

# Chapter 4

## Urban Brownfield Regeneration Projects: Complexities and Issues



**Abstract** Because of urban brownfields' inherent complexity related to their very nature, as well as their intermediate scale—the neighbourhood—regeneration projects are not a spontaneous process. Indeed, an urban brownfield regeneration project may encounter several issues, which can be obstacles, barriers, or resistance, that we classify in four types: sociocultural barriers, governance involved by the multiplication of actors, legal and regulatory constraints, and deterrent costs. While these issues contribute in turn to complexify brownfield regeneration projects, they are not insurmountable. Finally, to overcome urban brownfield regeneration projects' complexities and issues, we argue that there is a need to implement real project dynamics. To this end, we provide four potential approaches to foster the creative development of tailored solutions.

**Keywords** Urban brownfield regeneration project · Sociocultural barriers · Stakeholders · Governance · Legal and regulatory constraints · Costs · Soil contamination · Project dynamics

### 4.1 Regenerating Urban Brownfields

While urban brownfields' potential for the sustainable transition of metropolitan areas has been demonstrated in the previous chapters, notably as a densification strategy, it should be noted that their redevelopment is far from a spontaneous process. In the real world, brownfield regeneration projects encounter a series of issues—not to say obstacles, barriers, or resistance—related in particular to the complexity of such operations. Indeed, brownfield regeneration projects are far more complex than the construction of an isolated building or the development of a new neighbourhood on a vacant plot. Related to the very nature of urban brownfield sites covering an intermediate scale—the neighbourhood—with a building legacy of variable quality, often disconnected from their context, sometimes contaminated, and suffering from a poor image, we identify regeneration project issues according to four distinct types: sociocultural barriers, governance involved by the multiplication of actors, legal and regulatory constraints, and deterrent costs. In turn, these issues contribute to complexify brownfield regeneration projects. The proposed classification of issues

needs to be balanced by a certain degree of flexibility in terms of permeability between the different types of issues, since the legal, economic, or social dimensions are sometimes combined within a single resistance factor. Ultimately, we argue that the emergence of a real project dynamic in an urban brownfield regeneration, which extends far beyond the initial stages of the process, can contribute to revealing the site's potential and establishing a guiding vision. This approach is essential to allow for efficient management of these complex operations.

## **4.2 Sociocultural Barriers**

### ***4.2.1 Negative Perceptions***

The implantation of certain programmes—in particular, housing—on brownfield sites may, a priori, appear counter-intuitive. By definition, urban brownfields are partially or totally abandoned sectors, which tends to give them a sense of decline. For a long time assimilated to inhospitable territories, these abandoned sites tend to become a privileged place for the expression of urban counter-cultures and marginalities of all sorts, sometimes resulting in a nefarious reputation (Menerault and Barré 2001). This negative image can discourage many potential investors.

Uncertainties related to soil contamination (more on this below) also contribute to reinforcing the negative perception of these sites. In addition, the inhospitable aspect or the resulting negative connotations do not support the triggering of investments nor the identification of target users. Hence, a veritable vicious circle can set in: unattractive sites do not encourage investment, and this lack of investment makes them even less desirable.

Despite this climate of negative perceptions, there is a true renewal of interest in city life. The desire for fresh air and open nature, which motivated many city dwellers to seek single-family houses in rural areas, is now clearly counterbalanced by the idea that urban life has become “chic” (Federal Environmental Agency 2005). In many European cities, populations are on the rise again. Among other aspects, city residents are typically attracted by such urban attributes as old building atmosphere, historical character, proximity to workplaces or educational facilities, infrastructures, cafés, restaurants, etc. The “back to the city” trend certainly gives new chances to urban brownfields and positively influences their overall perception.

