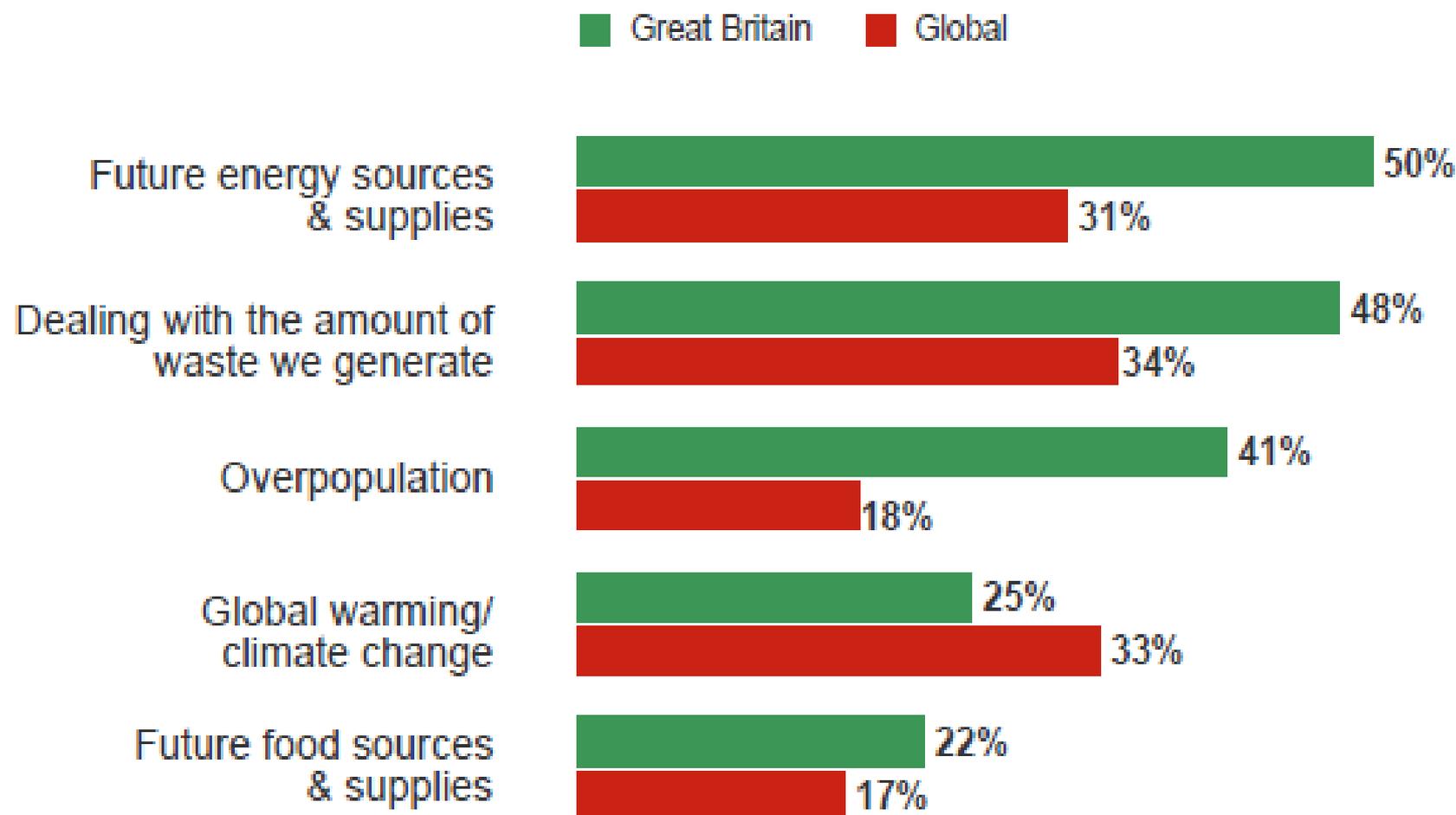




Garrett Dolan, Ph.D.
Rice University,
SSPEED Center
October 2011

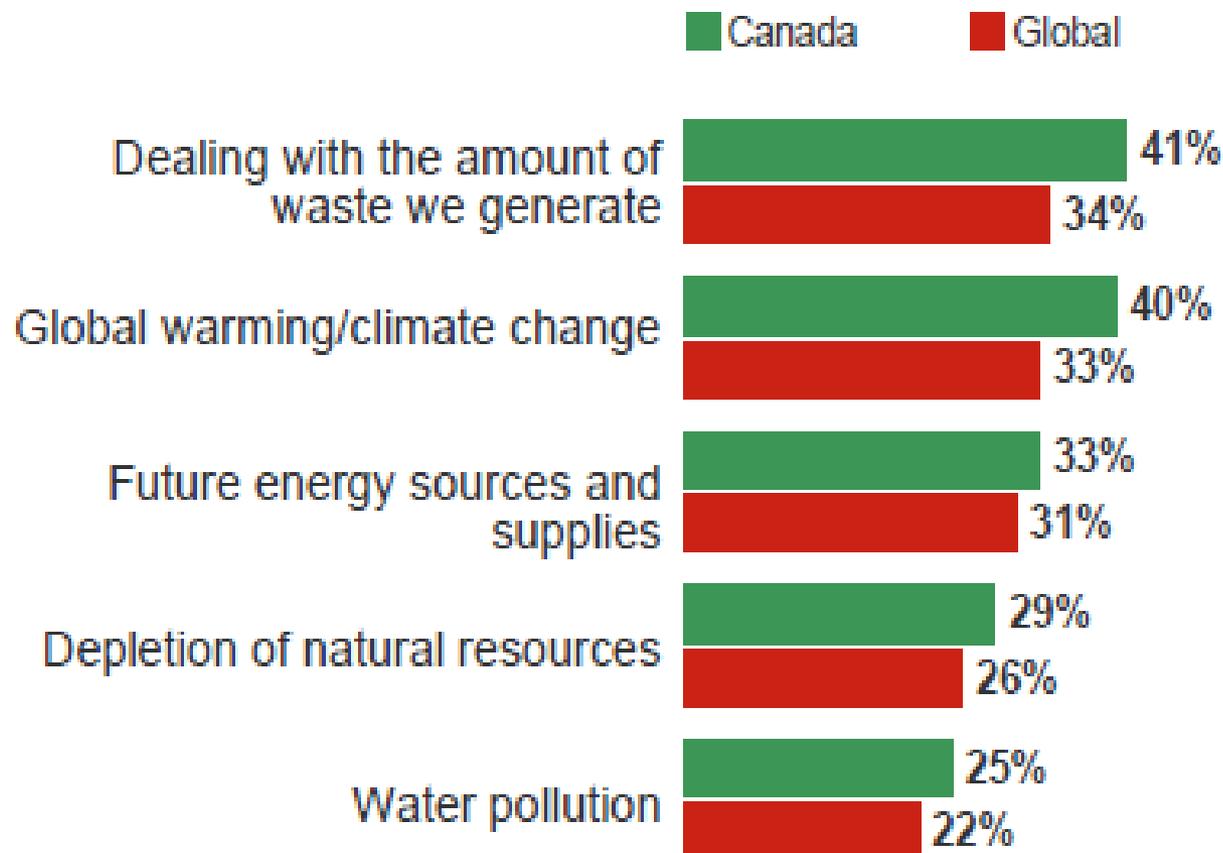
Key environmental concerns for Great Britain - 1

