

DEGROWTH: ARCHITECTURE AFTER CAPITALISM

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Studio Days: Monday & Thursday – 9:30-12:30 & 1:30-5:30pm.

Office hours: Upon request

Territorial Acknowledgement

We acknowledge that the School of Architecture is located on the traditional territory of the Neutral, Anishinaabeg and Haudenosaunee peoples. The University is situated on the Haldimand Tract, the land promised to the Six Nations that includes 10 kilometres on each side of the Grand River.

(see references here: <https://uwaterloo.ca/engineering/about/territorial-acknowledgement>)

“Architecture is now a tool of capital, complicit in a purpose antithetical to its social mission. [...] Once discovered as a form of capital, there is no choice for buildings but to operate according to the logic of capital. In that sense there may ultimately be no such thing as Modern or Postmodern architecture, but simply architecture before and after its annexation by capital.”

Reyner de Graaf, 2015

On the surface, degrowth sounds like an economics of scarcity, as many on both the right and left have been quick to allege. But in fact exactly the opposite is true. A long view of the history of capitalism reveals that growth has always depended on enclosure. [...] This is done not only in order to acquire free value from the commons but also, I argue, in order to create an “artificial scarcity” that generates pressures for competitive productivity. Degrowth seeks to invert the Lauderdale Paradox. By calling for a fairer distribution of existing resources and the expansion of public goods, degrowth demands not scarcity but rather abundance.

Jason Hickel, 2019

“What happens to a discipline so bound up with the city when the city is exhausted as a field of possibility? [...] architects in Japan have begun to look beyond the metropolis to reinvent their practice. The trajectories, scale, and content of their engagement vary. Yet there is a common effort to define a new form of exchange between architects and communities, one that supplants the traditional system of commissioning”

CCA Islands and Villages

1.0 INTRODUCTION AND PREMISE

Degrowth began as an activist slogan in France in the early 2000s, against consumerism and consumption, but has since become part of disciplinary discourse in a number of fields, including ecological economics, political ecology, environmental justice, anthropology, technology, philosophy, wellbeing, democracy, justice, among others.

Degrowth scholars argue that a profound, multi-scalar, systemic reorganization of society is required, one that moves from a perpetual growth paradigm inherent in our late capitalist economic model to a more sustainable framework, in order to reduce resource and energy consumption and achieve required climate goals. Instead of GDP being the ultimate measure of prosperity, the movement highlights the value of autonomy, care work, self-organization, notions of commons, community, localism, work sharing, and happiness.¹ Advocates for degrowth argue that we can live, as a society, with less, and that

¹ Giorgos Kallis Federico Demaria Giacomo D'Alisa, Degrowth: A Vocabulary for a New Era (E-Book), January 2015.

this shift in societal approach is “not only necessary but also desirable and possible”, and one might add, an opportunity for radical social, programmatic, spatial, and material innovation.²

However, in a world that is increasingly urbanized, and in which urban growth is often tied to economic growth, degrowth has largely been neglected the topic of the design disciplines. Some exceptions to this blind spot exists. The 2019 Oslo Triennale entitled “Enough: The Architecture of Degrowth” declared that *“as the drivers of growth begin to fail us, we must imagine alternative societal structures that do not incentivise unsustainable resource and energy use, and do not perpetuate inequality. Here we can look to Degrowth, a movement that contests the supremacy of economic growth and seeks to move us away from this stressful, damaging, impossible task of endless growth; not by collapse, but by design.”*³

If one agrees with Reyner de Graaf’s argument that architecture is, and has been for some time, “a tool of capital, complicit in a purpose antithetical to its social mission,” how can architects position themselves in relation to ideas of degrowth?⁴ What, if anything, is there to design if economies or population are shrinking? In architecture, urbanism, and landscape, degrowth can be understood through a multitude of lenses, from material reuse and resource sharing, to the challenges of demographic aging, economic cycles of boom/bust, or shrinkage due to political instability.

Degrowth can be a lens to understand both shrinking urban centers and the multitude of rural agricultural, industrial and Indigenous communities which struggle due to geographic isolation, mono-economies, and/or failing infrastructures (whether it be internet, clean water, road access, among others). Degrowth is closely linked to other movement such as the Slow City concept in which participant small cities commit to growing sustainably by preserving their local culture and diversity.

