

R-URBAN RESILIENCE

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The R-Urban strategy proposed by *atelier d'architecture autogérée (aaa)* explores the possibilities of enhancing the capacity of local resilience by introducing alternatives to the current models of living, producing and consuming in cities, suburbs and rural areas. *aaa* is a collaborative network with variable geometry which organizes itself according to different topics, contexts of intervention, competencies and availability of participants. It fosters practices of *autogestion (self-management)*¹ within a bottom up approach to ecological regeneration, in which ecology extends beyond the environmental aspects to include social, cultural, and economic concerns. There are increased calls for the necessity of collective action to face the challenges of the future: global warming, depletion of fossil fuels and other natural resources, economic recession, population growth, housing and employment crises, increased social and economic divides, and geo-political conflicts. While governments and institutions seem to take too long to agree and act, many initiatives start at local scale.² These initiatives are nevertheless confronted with the difficulty of changing the current economic and social models of society which depend on globally scaled economics and are based on increasing consumption and the subsequent exclusion of those who are not able to 'consume'. How to support initiatives that oppose the current consumption models? How to construct a more socially oriented economy? How to initiate progressive practices and sustain ecological lifestyles while acting locally and small scale? How to reactivate cultures of collaboration, self-management and sharing within the current society, based on individualism and competition? What is the role of architecture in this undertaking?

R-Urban began in Colombes, a suburban town near Paris, in 2011. It is centred on the active involvement of citizens in initiating collaborative practices and creating solidarity networks, closing cycles between production and consumption, operating changes in lifestyles, and acting ecologically at the level of everyday life. The strategy is conceptualised as a series of ecological, economic, cultural and social agencies which are based on coordinated actions at different local scales (domestic, neighbourhood, city, region) and complementarities between key fields of urban activity (such as economy, habitat, mobility, urban

agriculture, culture). A number of pilot architectural projects will be gradually implemented to create a network of locally closed ecological cycles across these fields. Flows, networks and cycles of production-consumption will be formed, closing chains of need and supply as locally as possible. To overcome the current crisis, we must try, as French philosopher André Gorz states 'to produce what we consume and consume what we produce'.³ R-Urban interprets this chain of production-consumption broadly, well beyond the material aspect, including the cultural, cognitive and affective dimensions. The circulatory changes induced in the social and environmental relations will maintain a socio-ecological metabolism, which without being fixed, will evolve together with the relations themselves. The pilot projects will be collectively run and will strategically introduce collaborative practices and agencies (such as recycling, food production, eco-construction, local culture and economy) that will catalyze existing individual activities and will little by little change current behaviours and lifestyles.

'R'

R-Urban is an 'R' word. It relates directly to the three 'R' imperatives discussed in ecological approaches to urban territories—Reduce, Reuse, Recycle—and suggests other iterations: Repair, Re-design, Re-think, Re-assemble etc. In addition, the term indicates explicitly that R-Urban reconnects the urban with the rural through new kinds of relations which are more complementary and less hierarchical. The 'R' of R-Urban is a reminder also that the main goal of the strategy is 'resilience'.

Resilience is a key term in the more nuanced discussion on sustainability, which takes place today in the context of current economic crisis and resource scarcity. In contrast with sustainability, which focuses on sustaining the *status quo* of a system by controlling the balance between its inputs and outputs, without necessarily addressing the factors of change and disequilibrium, resilience speaks about how systems can adapt and thrive in changing circumstances. Resilience is a dynamic concept,

which does not have a stable definition and identity outside the circumstances that produce it. In contrast to sustainability, which tends to focus on maintaining the environmental balance, resilience is adaptive and transformative, inducing change that offers huge potential to rethink assumptions and build new systems.⁴ It is this transformative quality that interests R-Urban, which is concerned not only with environmental sustainability but also with societal change and re-invention. The resilience capacity should imply also the preservation of specific democratic principles and cultural values, local histories and traditions, while adapting to more economic and ecological lifestyles. As such, a city can only become resilient with the active involvement of its inhabitants. To stimulate this commitment, we need tools, knowledge and places to test new practices and citizen initiatives, and to showcase the results and benefits of a resilient transformation of the city.

