Cultivating Community to Support Climate Change Action

Kyle D. Brown, PhD, ASLA

March 16th, 2017

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for Regenerative Studies

A Collective Impact Toward a Sustainable Future Since 1994

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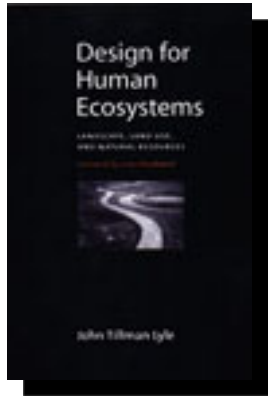
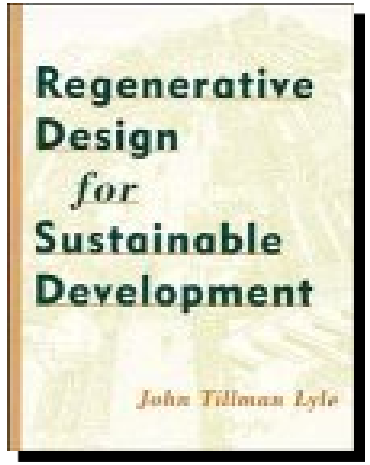
CAL POLY POMONA



Design for Human Ecosystems.
New York: Wiley. 1985 (reprinted by Island Press, 1999).



Regenerative Design for Sustainable Development.
New York: Wiley. 1994

Lyle's papers/archives recently donated to Cal Poly Pomona Library

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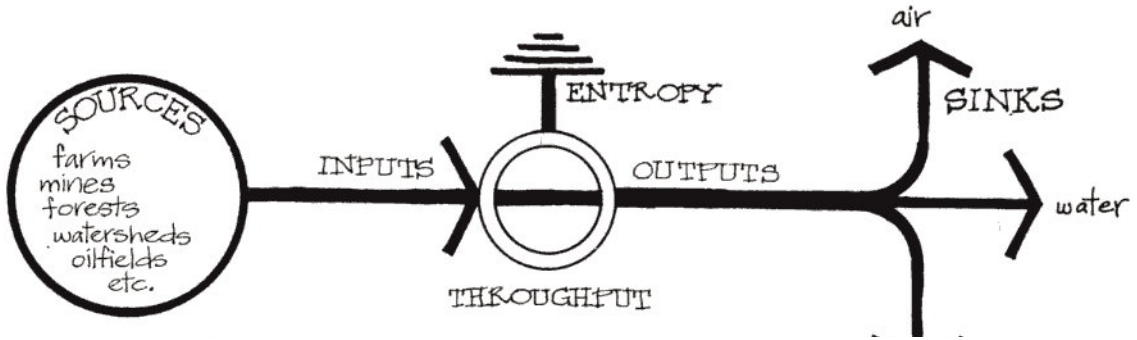
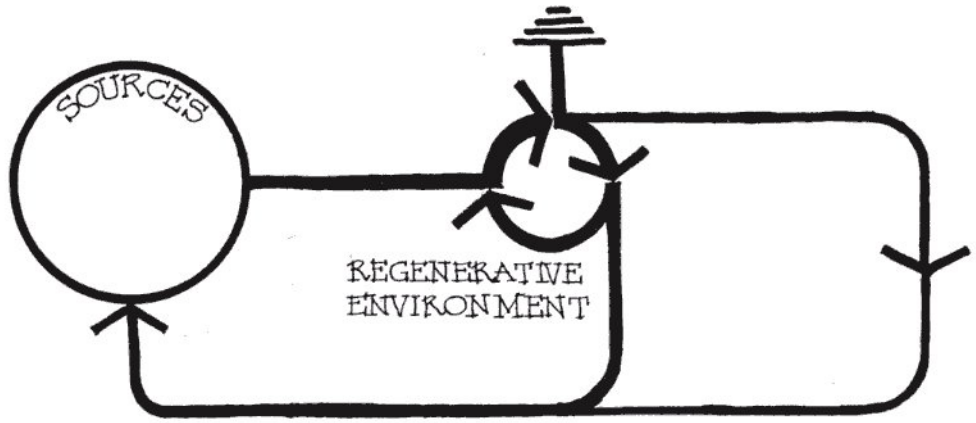
Aspects of Environmental Sustainability:



Throughput Systems Common in Conventional Design



Regenerative Systems for Sustainable Development

Source: Lyle, 1994

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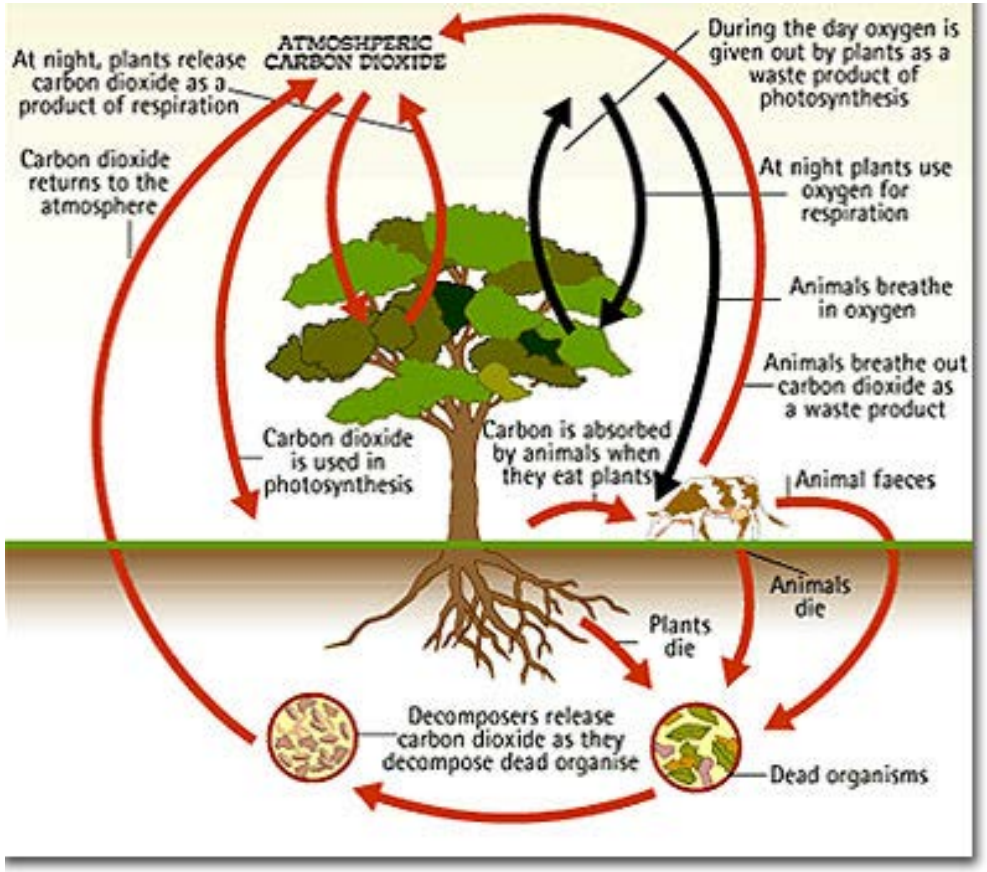
Today's Talk

- Climate Change Causes and Impacts
- Relationship to Other Pollution Concerns
- Environmental Inequality
- "What can I do?"
- "What can we do?"

