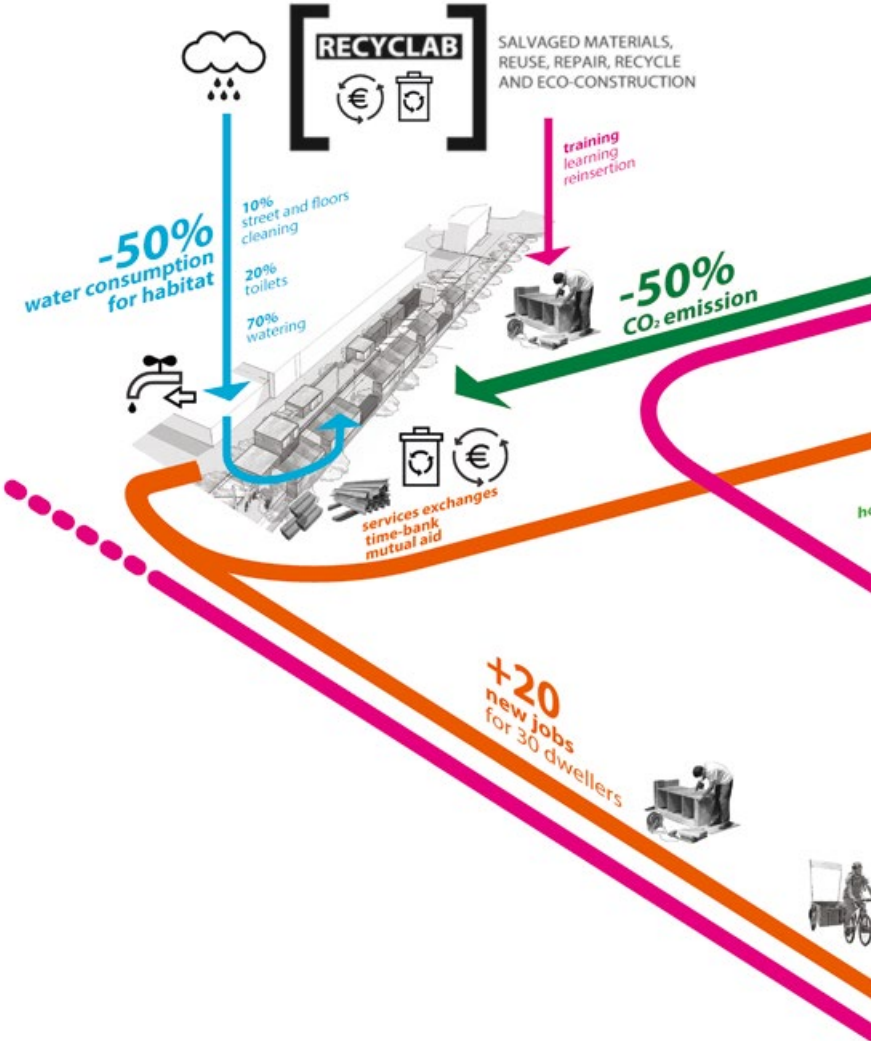


RESILIENCE VALUE IN THE FACE OF CLIMATE CHANGE

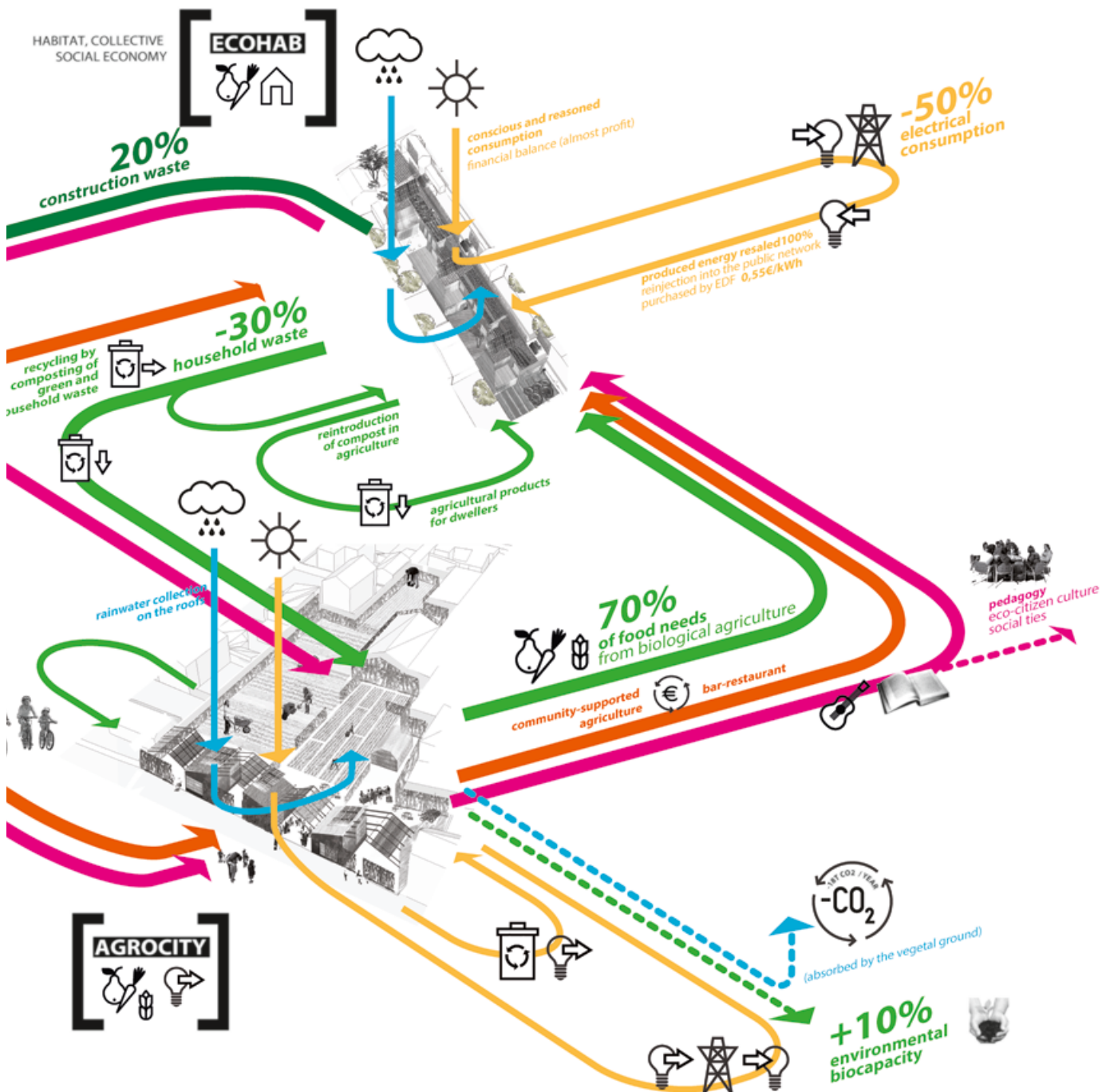
Doina Petrescu and Constantin Petcou



atelier d'architecture autogérée,
Pilot units and ecological cycles,
The R-Urban network,
Colombes, Paris,
2011

The diagram shows the network of three resilience hubs in Colombes functioning through locally closed circuits and creating social, economic and ecological benefits.

How can architecture enable civic ecological practices and community economies to fight climate change? **Doina Petrescu and Constantin Petcou**, founding members of Paris-based atelier d'architecture autogérée, describe strategies that have been developed to facilitate this virtuous resilience cycle particularly in relation to their project R-Urban.



R-Urban is a participatory strategy initiated by atelier d'architecture autogérée (aaa), based on the setting up of interconnected self-managed collective hubs, which boost the capacity of resilience within neighbourhoods by providing spaces where skills, knowledge, labour and creativity around urban agriculture, recycling, eco-construction and cooperative housing are shared.¹ As such, the R-Urban model proposes a resilient alternative to the current way of governing resources within a community and beyond. The 'R' of R-Urban stands for 'resilience' understood as 'resourcefulness', situating resilience in a positive light and relating it to the empowerment and agency of citizens and emergent communities. Although initially conceived by architectural designers and urban researchers, the R-Urban framework is further co-implemented with a wide range of actors including local residents, policy-makers and businesses.

