DEBRISIA

Alice Rong
Jing Ying Chin
Tanya Tungkaserawong

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DEBRISIA
self sustainability  net zero waste  resident-run

ALICE RONG
JING YING CHIN
TANYA TUNGKASERAWONG
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THESIS ADVISORY GROUP: ARCHITECTURE AFTER SHARING

ADVISORS: MARCOS PARGA  
JUNHO CHUN  
JOSEPH GODLEWSKI
Vacant spaces are the non-utilized or underutilized lands due to their parcel shape, size, or geographic location. These vacant lands are often associated with illegal dumping of construction and general waste due to avoidance of refuse collection fee payments, leading to social, environmental, and financial risks. With the rise in illegal dumping over the years, we aim to address this problem at the avoidance, minimization, and recovery level of waste management.

**VACANT LOTS CLASSIFICATION**

**ONE OR MORE TO BE CLASSIFIED AS VACANT PARCEL**

**ZERO DOLLAR BUILDING VALUE IN LOCAL TAX ASSESSOR’S RECORDS**

- REMNANT PARCELS
- PARCELS WITH PHYSICAL LIMITATIONS
- CORPORATE RESERVE PARCELS
- PARCELS HELD FROM SPECULATION
- INSTITUTIONAL RESERVE PARCELS
- DERELECT LAND

**TAX PARCEL WITHOUT A STRUCTURE ON IT**

- LIKELY TO BE PERMANENTLY VACANT

**CITY OWNED AND CONSIDERED VACANT AND DEVELOPABLE**

**TYPES OF VACANT LAND**

**AS PER RAY NORTHAM, URBAN ECONOMIST**

**CAUSES OF DECREASED VACANT LAND IN THE 1990s**

CITIES WITH 50,000+ POPULATION LATE 1997 - EARLY 1998

<table>
<thead>
<tr>
<th>Cause</th>
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<td>OTHER</td>
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<td>INDUSTRIAL REUSE</td>
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<td>CITY POlicIES</td>
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<tr>
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<td>OTHER REUSE</td>
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</tr>
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**EVOCATIONS**

**NEGATIVE**

- ABANDONMENT
- ODD SHAPED
- OTHER CONDITIONS
- VACANT LAND IN UNDERSUPPLY
- VACANT TOO LONG
- VACANT LAND IN OVERSUPPLY

**CONDITIONS IN U.S. CITIES**

CITIES WITH 50,000+ POPULATION LATE 1997 - EARLY 1998
146 RESPONSES TO SURVEY

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<thead>
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<th>Condition</th>
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<td>NOT LARGE ENOUGH</td>
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<tr>
<td>ODD SHAPED</td>
<td>75/186</td>
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<tr>
<td>“WRONG” LOCATION</td>
<td>72/186</td>
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<tr>
<td>OTHER CONDITIONS</td>
<td>60/186</td>
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<td>VACANT LAND IN UNDERSUPPLY</td>
<td>58/186</td>
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<td>VACANT TOO LONG</td>
<td>45/186</td>
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<td>VACANT LAND IN OVERSUPPLY</td>
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**CAUSES OF INCREASED VACANT LAND IN THE 1990s**

CITIES WITH 50,000+ POPULATION LATE 1997 - EARLY 1998
# ILLEGAL DUMPING

## WHAT?

- **OPEN DUMPING** - DUMPED IN OPEN AREAS
- **FLY DUMPING** - FROM VEHICLES ALONG THE ROADSIDES
- **MIDNIGHT DUMPING** - LATE AT NIGHT
- CONSTRUCTION AND DEMOLITION WASTE SUCH AS DRYWALL, ROOFING SINGLES, LUMBER, BRICKS, CONCRETE AND SIDING
- ABANDONED AUTOMOBILES, AUTO PARTS AND SCRAP TIRES
- APPLIANCES OR “WHITE GOODS”
- FURNITURE
- YARD WASTE
- HOUSEHOLD TRASH
- MEDICAL WASTE

## TIME

- AT NIGHT
- EARLY MORNING HOURS DURING WARMER MONTH

## COMMON POTENTIAL SITES

- ABANDONED INDUSTRIAL, RESIDENTIAL OR COMMERCIAL BUILDINGS
- VACANT LOTS ON PUBLIC OR PRIVATE PROPERTY
- INFREQUENTLY USED ALLEYS OR ROADWAYS
- NEAR JUNKYARD AND TEMPORARY DUMP AREAS AT CONSTRUCTION SITES