By concentrating on spatial agencies and pilot projects, R-Urban tries to offer tools and spaces that will make visible the resilient practices initiated by citizens. Spatial design processes can contribute to the expression of the ecological cycles in physical and tangible ways and engage inhabitants in experiences of making. Democratic governance principles are thus associated with concrete hands-on actions whose consequences are visible and measurable. More than just a method of adaptation, resilient practices are considered within R-Urban as a catalyst for urban innovation and creativity.

MODELS OF RESILIENT CITIES:

GARDEN CITY, REGIONAL CITY

AND TRANSITION TOWN

R-Urban was not conceived in isolation but follows a particular tradition of models of resilient development that started with Howard's Garden City and Geddes's Regional City and continues today with the Transition Town movement.

In 1889, Ebenezer Howard published his book *Garden Cities of To-morrow*, proposing a model of an utopian city that would combine qualities of urban and rural life. The book intended to provide a solution for the urban crisis that followed the agricultural depression in the late 19th Century, and generated a whole movement. The model proposed by Howard supposed a mechanism through which ownership would be transferred gradually from financial capitalists to inhabitants, with the idea that paying rent would translate into the maintenance of a local welfare state. The cooperative aspects of the original Garden City model were expressed not only in community gardens and popular kitchens, but also in mechanisms by which the inhabitants could

appropriate space. These mechanisms have not been implemented in most of the urban and suburban developments that followed these ideas, which adopted only the urban form and not its social and political principles.

In a similar way, few decades later, Patrick Geddes proposed a more naturalist understanding of the city, setting up the principles of a 'region city' in his books *City Development* (1904) and *City in Evolution* (1915). With his background as a biologist, Geddes states that before starting any kind of urban planning, one should thoroughly study the natural resources at regional scale, and analyse the existing economic and social dynamics. The Regional City is defined by complex relations between climate, vegetation, animals and economic activities, which all influence men and society's evolution. Geddes's vision of the city gives importance to institutions and civic life, as well as to social interaction and public space. The egalitarian relation between men and women is carefully considered together with the different modes of self-managing at local scale. Across a geographic vision, the region is considered in its capacity to regenerate social and political reconstruction. Geddes had the occasion to apply his analysis to some extent but his vision of the Regional City has been simplified and reduced, just as the Garden City had been during its modernist applications.

More recently, Rob Hopkins published the *Transition Handbook* (2008), which soon became the reference point of a whole Transition movement.⁵ The Transition Town does not provide an utopian model to be built, but proposes a guide to be followed by grassroots organisations who want to initiate the dynamics of transition in their existing towns. It is not a proposal for a new city but a set of rules and principles for a bottom-up adaption of existing cities. This model of development comes from permaculture rather than from planning. The driving dynamic is that of 'transition' within the horizon of a challenging future whose main parameters are Peak Oil and climate change. If, for the Garden City, comfort and political emancipation were ways of embracing an abundant future, for the Transition Town, the idea of local resilience and solidarity are solutions for adapting to a future with scarce resources.

In contrast with these models, R-Urban is not a direct application of theory but tries to develop an exploratory practice and a theoretical analysis that constantly inform each other. R-Urban shares with the Garden City an interest in combining qualities of urban and rural life in the context of existing cities and creating a better connection in terms of cycles of production and consumption. It also shares an interest in cooperative organisation and mechanisms for inhabitants to appropriate and manage space and also in the way these mechanisms translate into design solutions. But R-Urban is more interested in designing processes and cycles than forms, programmes and buildings. It does not propose a new model based on an ideal urban form, but rather deals with existing urban fabric and proposes social and political processes to negotiate adaptations and newly built structures and facilities. Alterations will result from the retrofitting of urban elements that are included in locally closed ecological cycles.

Spatial agencies will make the new organisation visible

in the city. They combine exciting initiatives in a coherent organisation, adding missing elements and contributing with new inputs. In contrast with the Garden City, R-Urban does not propose an ideal model of transformation but deals with the collapse of modern urban ideals and their failure in addressing the future seen for example in the features of monotonous urban fabric, obsolete tower blocks, real estate bankruptcy, segregation, social and economic exclusion and the pollution of land.