The hubs and their local ecological systems constitute a form of urban infrastructure that can contribute to a wider ecological transition in neighbourhoods rooted in new collaborative social and economic practices. They act as prototypes for new ways of building and managing the neighbourhood and demonstrate the positive impacts of ecological transition, generating economic, ecological and social benefits.

The strategy was implemented from 2011 in Colombes, a suburban town to the northwest of Paris, in partnership with the municipality and a number of local organisations. Three hubs were planned to be built there – Agrocité, Ecohab and Recyclab – each aiming to provide complementary facilities (respectively urban agriculture and local culture, cooperative ecological housing, and recycling and eco-construction), enabling citizen-run services and local economic and ecological systems. In the event only two were built: Agrocité and Recyclab. They were operational in Colombes for five years before being relocated by aaa to two other neighbouring towns – Gennevilliers and Nanterre – because of a change of the municipal team following local elections.

With a reactivated local community, a number of ecological parameters were directly improved through the way in which the hubs were conceived and functioned. Food was produced locally; rainwater was collected and grey water remediated and used for watering; and urban waste was collected and transformed within the hubs. The numerous social and ecological benefits that they brought about included annual reductions of 37.3 tonnes in CO₂ emissions (ie 142 per cent less than traditional buildings of similar size and programme), 330 tonnes in waste, 24,500 cubic metres (865,000 cubic feet) in water consumption and an overall 40 per cent of the ecological footprint, with 50 per cent of the energy necessary for their functioning being produced locally.²

Given that the whole activity of R-Urban is oriented towards increasing resilience in the neighbourhood, all these benefits constitute a 'resilience value'. The questions here are: How can this value be assessed?

What components of the architectural project contribute to it? And how can the value of resilience be made an important parameter in architectural and urban projects?

Calculating Resilience Value

To answer these questions, research conducted together with economists Katherine Gibson and Maliha Safri from the Community Economies Collective (CEC) has put forward a method of calculating the value created by the R-Urban project in a way that also captures its collective resilience value.³ Currently, the tools available to assess the value of any urban or architectural project are based exclusively on financial calculations. However, in a world where the aim is to promote ecologically sustainable development, the value question needs to go beyond financial capital and commodification to include nurturance and eco-maintenance. Determining full benefit requires identifying improvements in household, community and ecological health, social and psychological wellbeing, civic involvement and participatory democracy.

In *Take Back the Economy: An Ethical Guide for Transforming Our Communities*, JK Gibson-Graham (the feminist economists Katherine Gibson and Julia Graham), Jenny Cameron and Stephen Healy proposed a different tool which is the community economy return on investment (CEROI).⁴ A community economy is built upon ethical investments – in surviving well, distributing surplus, responsibly encountering others, consuming sustainably and sharing our planetary resources, all with a view to the wellbeing of future more-than-human generations. Community economy returns thus include both social benefits (such as increased forms of individual, household and community wellbeing) and ecological benefits (such as a reduced ecological footprint and ecological repair). They also include increased collectively controlled surplus, increased ethical trade and expanded commons.

In a diverse economy that recognises the contributions of both paid and unpaid labour – including volunteer work, caring work and governance work, to name just a few – monetary equivalents can be used to 'cost' labour, products and services that are not exchanged via the market and are not 'commodified'.

Given the pertinence of the CEROI tool for the case of R-Urban, it is used here as a guide to calculate the full benefits of the strategy. A matrix has thus been established to measure four distinct aspects of the hubs: the direct financial revenues generated for individuals and the collective; the value of unpaid labour; the value of increased individual capacities; and the cost savings to users' households, the state and the planet.

