bricolage show that it responds differently and makes new links between actors. Studies on bricolage must therefore develop an understanding of how bricolage supply network form and what are the needs and limits of this alternative form of organization.

#### 4.5 Building quality:

One of the major criticisms of bricolage is its built quality. It is assumed that without proper material sourcing and professional experience, construction can't achieve a qualitative outcome. In the studied case of the castors, the group tried to distinguish themselves from other self-construction and fought any association to 'taudis', a pejorative term to describe unhealthy homes<sup>217</sup>. But many studies have tried to question this prejudice. In Johannesburg, self-help was preferred by people to cheap public housing as they could for the same price, have a better-quality housing<sup>218</sup>. Bossuyt (2021) notes that "resident control over housebuilding allegedly results in improved housing quality (Parvin et al., 2011; Turner, 1972)"<sup>219</sup>. Duncan & Rowe (1993), precise that self-builders have an incentive to build well. They also note that surveys show higher satisfaction and lower subsequent mobility.

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**216.** Oroza, E. (2009) *Rikimbili : une étude sur la désobéissance technologique et quelques formes de réinvention* (1st ed.). Publications de l'Université de Saint-Étienne.

**217.** Boustingorry, J. (2008). *Des pionniers autoconstructeurs aux coopérateurs: Histoire des Castors en Aquitaine* [Phd thesis, Université de Pau et des Pays de l'Adour]. 25.

**218.** Harris, R. (1998). The silence of the experts: Aided self-help housing, 1939–1954. *Habitat International*, 22(2), 181.

**219.** Bossuyt, D. M. (2021). The value of self-build: Understanding the aspirations and strategies of owner-builders in the Homeruskwartier, Almere. *Housing Studies*, 36(5), 699.

“Even at the same construction cost level, all the evidence suggests that self-provided housing is certainly no worse than industry-built dwellings and is usually of better quality (Harms, 1982; Harloe and Martens, 1987; Røsnes, 1987; Jennings, 1990; Rowe, 1991)”<sup>220</sup>

In the study of American bricolage, only 9% report problems instead of the 14% of cost-adjusted conventional construction<sup>221</sup>. In the first 20 years after construction, self-builders engage less in renovation work than conventional construction, but over time this difference is reduced. The author argues that this is a sign of a more durable construction but can also be explained by a self-satisfaction for the work done disregarding potential issues. And while self-construction is considered as a health problem, a study on homeownership shows that in the UK mortality rates among owner occupied building is 20-25% lower than renters (Filakti & Fox, 1995)<sup>222</sup>. These same results appear filtering by social class. We want to highlight that homeownership and self-building is very different but this shows that public housing quality may be less of a hygienic solution than what has been argued. This raises the question of whether, self-construction is considered less qualitative because of the biases as it is by and large a construction for low-income groups or whether the process itself of bricolage is the issue.

There are in fact some valid criticism to be made. There is a tendency to have a romanticized understanding of bricolage. For example, the main ideologue of self-help, Turner, has been criticized for not taking into consideration how a suboptimal house can have important consequences on more social aspects<sup>223</sup>. In

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**220.** Duncan, S. S., & Rowe, A. (1993). Self-provided Housing: The First World's Hidden Housing Arm. *Urban Studies*, 30(8), 1340.

**221.** Durst, N. J., & Cangelosi, E. J. (2021). Self-help housing and DIY home improvements: Evidence from the American Housing Survey. *Housing Studies*, 36(8), 1241.

**222.** Easterlow, D., Smith, S. J., & Mallinson, S. (2000). Housing for Health: The Role of Owner Occupation. *Housing Studies*, 15(3), 372.

**223.** Ward, P. M. (2019). Self-Help Housing. In A. M. Orum, The Wiley Blackwell Encyclopedia of Urban and Regional Studies (1st ed., pp. 1–6). Wiley. 4.

fact, outcomes of bricolage are less predictable and, in some cases, disasters can happen. While, as seen above, it is argued that overall, self-building can be more qualitative, the worse cases must be taken in consideration. In Real (2008)'s paper, the author makes a detailed criticism of Anthony Burdin's 2006 art installation, *For day for night* at the biennial of the Whitney Museum of American Art, and Marjetica Petre's 2003, *Caracas: growing house in*, in the Palais de Tokyo. These works both bring elements of an informal settlement directly in a prestigious art space. By doing so, the artists are "reducing objects to signs". This shows that it is hard to convey the on the ground lived experiences of these spaces and the hardships are glossed away in profit of a decontextualized esthetic of informality. While the artists aim to denounce bad living conditions, the result is an admiration of an object without context<sup>224</sup>. Research on informality can have difficulty understanding the true lived experiences of these space as it is affected by biases and a lack of similar lived experiences. While anthropological study can help understand, biases in quantitative research is hard to undue and can lead to having very polarized opinions of the building quality of bricolage.

While quality, especially for architecture, is an important subject, studies show that it is in fact not among the first criteria for households. Turner in *Housing by people* note that most households first take into consideration, location. In fact, job opportunity can lead many households to make concessions, especially with building quality, as long as it doesn't have a significant health effect, the author notes<sup>225</sup>. Some self-help programs have imposed certain materials to ensure a better-quality outcome, but this has also posed issues of affordability, as the imposed materials, that were not subsidized, cost more<sup>226</sup>. The Moatasim (2019) study on

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<sup>224</sup>. Real, P. del. (2008). Slums Do Stink: Artists, Bricolage, and Our Need for Doses of "Real" Life. *Art Journal*, 67(1), 85.

<sup>225</sup>. Turner, J. F. C. (1977) *Housing by People: Towards Autonomy in Building Environments*. (1st ed.). Pantheon Books. 94.