### ***4.2.2 Railway Related Nuisances***

Railway brownfields and industrial brownfields located in proximity to railroads are particularly affected by this phenomenon. Indeed, often too close to heavy mobility

infrastructure, with an environment characterized by air pollution and electromagnetic fields, railway stations were systematically located away from urban centres. Today, advances in technology make it possible to overcome a large part of the nuisances traditionally associated with railway, in particular noise pollution, both in terms of emissions (modern disc brakes, composite brake blocks) and immissions (localization of living areas, noise barrier walls, soundproofing double glazing, etc.). Regarding non-ionizing radiation, railway electric transport lines have been shown to generate a relatively low level compared to other sources. Furthermore, additional shielding measures can be implemented within buildings.

European metropolitan regions host several successful examples of residential buildings located close to railways. One of the really noteworthy realizations is probably the Röntgenareal in Zurich, Switzerland, in particular because three inhabitant surveys have been carried out on this ensemble of nine housing units built along the railways (Gloor and Meier 2010). Results demonstrate users' feeling of improved quality of life and railway-related nuisances are seldom mentioned. Hence, the study speaks to the general satisfaction of the "railway residents", which is certainly the result of intelligent, carefully planned architectural measures.

### ***4.2.3 Opposition Risks***

Diverse types of opposition related to the presence of former users of the site also represent a significant sociocultural resistance factor. Stemming from individual actors or interest groups who fear the loss of character of the site or reject the new proposed programme, these oppositions may lead to the temporary blockage or definitive end of the regeneration project's process. Typically, they appear when the project is submitted for public approval, during the phase of changing land-use regulations to obtain building rights.

Two main categories of actor can be identified in terms of action potential: the beneficial owners (owners of the land concerned by the redevelopment project, direct neighbours, and some associations), who can be, according to national regulations, directly subject to the right of opposition; and the other citizens, i.e., any inhabitant enjoying civil and political rights, who might have the possibility of participating in referendum-type processes against decisions made by a public authority. Here again, the latter's scope for action greatly depends on national political systems: direct democracies, such as Switzerland and Luxembourg, are clearly more concerned by this potentially critical situation for a brownfield regeneration project.

Aiming at reducing the risk of opposition, participatory approaches allow planners to understand the concerned users' expectations and desires before reaching this critical stage. Very often, in practice, the result of a public inquiry or a referendum appears to depend both on the intrinsic qualities of the project and the communication strategies deployed by the project leaders (Lufkin 2010). The section of this book dedicated to the project's process (see Chap. 6) will provide the opportunity to return to and go further into that topic.

### 4.3 The Multiplication of Actors in the Project's Process

#### 4.3.1 *Five Categories of Stakeholders*

Considering their size (according to our adopted definition, their surface is superior to a half hectare) and their strategic importance for the development of the entire metropolitan region, brownfield regeneration projects are typically characterized by the involvement of a multiplicity of stakeholders, which undeniably tends to complexify the process. Presenting a large diversity of interests and degrees of influence, these stakeholders can be structured according to five main categories:

1. **Public authorities and services** are involved through their role of guardian of the general interest and their direct or indirect support for the project process.
2. **Landowners** play an active role at the beginning of the project, in particular for the sake of valorising their property. Subsequently, their involvement can either continue if they decide to invest themselves or diminish if they decide to sell their property.
3. **Clients** (or principals) include the different private or public investors participating in the project's funding.
4. **Planners** (or agents) include the different professionals involved in the project design and realization: urban planners, architects, engineers, specialists, and construction companies.
5. **Users** are represented either directly in the client's structures, in the case of an investment of their own, or in a more limited way if they are only tenants. Besides, temporary uses may mean that the clients need to manage relations with users not directly related to the project.

The first two categories of stakeholders (i.e., public authorities and services and landowners), which play strategic roles at the beginning of the project, may potentially generate greater complications in the redevelopment project process, as we will see in the next section. For municipal authorities, an urban brownfield regeneration represents an opportunity to support a project in line with the strategic objectives of sustainable urban development, which notably aim at encouraging the densification of already built-up metropolitan areas (more on sustainability issues in Chap. 5). Furthermore, a regeneration project may be an opportunity to meet the need for specific infrastructure (cultural activities, sports facilities, etc.), foster the creation of new housing or diversify the range of commercial premises. Established within a global approach of improving the metropolitan region's image, it offers the possibility of reintroducing urban continuities while simultaneously creating new public spaces. For landowners, the primary purpose is to add value to their property, either by selling it to a third-party investor or by an investment of their own, which should allow them to generate new rental incomes.