The Carbon Cycle Before the Industrial Era

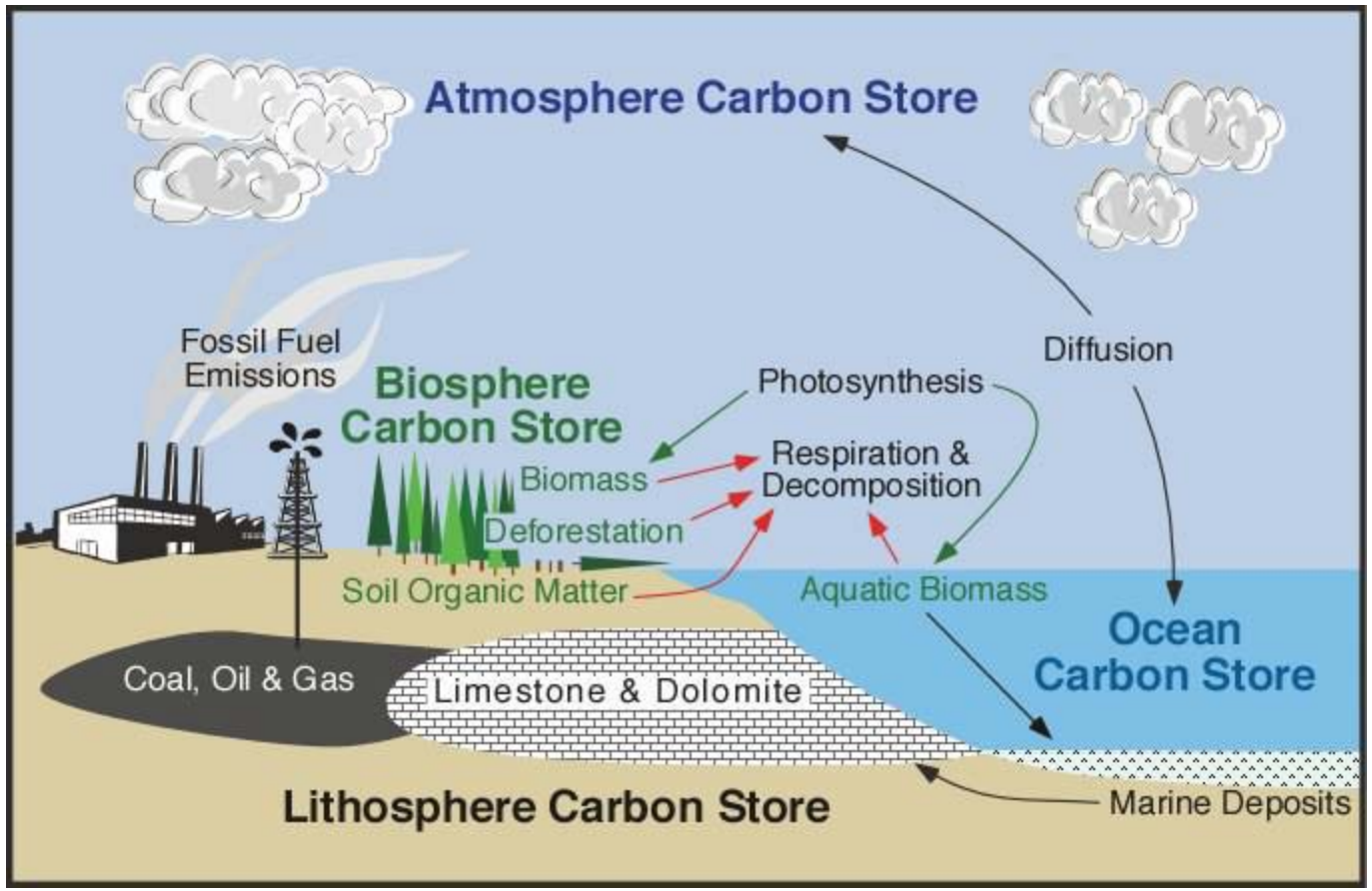
Prior to industrialization, most carbon cycling involved only the atmosphere, biosphere and the shallow soil depths of the earth.



Source: www.world4green.org/world4green/earth-awareness/

The Carbon Cycle of the Industrial Era

Extensive use of fossil fuels has brought carbon reserves from the geosphere into active carbon cycling in the atmosphere and biosphere.



Source: www.physicalgeography.net/fundamentals/9r.html

Implications of Greenhouse Gas Emissions per IPCC

Intergovernmental Panel on Climate Change (IPCC). Released the 5th Assessment Report – Summary for Policy Makers in 2014.

Common Terms Defined:

virtually certain 99–100% probability

extremely likely: 95–100%

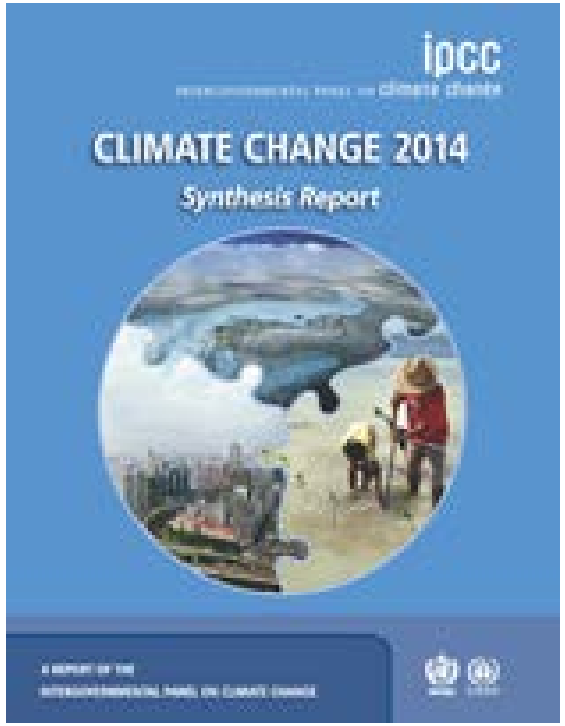
very likely 90–100%

likely 66–100%

about as likely as not 33–66%

unlikely 0–33%

very unlikely 0–10%



Implications of Greenhouse Gas Emissions per IPCC

- It is *extremely likely* that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in greenhouse gas concentrations and other anthropogenic forcings together.

- Anthropogenic influences have *very likely* contributed to Arctic sea ice loss since 1979.

- It is *virtually certain* that there will be more frequent hot and fewer cold temperature extremes over most land areas on daily and seasonal timescales as global mean temperatures increase. It is *very likely* that heat waves will occur with a higher frequency and duration.

- Extreme precipitation events over most of the mid-latitude land masses and over wet tropical regions will *very likely* become more intense and more frequent by the end of this century, as global mean surface temperature increases

The Impact of Other forms of Pollution

- The health effects of air, water and soil pollution are well documented

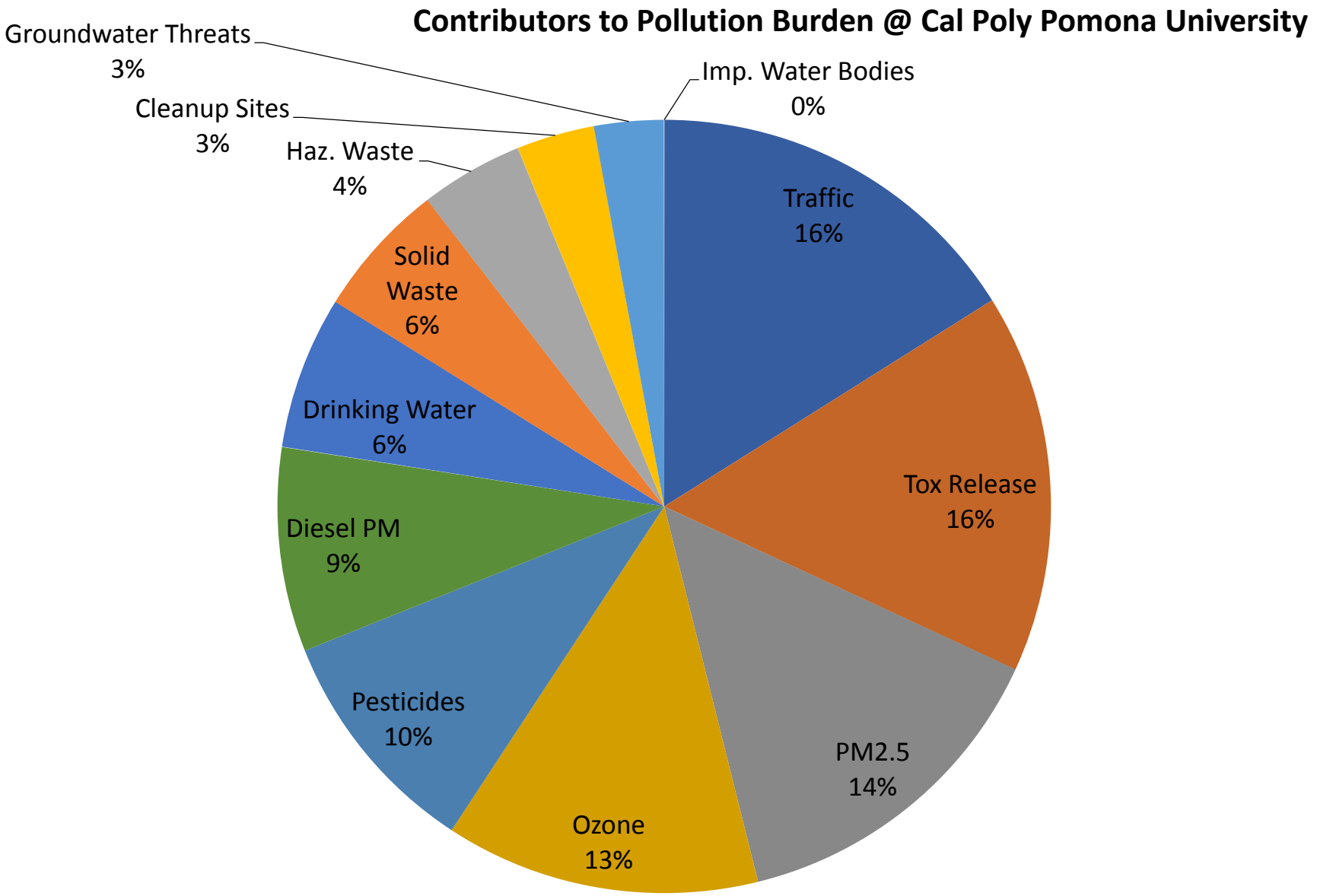
- Growing awareness among researchers of the cumulative effects of exposure to multiple pollutants over a lifetime