2.0 COURSE DESCRIPTION

As a studio group, we will seek out contexts in which degrowth is occurring due to economic decline, political instability, shrinking population, resource scarcity, material scarcity, or other forces. It can be located in Canada or abroad, however ideally a context for which you have at least a partial understanding of the local culture, politics, and social structures. In order to understand how to intervene, we will examine the causes for said decline, and understand, in the spirit of Bruno Latour’s Actor Network Theory, the networks of actors, resources, opportunities and forces which contribute to the decline and conversely might contribute to new models of community.⁵

The studio posits that a degrowth framework would enable places experiencing such decline to leverage this state of imbalance as an opportunity rather than a liability.⁶ This would encourage the repurposing of building, or the creation of new building typologies and/or community programs which embrace ideas of

² Angelos Varvarousis and Penny Koutrolidou, “Degrowth and the City” by, *e-flux Architecture*, October 2018
<https://www.e-flux.com/architecture/overgrowth/221623/degrowth-and-the-city>

³ Maria Smith; Matthew Dalziel; Phineas Harper; Cecilie Sachs Olsen. OAT 2019 Curatorial Statement, Oslo Architecture Triennale. <http://oslotriennale.no/en/news/oat-2019-curatorial-statement>. Accessed December 5, 2021

⁴ Reyner de Graaf, “Architecture is now a tool of capital, complicit in a purpose antithetical to its social mission” in *The Architectural Review*, 24 April, 2015.
<https://www.architectural-review.com/essays/architecture-is-now-a-tool-of-capital-complicit-in-a-purpose-antithetical-to-its-social-mission>

⁵ Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory*, (Oxford: Oxford University Press, 2005).

⁶ Lola Sheppard & Maya Przybylski, “Imbalance and Unpredictability as a Productive Practice” in *Bracket [at Extremes]*. (Barcelona: Actar publishers, 2013).

sharing, reuse, reinvention, disassembly, etc. Degrowth arguments intersect with advocacy for co-housing, co-working, the sharing economy, recycling of materials and resources, etc. in so far as they seek models which reduce our consumption of space, money and or resources. We also know that as these “sharing economies” scale up, they become victim to the same forces of capitalism. To this end, the studio will focus on small scale, local strategies of degrowth.

What is the role of design in this context? How might we rethink housing, education, health and aging, if we relied more on sharing, repurposing, making do with less, repairing, self-producing, etc.? How do we rethink our access to food, consumer goods, travel or recreation in various cultural and social environments? How might mobility change in a degrowth context? How might degrowth strategies support marginalized or racialized communities? Are lessons from one context transferable to another? Could degrowth encourage ideas of new commons; the creation and protection of cultural and natural resources which are accessible to all members of a society and are held in for collective benefit.

The studio will be grounded by research in the first weeks of the studio and is organized such that research and design continue to feedback on each other through most of the term. The studio encourages broad speculations, independent thinking, and the positioning of architecture within a comprehensive geographic, cultural, and material context. The studio attributes new roles to the architect— not simply problem solver, but cultural, environmental and spatial detective—bringing to light the forces at work within a given geography, and the possibility of leveraging opportunities and synergies to imagine new formats of architecture. The studio asks what larger agency can architecture have?

While the ambitions of the studio are broad, the course will be structured to enable students to move effectively across scales, with the term project divided into several sub-phases. The studio will work across a range of scales—from the regional to the site specific to material and tectonic resolution. We will work from large-scale mapping and analysis of contexts, to spatial diagrams, and from building organization down to detailed design.

The studio will use the organized across 3 scales of thinking:

- ***FLows: Networks (Local, Regional or Territorial and Global):***
How does the idea of degrowth require your proposal to situate itself within a regional network of places, other economies, flows of people and or resources within a larger territory?
- ***FIELD: Local Impact***
How does your proposal situate itself within its immediate context: spatially, culturally, socially. What programmatic opportunities does it create? What voids does it fill? Does the project fit into existing “vernacular” practices, or establish new vernaculars? (You are strongly encouraged to select a context you have visited in person, even if only once.)
- ***OBJECT: Building and Material Practices***
How does your project consider material practices, including (re)use of materials, full or partial reuse of buildings, consideration of building lifespan and possible disassembly of buildings, innovative material assemblies, local capacity, etc.