R-Urban picks up from the Regional City the idea of regional dynamics, but based in this case on the bottom-up initiatives of inhabitants. It considers big scale processes but also small-scale phenomena. Global concerns are addressed locally, within the current existing conditions. Their transformation is realised throughout successive phases, by investing in temporarily available spaces and creating short-term uses, which can prefigure future urban developments.

R-Urban also incorporates many of the Transition Town principles. However, resilience in R-Urban is not understood as an imperative to maintain the status quo but as a necessity to transform and invent new possibilities, as a driver for collective creativity. Through its pilot projects and collective facilities, R-Urban tries to make visible the solidarity networks and ecological cycles that it creates. It does not have a specific scale or size and does not operate necessarily within a 'town', but instead it negotiates its own scale (a block, a neighbourhood, a district) depending on the context. There are no specific pre-existing communities that are targeted through the project, but instead new communities are formed that have to agree their own set of rules and principles.

MICRO-SOCIAL AND MICRO-CULTURAL RESILIENCE

In contrast to other initiatives that deal exclusively with sustainability from a technological and environmental angle, R-Urban states the importance of a general 'change of culture', understood as a change in *the way we do things*. The future is culturally shaped as much as the past is and this is because culture, as Arjun Appadurai says, gives us *'the capacity to aspire'*.⁶

R-Urban proposes new collective practices through reinventing and regenerating proximity relations based on solidarities (for example ways of being involved and deciding collectively, sharing spaces and grouping facilities, rules and principles of co-habitation). Urban life styles in neo-liberal societies have gradually abandoned the different forms of solidarity that were perceived as inadequate or outdated. But these relations of reciprocity constitute the basis of social progress. In his analysis of the connections between economy and politics (inspired by Tarde's sociology), philosopher Maurizio Lazzarato critically describes the civilisation of 'progress' as 'a constantly renewed effort to replace

the reciprocal possession by the unilateral possession'.⁷ It is exactly these relations of reciprocity and solidarity that are missing in the urban environment today. The dwelling models proposed by R-Urban restore these solidarity relations through processes that implicitly produce sociability, shared spaces, common values and affective relations.

Transformations have to take place at micro-scale with each individual, each subjectivity and this how a culture of resilience is constructed. As Rob Hopkins puts it: 'Resilience is not just an outer process: it is also an inner one, of becoming more flexible, robust and skilled'.⁸ The culture of resilience includes processes of reskilling, skills-sharing, building social networks, learning from others, learning from other experiences. These micro-social and micro-cultural practices are most of the time related to lifestyles and individual gestures; they prompt attention to details, to singularities, to the capacity of creativity and innovation that operates at the level of everyday life. R-Urban maps into detail this local capacity to invent and transform, but also in parallel, the administrative constraints that block it, proposing ways of bypassing them through renewed policies and structures.

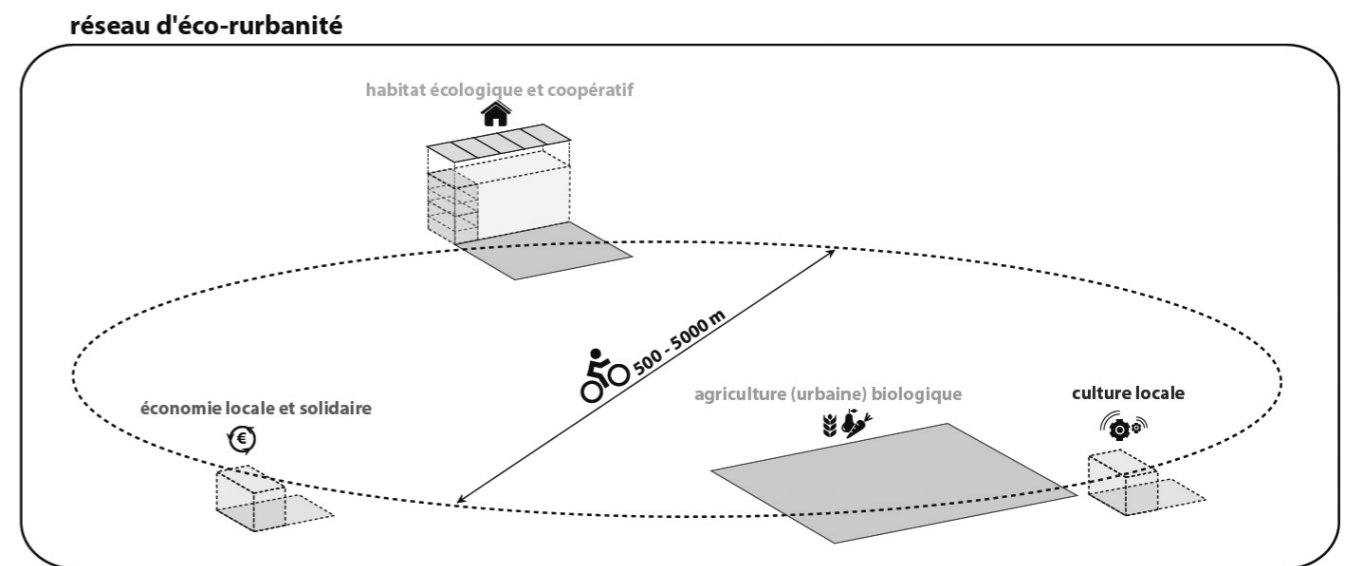
THE 'RIGHT TO RESILIENCE'