### ***4.3.2 The Importance of Governance***

The multiplicity of stakeholders involved in the process, and therefore of interests and deployed strategies, represents an additional challenge in starting up and realising a regeneration project. Therefore, governance becomes key. It can be defined as the ability to produce an informed decision based on a plurality of stakeholders. The organization of discussions between the latter is indeed the subject of many tensions and requires some expertise on the part of the decision-making actors.

The first difficulties to overcome are related to the possible necessity of redefining the land register (sometimes called parcel framework) and to the determination of the land price (agreement to be reached between the different landowners). This coordination between several owners' actions in order to establish a common vision sometimes faces differences of intention or blockages by certain key stakeholders.

On another level, institutional coordination also represents a major issue in the project process. Indeed, brownfield sites are often located on different municipalities within a metropolitan area and are often governed by regional policies. This may lead to conflicts related to inter-communality and coordination between the different political and administrative levels. Intersectoral coordination is also of paramount importance in the interplay of governance. Municipal or regional public authorities may experience internal communication difficulties, which can result in different services expressing contradictory views. The complex coordination between transport and urban planning policies can be cited as an example. Many reasons can explain this complexity, including the projects' temporality (transport project typically last 1 to 5 years, while urban planning projects last between 10 and 15 years), the continuity of public action, the involved stakeholders' professional cultures, and the potential power struggles between administrative services (Ollivier-Trigalo and Piechaczyk 2001).

## **4.4 Legal and Regulatory Constraints**

One of the primary objectives of the legal framework is to ensure citizens' security and safety. However, some adverse effects may result directly from overly rigid architectural or urban planning norms, which can potentially act as additional constraints. Therefore, the challenge is to find a balance between pragmatism and standardization, through creative, specific solutions and incentive public policies.

Until recently, in most European countries, planning tools were relatively inappropriate to brownfield regeneration strategies. Most regional masterplans projected significant construction potential in suburban and peri-urban municipalities, which made it difficult to channel urbanization within already built-up areas. In Chap. 3, we briefly illustrated the trend of territorial politics in the UK, Switzerland, and France. This evolution can also be observed in most European nations, where consensus is growing that brownfield regeneration can play an important role in revitalizing

metropolitan areas (Vanheusden 2009). It aims at rectifying a situation inherited from the “glorious thirty” (the years of reconstruction following the Second World War) by integrating densification strategies in proximity to city centres.

However, despite this favourable context, legal and regulatory frameworks are often cited as important barriers on the European level (European Commission 2019). The fact that the European Union does not yet have a general brownfield policy (Vanheusden 2007) probably contributes to complexifying the situation. Among the various obstacles, we can cite unclear or complex (transfer of) liability, inadequate, conflicting or changing legal frameworks, compliance with the polluter pays principle (e.g., orphan sites), or the unnecessary conservatism and precaution of some regulations.

Among the different situations where legal standards may have a constraining impact on brownfield regeneration, we find the specific example of former railway sites. The case of Switzerland, here again, is relatively eloquent. The Swiss Ordinance on Protection against Major Accidents applies to all developments next to infrastructures with frequent transportation of hazardous materials. A development threshold (in terms of buildings’ human density) is set for such areas considered at risk, according to the probability of a major accident and the severity of the potential consequences (Lufkin 2010). This can result in the implantation of low-density professional activities, at the expense of residential programmes, commercial premises or public institutions with heavy attendance—which, of course, is intrinsically contradictory to strategies of qualitative densification.

However, since debate on softening territorial or urban planning standards is not on the agenda of the majority of European states, the most realistic strategy is certainly to consider regulatory constraints, and standards in particular, as incentive obstacles to be overcome with increased inventiveness and creativity in architectural design. In parallel, the development of a common, long-term, and integrated vision, among other solutions, may constitute an efficient approach to deal with the complexities of the legal and regulatory frameworks (European Commission 2019). We will pursue these reflections on using the project as a basis for urban and architectural coherence in Chap. 6.