03: STUDIO STRUCTURE & METHODOLOGY

Detailed descriptions will introduce each phase of the project. While the ambitions of the studio are large, the course will be structured to enable students to move effectively across scales, with the term project divided into several sub-phases.

The course will be structured around a **single project, broken into 4 phases**.

P1: DEGROWTH LIBRARY // PREDECENT STUDY

Rapid research to build up a compendium of architectural, rural and urban degrowth precedents.

P2: STAGING DEGROWTH // SETTING THE STORY (Flows /Fields)

Selecting contexts in which to operate and analysis of the selected context, effectively writing your own brief for the studio

P3.1: SPATIALIZING A STABLE-STATE: DESIGNING A NEW COMMONS (Fields/Object)

The schematic design of your intervention.

P3.2: MATERIALIZING THE NEW COMMONS (Object)

Detailed, experiential design of your project.

The studio will work through a range of documentation and presentation methods—from cartography, photography, and diagrams, to plans, sections, axonometrics, and models—and across a range of scales—from the territorial, to the community scale, to the building and detailed tectonic resolution.

Because of the multiple scales and issues you will be asked to look at, **you are strongly encouraged to work in groups of two** for projects 2 and 3. This will enable you to research more, reduce work load, and enable you to bounce ideas off each other.

04: PEDAGOGICAL OBJECTIVES

This studio will operate as a design research laboratory, in which the initial collective research of the studio will help each student to formulate a thesis question centered on the studio's premise. The intention of the MB studio is to prepare students for the Master thesis; to encourage students to engage in independent, critical thinking and to develop - through rigorous preliminary research - a specific site and program within the larger framework of the studio. However, each assignment will be framed in such a way as to help students focus their work and efforts in the most effective way possible.

By the end of the studio, students should be able to demonstrate a clear and sophisticated ability to:

- pursue independent research
- develop and articulate a critical position relative to architecture, site and program, material
- expression
- develop a project at a range of scales – from site strategy, to building development and tectonics
- exhibit dexterity and understanding of geometry, scale, craft
- work through a range of representation modes

The studio fulfills the following **CACB accreditation** requirements:

- A1 Design Theories, Precedents and Methods; A2 Design Skills; A3 Design Tools; A4 Program Analysis (and Dev)
- A5 Site context and Design; A8 Design Documentation; B1 Critical Thinking; B4 Cultural Diversity & Global Perspectives

05: SCHEDULE AND STUDIO ATTENDANCE

You are expected to be in studio all day on studio days. (Breaks for lunch, coffee, library or lab use is, of course, permitted.) If you miss desk-crits, reviews, lectures, without a satisfactory explanation, this will also result in a 0 in your participation grade. Class attendance and participation play a key part in the course & will form part of the participation grade.

We will encourage peer-to-peer learning, asking students to join in discussions about fellow student's projects, ask questions, and participate in regular, but more informal pin-up sessions. The studio sessions will include lectures, individual desk-critiques, group discussions, pin-ups and formal reviews. Detailed descriptions will introduce each project. Lectures and other presentations will be given in conjunction with each introduction.

COURSE SCHEDULE

Week 01			
JAN	Priorities	M 03	NO CLASSES
	PRECEDENT	Th 07	STUDIO INTRO and LECTURE P1 HANDOUT – DOCUMENTING (Individual)
Week 02			
JAN	RESEARCH	M 10	Reading Discussion Research Pin-Up
		Th 13	P1 REVIEW P2 HANDOUT
Week 03			
JAN	POSITIONING	M 17	Charette (Group) GIS Workshop (1:30-3:00pm)
	UNDERSTANDING CONTEXT	Th 20	Desk Crits
Week 04			
JAN	MAPPING STAKEHOLDERS	M 24	Desk Crits
		Th 27	Pin-Up / Group Discussion
Week 05			
	PROPOSING PROGRAM	M 31	Desk Crits
FEB		Th 03	P2 REVIEW
Week 06			
FEB	TEST DRIVE ORGANIZATION	M 07	P3 HANDOUT Charette
		Th 10	Desk Crits
Week 07			
FEB	PLAN	M 14	Desk Crits
	SECTION	Th 17	Desk Crits

