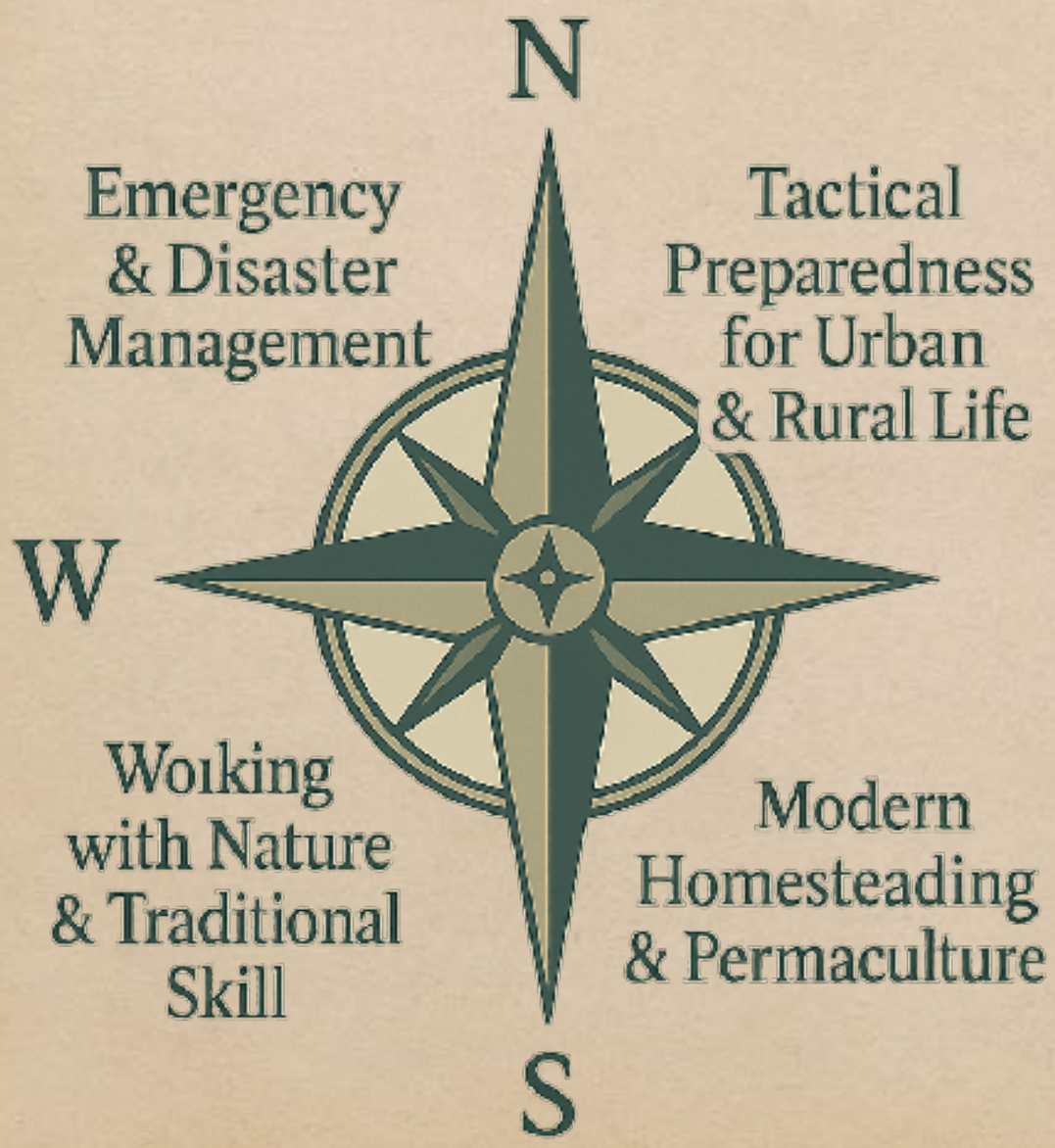
A Vision of Holistic Emergency Management & Resilient Design



Community & Relationships

My Background:

Chris Outdoors

Wild Muskoka
• botanicals •

Forest Gardening as a Form of Disaster Preparedness

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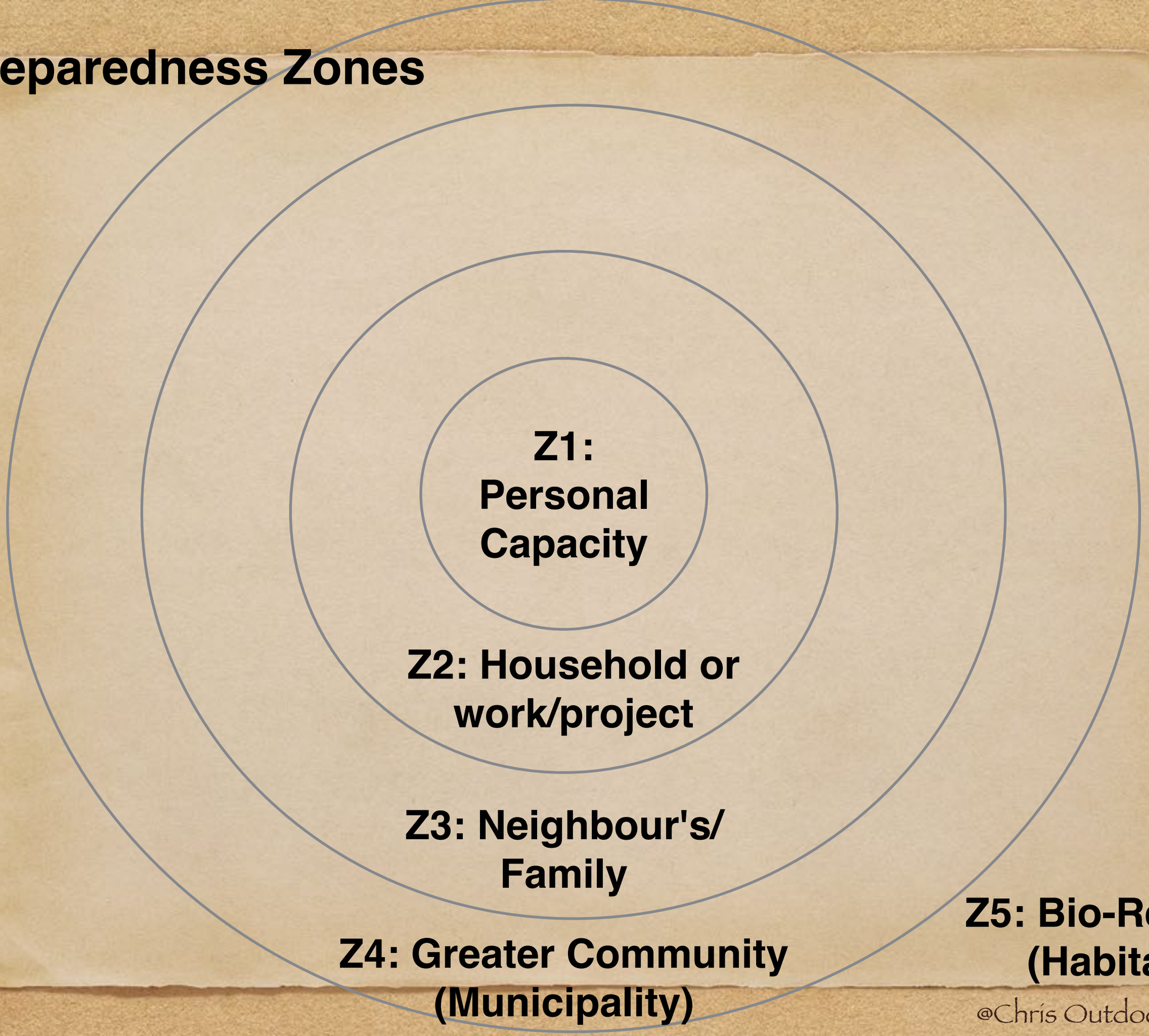
Preparedness Zones