- State of California recently began documenting cumulative pollution burdens across the state – recognizing that some communities are impacted more than others.

The Impact of Pollution & Relationship to Fossil Fuels

Pollutants	Principal Source(s)	Health Effects
Ozone	Vehicle Emissions	lung irritation, inflammation and exacerbation of existing chronic conditions (asthma)
Particulate Matter	Vehicle Emissions; Industry, Wood Burning or other combustion	Heart and lung disease
Diesel Particulate Matter	Truck and heavy equipment emissions	Heart and lung disease; lung cancer
Traffic Density	Vehicle Emissions/operations	Heart and lung disease; low-weight birth; traffic fatalities
Toxic Releases	Industrial operations	Various cancer and poisoning risks
Water Contaminants and threats	Agricultural and Industrial Uses; Urban stormwater runoff	Birth defects and miscarriages, delayed development; cancer risks
Pesticide Use	Agricultural/Horticultural Activities	Various cancers, pesticide-related illness; chronic diseases
Hazardous/Solid Waste and cleanup sites	Industrial uses; landfills; transfer/recycling facilities	Birth defects; cancer risks; fires

Contributors to Pollution Burden @ Cal Poly Pomona University



Source: Kyle D. Brown, 2014 – Derived from Data from DRAFT CALIFORNIA COMMUNITIES ENVIRONMENTAL HEALTH SCREENING TOOL, VERSION 2.0 (CALENVIROSCREEN 2.0)

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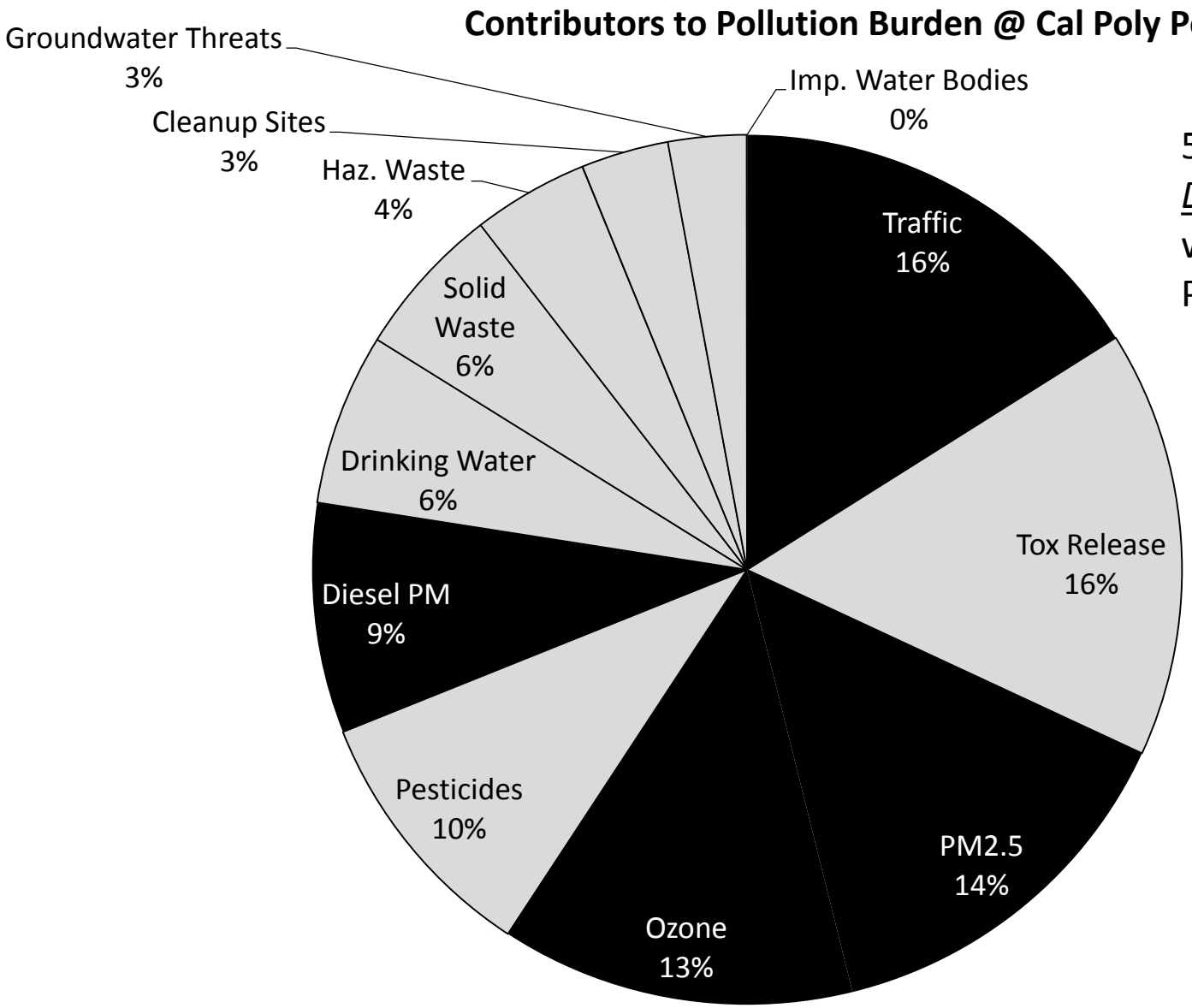


52% of Burden *Directly* Associated with Using Petroleum Products

Source: Kyle D. Brown, 2014 – Derived from Data from DRAFT CALIFORNIA COMMUNITIES ENVIRONMENTAL HEALTH SCREENING TOOL, VERSION 2.0 (CALENVIROSCREEN 2.0)