<sup>226</sup>. Dafeamekpor, C. A., Adjei-Kumi, T., Nani, G., & Kissi, E. (2022). Criteria for Assessing Self-Help Housing Projects Affordability: A Critical Literature Review. *Journal of Real Estate Literature*, 30(1–2), 40.

informal kiosks in Islamabad also highlight that materials and assembly can have political implication. In this case, while there is no mean of enforcing sanctions on all illegal kiosk, kiosk that look less temporary are more prone to sanction<sup>227</sup>. Kiosk therefore adopt a ‘long-term temporariness’ that permits a certain tolerance<sup>228</sup>. When enforcement does take place, the simplicity of construction ensured that they can be rebuilt, relocated or repaired easily<sup>229</sup>. This shows that quality may not be a criterion that is important for self-builder and this raises the question of awareness of potential health risks. Subsidized measures can therefore ensure that quality is made even when it is not a priority.

In general, it is important to keep in mind that research on building quality is quite subjective as criterions can be manipulated and opinions are quite polarized. For example, Fiadzo, Houston & Godwin (2001)’s study points out that international organization have used three criteria in the RPI analysis: overcrowding, physical deficiencies and shelter cost. However, Baer, Goedert & Goodman (1977) has shown since that these indicators give a poor understanding of the actual quality<sup>230</sup>. Better criteria are therefore essential to properly evaluate the quality difference of bricolage.

#### 4.6 Shift in resource thinking:

Since the introduction of the term in research by Levi-Strauss, bricolage has been analyzed in comparison to engineering. Derrida argues that bricolage in fact has the same aim of efficiency as engineering but without the western myth<sup>231</sup>. He believes that it is only a social construct that makes un distinguish bricolage from

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<sup>227</sup>. Moatasim, F. (2019). Informality Materialised: Long-term Temporariness as a Mode of Informal Urbanism. *Antipode*, 51(1), 278.

<sup>228</sup>. Ibid 89.

<sup>229</sup>. Ibid 292.

<sup>230</sup>. Fiadzo, E. D., Houston, J. E., & Godwin, D. D. (2001). Estimating Housing Quality for Poverty and Development Policy Analysis: CWIQ in Ghana. *Social Indicators Research*, 53(2), 140.

<sup>231</sup>. Derrida, J. (1978) Structure, Sign, and Playing the Discourse of the Human Sciences. In, *Writing and difference*. University of Chicago Press.

engineering. However, a case can be made that bricolage by revolving around an environment differs from engineering in the classical sense. Bossuyt (2021) argues that it is closer to Dewey (1922) concept of ends-in view<sup>232</sup>. Ends-in-view are flexible goals that vary over time. In fact, Bossuyt argues that aspiration and needs of self-builders are never clearly defined and evolve throughout the course of a project. This can be due to an adaptation of material means and resources. In this example some self-builders add a more sophisticated sustainability goal that was not present in the original intentions. In the most informal ways of practicing bricolage, the act of collecting material becomes important. This has led Reitz (2017) to link it with the concept of 'gleanage'<sup>233</sup>. This practice of foraging discarded resources is not particularly labor intensive but takes a lot of time<sup>234</sup>. There is of course a direct link between how much time is spent searching and the quantity of resources found. More experienced glaneur generally have certain spots that are more prone to findings. In the process of valorizing waste, terminology is particularly important as Nolan (2018) argues. In fact, just as much as the materiality might change to fulfill new purposes, its categorization changes. He notes that this can also be an issue in some case such as with international waste dumping. For example, a famous case of waste dumping, changed the labeling of toxic ash into fertilizer that was able to be unloaded in a port in Haiti avoiding legislative control<sup>235</sup>. How we label discarded good has direct consequences on how it will be used afterwards.

Some have also argued that bricolage because it is a long-term process, also questions the division between conception and making. In Léglise (2022)'s thesis, bricolage is described as a reunification of Aristotle's *praxis* and *poiēsis*<sup>236</sup>. This

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**232.** Bossuyt, D. M. (2021). The value of self-build: Understanding the aspirations and strategies of owner-builders in the Homeruskwartier, Almere. *Housing Studies*, 36(5), 708.

**233.** Reitz, L. M. (2016). *Assembler son quotidien sur la route: Une ethnographie de l'habiter mobile contemporain*. [Phd thesis, École Polytechnique Fédérale de Lausanne]. 260.

**234.** Ibid 263.

**235.** Nolan, G. (2018). Bricolage... or the Impossibility of Pollution. *e-flux architecture*, 26. 8.

**236.** Léglise, F. (2020). *La conception par bricolage comme art de la situation: Architecture, urbanisme, design*. [Phd thesis, Université Toulouse le Mirail - Toulouse II]. 17.

can however be questioned as there is still a process of conception but it evolves during construction. Interestingly, without the architect to plan in advance, there are still drawings made but mainly sketches to help visualize or calculate<sup>237</sup>. In the case of nomadic truck self-builder, representation is observed to mainly depend on sketches but free digital tools are used for initial conception<sup>238</sup>.

Bricolage is therefore a process that takes into account proximity resources and thus is open to evolution in goals, in conception and in representation. While sociological work has well documented this shift in construction thinking, the implications of this change are unclear. Is it impossible to make bricolage with a clear precursory planification? Does it mean that experience can only be gained by making and conceiving at the same time or is one enough to just do one? How does long-term planning occur? How does repair come in this process? Overall, while the fact that bricolage might revolutionize the construction thinking process is unlikely it does give hints to understand how to adapt throughout construction.

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As a whole, research on resource (financial and material) have proven extensively that governments have a decisive role in the provision of housing through bricolage. However, since little has been theorized beyond aided-self-help programs by international organization, there is no understanding of how much this changes the construction industry in terms of actor network, but also resource consumption. The argument that bricolage is more reactive to crisis [see fig. 6] is enough to make this a important subject of study for research. More grounded data on supply-chain, stockage, or building quality can help make bricolage a process just as efficient as conventional construction and more policy makers beyond preconceptions.

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237. Ibid 19.