## 4.5 Deterrent Costs for Potential Investors

Financial resistance can also constitute a particularly problematic parameter in brownfield regeneration projects (European Commission 2019). Abandoned sites, as their name evokes, are generally characterized by relatively low demand and therefore low land values. In most cases, this general lack of interest can be explained by the additional investments generated by longer planning or construction periods for brownfield regeneration projects with respect to new developments on a vacant piece of land.

### 4.5.1 *Soil Contamination*

A whole range of parameters tends to increase the uncertainty level in a brownfield regeneration project, starting with soil contamination, cited earlier. The high costs of soil investigation and remediation, determined by the level and type of pollution, represent a significant risk factor. Furthermore, in addition to generating potential obstacles to brownfield regeneration, the issue of soil, as a non-renewable resource, has been identified by many European public entities as a major challenge. Soil quality, especially in terms of soil functions and associated services to humans, is of paramount importance, and probably even more so in increasingly urbanized metropolitan contexts (Monfort et al. 2020).

In quantitative terms, the European Environmental Agency (EEA) estimates a total of 250,000 contaminated sites across Europe, and approximately 3 million potentially contaminated sites (i.e., where an investigation is necessary to establish whether remediation is required) (European Environmental Agency (EEA) 2007). However, this impressive figure must be put into perspective. In addition to sites contaminated by industrial and military use, it includes sites polluted due to waste landfills and agricultural activities. Contamination caused by industrial and military use represents around 70% of all cases (European Court of Auditors 2012). Thus, the number of sites potentially contaminated by such activities can be estimated at 2.1 million. Considering the industrial past of most EU countries, a relatively large proportion of the latter could be considered as brownfields (Vanheusden 2009). Therefore, despite the roughness of the calculations, potentially contaminated brownfield sites represent a consequent figure.

Many European countries such as the Netherlands, Germany, Belgium, or the United Kingdom have established finely tuned legal instruments to manage soil contamination issues (Ferguson et al. 2005). In Switzerland, all cantons are required to make a land register of polluted sites. The inventory, which is mainly based on a historical investigation on the type of activity and operational life of the site, determines the risk of soil pollution for each plot in the territory (Rey and Lufkin 2015). In France, similar mechanisms have been implemented by the ALUR law (2014), which aims at overcoming barriers to contaminated brownfield regeneration, in particular by clarifying responsibilities and introducing information on soil pollution in the Plan Local d'Urbanisme (Local Urbanism Plan) (Lafeuille and Steichen 2015).

At the European level, although community legislation specifically focused on soil protection does not exist so far, there are several relevant legal documents which address brownfield remediation (Vanheusden 2009). Recent actions have been taken by the European Commission and new official directives have been approved by the European Parliament. The latter can contribute to improving the situation with respect to liability and traceability of environmental contamination, in particular by identifying the company responsible for the contamination—which, according to the Environmental Crime Directive (Official Journal of the European Union 2008), may now be seen as a criminal offence.

In the real world, however, things are not so simple. On the one hand, access to information is not always guaranteed. On the other hand, the speculative nature of this type of investigation should not be minimized. Indeed, without an in-depth study of the soil, the determination of the precise level of contamination will always remain approximative. Therefore, investigations are not totally reliable instruments, and the fact that a site is not reported in an inventory does not necessarily mean that it is clean (Indaco and Chappuis 2008). Furthermore, each contaminated site has unique characteristics and features, which will determine the specific methods to be applied for its remediation (in situ, on-site or off-site), as well as the resulting costs. Off-site treatments are clearly the most expensive ones because they combine excavation, transport, and elimination. The elimination costs alone may vary a lot, depending on the adopted approach. On an indicative basis, experts calculate a factor 50 between the simple discharging of inert materials and their high-temperature incineration in a specialised centre (Indaco and Chappuis 2008).

In most European countries, the necessary measures (investigation, monitoring, sanitation, or reporting) are theoretically covered by the holder of the contaminated land (owner or tenant). Depending on the circumstances and national regulations, the polluter pays principle may sometimes be applied in order to privilege equal treatment.