R-Urban claims urban sustainability as a civic right. Sustainability is on the agenda of many urban projects today but this doesn't mean that all these projects are politically aware. A political ecology approach, such as R-Urban, not only positively asserts development dynamics but questions also the processes that bring about uneven urban environments and the social consequences of urban sustainability'.⁹ David Harvey, among others, argues that the transformation of urban spaces is a common right rather than an individual right because collective power is necessary to reshape urban processes.¹⁰ Following Lefebvre, Harvey speaks of 'the Right to the City' as a citizen's liberty to access urban resources: 'it is a right to change ourselves by changing the city'.¹¹ In this sense, R-Urban follows Harvey and enables the exercise of this 'right' through processes of appropriation, transformation, networking and use of the city infrastructure. The difference with him is maybe in scope: it is not so much a slogan to instigate a big global movement against the financial capital which controls urban developments in the world, but a means to empower inhabitants to propose alternative projects where they live. It also aims to foster local and trans-local networks, testing methods of self-management, self-build and self-production. Here R-Urban is maybe closer to Lefebvre's more utopian idea of 'Right to the City'. Lefebvre imagines it as a far more emancipatory project, emphasising the need to freely propose alternative possibilities for urban life. He proposes a new methodology, called 'transduction' to encourage the creation of 'experimental utopias'. Framed by the existing reality, this would

'introduce rigour in invention and knowledge in utopia', as a way of avoiding irresponsible idealism.¹² Lefebvre underlines the key role of urban imaginaries in understanding, challenging and transforming the urban and opening the door to a multiplicity of representations and interventions. From this point of view, R-Urban is a 'transductive' project, both rigorous and utopian, popular and experimental. It is a bottom-up approach based on the aggregation of many individual and collective interventions that decide to function together forming metabolic networks which stimulate circulatory changes and simultaneously determine each other. Such networks have the potential to accommodate multiplicity and valorize imagination at all levels.

'change themselves by changing the city', as claimed by Harvey, but to those currently in charge with the city, too.

As such, R-Urban is not only about grassroots innovation to meet social, economic and environmental needs, but also about a political critique and an ideological statement which affirms the necessity of new social and economic agencies based on alternatives to the dominant socio-technical regime. Through its self-organised constituency, R-Urban gives the means to all those involved to act locally at their own scale of dwelling and opens up possibilities for actions and activities that could change their future. It affirms their 'right to resilience'.