In your view, what are the three most important environmental issues facing your country today?



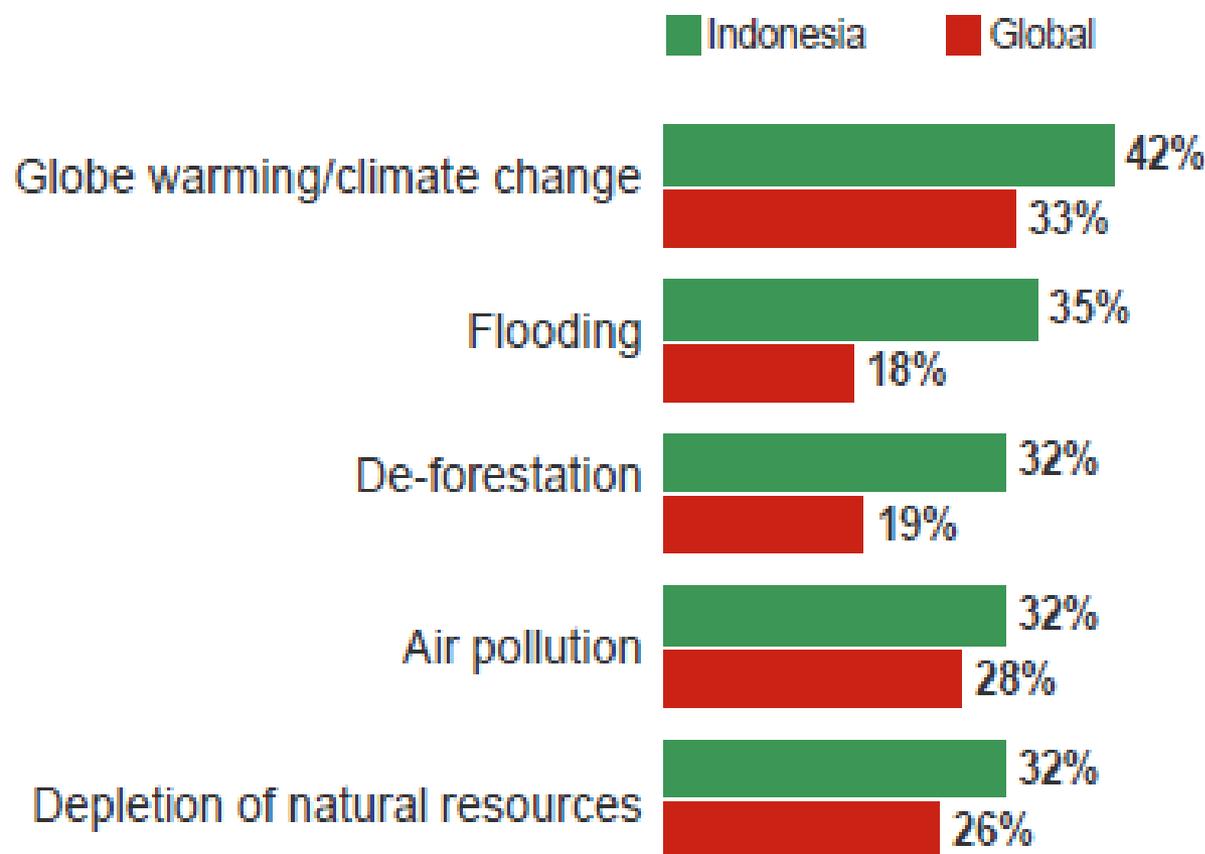
Leading environmental concerns for Canada