Group Reflection Questions:

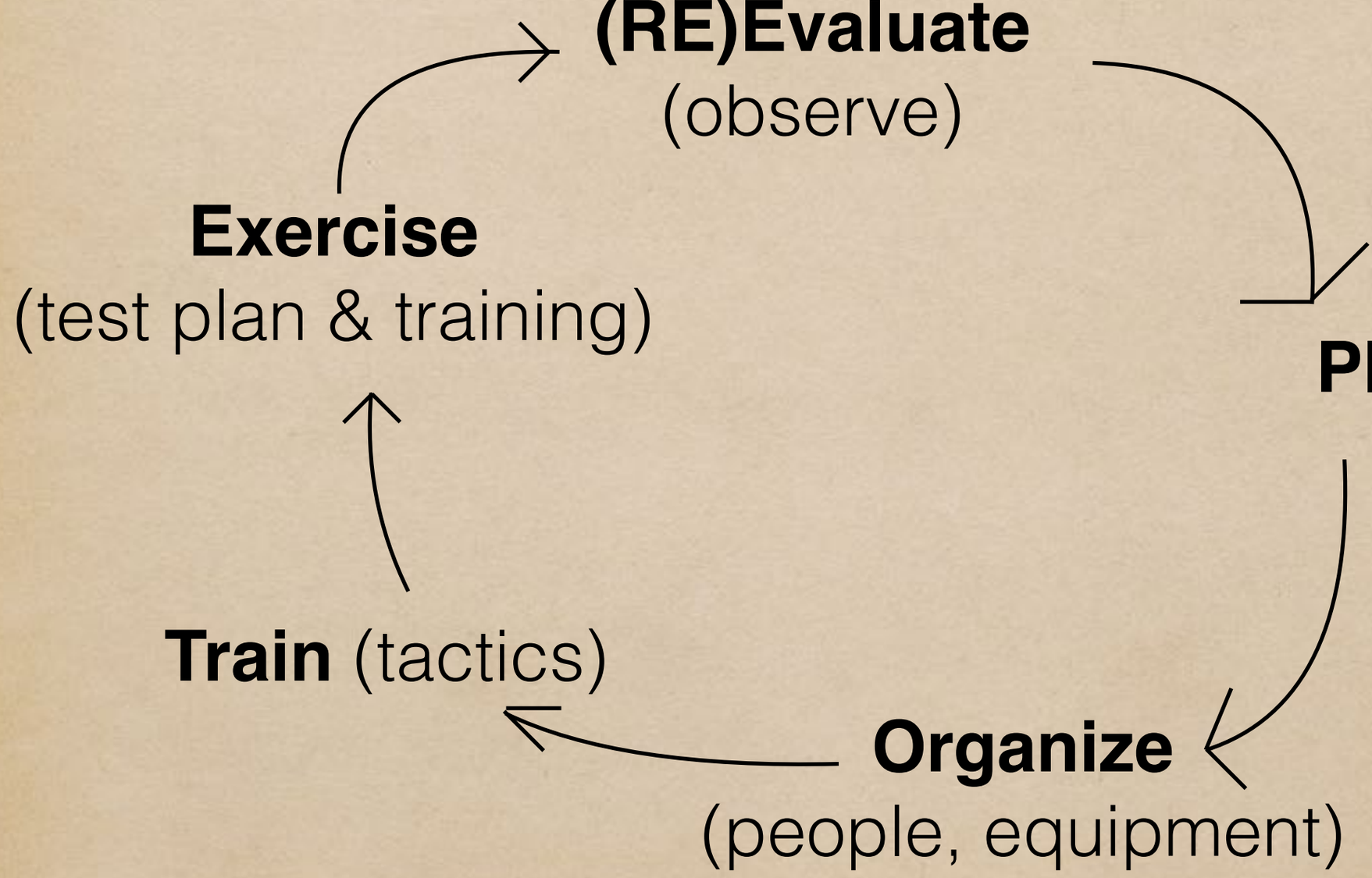
1. What are your gifts? What traits, skills & knowledge do you already bring to an adverse scenario?