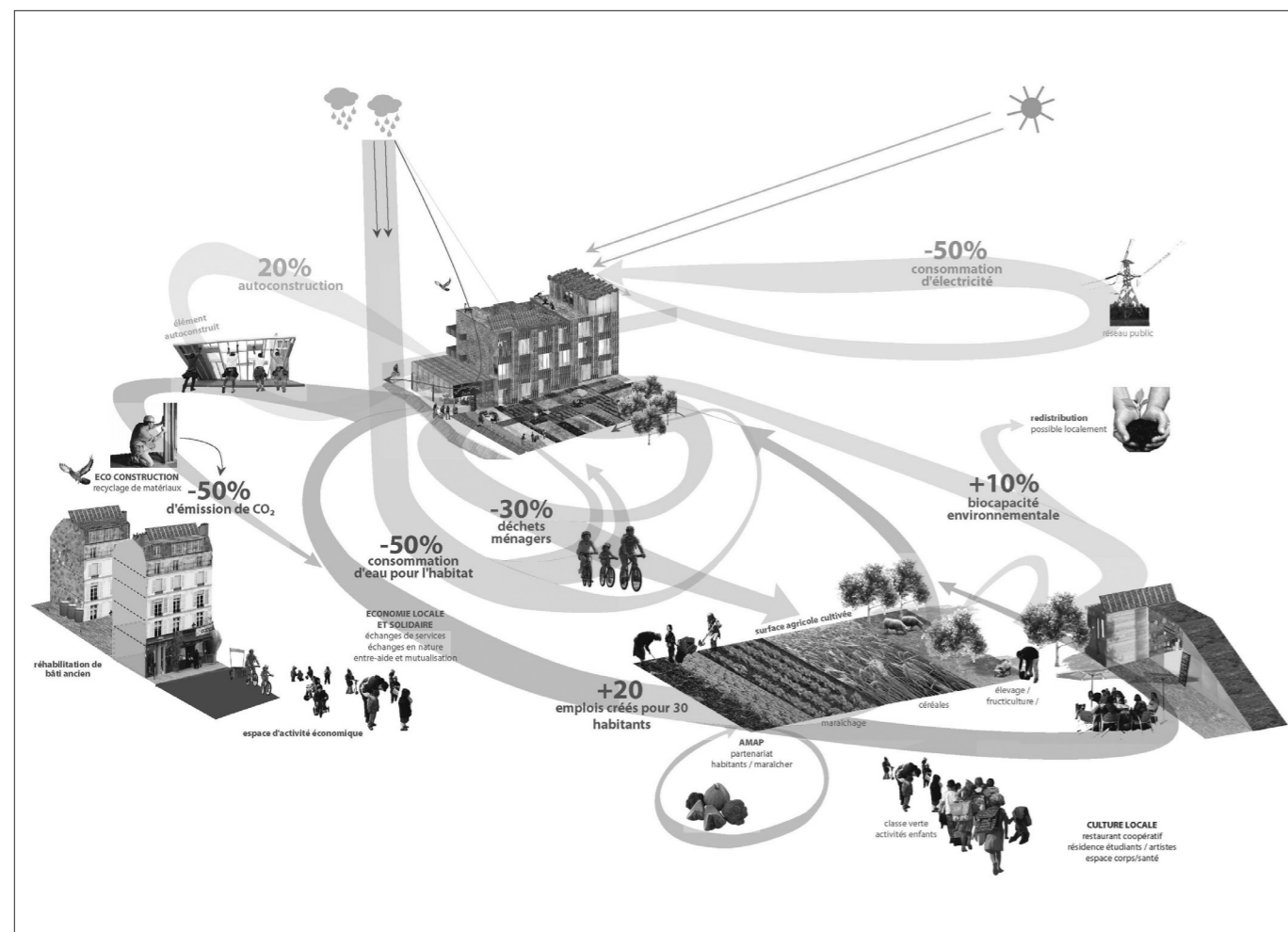
R-URBAN, Location of fields of activities following the R-Urban principles

However, R-Urban could be suspected of an opportunistic alignment with the 'Big Society' principles recently proposed by the UK Tory prime minister David Cameron to translate 'the idea of communities taking more control, of more volunteerism, more charitable giving, of social enterprises taking on a bigger role, of people establishing public services themselves'.¹³ The essential difference is that R-Urban does not react directly to the financial crisis and does not embrace a programme of economic resilience from which the State is absent: such a programme explicitly promotes unpaid work to mask the disappearance of welfare structures and the massive cuts in public services. The R-Urban strategy doesn't relegate economic responsibility to the citizen because the State is no longer capable of assuming it, but claims it as a social and political right to question power on its role and responsibility. Municipalities and public institutions are involved as equal partners in the strategy, assuming their roles of enablers, funders and administrators. Public structures are invited to take part in this experimental utopia and challenge their habits. It is not only up to the inhabitants to