In your view, what are the three most important environmental issues facing your country today?



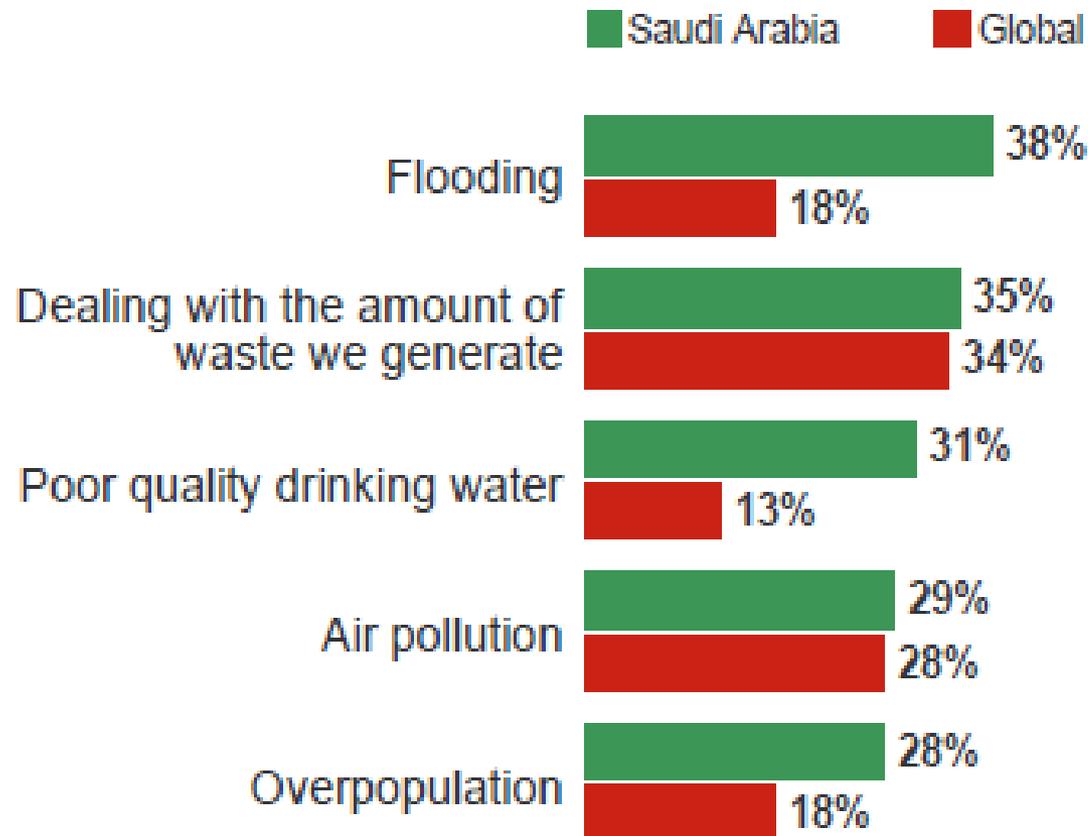
Leading environmental concerns for Indonesia

In your view, what are the three most important environmental issues facing your country today?