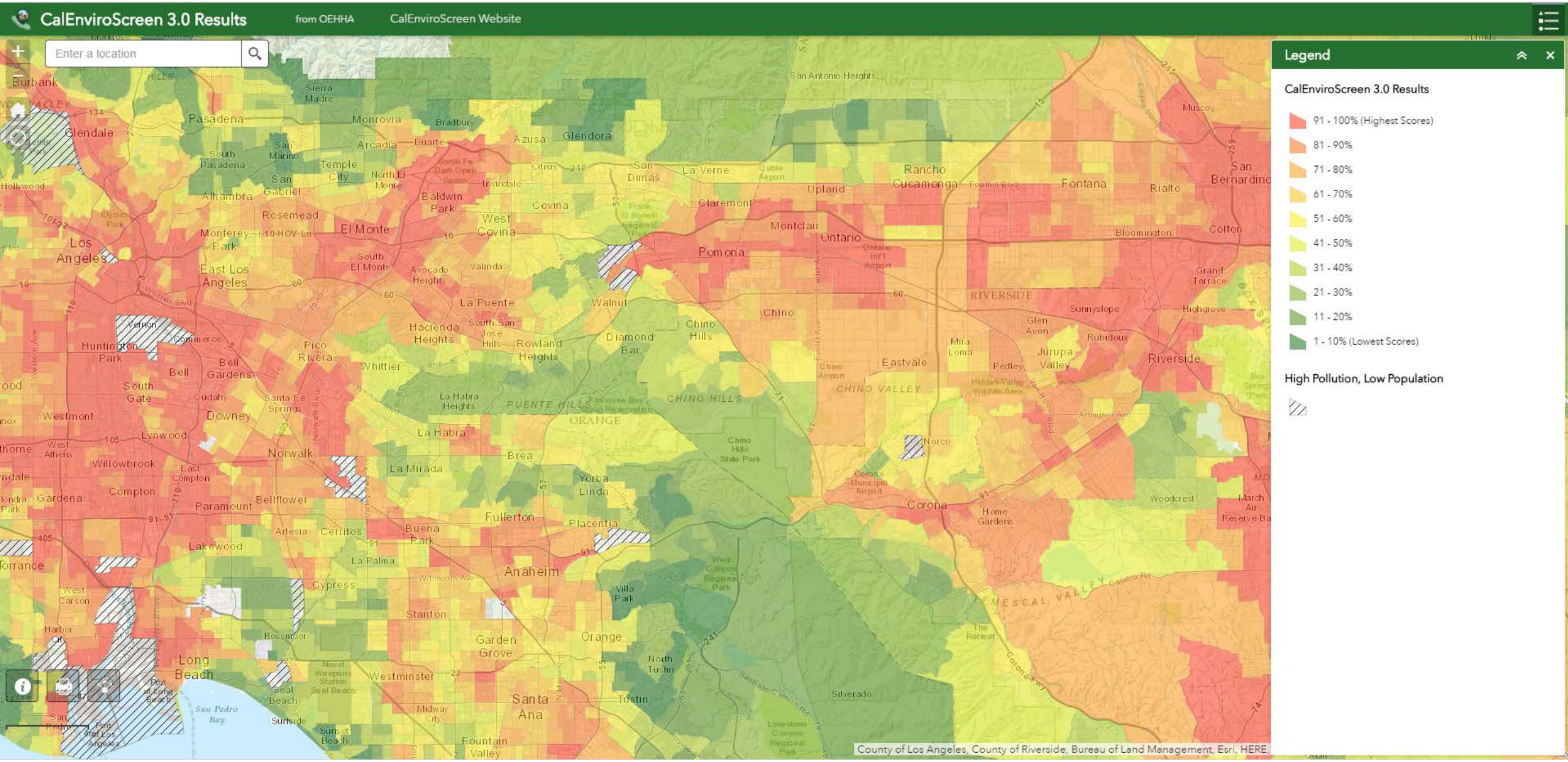
Environmental Stressors Contribute to Environmental Inequality

- ***Impacts of climate change and other pollution can be considered environmental stressors*** that the will make daily life more challenging for communities.

- Stressors like local air pollution, sea-Level Rise, changes in precipitation and temperature patterns will not be evenly distributed across the globe.

- Communities vary in their abilities to mitigate the affects of such stressors.

- Some communities will feel the effects more strongly than others, particularly low-income, minority communities.

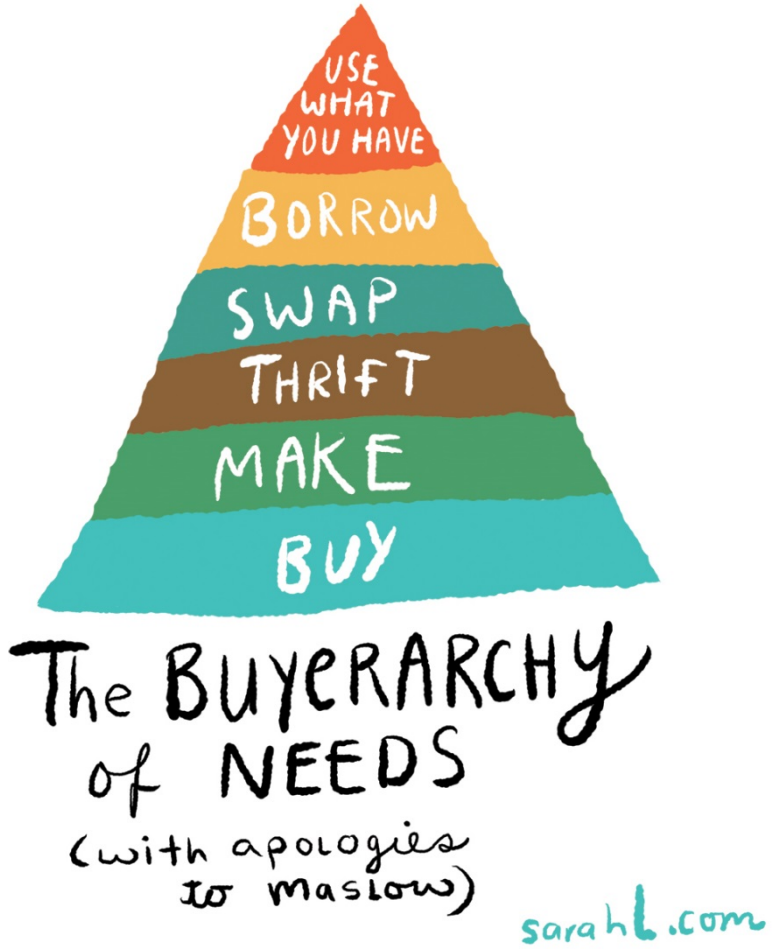

CalEnviroScreen 3.0 Results
from OEHHA
CalEnviroScreen Website
Enter a location
Legend
CalEnviroScreen 3.0 Results
91 - 100% (Highest Scores)
81 - 90%
71 - 80%
61 - 70%
51 - 60%
41 - 50%
31 - 40%
21 - 30%
11 - 20%
1 - 10% (Lowest Scores)
High Pollution, Low Population
County of Los Angeles, County of Riverside, Bureau of Land Management, Esri, HERE,

“What can I do to Combat Climate Change?”

Lack of governmental or collective response has prompted this question among those aware of the impacts of climate change.

Conscious Consumerism as a Common Strategy

- Strive to reduce our own carbon footprint
- Focus on what we can control
- Every purchase or behavioral change you make is a “moral act”—an opportunity to “vote with your dollar” for the world you want to see.
- Assumes if we give consumers transparency and information (education), they’ll make the right choice.
- Assumes the aggregate impact of our actions will make a difference




COMPOST


TAKE BACK THE TAP
UCSC
takebackthetapuc.org
400
300
200
bpa free

Impact of Conscious Consumerism

- Makes us feel good, maybe even superior to others.
- Scant evidence that this is effective over the long term
- Studies suggest footprints of “green” consumers are not significantly different from footprint of regular consumers (Csutora, 2012)

- The individual is pitted against large, systematic structures that are not supportive of sustainable practice.
- Some believe this dichotomy is by design……

Neoliberalism and Environmental Action

Neoliberalism – "A theory of political economic practices that proposes that human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterized by strong private property rights, free markets and free trade." (Harvey, 2005, P. 2)

- The individual should be free to pursue their interests, and if enough people have interests in common, the market will adjust accordingly.
- Ignores the reality that supply practices often shape what is desired.
- Ignores the reality that many persons lack resources to "adjust" the market
- Individual choice by the empowered few dilutes the impact of mass action – can perpetuate environmental inequality.
- Not much evidence to suggest that neoliberal approaches lead to environmental progress

“What can We do to Combat Climate Change?”