Of course, this is not always possible, for instance in case of orphan sites with no traceability (impossible to find out who is responsible), or if the polluter is found to be insolvent. In those situations, a public authority may assume part of the remediation costs. However, despite the variance in legal provisions from country to country, the idea that the site owner is required to bear the remediation costs remains widespread. Therefore, since the financial risk associated with potential costs is proportional to the level of uncertainty, unknown information about the nature and scale of contamination tends to discourage some investors.

### ***4.5.2 Relocation of Activities***

Besides soil contamination, the relocation of activities also occupies a considerable place in the list of financial resistance factors. Some transitory uses (residual rentals, temporarily authorized occupations) may put up resistance to the regeneration project because it implies their end. They may therefore stay on the site longer than initially expected. In addition, many abandoned sites depend on the relocation of part of persisting activities, whether industrial, artisanal, harbour, or other. The relocation of these activities may present challenges: the relocation costs can not only be high, but their temporalities can also be shifted from a site's development requirements. Therefore, the phasing of the project in conjunction with existing uses can sometimes be delicate. It may even lead more extended planning to deadlock.

Beyond financial aspects, the relocation of activities deserves to be viewed with a critical and global eye because it transcends conflicts of interest internal to the brownfield. Indeed, from a sustainable territorial development perspective, the strategy to



relocate industrial and artisanal activities or freight transport towards the outskirts of metropolitan regions is questionable. A mix of functions and the preservation of production activities within cities are necessary conditions to create sustainable neighbourhoods which are dynamic on the economic and sociocultural levels (see Chap. 5).

The example of railway brownfields, for instance, provides a clear illustration of the complexity of relocation issues. In terms of logistics, the relocation of sorting centres towards peripheral areas contributes to increasing the distance with the end consumer, thus generating important truck traffic within the metropolis. Relocating also tends to reproduce dynamics of territorial fragmentation similar to those of zoning practices. Indeed, the removal of cargo activities from urban centres increases the development of production sectors in peri-urban districts. And since public transport networks perform less well there than in denser areas, the rise in commuter flows results in massive use of individual cars.

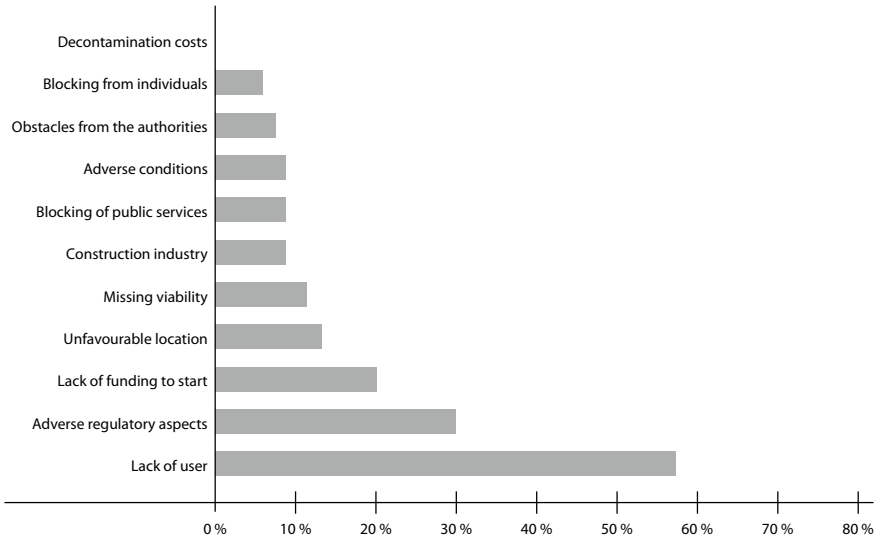
Similar arguments can be developed with regard to regeneration projects of harbour brownfields. Arbitrage between the creation of new residential neighbourhoods and the preservation of port activities is a delicate issue, which needs to be considered from a global and systemic perspective—and certainly not a sectorial viewpoint. The systematic removal of freight transport activities (and artisanally or industrially related functions) for the benefit of exclusively residential or tertiary programmes does not provide a satisfactory answer to the challenges faced by metropolitan areas in transition.