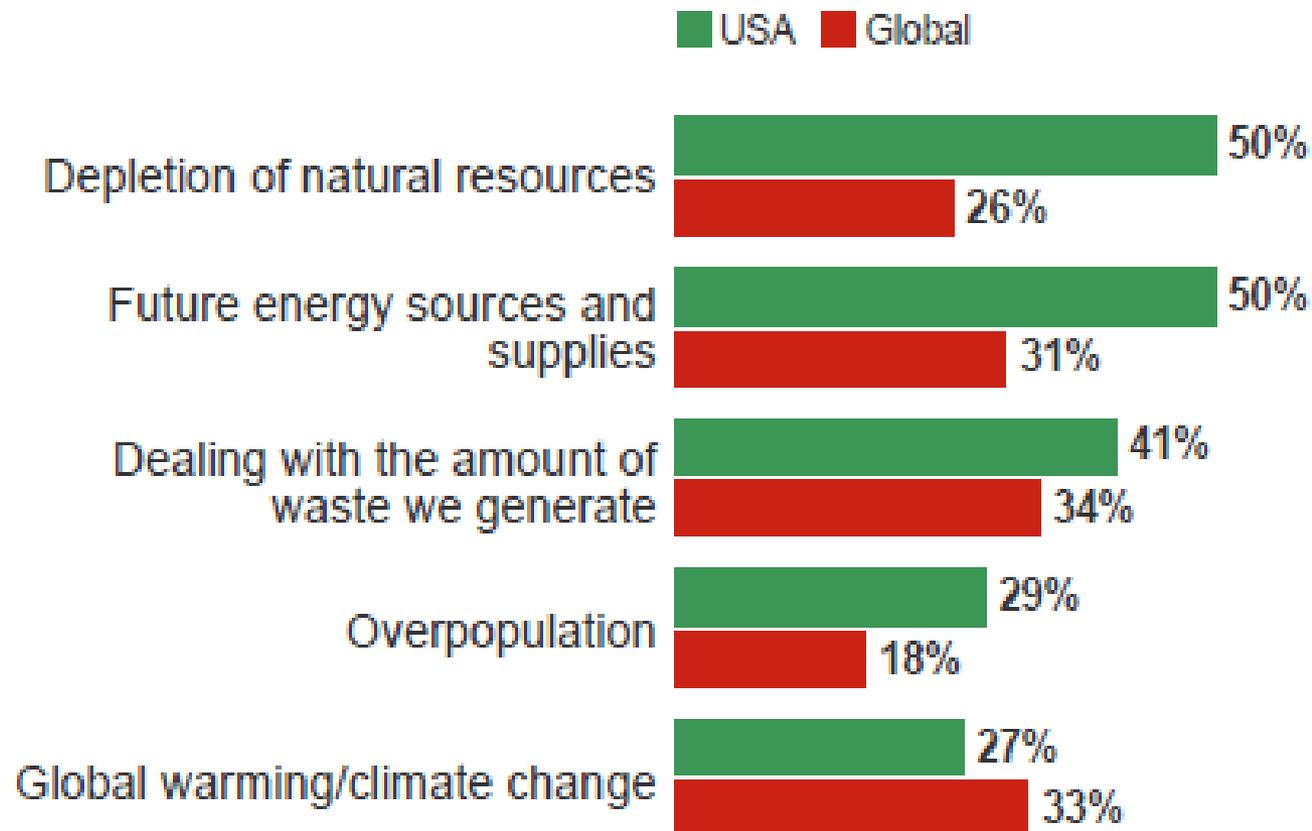
Leading environmental concerns for Saudi Arabia

In your view, what are the three most important environmental issues facing your country today?



Leading environmental concerns for USA

In your view, what are the three most important environmental issues facing your country today?





Overview

Sustainable Development

Sustainable Metrics

Challenges

Application

Questions and Answers

What is Sustainable Development?

A man with a long, grey beard and hair, wearing a dark, heavy robe, is shown from the chest up. He is looking upwards and to the right with a serious expression. He holds two large, dark, rectangular stone tablets. The tablet in his left hand (viewer's right) has the words 'Poverty', 'Economic Development', and 'Carrying Capacity' written on it. The tablet in his right hand (viewer's left) has the words 'Sustain', 'Develop', 'Systems', 'Humans', and 'Equity' written on it. The background is a dark, textured wall on the left and a reddish, textured wall on the right.