- Many experts argue that community-based climate change action holds the greatest promise.
- Local land use can greatly influence fossil fuel consumption
- At a scale where impact seems achievable…..
  <u>and where dialogue can take place</u>.
- As conversation turns away from climate change avoidance, toward climate change adaptation, local impacts and mitigation strategies will be primary

Climate Change Adaptation and Resiliency

With overwhelming scientific evidence about climate change, serious discussion is focused on ability of communities and ecosystems to adapt to anticipated changes or stressors

Some communities are better equipped to handle these stressors (resiliency)

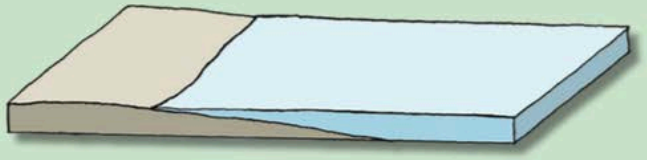
Most discussions of resiliency focuses on physical/resource issues and preparedness

- Combatting sea-level rise through infrastructure or land-use relocation
- Decentralizing and diversifying energy production
- Enhancing food and water security through resource diversification & conservation

Four Ways to Guard Against Sea Level Rise

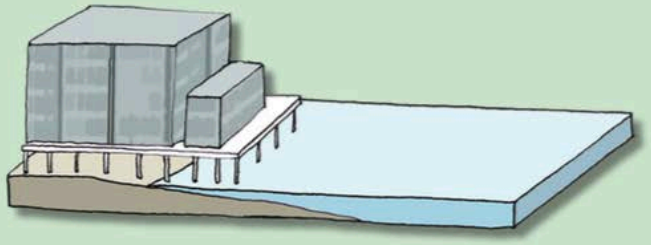
By Winifred Bird // Public Press
Illustrations by Emily Underwood // Public Press

Water brings both life and risk to the shoreline, so seaside residents have long built barriers, canals and other protections to guard against storms and floods. Now sea level rise is adding an extra challenge: Flood risk will grow dramatically in coming decades, and some land that is dry today will be underwater in our lifetimes. That leaves cities, including those around San Francisco Bay, with four main options.



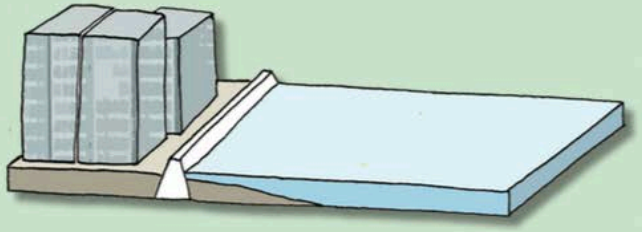
1. RETREAT FROM SHORELINE

The simplest response, abandoning land that is at risk, is also the rarest. Communities encourage and protect coastal properties "so they can get tax revenue to pay for services and even adaptation strategies," said Jessica Grannis, a sea level policy expert at Georgetown University Law Center in Washington. The best and cheapest time to adopt this strategy is after a disaster — not rebuilding after floods in some areas. But planning for these decisions should be made prior to such disasters.



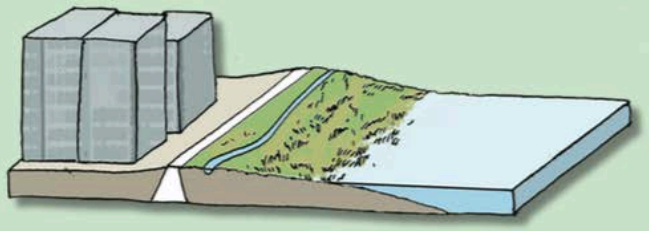
2. FLOOD-PROOF STRUCTURES

Engineers typically do this by raising occupied floors above flood level or trucking in dirt to raise the land before starting to build. A 2014 study of the Gulf Coast by researchers at The Nature Conservancy and academic researchers concluded that elevating structures was among the least cost-effective solutions, ranking behind seawalls, natural barriers and simple sandbags. But it is the most popular solution around San Francisco Bay.



3. BUILD LEVEES

Dirt, rock and concrete can be effective barriers. Most of the urban parts of the bay and the Sacramento-San Joaquin River Delta are already protected by a patchwork of levees. San Mateo and Santa Clara counties are both studying what it will cost to make their levees stronger. But levees — and their more compact cousins, seawalls — are expensive and can fail. Officials at the Port of San Francisco say $5 billion in retrofits is needed along the 4-mile Embarcadero to keep some 700 acres of high-value property above the water line through 2100.



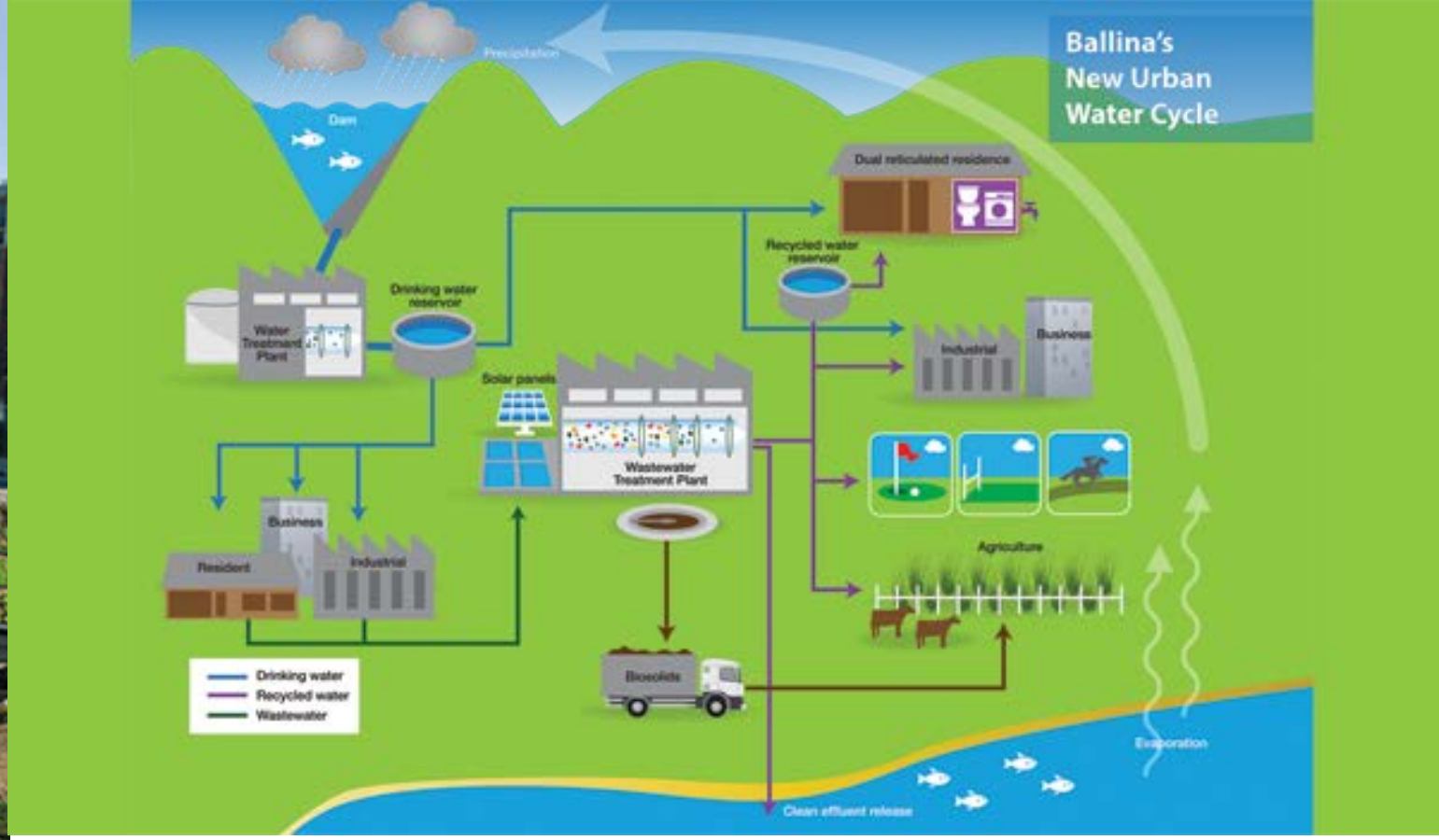
4. RESTORE NATURE

Natural habitats such as marshes, sandbars and creek beds absorb the energy of storms, mitigating risk from sea level rise. Past development has tended to erase or bury these features, but recent restoration projects are changing that. A 2013 study by the Bay Institute, a San Francisco-based nonprofit group, showed that restoring a 200-foot-wide strip of marsh around the bay would cut the cost of protection in half — mainly by allowing engineers to build smaller, less expensive levees. A rising bay will eventually put many marshes at risk of inundation, though some shoreline ecosystems are designed to grow vertically as seas rise.