238. Ibid 215.

Fig 5:

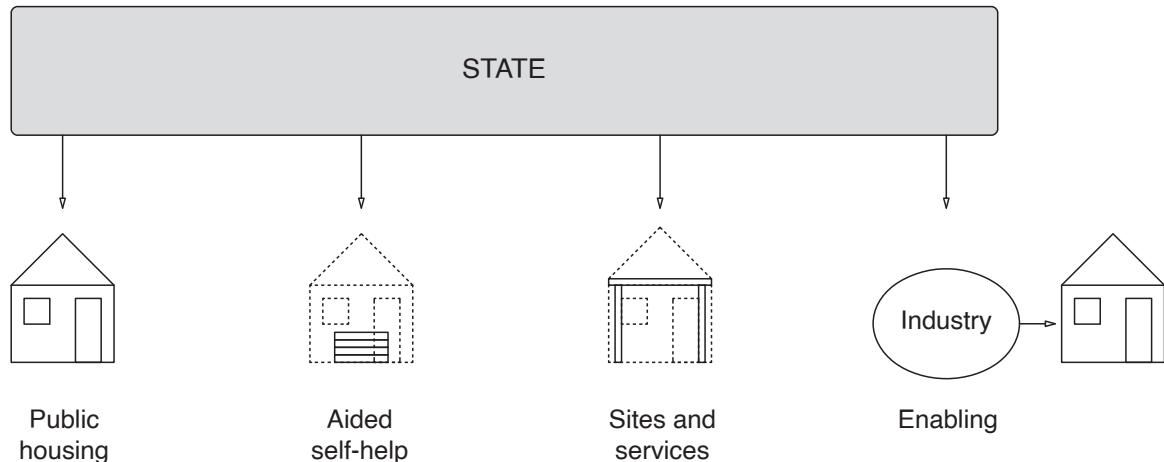
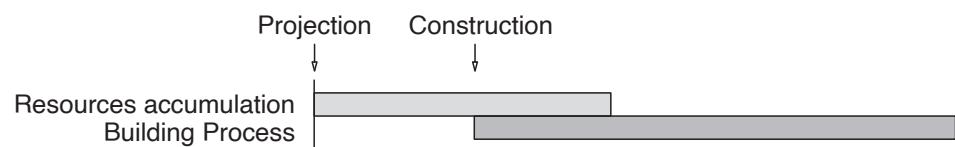
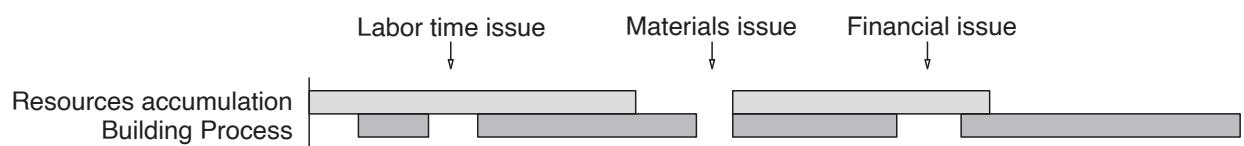


Fig 6:

Conventional construction:



Bricolage:



**Fig 5.** Diagram of different forms of state support

**Fig 6.** Diagram of construction time and resource management

## 5. SKILL:

### 5.1 Difference between artisan and bricoleur:

In the 1990s, Yona Friedman and Jean-Pierre Giovanelli made a project, *Une intervention sur le déchet*<sup>239</sup>. The aim was to value African crafts by sending European waste to African craftsmen to be transformed and shipped back to sell in a Parisian gallery and make it particularly profitable for African communities, using the conceptual art institution as a way to give more value to technical labor<sup>240</sup>. Besides the issues of international exploitation of labor, this project was problematic as it described trained artisans as bricoleur, blurring the actual work and skill that it required, in the same way that using the umbrella term of Africa blurred very different contexts. Bricolage has been used to describe craftsmen in the global south as their skillset is unknown. The fact that 'craftsmen' and 'bricoleur' has been used interchangeably is problematic as these two practices are very different.

First artisan are trained in a particular skill often depending on a specific material, however the bricoleur has more of a general understanding of assembly not limiting himself to a specific craft<sup>241</sup>. Léglise (2022) argues that bricoleur can be assimilated to the multidisciplinary expert of the renaissance<sup>242</sup>. The current system for artisans in Germany is regulated by the Handicrafts Code<sup>243</sup>. This law certifies only recognizes full-crafts and quasi-crafts that have skill but not specialized in a specific craft is not recognized. Changes in skill specialization is particularly difficult<sup>244</sup>. This is one of the reasons why it is not a major practice in Germany and most workers prefer opening up their potential work. As Clarke (2005) notes:

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239. Nolan, G. (2018). Bricolage... or the Impossibility of Pollution. *e-flux architecture*, 26. 1.

240. Ibid 2.

241. Clarke, L. (2005). From craft to qualified building labour in britain: A comparative approach. *Labor History*, 46(4), 475.

242. Léglise, F. (2020). *La conception par bricolage comme art de la situation: Architecture, urbanisme, design*. [Phd thesis, Université Toulouse le Mirail - Toulouse II]. 15.

243. Bosch, G., & Philips, P. (2003). *Building chaos: An international comparison of deregulation in the construction industry*. Routledge. 57.

244. Ibid 86.

“The craft nature of the division of labor in Britain is manifest also on sites. Interfaces, for instance between the door and the wall, tend to be defined by trade”<sup>245</sup>

Secondly, artisan have a system in place that protects their profession. The number of practitioners is limited by the number of apprentices<sup>246</sup>. In Clarke (2012)’s paper, it is argued that although this system evolved in the UK from its introduction in the middle-age to its abandonment during the industrial revolution but the essence of the system was to limit practitioners with licenses and a hierarchical division of class: apprentice, journeyman, workman, artisan and master<sup>247</sup>. This system was put in crisis with the industrial revolution as tools and methods evolved and therefore the acquired skillset, depending on a 7 years apprenticeship, didn’t correspond to actual output or quality<sup>248 249</sup>. This significantly changed the division of class, as journeymen could now access a status of master and there was no difference in roles between a journeyman and a workman. Artisans were particularly mobilized in the Chartism movement, to protect their profession against unlicensed practitioners<sup>250</sup>. Craftsmanship isn’t the main construction system anymore, the structure of artisans is still somewhat in place.