Sustain
Develop
Systems
Humans
Equity

Poverty
Economic
Development
Carrying Capacity

**“development that
meets the needs of the
present without
compromising the ability
of future generations to
meet their own needs.”**

**Gro Harlem Brundtland
Prime Minister Norway
U.N. World Commission on
Environment and Development , 1987**





Key Concepts

Poverty



HELLO
my name is

Opportunity

Carrying Capacity



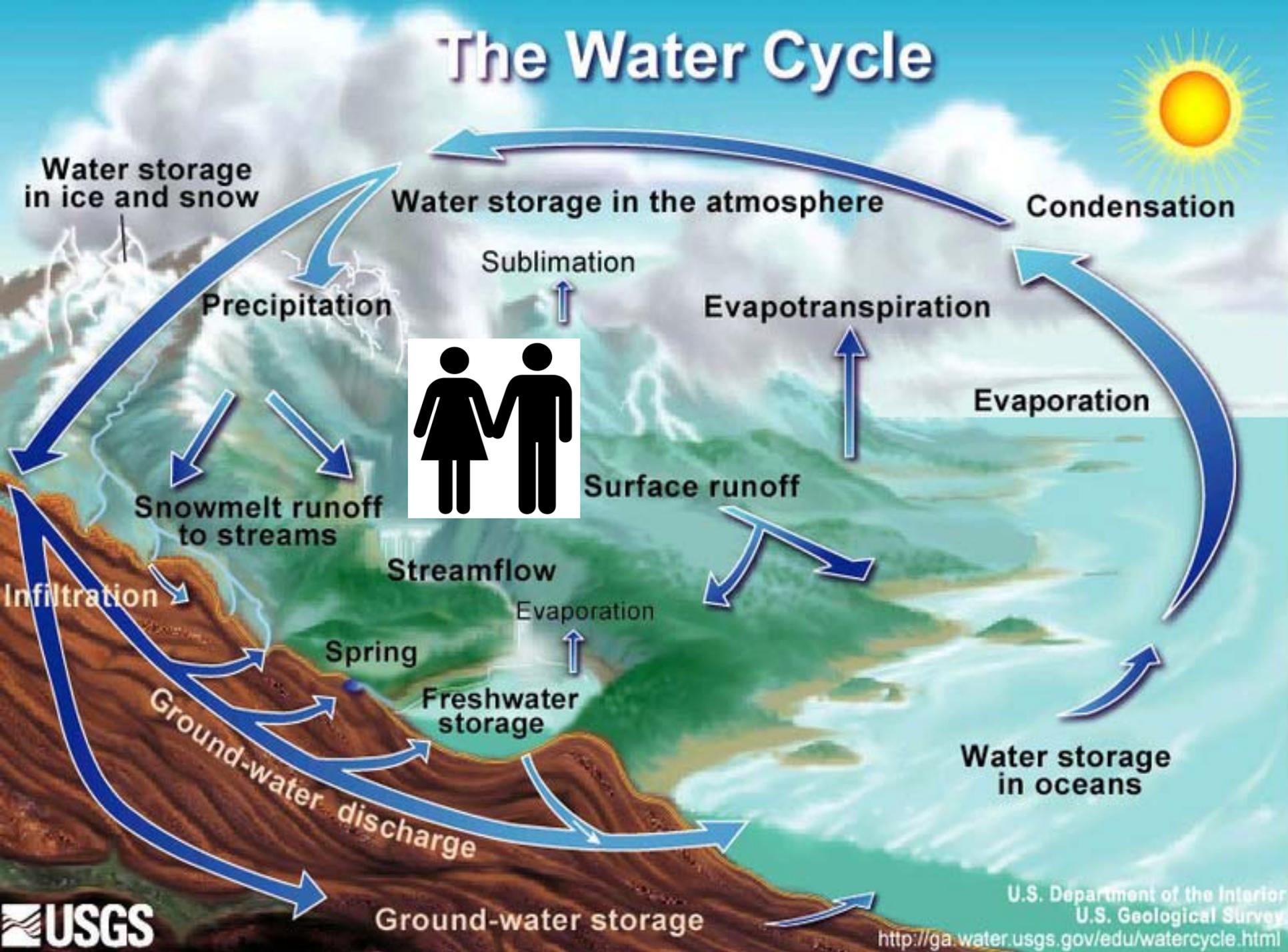
Economic Development



SUSTAIN

recover + repair + evolve

The Water Cycle



A large, semi-transparent blue globe of the Earth is centered in the background. The continents are visible as darker blue shapes. In the foreground, several hands of various skin tones (light, medium, and dark) are reaching upwards, with some fingers touching the bottom of the globe. The background is a bright blue sky with soft, white clouds. The text "What about me?" is overlaid in the center-left area of the globe.

What about me?