2.How can you continue to cultivate and hone these with disaster preparedness & resilience in mind?

3.What are 3 of your biggest concerns right now?

4.Where do you feel the biggest gaps are in your skills, knowledge, plans and life situation?

Disaster Preparedness Cycle



***Concept from FEMA*

A Permaculture Approach to Emergency Preparedness

Observe & Interact

Evaluate

Design from Patterns to Details

Plan

Integrate Rather than Segregate

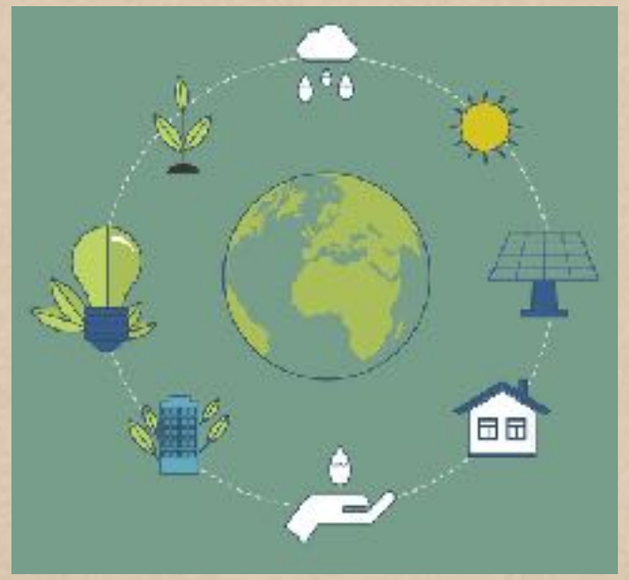
Organize
(people, equipment)

Creatively Use & Respond to Change

Train (tactic)

Apply Self-Regulation & Accept Feedback

Exercise & Update



Step 1: Evaluate - Observe & Interact

- **Initial Assessment:**

  - Ecology of the Land
  - Hazards & Concerns
  - Critical Infrastructure
  - Vulnerabilities (turned into strengths)
  - Assets & Resources
    - People, skills, equipment, natural landscape, etc

Types of Critical Infrastructure

"CI refers to processes, systems, facilities, technologies, networks, assets and services essential to the health, safety, security or economic well-being…"
- Public Safety Canada

Canada's 10 Identified Critical Infrastructure Components:

- Water
- Safety
- Health
- Finance
- Transportation
- Energy
- Food
- Manufacturing
- Government
- Information & Communication Technology

Examples from Ecovillage::

- Water Pump
- Freezers with Farm Meat
- Electricity
- Gardens & Animals
- Morning Check-In
- Two most experienced/ longest term residents

4 Pillars of Emergency Management Framework

Prevent - How do we prevent an incident/disaster from occurring?

Prepare & Mitigate - How do we prepare for the possible incident and reduce the impact?

Respond - How will we respond when something happens?

Recover - What do we put in place NOW, to help us recover afterwards?

*** Emergency Responder vs Regenerative Responder*

Risk Assessment & Mitigation Tree

Electricity ⟶ **Home**

Do I just need some candles & a flashlight?

Risk Assessment & Mitigation Tree

Electricity

Home

- → Water Pump
- → Fridge/Freezer
- → Lights
- → Stove/Cooking
- → Communications (Phone/Internet)
- → Appliances
- → Charging Jackery Generator

Electricity

- Water Pump
  - Sanitation
  - Drinking Water
    - Us
    - Animals
  - Toilet
    - Toilet Waste
  - Garden
  - Laundry
- Fridge/Freezer
- Lights
- Stove/Cooking

Home

- Communications (Phone/Internet)
  - Laura & I
  - Family
  - Call for Help
  - Info - What's Happening?
- Appliances
- Charging Jackery Generator

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Risk Assessment & Mitigation Tree

Electricity ⟶ **Home**

Can I Prevent?