Potential tidal inundation based on sea level rise projections for 2100: low 2.1 feet and high 5.4 feet.

Community Sea-Level Adaptation

Community Energy Planning



Community Food and Water Sovereignty

Climate Change Adaptation and Resiliency

- What about social resiliency? What role does it play in climate change action?

- Communities that are resilient are privileged and empowered – tend to be wealthier, better-educated, have greater access to power and control over own resources.

- How did resilient communities become empowered?

  What are the conditions that contribute to resiliency?

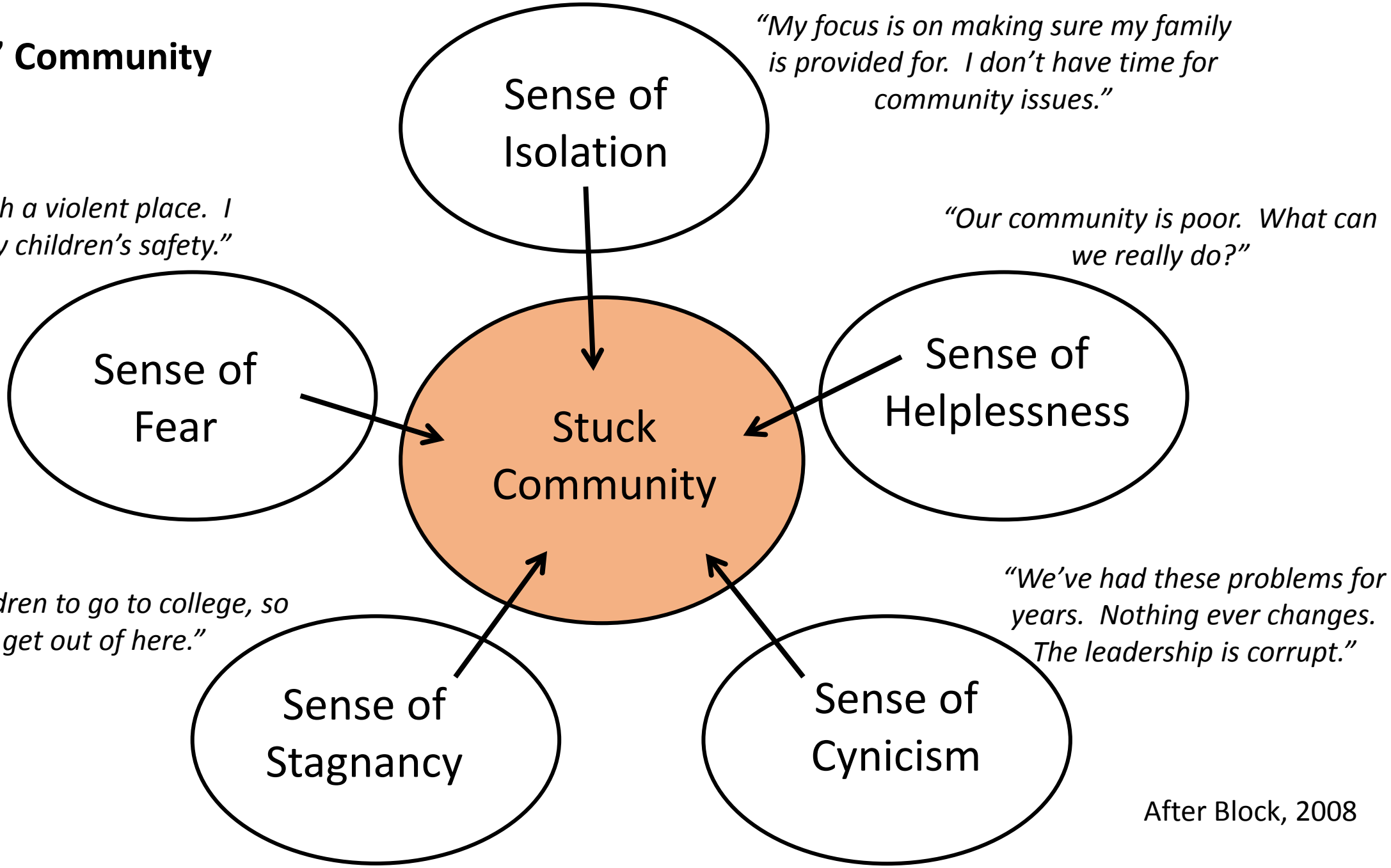
  Do resources = privilege?

  Can empowerment be cultivated in communities that lack some of these conditions?

Challenges to Sustainability in Pomona, CA

Indicator	Challenge in Pomona
Low Educational Attainment	17% of residents 25 years or older have college degrees, compared to 31.0% statewide
Disproportionate Poverty	22.6% of all residents live below the poverty line, compared to 16.4% statewide
High Pollution Exposure	All neighborhoods in City have higher burdens than 83% of the State of California. Burdens in Westmont neighborhood rank 9th out of over 8,000 neighborhoods evaluated by the State of California; burdens in Kellogg neighborhood rank 32nd (worst rankings in Pomona)
Much Lower Life Expectancy	Average life expectancy in Pomona is 78.5, compared to 80.3 throughout LA County

The "Stuck" Community



After Block, 2008

"Local government has two primary responsibilities. One is to sustain and improve the infrastructure of its community: roads, traffic, transportation, public safety, code enforcement, economic development, master planning, environment, and more. City managers and civil servants are well trained to do this and mostly do an excellent job at it.

The other role of local government is to build the social fabric of the community. They are in a key position to engage citizens in the well-being of the city." (p. 91).

Block, Peter. 2008. *Community: The Structure of Belonging*. Berrett-Koehler: San Francisco.

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"something shifts on a large scale only after a long period of small steps, organized around small groups patient enough to learn and experiment and learn again." (p. 74).

"The small group is the structure that allows every voice to be heard. It is in groups of 3 to 12 that intimacy is created. This intimate conversation makes the process personal. It provides the structure where people overcome isolation and where the experience of belonging is created." (p. 95).

Block, Peter. 2008. *Community: The Structure of Belonging*. Berrett-Koehler: San Francisco.