Week 08			
FEB	RE-RUN	M 21	READING WEEK
		Th 24	READING WEEK
Week 09			
FEB	AXONOMETRIC RELATIONSHIPS	M 28	Desk Crits
		Th 03	Structures Lecture am Desk Crits
Week 10			
MAR		M 07	P3.1 MID REVIEW - DESIGNING A NEW COMMONS
	SCALES OF SPACES	Th 10	P3 CHARETTE: MATERIALIZING THE NEW COMMONS (In class work)
Week 11			
MAR	STRUCTURE	M 14	LS AWAY – Independent work
		Th 17	STRUCTURES WORKSHOP with Andrea Atkins
Week 12			
MAR	RERUN	M 21	Desk Crits
		Th 24	PIN UP
Week 13			
MAR	MATERIALITY FRAGMENT	M 28	Desk Crits
		Th 31	Desk Crits
Week 14			
APR	ATMOSPHERE	M 04	Last day of classes Desk Crits
		Th 07	Desk crits (voluntary)
Week 15			
APR		M 11	Plotting Deadline to ACM
		W 13	FINAL REVIEW (TBC)

07: EVALUATION

Students will be graded on the work performed during this course. Grading will be based on the degree to which submitted work satisfies the requirements and objectives of each assignment. In addition, grading will reflect student participation, commitment, effort and improvement over the 13 weeks of the course. The weighting of the projects throughout the term is as follows:

Project 1:	5%
Project 2:	25%
Project 3.1 Mid-review:	20%
Project 3.2 Pin-Up:	5%
Project 3.2 Final Project:	40%
Participation & Growth:	5%
Total:	100%

The specific basis for the evaluation of each project will be identified in individual project handouts. Grades will be posted on LEARN within 2 weeks of deadline/review.

Note: You must receive a passing grade in P3.2 in order to pass the course.

Presentation at Final Reviews: While studio reviews are not evaluated per se (and in particular, the discussions of studio reviews are not an indication of grading outcomes) attendance and presentation of work is mandatory. Students who fail to present their work without prior agreement with a studio professor will receive a 10% grade deduction on the project, over and above any late penalties that might apply.

Hand-In and Digital Submissions: Students must complete all projects to an acceptable level and obtain a passing average in order to receive credit for this course.

You are required to have hard copy print-out for all pin-ups and formal reviews. Last minute printing problems, lost or corrupt files will not be accepted as an excuse for late project submissions. All work in this course must be presented in hard copy format regardless of one's preferred working methodology.

Late Work: All assignments are due in class (or online) at the specified time and date. Project deadlines can be extended only in cases of illness or incapacity, or special circumstances. Requests for such extensions must be made **before** the project deadline to the studio coordinator, using the Request for Extension form available from the front office, and be accompanied by a medical certificate when appropriate.

Work submitted after the hand-in date and time without a confirmed extension will be subject to a penalty of 20 on the first calendar day and 5% penalty per day thereafter. After five calendar days a mark of zero will be recorded for the project.

For all digital upload submissions, it is the students' responsibility to verify that the upload worked, that the file size and preview of the upload are correct.

Course Delivery Platforms & Communication

The studio will online for the start of term for Winter 2022. During this time, and beyond, we will use ZOOM, TEAMS MIRO and LEARN as platforms for sharing documents, visual materials, and in the event that any guest critics are remote. It will be

In-Person Activities Planning

If course activities are impacted by a change in restrictions to in-person activities, such as changes in room occupancy limits, the instructor will communicate updated in-person activity plans. These plans may alter student plans for in-person activities.

Course Time Zone

All dates and times communicated in the document are expressed in Eastern Time. Eastern Standard Time (EST, UTC-05:00) applies November to March and Eastern Daylight Time (EDT, UTC-04:00) applies from March to November.

COVID-19 Special Statement

Given the continuously evolving situation around COVID-19, students are to refer to the University of Waterloo's developing information resource page (<https://uwaterloo.ca/coronavirus/>) for up-to-date information on academic updates, health services, important dates, co-op, accommodation rules and other university level responses to COVID-19.