The confusion of bricolage with artisanal work can therefore lead to assumption that bricolage is protected by work unions which is not the case. Understanding how general skill is developed is therefore key to highlighting the difference between bricoleurs and artisans.

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<sup>245</sup>. Clarke, L. (2005). From craft to qualified building labour in britain: A comparative approach. *Labor History*, 46(4), 482.

<sup>246</sup>. Ibid 475.

<sup>247</sup>. Clarke, L. (2012). Building Capitalism (Routledge Revivals) (1 ed.). Routledge. 124.

<sup>248</sup>. Ibid 126.

<sup>249</sup>. Ibid 130.

<sup>250</sup>. Ibid 123.

## 5.2 Innovation:

The most important criticism to be made about self-construction is that innovation doesn't occur as well as in formalized construction. Although the construction process is in fact by and large communal, there is still a risk of an inward-looking practice that could be unable to innovate technically. Bertoni & Catini (2008) also note that there can be a 'self-builder's syndrome', where some self-builder with a particular anti-professionalism mentality believe they can find better solution than what professional propose. This belief however most of the time doesn't manage to concretize as to innovate on a field one must first understand all its aspects<sup>251</sup>. Harris & Giles (2003) point out that self-help doesn't promote a strong and innovative industry which could help on the long term increase the build quality<sup>252</sup>. They add: "aided self-help is necessary but not sufficient"<sup>253</sup>. Some have tried to understand why innovation doesn't happen. Bosch & Philips (2003)'s paper on deregulation shows that in the UK, as a result of deregulation, construction becomes less organized and less dependent on technology and opts for a more low-skill, less equipped and labor-intensive construction<sup>254</sup>. This can also cause an issue in skill retention as individuals don't transfer skill information to other practitioners. In fact, even in the design, Brown (2008) observes that English self-builders generally opt for conservative design.

Duncan & Rowe (1993) notes that self-building can also be unable to compete with more formalized companies in the housing market<sup>255</sup>. This is an issue as instead of having a cohabitation of bricolage and conventional construction that can therefore innovate and meet economic and social needs, there is a chance

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251. Bronzini, M. (2017). Contested issues surrounding social sustainability and self-building in Italy. *International Journal of Housing Policy*, 17(3), 365.

252. Harris, R., & Giles, C. (2003). A mixed message: The agents and forms of international housing policy, 1945–1973. *Habitat International*, 27(2), 176.

253. Ibid 181.

254. Bosch, G., & Philips, P. (2003). *Building chaos: An international comparison of deregulation in the construction industry*. Routledge. 3.

255. Duncan, S. S., & Rowe, A. (1993). Self-provided Housing: The First World's Hidden Housing Arm. *Urban Studies*, 30(8), 1349.

that formalized companies overtake the whole market. This can be observed as a result of ‘enabling’ policies in the global south where a limited number of construction company overtake the entire market. Research on this subject must therefore look for an intermediary model that can take advantage of both models or find a way to regulate conventional construction in order to prevent technical overpowering of bricolage.

### 5.3 Skill certification:

Bricoleur are mainly uncertified. In a study on Nigeria, 38% of informal workers have no training and 32% have only on the job training<sup>256</sup>. Reitz (2017) observes in France that people don’t have technical knowledge before adopting a nomadic life style<sup>257</sup>. Knowledge is only gained during the process. However, some self-builders use general skills that have been acquired over a long time with tasks of repair that have a construction component<sup>258</sup>. The non-construction specialization of a self-builder can however help for specific task. In group structures, interdisciplinary helps organize the group according to prior knowledge. For example, sociologist have been observed to be quite helpful in group coordination<sup>259</sup>. Throughout a project different leaders emerge with an expertise in a particular domain<sup>260</sup>.

Skill certification can have a direct benefit for self-builders. First it can be a mean of earning a revenue with the acquired skill. There are wages based on output, as in the case of the UK, and wages based on certification, such as in Germany<sup>261</sup>. While the first doesn’t need certification, in both cases it is a token of skill. Certification wage also pays better as it is established by collective agreements<sup>262</sup>. However, it is interesting to note that how specific certification is, can also have an impact

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<sup>256</sup>. Anigbogu, N.A. (2002). An appraisal of the Nigerian construction industry informal labour market. *Journal of Environmental Science*, 6(1), 99.

<sup>257</sup>. Reitz, L. M. (2016). *Assembler son quotidien sur la route: Une ethnographie de l’habiter mobile contemporain*. [Phd thesis, École Polytechnique Fédérale de Lausanne]. 118.

<sup>258</sup>. Ibid 257.

<sup>259</sup>. Laine, M., Helamaa, A., Kuoppa, J., & Alatalo, E. (2020). Bricolage in Collaborative Housing in Finland: Combining Resources for Alternative Housing Solutions. *Housing, Theory and Society*, 37(1), 112.

<sup>260</sup>. Ward, P., & Chant, S. (1987). Community leadership and self-help housing. *Progress in Planning*, 27, 79.

<sup>261</sup>. Clarke, L., & Wall, C. (2000). Craft versus industry: The division of labour in European housing construction. *Construction Management and Economics*, 18(6), 690.