## FACTORS WHY?

- COMMUNITIES AREAS WITH LIMITED ACCESS TO WASTE DISPOSAL FACILITIES OR SERVICES AND RECYCLING PROGRAMS
- LOWER-INCOME AREAS
- DANGEROUS AND HIGH CRIME RATE AREAS WITH LOW PRIORITY BY LAW ENFORCEMENT
- AREAS WITH A HIGH POPULATION OF RENTERS WHO HAVE LESS STAKE IN THE COMMUNITY
- UNSECURED PROPERTIES (UNDEVELOPED LOTS, ABANDONED STRUCTURES, UNUSED INDUSTRIAL FACILITIES AND REMOTE SPACES)
- VACANT PROPERTIES WITH REDUCED POTENTIAL FOR DUMPERS TO BE SIGHTED
- SPACES THAT ARE SPARSELY POPULATED AND DARK
- BORDERS OF CITIES WITH LACK OF POLICE PRESENCE
- NATURAL DISASTERS
- RURAL ROADS AND RAILWAYS

## LACK OF ...

- ALTERNATIVE WASTE DISPOSAL AND RECYCLING PROGRAMS
- CONTRACT WITH A WASTE HAULER AND STANDARDIZED BILLING
- SOLID WASTE CODES AND ORDINANCE
- ORDERS THAT PROHIBITING OPEN DUMPING OR BURNING OF WASTE
- DEPEND OF LOCAL CODES

## WHO?

- CONSTRUCTION, DEMOLITION, REMODELING, ROOFING OR LANDSCAPING CONTRACTORS
- WASTE MANAGEMENT COMPANIES OR GENERAL HAULING CONTRACTORS
- OPERATORS OF TRANSFER STATIONS OR JUNKYARDS
- AUTOMOBILE REPAIR OR TIRE SHOPS
- SCRAP COLLECTORS
- LOCAL RESIDENTS AND “DO-IT-YOURSELVES”

## HOW IS THIS A PROBLEM?

- PHYSICAL (PROTRUDING NAILS OR SHARP EDGES)
- CHEMICAL HAZARDS (HARMFUL FLUIDS OR DUST)
- ATTRACTS RODENTS, INSECT AND OTHER VERMIN
- ATTRIBUTED TO DISEASE-CARRYING MOSQUITOES

## OTHER AFFECTS

- FIRE: SPONTANEOUS COMBUSTION AND ARSON
- FLOODING (IMPACT PROPER DRAINAGE OF RUNOFF)
- FOREST FIRE AND SEVERE EROSION
- CONTAMINATE WELLS AND SURFACE WATER
- PROPERTY VALUES DECREASES
- COST OF PUBLIC CLEANUPS INCREASES (TAX)
COMMON TYPES OF WASTE IN ILLEGAL DUMPING

PLASTIC
- PET/ PETE
- HDPE
- PVC/V
- LDPE/ LLDPE
- PP
- PS
- PLASTIC RESIN + ABS
- UNIDENTIFIED PLASTIC
- PURE PLASTIC FILM
- COMPOSITE PLASTIC

PACKAGING
- NON-PACKAGING
- PLASTIC FILM
- OTHER/ SPECIAL

GLASS
- CLEAR GLASS
- BROWN GLASS
- GREEN GLASS

PAPER
- PRESS/ PRINTING
- MISCELLANEOUS PAPER
- CORRUGATED BOXES
- FOLDING BOXES
- CARTONS, PLATES, CUPS
- MISCELLANEOUS BOARD

PACKAGING
- NON-PACKAGING
- BOARD
- APPLIANCES
- WRAPPING FOIL

METAL
- FERROUS
- NON-FERROUS

CONSTRUCTION
- SHINGLES
- MIXTURE WITH CONCRETE
- STEEL
- WOOD
- BRICK AND CLAY TILES
- DRYWALL AND PLASTERS

BULKY ITEMS/ FOOD
- EXCESS LEFTOVER
- HOUSEHOLD
- TIRES/ INNER TUBES
- FURNITURE
- MATTRESS
- CAR PARTS

BULKY
- FOOD WASTE
- BANNED FROM LANDFILLS
- HARD TO DISASSEMBLE
ILLEGAL DUMPING SITE ANALYSIS

VACANT LOTS IN LOS ANGELES

ILLEGAL DUMPING IN LOS ANGELES DISTRICTS

POPULATION DENSITY IN LOS ANGELES

MEDIAN HOUSEHOLD INCOME IN LOS ANGELES

ILLEGAL DUMPING REQUESTS MONTHLY AVERAGES PER YEAR

COMMON TYPES OF WASTE

BULKY ITEMS/APPLIANCES
GENERAL DEBRIS/TRASH
CONSTRUCTION DEBRIS
BRUSH
PRODUCE/FOOD

POPULATION PER SQUARE MILE OF LAND

0 - 9000
9000 - 17000
17000 - 26000
26000 - 34000
34000 - 43000

MEDIAN HOUSEHOLD INCOME BY NEIGHBORHOOD

$20,000 - $54,000
$54,000 - $88,000
$88,000 - $121,000
$121,000 - $155,000
$155,000 - $189,000