The first aspect – the direct financial revenues – include design and research commission revenues related to new R-Urban developments, and the selling of services and goods produced by the R-Urban hubs (ie vegetables, cafe meals, fees for the different training courses: compost, apiculture, permaculture, etc).

The second – the value of unpaid labour related to R-Urban – is estimated by referring to the market

value of each particular form of labour. A large amount of unpaid architectural and construction labour was volunteered by users to complete the design and construction work done by professionals and add further features in order to appropriate the project and adapt it to needs. Another large bulk of volunteering work concerned the growing and processing of food, both for sale and for direct use in the cafe. Volunteer contributions were also made by researchers, scientists, trainers, etc. A significant amount of volunteer hours were put into event organising, managing group activities, administering the hubs and book-keeping for hubs governance.

The third aspect includes the value of the new capacities and skills that participants gained by involvement in the broad range of R-Urban activities, including regular gardening and care, recycling and repair activities, workshops around particular skills, and ecological and cultural events such as conferences, symposia, seminars and art exhibitions.

Lastly, the saved costs to users' households, the state and the planet include the value of ecological repair such as CO₂ emissions reduction, air pollution reduction, increased biodiversity, waste collection and transformation, and green energy production. The ecological principles considered in the design of the R-Urban infrastructure meant that there were savings in building costs, energy and water use. Also R-Urban participants learnt new habits of reducing water consumption and carried them through into their household management and everyday life. The state saved social benefits for those people who have taken training in the R-Urban hubs and gained employment. Also participation in physical and social activities reduced health costs to households and the state. Adopting reusing, repairing and recycling of used goods in the function of the hubs and through barter and exchange schemes generated savings for individual participants.



atelier d'architecture autogérée,
Culture, research and pedagogy
activities at the Agrocité hub,
Colombes, Paris,
2013

Training workshop conducted by Professor Fionn Stevenson from Sheffield University with Agrocité users to work on R-Urban ecological circuits.



atelier d'architecture autogérée,
Architecture and construction
activities at the Agrocité hub,
Gennevilliers, Paris,
2017

Dismantling and reconstruction in Gennevilliers of the Agrocité hub formerly located in Colombes. Ninety per cent of the materials initially used in Colombes were recovered and reused in the reconstruction process.

The ecological principles considered in the design of the R-Urban infrastructure meant that there were savings in building costs, energy and water use



atelier d'architecture autogérée,
Economic activities at the Agrocité hub,
Colombes, Paris,
2014

Collective catering during public events was one of the diverse economic activities based on voluntary work developed at Agrocité. The monetary revenues of these activities were further collectively reinvested in other R-Urban activities.



atelier d'architecture
autogérée,
Environmental care
activities at the
Agrocité hub,
Colombes, Paris,
2014

Self-organised bicycle repair
sessions took place regularly
in the Agrocité greenhouse,
as one of the many environmental
care activities.





atelier d'architecture autogérée,
Wellbeing activities
at the Agrocité hub,
Colombes, Paris,
2015

The architecture of Agrocité allowed a diversity of activities to take place in parallel and encouraged encounters and exchanges between participants. This constructed and supported conviviality contributed to the increased wellbeing of the hub's users.



atelier d'architecture autogérée,
Ecological prototypes
at the Agrocité hub,
Colombes, Paris,
2013

The rainwater collector storing 20 cubic metres (700 cubic feet) of water in the basement of Agrocité is one of the prototyped devices supporting ecological practices such as reduced water consumption in garden watering.

These returns were grouped according to the different areas of activity of the project. They comprised: culture, research and pedagogy (including activities of research, training, and education); architecture and construction (including design of the hubs and related devices, building of furniture and ecological devices for R-Urban hubs and external clients, DIY, recycling, repairing activities); economy (including small business and job training activities such as farming, catering, compost making, beekeeping, repairing etc); wellbeing (including individual and social wellbeing, reduced delinquency, reduced consumption, health improvements etc); ecology (including gardening, repair, reuse and other ecological care activities and their consequences on the environment); and management, care and governance (including activities such as repairing, cleaning, book-keeping, communication, events organisation etc).