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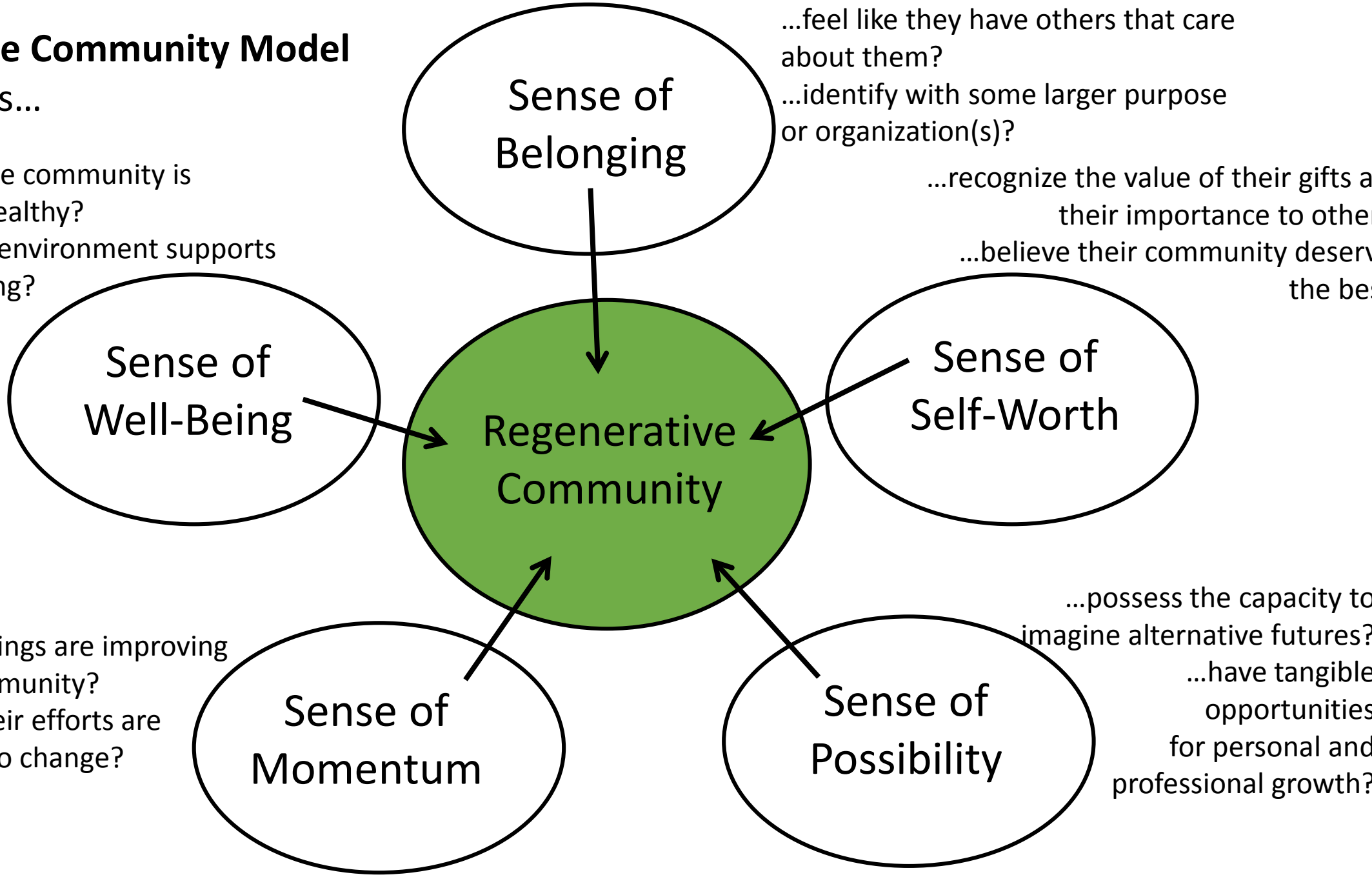
Regenerative Community Model

Do Members…



What is the Regenerative Communities Initiative?

- Lyle Center Students, faculty, staff and community members collaborating on integrated programs addressing environmental, social and economic dimensions of community life
- Emphasizes the University's role as facilitator or catalyst not expert problem-solvers; ***we empower communities to learn, plan and act for themselves***.
- A persistent strategy, engaging multiple populations within one defined local geography over multiple years.
- Promotes sustainability through the regeneration of systems that are vital to support daily life

40 Developmental Assets – For the healthy development of young people

The 20 External Assets	
Support	☐ Family support ☐ Positive family communication ☐ Other adult relationships ☐ Caring neighbourhood ☐ Caring school climate ☐ Parent involvement in schooling
Empowerment	☐ Community values youth ☐ Youth as resources ☐ Service to others ☐ Safety
Boundaries and Expectations	☐ Family boundaries ☐ School boundaries ☐ Neighbourhood boundaries ☐ Adult role models ☐ Positive peer influence ☐ High expectations
Constructive Use of Time	☐ Creative activities ☐ Youth programs ☐ Religious community ☐ Time at home

The 20 Internal Assets	
Commitment to Learning	☐ Achievement motivation ☐ School engagement ☐ Homework ☐ Bonding to school ☐ Reading for pleasure
Positive Values	☐ Caring ☐ Equality and social justice ☐ Integrity ☐ Honesty ☐ Responsibility ☐ Restraint
Social Competencies	☐ Planning and decision making ☐ Interpersonal competence ☐ Cultural competence ☐ Resistance skills ☐ Peaceful conflict resolution
Positive Identity	☐ Personal power ☐ Self-esteem ☐ Sense of purpose ☐ Positive view of personal future

Source: The Search Institute

Regenerative Communities Fellowship Program

Goals:

1) encouraging pathways to higher education for underrepresented students
2) empowering communities to address environmental challenges
3) Contribute to science learning among elementary students

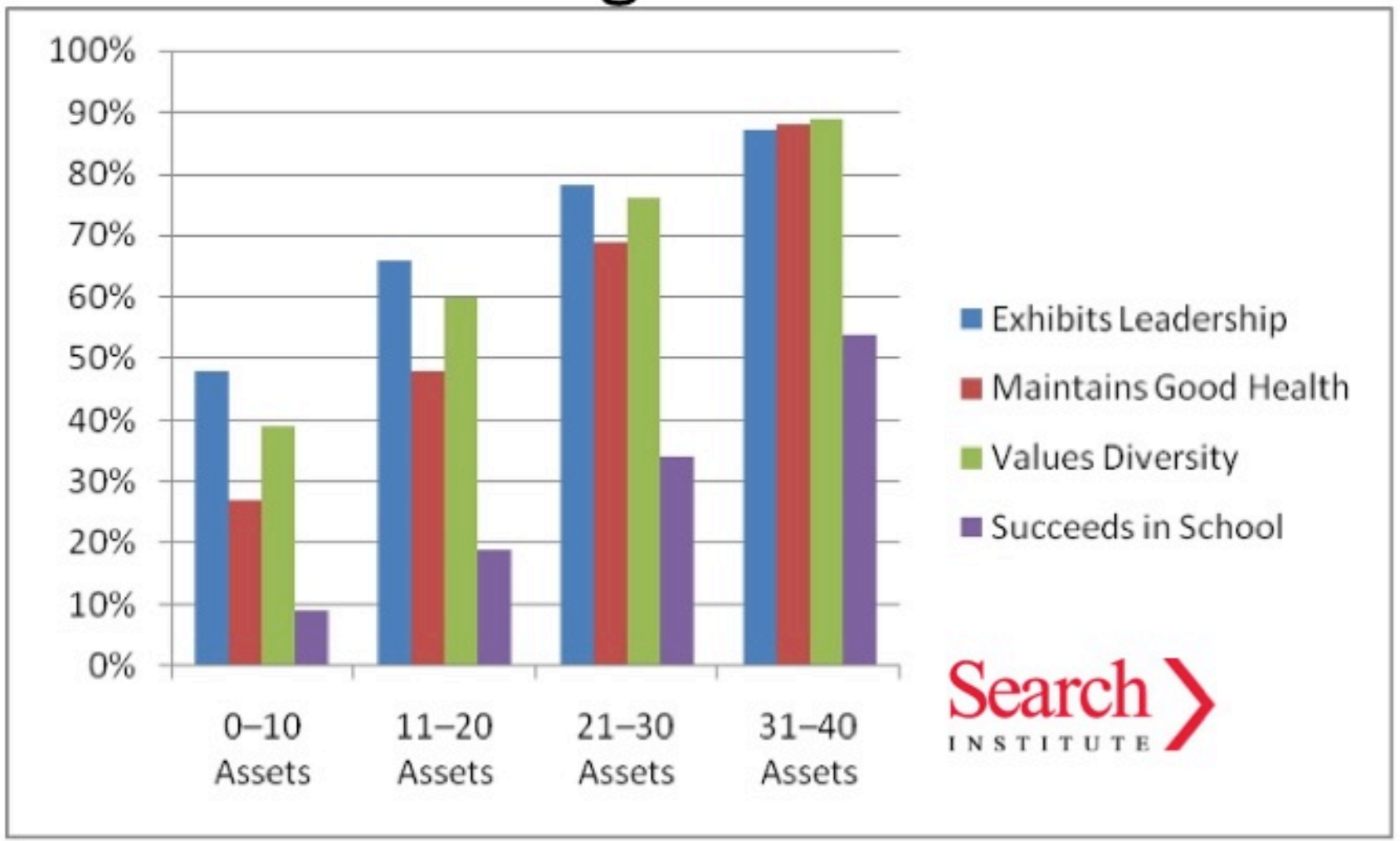
Twelve CPP students from diverse disciplines and backgrounds work with an elementary school community on environmental education projects, student mentoring, and whole family activities

Regenerative Communities Program Fellows

- 1 out of every 25 applicants selected
- Fellows from Environmental Design, Science, Engineering, Education, Agriculture and the College of Letters Arts and Social Sciences.
- Fellows contribute experiences with immigration, English as a second language, first-generation college students, and environmental action.