POPULATION IN 2020 : 3,898,747
CITY AREA : 503 SQ. MILES
### Refuse Collection Fees per Month

<table>
<thead>
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<th></th>
<th>Los Angeles</th>
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<th>New York City</th>
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<tr>
<td>Single-Family Unit</td>
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<td>Four-Or-More Family Unit</td>
<td>$24.33</td>
<td>$41.67</td>
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### Reasons for High Illegal Dumping

**High Population Density**

- 2nd Most Populous US City in 2020
- Lack of L.A. sanitation and environment workers and public officers for investigations and arrests of illegal dumpers.
- Businesses hire pickup trucks to dump their wastes on public streets, alleys, and vacant lots.
- Businesses and individuals avoid paying refuse collection fees to legally dispose of their waste.

**6th Most Populous US City in 2020**

- Raised fines for illegal dumping, but the shortage of surveillance cameras made the law rarely enforced.
- ‘Big belly’ trash cans installed in 2017 worsen the illegal dumping of hazardous waste.
- Businesses and individuals avoid paying refuse collection fees to legally dispose of their waste.

### Zoning Districts

- SFR: Single-Family Residential
- MFR: Multi-Family Residential
- COM: Commercial
- MFG: Manufacturing
- RSA: Residential Single-Family Attached
- RM: Residential Multi-Family
- CMX: Commercial Mixed-Use
- I-1: Light Industrial
- I-2: Medium Industrial
Vacant spaces are the non-utilized or underutilized lands due to their parcel shape, size, or geographic location. American cities are underdeveloping vacant lots, and as a result, many of these lots are being used for illegal dumping, harming communities in social, environmental, and financial ways. Debrisia aims to help each community reclaim their vacant lots by equipping them with curated infrastructure for intervention that will allow the people to activate the space themselves. Instead of waiting for institutions to do something, the people are taking action into their own hands.

The project aims to explore the potential of enhancing vacant lots to the benefit of the community and achieve net zero waste by introducing a self-sustaining system. Debrisia acts as a prototype that addresses local needs and adapts to different scales of community. There are five networks supporting each other: energy, water, agriculture, livestock and recycling workshops. The locals will generate electricity collected by motion, manage the livestock, produce fertilizer for vegetation, and create products from their food waste. Emphasis is placed on participation from the residents, and such, the residents will get to receive back what they help produce at the facility.

Through the implementation of Debrisia, and through the lens of illegal dumping, people will become aware of the power they have. Instead of unconsciously throwing things away, they can participate in an initiative that repurposes waste, and draws awareness to sustainability. Instead of contributing to a problem by illegal dumping, they can be part of a collective that is a solution for creating a better space to live.
SELF-SUSTAINING SYSTEMS

ELECTRICITY

PRODUCT

WATER

VERMICOMPOST

RECYCLED PRODUCTS
IMPLEMENTATION PROCESS

ORGANIZE

FREE LOTS ANGELES (FLA)

CITY COUNCIL

BUILD

RECYCLE FACILITY

SPARKLING SPECIALISTS + COMMUNITY

MAINTAIN

CITY COUNCIL + SPECIALISTS

VOLUNTEERS + COMMUNITY

DEBRISIA, FREE LOTS ANGELES (FLA), AND CITY COUNCIL MEET TO IDENTIFY AND DISCUSS POTENTIAL LOTS FOR ACTIVATION

1. NEIGHBORHOOD VISIT
2. PROJECT INTRODUCTION
3. LOT CLEAN UP
4. MECHANICAL INSTALLATION
5. SCAFFOLDING CONSTRUCTION
6. INITIAL SCAFFOLDING FRAMEWORK
7. COMMUNITY MEETING
8. POST IMPLEMENTATION
STRUCTURES AND MATERIALITY