<sup>262</sup>. Clarke, L. (2005). From craft to qualified building labour in britain: A comparative approach. *Labor History*, 46(4), 483.

on the division of labor. In the German case, there are 14 different certified trades and in the UK 44, showing a higher division of labor<sup>263</sup>. But Houston & al. (2016) also prove in the case of electronics repair there are tensions between certified practitioners and unlicensed repair shop. The authors point out that there is degree of subjectivity in deciding whether to repair a part or to replace it. The worth of repair is evaluated and can depend on social and material context<sup>264</sup>. In other words, if a product is cheap or of less value to the user, there is less incentive to repair it. But while certified and uncertified repairers agree that “A good repairer erase or minimize the evidence of breakdown (both in term of aesthetics and functionality)”, uncertified repairer engage in ‘looping’, breaking down manufactured parts to repair them instead of replacing by new factory parts<sup>265 266</sup>. The distinction between assembly and repair is subjective. Certification is therefore a way to ensure tidiness and guarantying results but also by going less far in the repair process. While the limit of how far to repair is skill-based, it is also determined by self-restriction and common agreement of practice. The object of repair is tied in this paper to Foucault concept of ‘commodity fiction’<sup>267</sup>. This concept highlights that nothing is ever a commodity as values are personal and evolve.

In addition, certification can be a mean to indirectly promote training, Bosch & Philips (2003) differentiate 4 methods of supporting training in construction: subsidized training, licensing requirement, taxation of companies that don’t invest in human capital and collective bargaining of training<sup>268</sup>. In fact, while contractors don’t have many incentives to train skilled workers, workers themselves want to reduce job security risks by broadening their expertise<sup>269</sup>.

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263. Clarke, L., & Wall, C. (2000). Craft versus industry: The division of labour in European housing construction. *Construction Management and Economics*, 18(6), 697.

264. Houston, L., Jackson, S. J., Rosner, D. K., Ahmed, S. I., Young, M., & Kang, L. (2016). *Values in Repair*. Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems, 1409.

265. Ibid 1411.

266. Ibid 1410.

267. Ibid 1406.

268. Bosch, G., & Philips, P. (2003). *Building chaos: An international comparison of deregulation in the construction industry*. Routledge. 12.

269. Ibid 3.

However, although there are reasons to certify bricoleurs, there are little means to do so. In the case of the castors, on site workshops were made with official technicians that certified participants before being able to work<sup>270</sup>. This would be difficult to scale up. In addition, the skills learned through and needed for bricolage are varied and hard to evaluate for certification. Some skills such as troubleshooting and problem solving essential to repair is also different from conventional construction skills<sup>271</sup>. In Germany, the only way to become self-employed is to be a certified meister by the Handicrafts code, this only represents 11% of the workforce of the country<sup>272</sup>. The restrictiveness to a specific craft makes it uninteresting for workers who don't want to make artisanal work. In France a VAE system can certify skills learned onsite. But the procedure is particularly complicated and general recognition of this certification is unclear<sup>273</sup>.

Although self-builder should have more robust ways to access certification, one must keep in mind that conventional construction often revolves around uncertified workers and the problem of certification isn't limited to bricolage. Germany is an exception. It had an increase in the 1970 of certified workers with a good structure to integrate workers in training<sup>274</sup>. As a result, unskilled tasks are performed by skilled workers, at a higher cost, due to a simpler work structure as training can be complicated to put in place<sup>275</sup>.

Models of skill certification and skill building have not been made in consideration of workers that are not unionized and not in a construction company. Research on this subject must therefore seek a new model that does not depend on a formal structure, for example, with an open access to exams.

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**270.** Boustingorry, J. (2008). *Des pionniers autoconstructeurs aux coopérateurs: Histoire des Castors en Aquitaine* [Phd thesis, Université de Pau et des Pays de l'Adour]. 20.

**271.** Reitz, L. M. (2016). *Assembler son quotidien sur la route: Une ethnographie de l'habiter mobile contemporain*. [Phd thesis, École Polytechnique Fédérale de Lausanne]. 232.

**272.** Clarke, L., & Wall, C. (2000). Craft versus industry: The division of labour in European housing construction. *Construction Management and Economics*, 18(6), 694.

**273.** Sigaud, M. (2017). *La pratique de l'auto-construction comme base de mise en place d'une société conviviale*. [Master thesis, Université Grenoble Alpes]. 72.

**274.** Clarke, L., & Wall, C. (2000). Craft versus industry: The division of labour in European housing construction. *Construction Management and Economics*, 18(6), 693.

**275.** Bosch, G., & Philips, P. (2003). *Building chaos: An international comparison of deregulation in the construction industry*. Routledge. 54.

## 5.4 Information and skill making:

The diffusion of information is crucial for bricolage. In France up to 25.5% of self-builders in 1984 have prior knowledge by working in the construction industry<sup>276</sup>. This implied that a significant portion has no training and depends of available information and training. Some have argued that without a structured industry training is less available. The comparison of Germany and the UK shows that Germany has 5 times for training for carpentry for example<sup>277</sup>. In addition, in Britain, without employed-employee relation the skill reproduction failed to sustain<sup>278</sup>. However other argue that training does have but in a less formalized space. One key example is the participatory construction site, which involves volunteer that are housed and fed in exchange for their labor<sup>279</sup>. Although this form of training by making is uncertified, more and more construction workers are interested in the practice as a mean to construct with less common techniques<sup>280</sup>. In informal industries, construction sites are the key mean of knowledge transfer<sup>281</sup>. Many authors have shown the efficacy of learning on site compared to theoretical training in informal construction (Teerajetgul & Charoenngan, 2006; Kvarnström, 2014; Ngulum, 2003; Mlinga & Wells, 2002)<sup>282</sup>.

Some have even argued that training can be made without any expert in a learning group, simply learning by doing (Lave & Wenger, 1991; Brown & Duguid, 1991). In his book, *Le maître ignorant* (1987), Jacques Rancière argues with the example of Joseph Jacotot, a teacher who taught a language at the same time as he was learning the language of his students, that learning can be done without a master dispensing his knowledge. This question the way we view training in the construction

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<sup>276</sup>. Sigaud, M. (2017). *La pratique de l'auto-construction comme base de mise en place d'une société conviviale*. [Master thesis, Université Grenoble Alpes]. 28.

<sup>277</sup>. Clarke, L., & Wall, C. (2000). Craft versus industry: The division of labour in European housing construction. *Construction Management and Economics*, 18(6), 693.