Accommodation: Should students require accommodation due to illness, they must provide a Verification of Illness Form to support their requests. [Check <https://uwaterloo.ca/registrar/current-students/accommodation-due-to-illness> for more information.]

Student Notice of Recording

The course's official *Notice of Recording* document is found on the course's LEARN site. This document outlines shared responsibilities for instructors and students around issues of privacy and security. Each student is responsible for reviewing this document.

Course events that will be recorded and made available through official course platforms (LEARN and/or MS Teams) are indicated in the course schedule. Students wishing not to be captured in the recordings have the option of participating through the direct chat or question and answer functions in the meeting platforms used.

Individual desk critiques/meetings and small group meetings will not be recorded.

Late Work

Assignments that are handed in late will receive an initial penalty of 20% on the first calendar day late and a 5% penalty per calendar day thereafter. After 4 calendar days, the assignment will receive a 0%. Only in the case of a justified medical or personal reason will these penalties be waived, and only if these have been officially submitted to the [Graduate Student Services Co-Ordinator](#) and accepted by the Graduate Office.

Students seeking accommodations due to COVID-19, are to follow Covid-19-related accommodations as outlined by the university here: (<https://uwaterloo.ca/coronavirus/academic-information#accommodations>).

Late Pass

Students are allocated one late pass for the term. This allows students to make one submission up to 48 hours after the stated deadline without penalty and without any request for accommodation. However, a make-up review will not be organized in this case. Students will simply receive written and verbal feedback from the instructor.

Students are required to communicate with your instructor their intention to use a late pass before the relevant deadline.

Passing Grades

The standard minimum passing grade in each ARCH graduate course is 65%. Grades below the specified passing grade result in a course failure.

Exam Period Travel: Student travel plans are not considered acceptable grounds for granting an alternative examination time.

08: COMMUNICATION WITH STUDIO COORDINATOR

During the course of the term, the professor may need to send communications to ARCH 690 students. It is required that each student confirm their current active email address with the Graduate Student Service Coordinator during the first week of class. Any correspondence regarding studio matters can be addressed to **lsheppard@uwaterloo.ca**

Mental Health Support

All of us need a support system. We encourage you to seek out mental health supports when they are needed. Please reach out to Campus Wellness (<https://uwaterloo.ca/campus-wellness/>) and Counselling Services (<https://uwaterloo.ca/campus-wellness/counselling-services>).

We understand that these circumstances can be troubling, and you may need to speak with someone for emotional support. Good2Talk (<https://good2talk.ca/>) is a post-secondary student helpline based in Ontario, Canada that is available to all students.

Equity, Diversity and Inclusion Commitment

The School of Architecture is committed to foster and support equity, diversity and inclusion. If you experience discrimination, micro-aggression, or other forms of racism, sexism, discrimination against 2SLGBTQ+, or disability, there are several pathways available for addressing this:

A) If you feel comfortable bringing this up directly with the faculty, staff or student who has said or done something offensive, we invite you, or a friend, to speak directly with this person. People make mistakes and dealing them directly in the present may be the most effective means of addressing the issue.

B) you can reach out to either the [Undergraduate office](#), [Graduate office](#), or Director ([Anne Bordeleau](#)). If you contact any of these people in confidence, they are bound to preserve your anonymity and follow up on your report.

C) You can choose to report centrally to the Equity Office. The Equity Office can be reached by emailing equity@uwaterloo.ca. More information on the functions and services of the equity office can be found here: <https://uwaterloo.ca/human-rights-equity-inclusion/about/equity-office>.

D) [Racial Advocacy for Inclusion, Solidarity and Equity \(RAISE\)](#) is a student-led Waterloo Undergraduate Student Association (WUSA) service launching in the Winter 2019 term. RAISE serves to address racism and xenophobia on the University of Waterloo campus with initiatives reflective of RAISE's three pillars of Education and Advocacy, Peer-to-Peer Support, and Community Building. The initiatives include but are not limited to: formal means to report and confront racism, accessible and considerate peer-support, and organization of social events to cultivate both an uplifting and united community. You can report an incident using their [online form](#).

Academic integrity, grievance, discipline, appeals and note for students with disabilities:

Academic integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [Check [the Office of Academic Integrity](#) for more information.]

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read [Policy 70, Student Petitions and Grievances, Section 4](#). When in doubt, please be certain to contact the department's administrative assistant who will provide further assistance.