A man with a long, grey beard and hair, wearing a dark, heavy robe, is shown from the chest up. He is looking upwards and to the right with a serious expression. He holds two large, dark, rectangular stone tablets. The tablet in his left hand (viewer's right) has the words 'Poverty', 'Economic Development', and 'Carrying Capacity' written on it. The tablet in his right hand (viewer's left) has the words 'Sustain', 'Develop', 'Systems', 'Humans', and 'Equity' written on it. The background is a dark, textured surface on the left and a reddish, mottled area on the right.

Sustain
Develop
Systems
Humans
Equity

Poverty
Economic
Development
Carrying Capacity

What is a Metric?



Helps you understand where you are

Which way you are going and

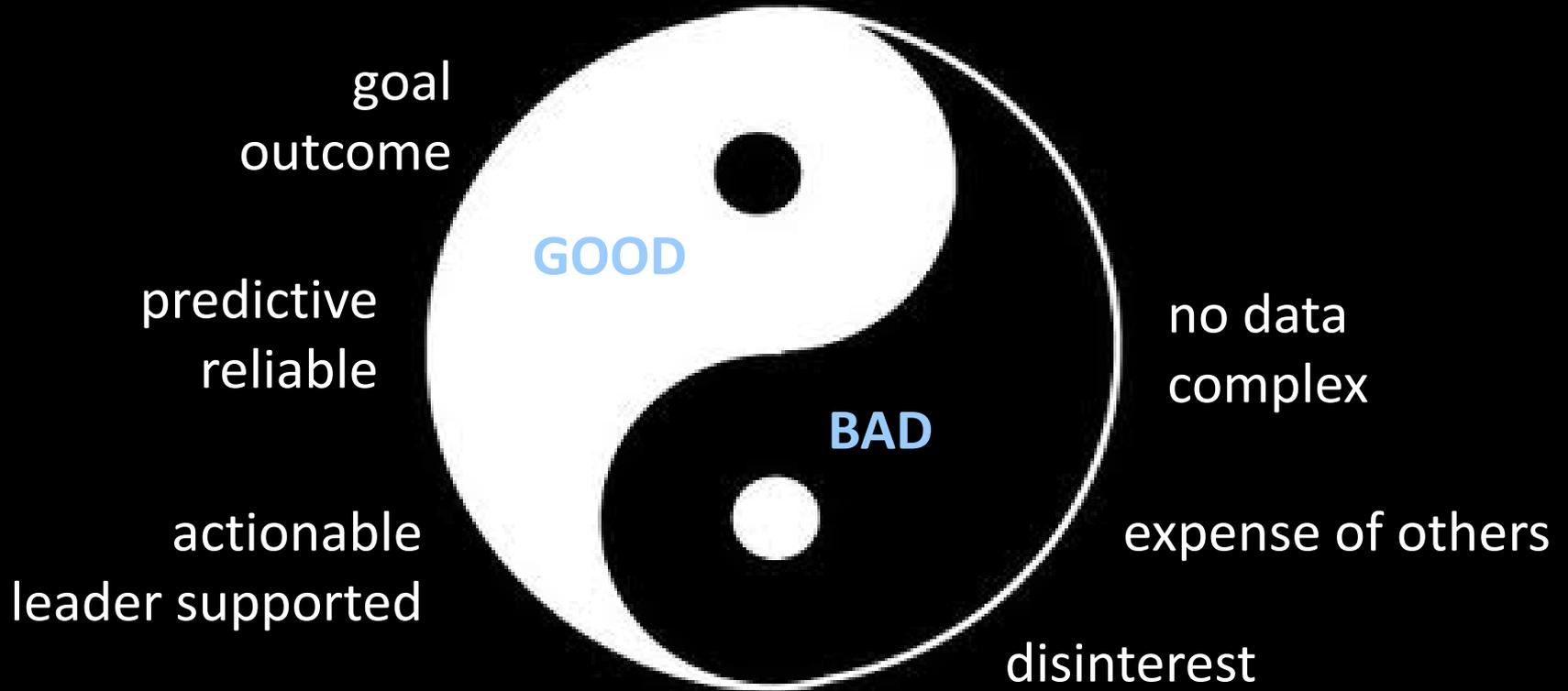
How far you are from where you want to be

Purpose of Metrics

Understand and learn what is happening relative to the subject so that informed decisions can be made