DEMOCRATIC WAYS OF WORKING AND DWELLING

The modes of production introduced by Fordism have produced de-subjectivised labour relations through progressive accumulation of repetitive tasks, which by their fragmentary and repetitive nature have destroyed the long-term visions of labour goals and results.¹⁴ The ultraliberal economy induced social relations empty of symbolic and subjective charge. Under post-Fordist labour conditions, the construction of micro-social universes is realised only in connection with leisure domains (cinema, holidays, sports, parties and more recently all sort of events organised via social networks). This free time sociality is alienating: it is meant to fill in an existential void, while being implemented insidiously and modifying radically the collective values and behaviours.

R-URBAN Locally closed ecological cycles based on a number of pilot facilities which activate material (water, energy, waste, food) and immaterial flows (local skills, social economy, local culture, self-building, etc.)



R-Urban tries to give back the possibility of re-appropriation and re-subjection of labour as fundamental ontological activity, while developing links and transversalities between work and emancipatory social, cultural, political and environmental values.

The diversity of activities developed by R-Urban should allow not only a new assemblage and emerging agencies but also a gradual disassembling of a system in crisis. To slowly escape from the generalized footprint of the neo-liberal economy, which has excluded all other forms of material and symbolic exchange, we must dismantle one by one our ties to the market system and go out of the system to make change possible. We must undo, dis-assemble —*des-agencer*, as Deleuze and Guattari might say— and lean out of the neo-liberal logic in order to re-assemble new ethical, environmental and long term ecological agencies.¹⁵ This re-assemblage is a collective act based on the conviction of each participant. The R-Urban strategy relies on ‘off-market’ elements that can potentially leave the system (for example interstitial spaces, community associations, marginalized or emerging practices) and can be integrated in new agencies and collective processes of re-assemblage.

The accumulation of numerous small changes that will form a large-scale strategy depends on the long term involvement of individual participants and on the collective dynamics around their initiatives. R-Urban aims for an urban environment which can adapt itself to the aspirations of every city dweller. This should be constituted progressively, by welcoming the most varied range of activities proposed by all kind of residents, including activities developed in free time. Later these free time activities could evolve into economic, cultural and ecological initiatives that will gradually replace the current productive and re-productive relations and will fundamentally define more democratic and more sustainable ways of working and living.

R-Urban recognises the condition of ‘dweller’ as political and promotes an emancipatory politics of living within populations which are usually limited in their existential choice by their social condition and the spatial, social and cultural experiences they have access to. Democracy, as Rancière says, is first and foremost ‘the place of all these places where the facticity is affected by contingency and egalitarian resolution. In this way, the street, the factory or the university can be places for such resurgence’.¹⁶ The space that R-Urban initiates will constitute, just as in other *aaa*’s projects, places of permanent negotiation, places of learning and bottom-up reconstruction of political fundamentals of democracy : equality of representation, general interest and common good, liberty and responsibility, collective governance, etc. These places are open to reconfiguration, introducing—depending on the people involved—dynamics of self-management, of responsibility and a sense of initiative and negotiation. This is the basis of any democratic functioning.

In R-Urban, we are trying to create spaces of self-managed sociality: a sociality which is self-regulated and in

permanent reconstruction. We try to create conditions for what Rancière called a ‘new sociality based on equality of conditions. This sociality will bring its providential solutions to the regulatory mechanism between the social and the political. What the most informed politics do not manage to do, the production of a self-regulated sociality (...), the providential movement of equalising social conditions will achieve’.¹⁷ In the long term, R-Urban could contribute to the reconnection of the political with the social through a more democratic way of dwelling.

‘ECOLOMY’ OF COMMONS

R-Urban participative networks will generate a multitude of micro-social dynamics (bottom-up, local, trans-local, rural and urban). Based on trust and solidarity, these participative networks should increase the capacity of action across different social and cultural milieus and in time structure a new long-term social pact. In his seminal book *Freefall*, Joseph Stiglitz explains the roots of the current economic crisis and notices that “‘even within a market economy, trust is the oil that makes a society function’”.¹⁸ Destabilised by egocentric behaviours, social trust needs to be reconstructed collectively and on a daily basis. The ‘oil that makes a society function’ needs regeneration and needs to infiltrate the practices of everyday life.