All these returns were estimated in monetary terms in order to speak about the broader social and environmental value of R-Urban (and other similar projects) in a 'language' that can be understood by policy-makers and urban developers. The method allows this specific resilience regeneration project to be compared with other urban development projects, and enables a post-capitalist vision and politics to be supported here and now.

Data were collected annually over a five-year period (2011 to 2016). Only the graphic representations of final data, and not the details of the calculations, are given in this article.⁵This exercise can be continued for subsequent iterations of R-Urban hubs, and provides a calculation and graphic representation guide for other similar projects.

The Resilience Value Iceberg

The value of the R-Urban project's social and ecological benefits, as estimated here, is something that is invisible most of the time, and is not generally included in any type of value calculation for urban projects. However, for a community-oriented project it is exactly this value which makes the difference.

This difference is evidenced by a graphic representation of data that recalls JK Gibson-Graham's iceberg model of the economy, first published in 2006 in *Postcapitalist Politics*.⁶ For Gibson-Graham:

The image of the economy as an iceberg is one way of reframing which practices are included and valued as 'economic'. When we see the whole iceberg above and below the waterline, the economy as we have known it melts away. We start to recognize the vast range of practices, places, organizations and relationships that contribute to daily survival. What was once seen as 'alternative' is but part of the already existing diverse economy.⁷

Gibson-Graham speak also about the need to recognise the enabling aspect of the built environment in terms of allowing these 'diverse economies' that promote collectivity and sharing, or allowing care to be enacted. R-Urban is indeed an exemplary case of how an architectural project can create specific spaces to enable

JK Gibson-Graham,
The Economy as an Iceberg,
2013

Economic geographers Katherine Gibson and Julia Graham (aka JK Gibson-Graham) created the image of the iceberg of diverse economies, which was redrawn by artist James Langdon for the 'Trade Show' curated by Kathrin Böhm and Gavin Wade at Eastside Projects, Birmingham, in 2013-14. A group exhibition, the show exercised the function of art to exchange, present and enact different economic practices and cultures of trade.



atelier d'architecture autogérée,
The 'iceberg' diagram of resilience value for R-Urban,
Colombes, Paris,
2011-16

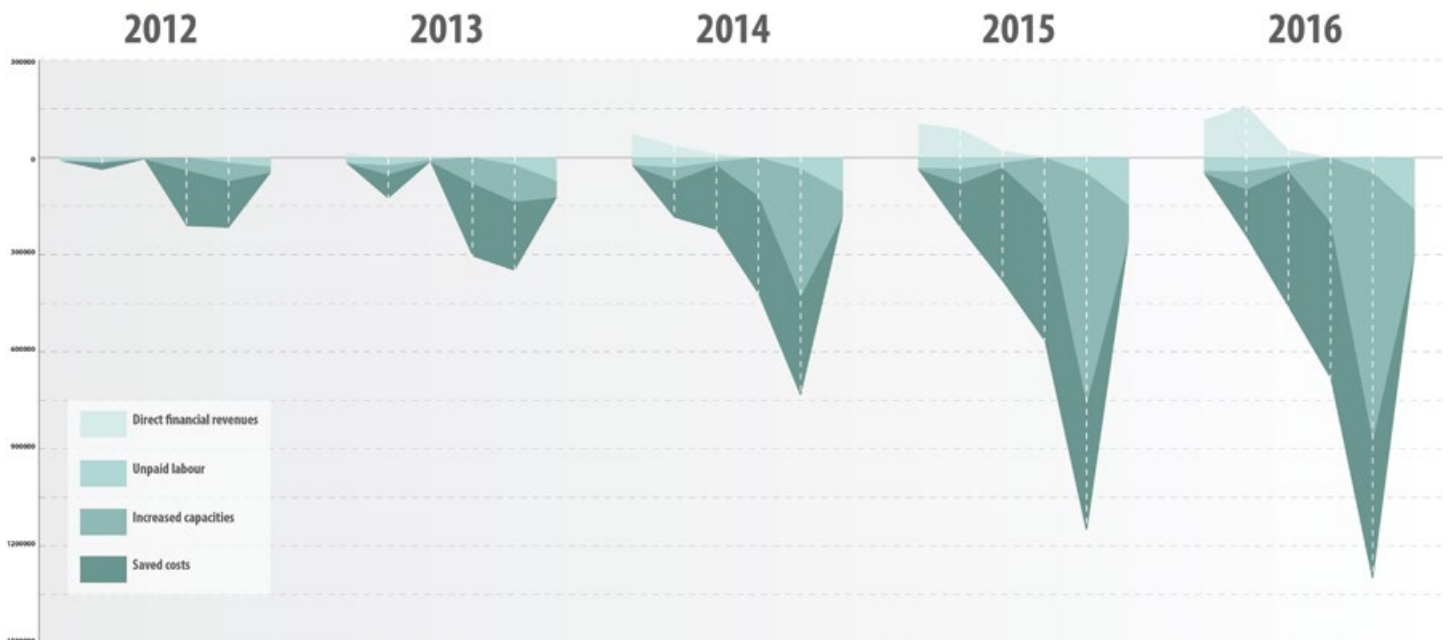
below: The diagram shows the evolution of the resilience value produced by the R-Urban project during its five-year installation in Colombes, represented by the evolution of its 'economy' iceberg. Additional detail is shown in a one-year snapshot (2016).