- Landscape Design to Prevent Outages (Ex; Tree Species/ Placement, Windbreaks, etc)

- Alternative Power (not reliant on power grid in first place)

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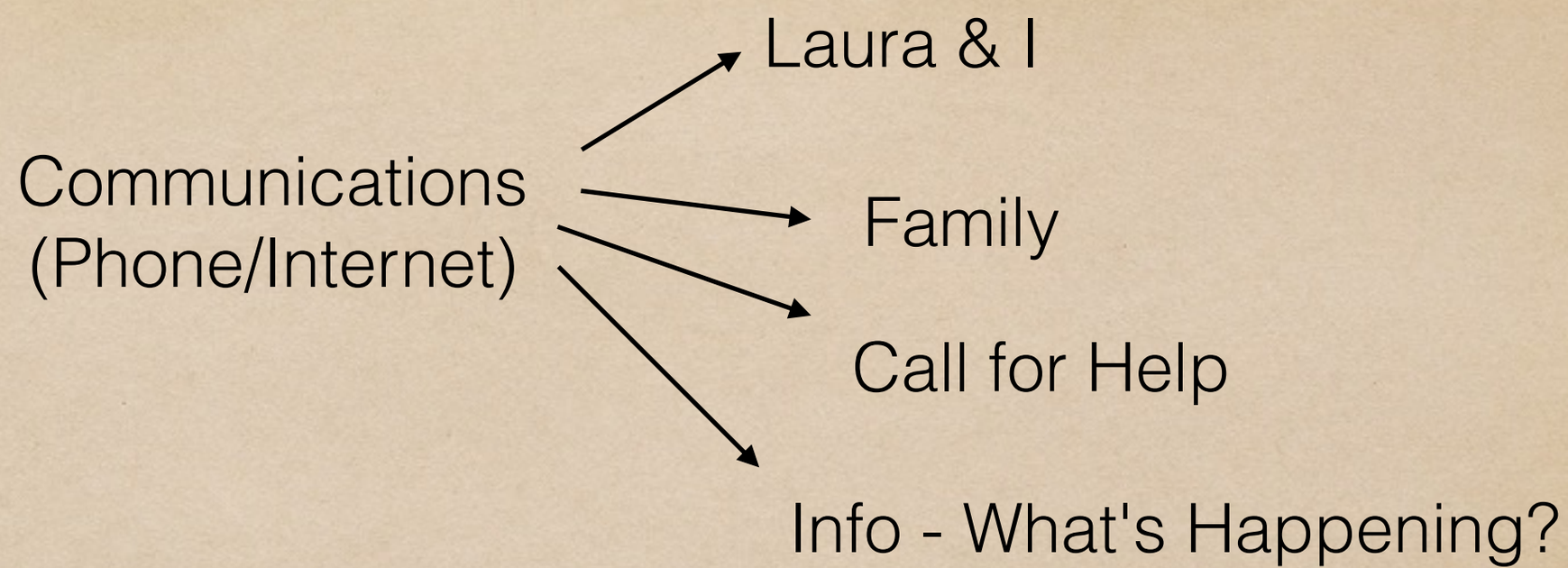
Risk Assessment & Mitigation Tree

Electricity ⟶ **Home**

What about Mitigate?

- Alternative Power (not reliant on power grid in first place)
- Back-up Power generation
- Mitigate areas/items where power flows

Risk Assessment & Mitigation Tree



Primary: Emerg Coms Plan & Mobile Phone

Alternate: Signal or Zello App, Satelight Communications

Contingent: Arranged Meeting Places (Ppl & Msg's)

Emergency: Out of town contact, Two-Way Radios

Risk Assessment & Mitigation Tree

Stove/Cooking

Primary: Camping Stove

Alternate: Wood Stove

Contingent: Outdoor fire

Emergency: Know how to build improv rocket stove

Assess Your Critical Infrastructure

Examples:

- House
- Electricity
- Wood Stove
- Chainsaw
- Water Pump (house & animals
- Supply chain for animal food (Dogs, Chickens, Rabbits, Us)
- Finances
- Phones/Internet (Communications)
- Vehicles/Travel Living Rural
- Tools
- Laura's Glasses for seeing
- Medical
  - Prescription medications for parents

Hazard Identification & Risk Assessment

How do we most effectively focus our preparedness efforts & resources?