FRAMEWORK STRUCTURE

3

4

MATERIALITY

POLYCARBONATE SAFT

STEEL SCAFFOLDING STRUCTURES

RECYCLED SOLAR ENERGY CARTONS

SAMPLE LOT
SITE SPECIFIC DESIGN

POSSIBLE SITE IN LOS ANGELES

BELMONT AVENUE, LOS ANGELES
SITE SPECIFIC DESIGN
SITE SPECIFIC DESIGN
**PRECEDENTS**

**SELF SUSTAIN SYSTEM PRECEDENTS**

**REGEN VILLAGES**

**DESIGNER**

EFFEKT

**DESCRIPTION**

ReGen Villages is a new visionary model for the development of off-grid, integrated and resilient eco-villages that can power and feed self-reliant families around the world. This redistribution of density fosters “a model that adds not only environmental and financial value but also social value by creating the framework for empowering families and developing a true sense of community, reconnecting people with nature and consumption with production.” It brings back a sense of achievement that accompanies the environmental and social benefits, making it a more sustainable long-term model.

**R-URBAN**

**DESIGNER**

R-Urban

**DESCRIPTION**

R-Urban is a bottom-up strategy that explores the possibilities of enhancing the capacity of urban resilience by introducing a network of resident-run facilities to create complementarities between key fields of activity (economy, housing, urban agriculture, culture). Flows, networks and circuits of production-consumption will be formed through these activities, with an emphasis on sustainability. R-URBAN provides tools and resources to facilitate citizen involvement in this project, including accompanying emerging projects at local and regional levels that are working to meet the same ends.

**MOTION ELECTRICITY GENERATION PRECEDENTS**

**MOTION TILES**

**DESIGNER**

Kohel Hayamizu, Pawegen

**DESCRIPTION**

ReGen Villages is a new visionary model for the development of off-grid, integrated and resilient eco-villages that can power and feed self-reliant families around the world. This redistribution of density fosters “a model that adds not only environmental and financial value but also social value by creating the framework for empowering families and developing a true sense of community, reconnecting people with nature and consumption with production.” It brings back a sense of achievement that accompanies the environmental and social benefits, making it a more sustainable long-term model.

**RECREATION SPACE/ PLAYGROUND EQUIPMENT**

**DESIGNER**

Empower Playground Inc (EPI), The Great Outdoor (TGO)

**DESCRIPTION**

Offering much more than just electricity, from fitness opportunities to educational lessons to pure play, these energy-generating playgrounds and recreation spaces have the potential to take off and affect the lives of people around the globe. The energy produced by the equipments just translates into friction and capture this kinetic energy and put it toward useful purposes for the surrounding community.
PRECEDES

URBAN AGRICULTURE PRECEDES

SUNQIAO URBAN AGRICULTURAL DISTRICT

DESIGNER
Sasaki

DESCRIPTION
Smaller scale agriculture now dominates Shanghai’s peri-urban landscape. Sunqiao is a district for urban agriculture with laboratory for agricultural innovation and education. With limited land supply, vertical farming with hydroponic and aquaponic growing systems are used to grow leafy greens to support Shanghai food consumption. As part of the sustainability system, collected rainwater and wastewater are filtered to use for watering the plants. The aquaponic system works as water treatment that return clean water into Lujiaibang Canal.

AGROCITE

DESIGNER
R-URBAN

DESCRIPTION
AgroCite is a part of R-URBAN project. The project explores the ideas of urban agriculture and community gardening, which provides cultural and educational activities on those areas. The facilities include a greenhouse, an agricultural products market, a cooking facility, and a cafe. Additionally, the project provides prototypes of rainwater collection, phytoremediation, solar energy and biogas systems, and aquaponic crops. Local residents can support the dynamics of urban agriculture by contributing in the provided facilities.

FOOD WASTE TO TABLEWARE PRECEDES

THE ANIMA COLLECTION

DESIGNER
Kosuke Araki

DESCRIPTION
The collection features a series of cups, plates and bowls, which was made by combining carbonised vegetable waste and “animal glue”, from the bones and skin of animal offcuts. Araki designed the collection to demonstrate the alternatives to throwing away food waste, which is often disposed of in landfills.

COLLECTION OF HOMEWARE ITEMS

DESIGNER
Barbara Gollackner

DESCRIPTION
To create the tableware items, the studio gathered food waste, such as pork skin and old bread, from personal and industrial waste. The waste is either dried out or cooked, depending on the food, and blended into a smooth paste that is bound together by mycelium. Sometimes water or additional food items, such as more breadcrumbs, are added to the mix. The paste is then inserted into a 3D-printer to produce the paste into simple shapes.
VACANT LOT


ILLEGAL DUMPING AND WASTE MANAGEMENT


PUBLIC SPACE