Characteristics



Common Themes

Education

Poverty

Health

Housing

Government

Economy

Public Safety

Income Distribution

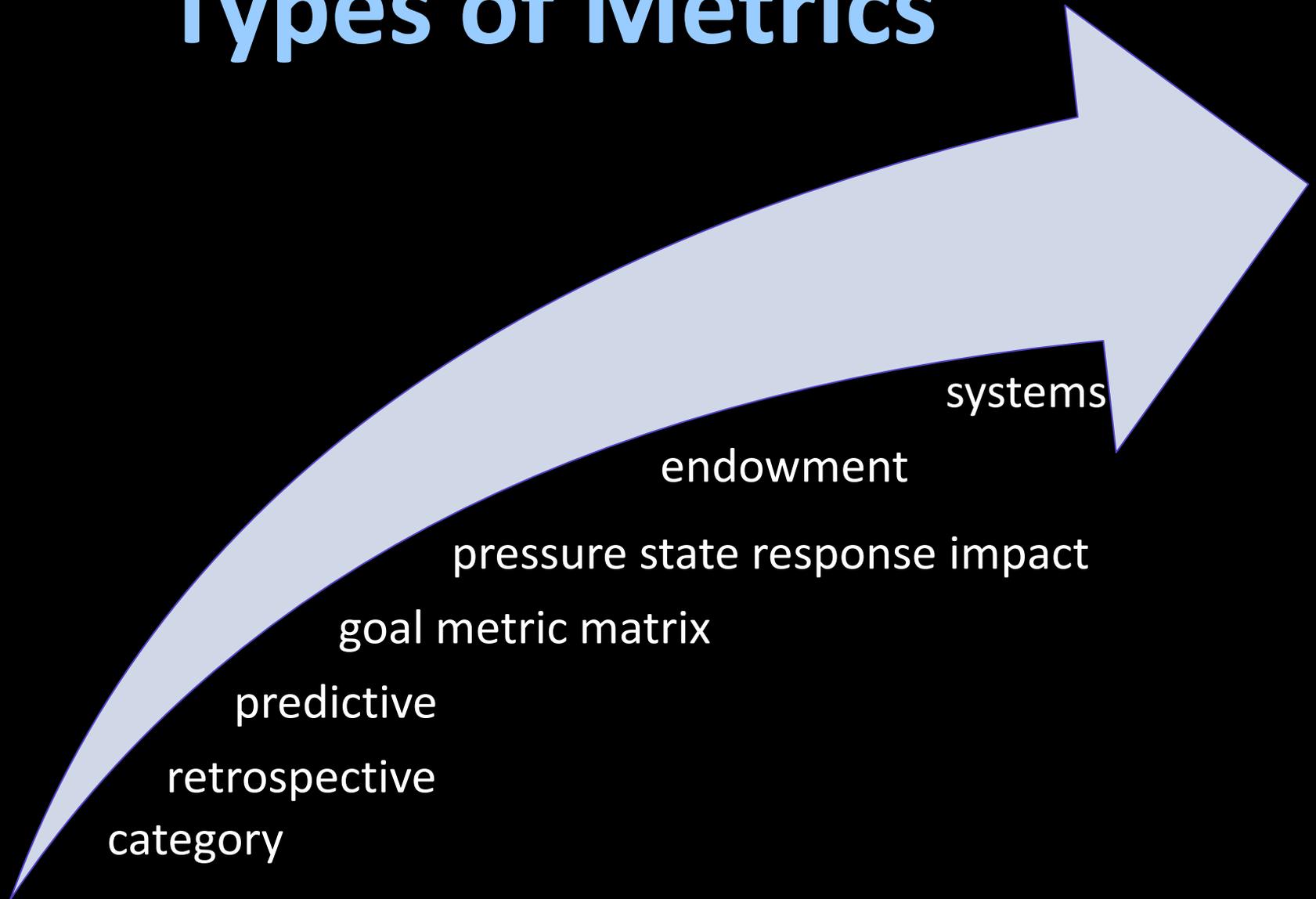
Cultural diversity

Transportation

Infrastructure

Demographics

Types of Metrics



The Sustainable Component

Traditional	Sustainable	New Emphasis
Per capita income	People earning a livable wage	Changes focus from how much to the amount needed
Tax expenditures	Ratio of tax revenue to support humans living in flood prone areas versus safe areas	Measures underlying subsidies that may distort public policy
Number of fishing permits	Ratio of permits awarded versus rates of regeneration	Changes focus from sheer numbers to ratio needed to sustain