Hazard - Any potential incident that could negatively impact people, infrastructure, environment.

ex: earthquake, flood, fire, pandemic, drought, etc…

Vulnerability: What would the impact of this hazard occurring be on us?

Risk: What is the likelihood of this hazard occurring?

HIRA Example:

Hazard	Vulnerability (Impact)	Risk (Likelihood)	Score
House Fire	4	4	8
Wildfire	4	5	9
Flood	2	1	3
Power Failure More than 3 days)	2	5	7
Extended Drought	3	4	7
Zombie Invasion	5	0.5	5.5

HIRA Format from FEMA School Plan

Table 2: Sample Risk Assessment Worksheet

Hazard	Probability	Magnitude	Warning	Duration	Risk Priority
Fire	4. Highly likely 3. Likely 2. Possible 1. Unlikely	4. Catastrophic 3. Critical 2. Limited 1. Negligible	4. Minimal 3. 6–12 hrs. 2. 12–24 hrs. 1. 24+ hrs.	4. 12+ hrs. 3. 6–12 hrs. 2. 3–6 hrs. 1. < 3 Hours	❑ High ❑ Medium ❑ Low
Hazmat spill outside the school	4. Highly likely 3. Likely 2. Possible 1. Unlikely	4. Catastrophic 3. Critical 2. Limited 1. Negligible	4. Minimal 3. 6–12 hrs. 2. 12–4 hrs. 1. 24+ hrs.	4. 12+ hrs. 3. 6–12 hrs. 2. 3–6 hrs. 1. < 3 hrs.	❑ High ❑ Medium ❑ Low

Applying the “All-Hazards Approach”

All Hazard Approach = Stacking Functions

Design From Patterns to Details

What patterns do you see in multiple hazards?

What Patterns Can We Find in Our HIRA?

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Pattern: A need for water to,

- Water garden/animals in drought
- Drink during power outage
- Use to prevent, mitigate and respond to fires

All Hazard Approach = Stacking Functions

Example: Dig swales in strategic places:

- Act's as a fire break for prevention
- Increases moisture in landscape for prevention & mitigation
- Makes Garden more resilient in a drought
- Helps conserve water easing stress on aquifers and reduces carbon footprint

All Hazard Approach = Stacking Functions

Example: Create a Water Catchment & Gravity Fed Irrigation System that reaches Critical Infrastructure

- Back-up drinking water when power is out
- Capture and store for times of drought
- Can be used for fire response if designed into system

All Hazard Approach = Stacking Functions

Example: Building a Cob or Rammed Earth Building

- Fire resistant (mitigation)
- Better insulated during blackout/cold & hot spells (preparedness)
- Lowers carbon footprint (prevention)

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The 4 Pillars Applied to Fire

Prevention

- Design non-flammable areas around open flames or higher risk areas (stone/cob)

- Observe & Interact - Keep Zone 1 & 2 clean from flammables (microclimate design)

- Design Zones 3 and 4 to be more fire resistant (ex: planting fire resistant plants, swale systems, fire breaks, strategic irrigation & water access)

The 4 Pillars Applied to Fire

Preparedness & Mitigation

- Audit property for fire risks

- Planting fire resistant tree/plant guilds

- Swales to slow water flow and increase moisture in landscape

- Build with fire resistant materials such as cob

- Design water irrigation to higher risk areas.

The 4 Pillars Applied to Fire

Response

- Organizing response procedures (social permaculture).

- Design response systems such as irrigation to higher risk areas & critical infrastructure for fire fighting.

- Run “mock emergency exercises” for fire evacuation & response.

The 4 Pillars Applied to Fire

Recovery: Creative Use & Response to Change

- Debrief

- Grief Processing

- What next?

- What do we do with this new opportunity to build anything lost/damaged differently? How do we make it more resilient & regenerative this time?