In this sense we need to replace the obsessive pursuit of ‘purchasing power’, the drive for selling and consuming, by the desire to self-produce locally, to reuse and recycle, to preserve and transmit, to share services and mutualise space through collective management. R-Urban proposes a change of mentality and social and economic vision, which will at the same time preserve attention to the other and care for the common future.

As Stiglitz demonstrates, we need to orient ourselves towards a new political economy that will ‘reconstruct the balance between the market and the state, between individual and collective, between man and nature, between means and goals’.¹⁹ The current market economy should quickly evolve into an ecological economy: *an ecolomy*²⁰. This is the direction to be taken if we want the economy to be adapted to different territorial scales and developed on a long-term basis under principles of solidarity and sharing. This attitude will not only change the way we manage our economy but also the way we manage our lives.

By introducing a capacity for multiple collective production (green productive spaces, active dwelling, local economy, etc.), R-Urban enables forms of *ecolomy*, understood as a production of commons.²¹ The question of the commons is at the heart of discussions about democracy today. In some of their recent texts, Michael Hardt and Antonio Negri define the commons as something which is not discovered but produced: ‘We call “biopolitical production” the current dominant model to underline the fact that it involves not only a material production in straight economic terms, but also it affects and contributes to produce all

other aspects of social life: i.e. economic, cultural and political. This biopolitical production and the increased commons that it creates, support the possibility of democracy today'.²² A sustainable democracy should be based on a long-term politics of the commons but also on social solidarities understood as commons. 'Creating value today is about networking subjectivities and capturing, diverting, appropriating what they do with the commons that they began'.²³

According to Negri, the contemporary revolutionary project is about this capturing, diverting, appropriating, reclaiming of the commons as a constituent process. It is at the same time a re-appropriation and a reinvention. This undertaking needs new categories and institutions, forms of management and governance, space and actors—an entire infrastructure that is both material and virtual.

R-Urban tries to create this new infrastructure, which is at the same time a re-appropriation and a reinvention of new forms of commons: from collective self-managed facilities to collective knowledge and skills, and forms of groups and networks. The facilities and uses proposed by R-Urban will be shared and disseminated at different scales, eventually constituting a network open to different users, including adaptable elements and processes based on open source knowledge. The resilient city is a city of sharing, empathy and cooperation; it is a city of commons.

PIONEERING R-URBAN

During the last few years we have developed and built a number of R-Urban prototypes to both anticipate and test ecological devices and locally closed cycles: water, energy, waste, food, skills, practices. We have also initiated social, economic and cultural networks based on existing and emerging local initiatives. We have identified and

encouraged local skills necessary to support such initiatives and have invited specialists to contribute to learning and re-skilling. We have also elaborated forms of knowledge production and skill exchange.

These prototypes allowed us to experiment with simple methods of implementation of an ecological approach at the level of everyday life and to generate self-managed collective use and environmental practices. We are preparing the construction of the first R-Urban pilot projects, which will implement resilient practices in a neighbourhood in Colombes. A social economy cluster and organic food market will be initiated in connection with urban agriculture plots. A recycling unit that will process construction materials and co-operative housing built from these



PLOT TRACING within urban gardening initiative, part of the R-Urban strategy in Colombes

materials will be ready in 2012. Seminars debates and workshops will disseminate knowledge and skills necessary to the process. R-Urban is on the way.