<sup>278</sup>. Bosch, G., & Philips, P. (2003). *Building chaos: An international comparison of deregulation in the construction industry*. Routledge. 204.

<sup>279</sup>. Sigaud, M. (2017). *La pratique de l'auto-construction comme base de mise en place d'une société conviviale*. [Master thesis, Université Grenoble Alpes]. 21.

<sup>280</sup>. Ibid 27.

<sup>281</sup>. Sanga, S. A., & Mselle, J. (2018). Informal Construction Practices as Knowledge Incubators: A Conceptual Framework. *Business and Economic Research*, 8(1), 13.

<sup>282</sup>. Ibid 25.

industry. As noted by Léglise (2022), Hassan Fathy tried to make a project with an untrained workforce, without resorting to training by local artisans<sup>283</sup>. However, this project failed as the construction method was too sophisticated to be learned during the course of one project. This example shows that even when materials, time and labor is available, a project can fail without a proper training structure.

Another way bricoleur can create knowledge is through the diffusion of literature. In the case of nomad truck self-builders, knowledge is made through communal spaces such participatory worksites but also self-managed associations, festivals, or friend encounters<sup>284</sup>. In these spaces, magazines are particularly appreciated, such as the *Whole earth catalog*, Lloyd Kahn's *Shelter publication*, *Revue Technique Automobile* or *Système D*<sup>285 286</sup>. However, we can note that there is also economic recuperation in the commercial diffusion of magazines and that educational purposes clash with economic ones. Recently information is also freely made available online. There are blogs, video tutorials and open access documentation that now represents a major source of information for those who have internet access<sup>287</sup>. Interestingly blogs are also a way for self-builder to get social recognition for their work in a digital community<sup>288</sup>. The representation in these new mediums also differs as professional norms of representation don't necessarily apply and everything is made to be as easy to understand as possible<sup>289</sup>.

Although training structures do exist, bricoleur tend to rely more on training by doing and the free diffusion of information. Research on construction unformalized training is quite limited only relying of empirical studies. However, research on education has long looked at alternative methods. In the case of bricolage,

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**283.** Léglise, F. (2020). *La conception par bricolage comme art de la situation: Architecture, urbanisme, design*. [Phd thesis, Université Toulouse le Mirail - Toulouse II]. 236.

**284.** Reitz, L. M. (2016). *Assembler son quotidien sur la route: Une ethnographie de l'habiter mobile contemporain*. [Phd thesis, École Polytechnique Fédérale de Lausanne]. 266.

**285.** Léglise, F. (2020). *La conception par bricolage comme art de la situation: Architecture, urbanisme, design*. [Phd thesis, Université Toulouse le Mirail - Toulouse II]. 236.

**286.** Reitz, L. M. (2016). *Assembler son quotidien sur la route: Une ethnographie de l'habiter mobile contemporain*. [Phd thesis, École Polytechnique Fédérale de Lausanne]. 269.

**287.** Sigaud, M. (2017). *La pratique de l'auto-construction comme base de mise en place d'une société conviviale*. [Master thesis, Université Grenoble Alpes]. 32.

**288.** Ibid 63.

**289.** Reitz, L. M. (2016). *Assembler son quotidien sur la route: Une ethnographie de l'habiter mobile contemporain*. [Phd thesis, École Polytechnique Fédérale de Lausanne]. 274.

government policies should therefore ensure that training is available for all and information not privatized. Research should also look more precisely at means of information diffusion that don't rely on professional modes of representation, that can therefore be accessible not just for self-builders but also for illiterate people or other language group.

## 5.5 Norms:

Ellen Vaughan, the EESI's (Environmental and Energy Study Institute) Policy Director, shows in her report coauthored with Jim Turner, that norms have an essential role in building quality and the guaranty of a better-quality building means less repair and maintenance costs on the long term<sup>290</sup>. Taking the example of environmental norms, they argue that the cost of applying environmental norms gives a return on investment up to 6 time as high<sup>291</sup>.

However, this initial investment is not available for all. Some have noted that restrictive norms can push towards housing inflation and that green construction is used as a tool for gentrification (Jimenez, 1982; Anguelovski & al., 2019)<sup>292 293</sup>. In fact, this is not a recent process: in 1904, in Toronto, norms for fire protection imposed to build out of bricks<sup>294</sup>. As a result, a significant population that couldn't pay for bricks moved to build their homes in the suburbs where this law was not enforced. In the process, enforcement of the norm provoked spatial segregation and gentrification.

Another critic of the norm system is that building regulation are made without the

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<sup>290.</sup> Vaughan, E., & Turner, J. (2013). The value and impact of building codes. *Environmental and Energy Study Institute White Paper*, 20, 2.

<sup>291.</sup> Ibid 12.

<sup>292.</sup> Jimenez, E. (1982). The economics of self-help housing: Theory and some evidence from a developing country. *Journal of Urban Economics*, 11(2), 214.

<sup>293.</sup> Anguelovski, I., Connolly, J. J. T., Pearsall, H., Shokry, G., Checker, M., Maantay, J., Gould, K., Lewis, T., Maroko, A., & Roberts, J. T. (2019). Why green "climate gentrification" threatens poor and vulnerable populations. *Proceedings of the National Academy of Sciences of the United States of America*, 116(52), 26139–26143.

<sup>294.</sup> Harris, R. (1991). Self-Building in the Urban Housing Market. *Economic Geography*, 67(1), 1–21. 14.

involvement of the user that will ultimately have to endure or profit from these changes. Bosch & Philips (2003) note that regulation is the product of professional agreements of unions and employer<sup>295</sup>. Vaughan & Turner (2013) precise that experts, manufacturers and professionals are involved in the creations of norms<sup>296</sup>. But while all these actors have expertise, interest especially in technological solution make the decision biased. For example, insurance companies have always promoted heavily building codes in what can only be described as lobbying<sup>297</sup>. Getting user-feedbacks and involving users can therefore ensure that norms align with the resources and desired of users.