collectivity, sharing and care and promote social and ecological values.

By analogy with Gibson-Graham's iceberg, the R-Urban resilience value diagram draws a hypothetical waterline which separates the visible and invisible parts of the value iceberg. The visible part represents the direct financial revenues generated by the project (ie the revenues from selling of services and goods produced by participants in the R-Urban hubs). This represents the part of the R-Urban economy which relates to the market. The invisible part monetises savings from voluntary work and skill improvements, as well as ecological savings generated during the construction and utilisation of buildings and through the activities they host. This is the plural and diverse economy of the project which is social and ecological. It also includes the 'enabling' value of the architecture which makes collectivity, or sharing, possible, or allows care to be enacted to save social costs for the state or ecological costs for the planet.

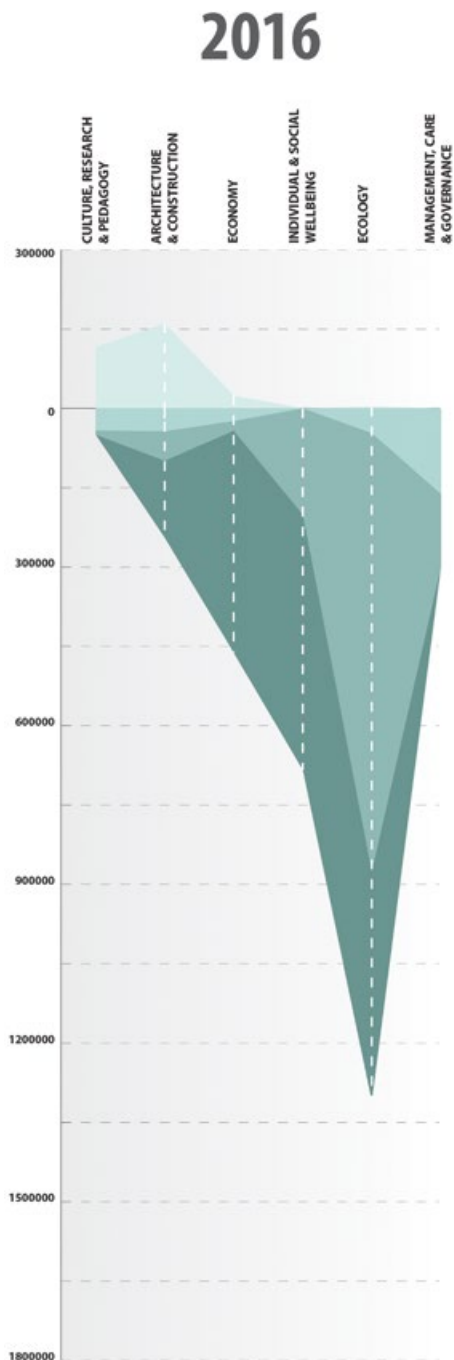
The calculations show that for an apportioned annual investment of €250,000 during the five-year period (including the costs of building and management of the two hubs), the yearly return on investment (which includes the value of ecological and environmental repair embedded in the hub's activities) grows gradually over time, reaching almost €2 million in 2016.