ENDNOTES

- 1 atelier d'architecture autogérée places autogestion at the core of its practice. Autogestion literally translates into English as 'self-management', but the word has a history in the French political thinking and practice that refers directly to ideological struggles and the antistatist social movements of the 19th Century, and to the idea of 'workers' control'. Together with other thinkers like Lefebvre, Castoriadis, Guillerm etc., we are fully aware of this meaning, but in our case, the figure of the 'worker' is replaced by that of 'inhabitant' or 'city dweller'. According to Negri, within the contemporary condition, the 'city' has replaced the 'factory' as place of predilection for the biopolitical production. atelier d'architecture autogérée promotes a kind of architecture in which the 'inhabitant', the 'city dweller', plays a central role. For us, the 'architecture autogérée' is an architecture which enables the 'dwellers' control'.
- 2 Transition Towns, Incredible Edible, Continuous Productive Urban Landscapes (CPULs), Ecovillage networks, to name only a few, are such initiatives that have started at local scale and have further developed into extended networks.
- 3 André Gorz, in *Manifeste Utopia*, Brest: Edition Parangon, 2008, p.13.
- 4 Compare Brigit Maguire and Sophie Cartwright, 'Assessing a community's capacity to manage change: A resilience approach to social assessment', 2010, available from <http://learningforsustainability.net/susdev/resilience.php>.
- 5 Rob Hopkins, *The Transition Handbook: From Oil Dependency to Local Resilience*, Green Books, 2008.

- 6 Arjun Appadurai, "The Capacity to Aspire" in V. Rao, M. Walton (eds.), *Cultural and Public Action*, Stanford: Stanford University Press, 2004.
- 7 Maurizio Lazzarato, *Puissance de l'invention*, La psychologie économique de Gabriel Tarde contre l'économie politique, Paris: Les Empêcheurs de penser en rond, 2002, p.354.
- 8 Rob Hopkins, 'What Communities Can Do', 2010, available at www.postcarbon.org/Reader/PCReader-Hopkins-Communities.pdf.
- 9 Some of these ideas were developed in Clare Brass, Flora Bowden, Kate McGeevor's paper 'Co-designing Urban Opportunities', on line <http://www.scibe.eu/publications/>, accessed 5 May, 2011
- 10 David Harvey, "The Right to the City", *New Left Review* 53, September/October 2008, p.23.
- 11 *ibid.*
- 12 Henri Lefebvre, 'Right to the City' in *Writings on Cities*, New York: Blackwell, 1996, p. 129-30.
- 13 See David Cameron's speech on Big Society, 14th February 2011 (www.number10.gov.uk/news/speeches-and-transcripts/2011/02/pms-speech-on-big-society-60563) accessed 2 July 2011.
- 14 These ideas have been developed notably in the work of Ivan Illich and André Gorz.
- 15 On disassembling—"des-agencer", see Gilles Deleuze, Felix Guattari, *Capitalisme et schizophrénie 2*, Mille Plateaux, 1980, Les Éditions de Minuit, p 17 e.s.
- 16 Jacques Rancière, *Au bord du politique*, Paris: Essais

- Folio Gallimard, 1998, p.126.
- 17 Jacques Rancière, *Au bord du politique*, pp.36-37.
- 18 Joseph Stiglitz, *Freefall*, Free Markets and the Sinking of the Global Economy, New York: Norton, 2010.
- 19 Joseph Stiglitz, *Freefall*, p. 516.
- 20 The terms 'ecology' was coined by Bjarke Ingels in his article 'The Joys of Ecology: How to Make Sustainability a Haven of Hedonism' (in Ilka and Andreas Ruby, *Re-Inventing Construction*, Berlin: Ruby Press, 2010, pp.55-66). Ingels draws his argument around the idea of an economy of ecology, based on production and consumption rather than reduction and abstention. He promotes a sort of cradle to cradle approach, which channels new flows and establishes closed cycles. Our understanding of 'ecology' extends his idea of 'economy of ecology' to its reverse: an 'ecology of economy', an economy aware of the relationships it creates and driven by ethical principles.
- 21 The 'commons' traditionally defined the elements in an environmental space and natural resources—say, forests, atmosphere, rivers, pasture—of which the management and use was shared by the members of a community. They were spaces that no one could own but everyone could use. The term has now been enlarged to include all resources (whether material or virtual) that are collectively shared by a population.
- 22 Michael Hardt, Antonio Negri, *Multitude, Guerre et démocratie à l'âge de l'Empire*, Paris: La Découverte, 2004, pp.9-10.
- 23 J. Ravel and A. Negri, 'Inventer le Commun des Hommes', *Multitudes*, 31 (2008), p. 7.