Some have argued that norms are problematic in themselves. Sofia Lemos, in Leopold Lambert's *The Funambulist papers vol.2* (2015), argues that norms participate in a process of control and surveillance that can have important consequences. This tool of power has been popularized in Erst Neufest's *Architect's Data* (1936), written in the context of nazi Germany's totalitarianism<sup>298</sup>. Similarly, it was also a major tool of colonial domination<sup>299</sup>. Ultimately the author aims to question whether health is a good enough reason to control bodies or only a tool of control. She quotes Georges Canguilhem: "Is the pathological the same concept as abnormal?"<sup>300</sup>.

Although means of regulation can be questioned, building quality in the case of non-professional has to take into consideration that precision can't be achieved easily. The question of tolerances therefore become essential. As Baudoin (2016) describes building details only seek the 'appearance of precision' and tolerance is therefore a way to accommodate uncertainty<sup>301</sup>. One could question whether

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<sup>295.</sup> Bosch, G., & Philips, P. (2003). *Building chaos: An international comparison of deregulation in the construction industry*. Routledge. 11.

<sup>296.</sup> Vaughan, E., & Turner, J. (2013). The value and impact of building codes. *Environmental and Energy Study Institute White Paper*, 20, 3.

<sup>297.</sup> Ibid 19.

<sup>298.</sup> Lambert, L. (Ed.). (2020). *The Funambulist Papers 2: Volume 2*. Project Muse. 94.

<sup>299.</sup> Ibid 95.

<sup>300.</sup> Ibid 92.

<sup>301.</sup> Baudoin, G. (2016). A matter of tolerance. *The Plan Journal*, 1(12), 36.

this aesthetic of precision is necessary or not, but considering that it has direct repercussion on the valorization of a building, it remains important for all actors. Skill therefore revolves around assembly and the capacity to design forgiving details and execute them well.

While building norms are considered as the main vector of innovation in construction, research on building norms should therefore look have a more grounded application, more in line with users and minimizing building inflation, institutional biases and power dynamics that are at play. On the other hand, research on building technologies, should look at how assembly is made in bricolage contexts and how to integrate tolerances.

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Research on bricolage skill is very limited and people still see bricolage as a work either of a skilled craftsman similar to an artisan, or of a total amateur with no skill at all. Research on this subject must therefore look more at models of on-site skill building and dissemination of skill, that must therefore not rely of unions or professionals records. This calls in question norms as a key element that needs to change its relation to non-professionals. Similarly training structure also have to find a way to attain self-builders. Beyond creating new models, research on the subject must also assess building quality with more adapted indexes.

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## 6. Conclusion:

While the subcategories presented here are subjective and don't pretend to any universality, the selected corpus of article and the complementary bibliography shows that there are less studied aspects of bricolage, some that the author strongly encourages researchers to pursue [see fig. 7]. As a whole, this paper shows that the following subjects have not been studied enough: Forms of labor; Internal divisions of labor; Labor risk; Division of land; Supply-chain; Paradigm shift; Innovation; Information and Norms.

These can lack data, but in many cases suffer from a lack of adapted indexes. Measuring costs, quality and time is an issue that needs to be solved.

Some other subject have a more complete understanding of the process but can be completed by further studies: Group structures with more data of representativity; Political appropriation with a more grounded research of effects; Low-income groups with more long-term research on the evolution of the building and the people it houses; State responsibility with more comparative data.

This paper has proved that bricolage is not a marginal process that does not need extensive attention. More importantly bricolage has been shown to be very complex, therefore needing additional research. The analysis on existing bibliography has shown that some subjects are disregarded. Linking back bricolage to it's material reality has helped to showcase how it is not a product but rather a socio-technical process that has similarities and differences with ordinary construction. The lens of the means of production (labor, resources and skill) highlight the contradiction that bricolage embodies. While it might be seen as the future of architecture of

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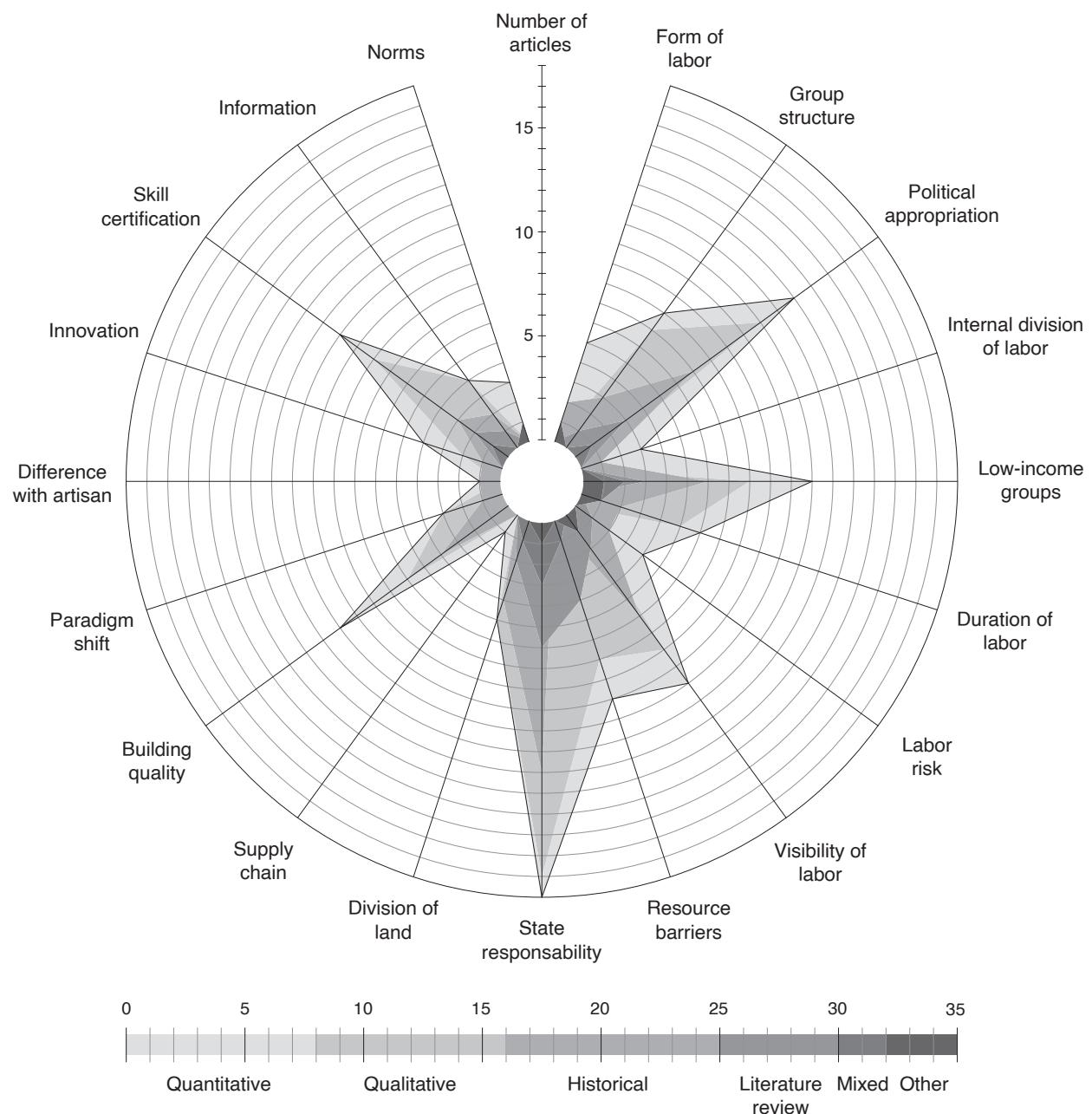
participation, there are clear limitations that need to be taken into account and for now have not been studied thoroughly.