What We Hope For

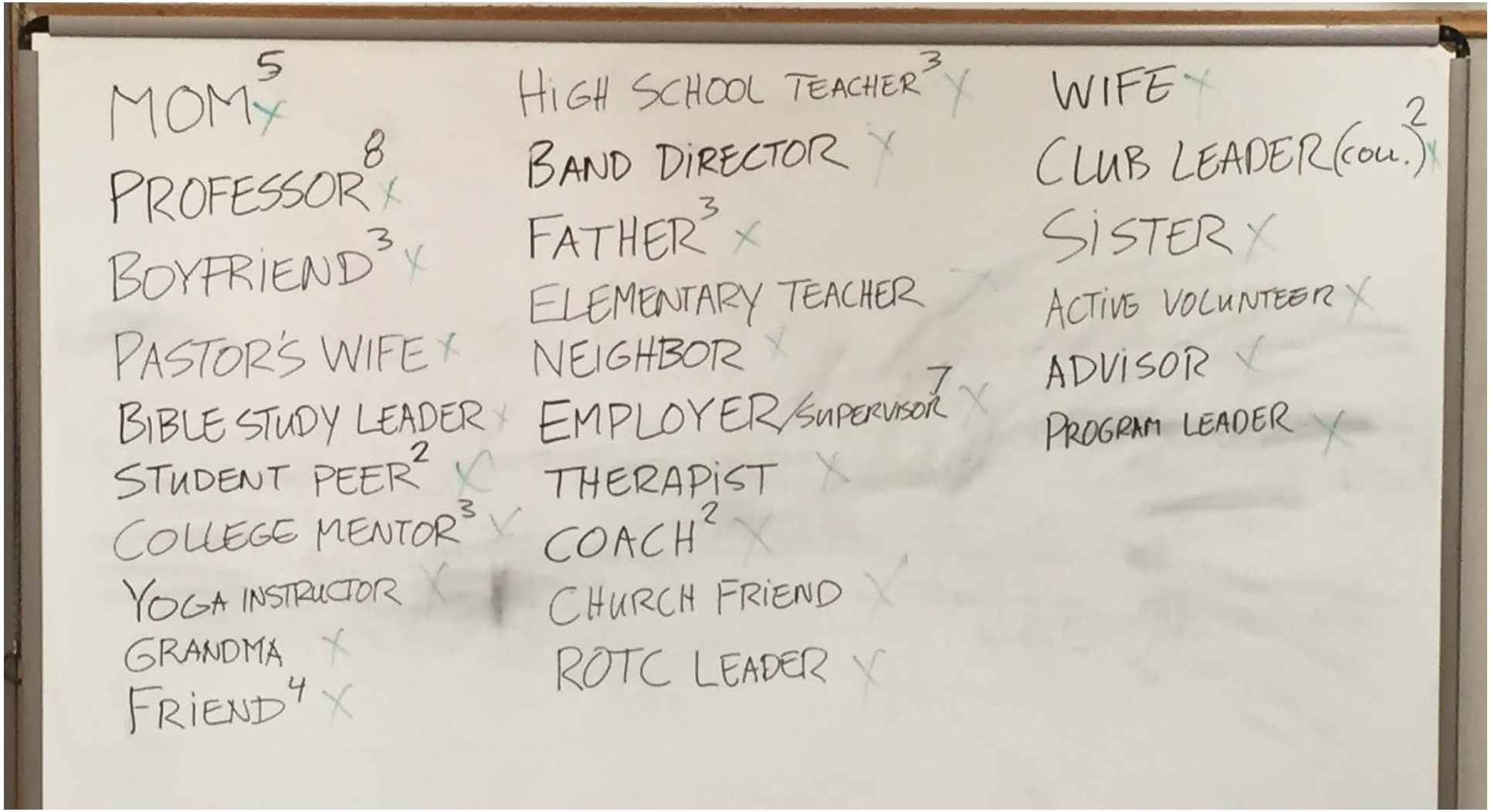
Thriving Indicators



Developmental Relationships Key to Building Assets

- Express Care – Show that you like me and want the best for me
- Challenge Growth – Insist that I try to continuously improve
- Share Power – Hear my voice and let me share in making decisions
- Expand Possibilities – Expand my horizons and connect me to opportunities

Developmental Relations – Recognizing Support Networks that Help People Succeed



Regenerative Community Model

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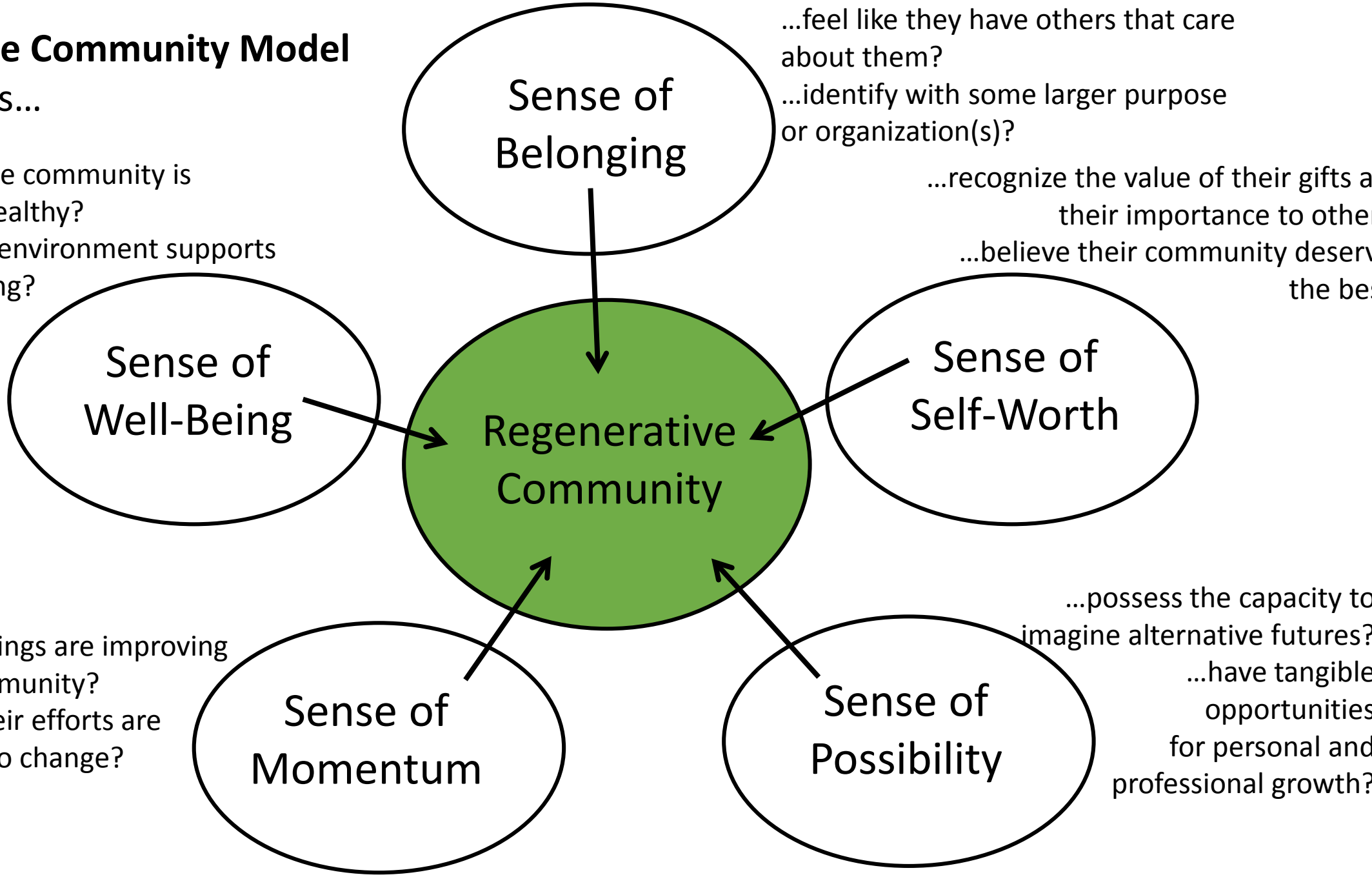

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