Looking at the evolution of the iceberg, it is noticeable that it is mainly the invisible value which grows exponentially. As such, in the fifth year (2016) the invisible value is 10 times larger than the visible market value. While the market value is created by only a few businesses incubated by the R-Urban hubs and involving tens of people, the invisible value is collectively created by hundreds of participants. The more participants join the project, the larger the generated invisible value is. As such, the wellbeing value increases because more people reduce their consumption and health costs, while increasing their sociality, skills and capacities.



The savings for the state and the planet also increase as more people join the project to achieve ecological repair, being involved in activities of recycling and reducing of waste or in gardening, with consequences including a reduction of CO₂ emissions and air pollution and an increase in biodiversity.

The most significant increase is in the field of wellbeing and ecology, in terms of the estimated value of increased capacities and saved costs. However, this value is never considered in current transactions, and projects like R-Urban are usually dismissed because they do not generate direct financial value in the way a developer project does. This was the case with two of the R-Urban hubs which were threatened with eviction in 2016 by the then Mayor of Colombes, who wanted to sell and develop their sites on a capitalist model, for financial



profit, dismissing the social, cultural and ecological values created by these hubs. In fact, nothing is wrong with these hubs; what is wrong is the power system which assesses the values they create.

The calculations demonstrate that these types of project generate even more important sorts of value: savings for the state and for the planet, as well as added social value and increased wellbeing. These value types can contribute very directly to covering the costs involved in the ecological transition. This is the 'resilience value', and is something that should be considered an integral part of the diverse economy-ecology of any architectural or urban project.

Lessons Learned on How to Act Against the Climate Crisis

R-Urban offers insight into how architecture can help to radically transform everyday practices and strengthen urban resilience. The setting up of community infrastructure where learning and exchange can take place alongside the activities of gardening, recycling and repair activities is important. Space is required for people to learn how to participate in community economy transactions and negotiations. The design and architectural qualities of R-Urban contribute to this. Without designated spaces for convivial exchange during winter, or places to hang out and make food together, the connections and trust building necessary to develop these practices are harder to make and sustain. Also, specific conditions are necessary to allow the project to grow its activities and its number of users over time. The R-Urban experience suggests this as a rule for increasing the invisible part of the resilience value iceberg. In addition, R-Urban's resilience value demonstrates that society actually has the means to act effectively against the climate crisis if opportunities are created for everyone to invest in and collectively reconsider the economic, social and ecological values of their actions. ▽

Notes

1. See the project website: <http://R-Urban.net>.
2. Doina Petrescu, Constantin Petcou and Corelia Baibarac, 'Co-producing Commons-Based Resilience: Lessons from R-Urban', *Building Research & Information*, 44 (7), 2016, p 729.
3. Doina Petrescu, Constantin Petcou, Katherine Gibson and Maliha Safri, 'Calculating the Value of the Commons: Generating Resilient Urban Futures', in *Transformative Geographies of Community Initiatives* profile issue of *Environmental Policy and Governance*, 2020 (in press).
4. JK Gibson-Graham, Jenny Cameron and Stephen Healy, *Take Back the Economy: An Ethical Guide for Transforming Our Communities*, University of Minnesota Press (Minneapolis), 2013.
5. <http://R-Urban.net>.
6. JK Gibson-Graham, *Postcapitalist Politics*, University of Minnesota Press (Minneapolis), 2006.
7. JK Gibson-Graham, *Economic Meltdown, or What An Iceberg Can Tell Us About The Economy*, Trade Show Eastside Projects (Birmingham), 2013, p 1.