Discipline: A student is expected to know what constitutes academic integrity to avoid committing an academic offence, and to take responsibility for his/her actions. [Check [the Office of Academic Integrity](#) for more information.] A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate associate dean. For information on categories of offences and types of penalties, students should refer to [Policy 71, Student Discipline](#). For typical penalties, check [Guidelines for the Assessment of Penalties](#).

Appeals: A decision made or penalty imposed under Policy 70, Student Petitions and Grievances (other than a petition) or Policy 71, Student Discipline may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72, Student Appeals.

Note for students with disabilities: [AccessAbility Services](#), located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with [AccessAbility Services](#) at the beginning of each academic term.

Turnitin.com: Text matching software (Turnitin®) may be used to screen assignments in this course. Turnitin® is used to verify that all materials and sources in assignments are documented. Students' submissions are stored on a U.S. server, therefore students must be given an alternative (e.g., scaffolded assignment or annotated bibliography), if they are concerned about their privacy and/or security. Students will be given due notice, in the first week of the term and/or at the time assignment details are provided, about arrangements and alternatives for the use of Turnitin in this course.

RECOMMENDED READINGS

Attached is a bibliography of books and websites that touch upon many of the issues will be discussing this term. Reference material will be held on reserve in the *Musagetes Library* (once we are back in person) for use by the class, or will be provided in pdf form and posted to LEARN. We encourage all students to actively use the *Musagetes Library* collection.

Aureli, Pier Vittorio. "Toward the Archipelago," in *Log*, Winter 2008, Anyone Corporation, No. 11: 91-120.

Dalziel, Matthew; Harper, Phineas; Sachs Olsen, Cecilie, Smith, Maria. Oslo Triennale OAT 2019 Curatorial Statement. <http://oslotriennale.no/en/news/oat-2019-curatorial-statement>

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Harper, Phineas. "Our dependency on growth, like on concrete, must be abolished," in *Dezeen*. (25 September 2019).
<https://www.dezeen.com/2019/09/25/oslo-architecture-triennale-architecture-degrowth-phineas-harper/>

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Oswalt, Philipp; Bittner, Regina; Fishman; Robert. *Shrinking Cities: International research, vol.1*. Art Pub Incorporated, 2005.

Piper, Kelsey. "Can we save the planet by shrinking the economy?" *Vox*. (August 2, 202) [interesting counter argument to degrowth]
<https://www.vox.com/future-perfect/22408556/save-planet-shrink-economy-degrowth>

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<https://www.e-flux.com/architecture/overgrowth/221623/degrowth-and-the-city>

Additional References

Solidarity Economies: Ian Scoones on populism and rural politics, interviewed by David Huber
Canadian Center for Architecture

www.cca.qc.ca/en/articles/issues/26/what-about-the-provinces/56877/solidarity-economies

Islands and Villages, Canadian Centre for Architecture.

<https://www.cca.qc.ca/en/articles/issues/26/what-about-the-provinces/56455/islands-and-villages>

Bowring, Jacky; Swaffield, Simon. "Think Global, Think Local: Critical Regionalism and Landscape Architecture," in *Landscape Review* 9, no. 2 (2004), 1-12.

<http://search.proquest.com.proxy.lib.uwaterloo.ca/docview/1609296684?accountid=14906>.

Cassidy, John. "Can we have prosperity without Growth?" *The New Yorker* (February 3, 2020).

<https://www.newyorker.com/magazine/2020/02/10/can-we-have-prosperity-without-growth>

Latouche, Serge. "Degrowth Economics," *Le Monde Diplomatique*, (November 2004) [on Degrowth in the South] <https://mondediplo.com/2004/11/14latouche>

Wainwright, Oliver. "China's rural revolution: the architects rescuing its villages from oblivion," *The Guardian*. (March 24, 2021).

<https://www.theguardian.com/artanddesign/2021/mar/24/chinas-rural-revolution-architects-rescuing-villages-oblivion-tofu-rice-wine-lotus-tea>

ARUP & The Circular Economy in the Built Environment

https://www.arup.com/perspectives/publications/research/section/circular-economy-in-the-built-environment?utm_medium=website&utm_source=archdaily.com