Ultimately, the coexistence of activities of various scopes and natures requires an arbitrage that needs to be operated upstream, including all concerned stakeholders in order to avoid major blockages or large-scale functional deficits.

## 4.6 The Need for Project Dynamics to Overcome Obstacles

While all the above-mentioned issues contribute to complexify brownfield regeneration projects, they are not, however, insurmountable obstacles. To better understand these mechanisms and identify the leverage likely to encourage these sites' redevelopment, a survey was carried out on Swiss industrial brownfield landowners (Valda and Westermann 2004). The results analysis shows that the most acutely perceived barriers are mainly related to unfavourable conditions (lack of users or land-use plan building constraints) and to the difficulty of triggering the necessary investments to launch a project (lack of initial funding and absence of financial help).

Given these results, it appears essential to note that the importance generally assigned to brownfield remediation costs should not be overemphasized (see Fig. 4.1). No brownfield landowner has cited the latter in the list of obstacles to brownfield redevelopment. To explain this outcome, the survey's authors mention several assumptions:



**Fig. 4.1** The relative importance of the various obstacles to the regeneration of brownfields. Data according to Valda and Westermann (2004)

- Remediation costs may have been assessed through an evaluation of the site's contamination; therefore, it was possible to integrate them into the project's financial plan;
- Contamination is not perceived as an issue for owners, but rather for investors;
- The contamination obstacle may sometimes be classified in the "lack of users" category;
- Contaminated sites may be perceived less as a financial obstacle than as a slowdown factor at the beginning of the project;
- Owners who consider remediation costs as a major obstacle did not participate in the survey.

However, it remains true that the emergence of real project dynamics is often confronted with the difficulty of overcoming the above-identified issues. The observation of multiple projects of this type also allowed us to highlight that their realization is often marked by the commitment of a main stakeholder who leads the project and plays a driving role. The latter may come from any number of professional horizons, but in the case of urban brownfield regeneration projects, architects or urban planners often assume this function, whether through their specific position within a public structure or a public or private mandate. Sometimes, following an action triggered by a stakeholder's initiative, he or she may be recognized as project lead and therefore acquire a specific position within the involved stakeholders' group (Wyss et al. 2011).

Having a political representative lead the project can also become a key element for the smooth rollout of the regeneration process. These dynamics, however, are often

complex and generally unpredictable. Indeed, the time span of an urban project considerably exceeds that of an elected person's office, which tends to generate conflicts of interest or interruptions in decision-making processes.

The presence of a driver at the operational level also appears as an essential element not only to motivate investors' interest in the regeneration project, but also to organize negotiations, implement adequate regulations, and, more generally, to overcome blocking points throughout the operation. More specifically, this can be translated into the creative development of tailored solutions, which can be structured according to four axes (Von Fischer and Bulliard 2002):

- *Consultation processes.* The project dynamics enables to stimulate converging interests and arbitrate between the potentially divergent interests of some stakeholders (networking and mediation);
- *Organization and cooperation models.* The project dynamics supports the emergence of innovative partnership models, which aim at pragmatically conciliating public interest (in particular in terms of sustainable development) and private sector logics;
- *Funding Mechanisms.* The project dynamics encourages the implementation of financial synergies between private investors and public authorities, which are responsible for stimulating the dynamism of the urban territory they are in charge of;
- *Tools for controlling urban development.* The project dynamics facilitates the development of innovative processes, which allow the achievements of a concrete strategy for the site's management.

Ultimately, the need for implementing a project dynamic in an urban brownfield regeneration extends far beyond the initial stages of the process, which relate to revealing the site's potential and establishing a guiding vision. Until the project's completion, this approach is essential to allow efficient management of such a complex operation. The Chap. 6 dedicated to the "Key steps of a regeneration process" will provide us with an opportunity to analyse the different stages of a brownfield regeneration project and study operational project strategies likely to facilitate the operation's success.

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