By uncovering how bricolage functions we can therefore arrive to a more material definition of bricolage that does not pass judgement: bricolage is a non-professional process of construction assembly employing various building systems in an incremental and expedient, resource-based manner.

Although bricolage can be understood as a populist architecture, accepting its existence and dynamics does not sacrifice the profession of architecture. On the contrary, as Jacques Rancière argues in *La haine de la democracie* (2005), populism is a term used to devalue an open democratic debate and undermine the capacity of any individual to make informed decisions. While information is key in an open debate, subaltern can only express their opinions through a deliberative structure. In architecture, bricolage can therefore be a way to integrate users in the construction debate, in the process ensuring a better public understanding of the role and value of an architect.

This text has proven that bricolage does have substantial flaws, but its omnipresence as a counter-culture of architecture, proves that it is important to build research on the subject. More informed policies can therefore look at better ways of building through bricolage, in terms of labor structure, financing, resources provision, training, and skill. As architects, bricolage is also a new field of study that has potential for providing quality housing to more people with a role of expert adviser. Through bricolage we can therefore ensure that architecture doesn't have to fall into elitism.

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**Fig 7.** Graph of the number and methodology of articles of the selected corpus by subject

Subject	Presence	Limitation	Further research
Forms of labor	-	No constant measure of labor input	Definition of new indexes
Group organization	++	No information of prevalence	Representativity data
Political appropriation	++	No information on consequences	Data of effects
Internal division of labor	--	Limited or no content	Qualitative study
Low-income groups	+	No information of long-term effects	Post-occupancy study
Duration of labor	-	No information on consequences	Qualitative data
Labor risk	+	No information of long-term effects	Post-occupancy study
Labor visibility	-	Limited or no content	Qualitative study
Resource barriers	++	No comparison	Comparative study
State responsibility	+++	No comparison	Comparative study
Division of land	--	Limited or no content	Qualitative study
Supply chain	--	Limited or no content	Actor network study
Building quality	+	No constant measure of quality	Definition of new indexes
Paradigm shift	-	Limited or no content	Quantitative study
Difference with artisan	+	Prevailing confusion	Dissemination
Innovation	--	Limited or no content	Qualitative study
Skill certification	-	No models of skill certification	Experiment
Information	+	No models of information building	Experiment
Norms	-	No models of user participation	Experiment

**Fig 8.** Table of current limitation in research observed in the corpus

## 7. Appendix:

### Lexicon:

**Aided-self-help:** policy aimed at actively supporting individuals or communities in their building efforts through technical assistance, access to resources, and capacity-building measures.

**Bricolage:** non-professional process of construction assembly employing various building systems in an incremental and expedient, resource-based manner.

**Incremental:** process of building or developing structures in stages over time, often driven by resource availability, evolving needs, or user participation. It emphasizes flexibility, adaptability, and the progressive improvement or expansion of a built environment rather than its completion in a single phase.

**Informal settlements:** unplanned residential areas characterized by inadequate housing, lack of secure tenure, insufficient infrastructure, and noncompliance with urban planning or building regulations, often arising from socio-economic constraints and rapid urbanization.

**Self-building:** process in which individuals or groups design, construct, or manage the construction of their own homes or structures, often without reliance on formal developers or contractors, reflecting specific needs, preferences, and cultural contexts.

**Self-promotion:** process where individuals or groups independently initiate, plan, and oversee the development of a building project, often acting as the client or developer. This approach emphasizes personal agency, direct involvement in decision-making, and customization to meet specific needs, preferences, or values.

**Self-help:** policy that shifts the responsibility for improving living conditions onto individuals or communities, often with minimal external intervention (unlike aided-self-help). While it emphasizes autonomy and local initiative, it can sometimes lack the necessary support to address systemic barriers effectively.

**Sites-and-services:** housing policy or development approach where governments or organizations provide basic infrastructure (such as structures, water, sanitation, roads, or electricity), enabling individuals or families to construct their own homes incrementally. This approach aims to balance affordability with support, addressing housing needs while encouraging self-help and community-driven development.

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