Simple System

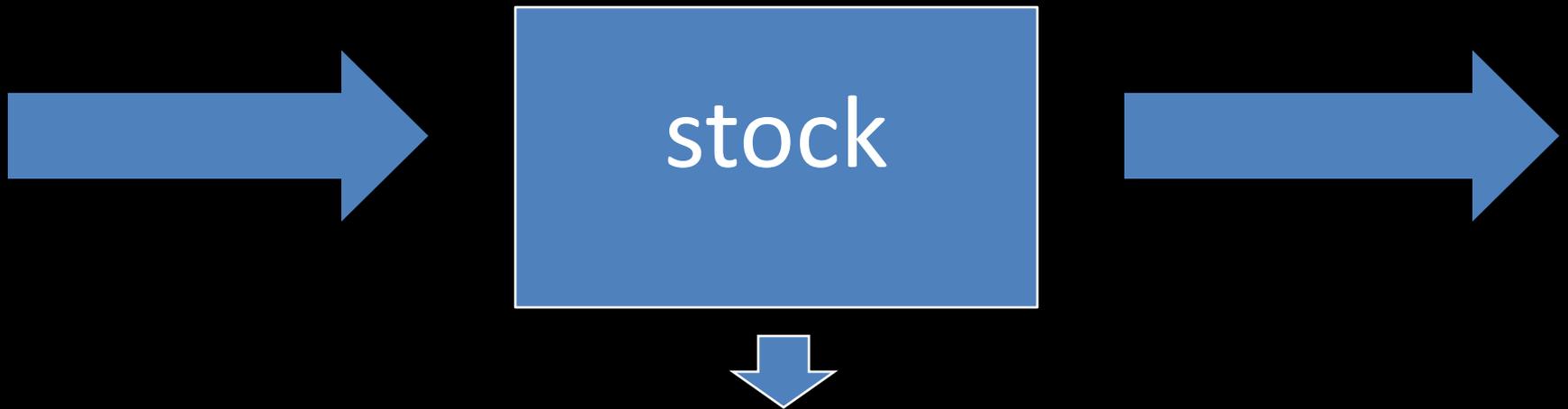


input

stock

output

System Metrics



turnovertime
depletion rate

System Metrics



change vs. response rate
crash point

System Metrics



evolutionary potential

Challenge #1: Conceptual Framework

Challenge

- What is our agreed understanding of sustainable development such that it will help us make decisions?

Recommendation

- Do this first!
- Codify meaning and remind people often
- Process is as important as result

Values

Goals

Definition

Challenge #2: Definitional Ambiguity

Challenge

- Words have meaning and they are all subjective

Recommendation

- Agree on meaning
 - Sustain, develop, community, metric, carrying capacity



Critical Issue #3: Time is of the Essence

Challenge

- How much time does a sustainable metric require?

Recommendation

- Seek generational equity
- Regenerative capacity

“In our every deliberation we must consider the impact of our decisions on the next seven generations.”

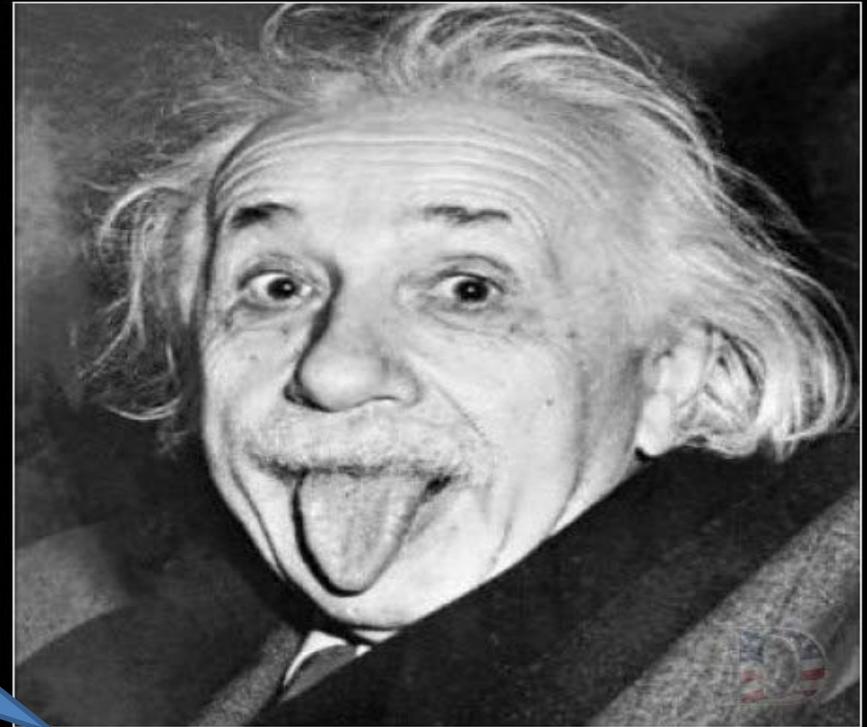
From the Great Law of the
Iroquois Confederacy

Critical Issue #4: How Many?

Challenge

- Complex systems

Recommendation



Albert Einstein

Everything should be made as simple as possible...
but not simpler.

Simple as possible,
But not simpler!

Critical Issue #5: Who Decides?

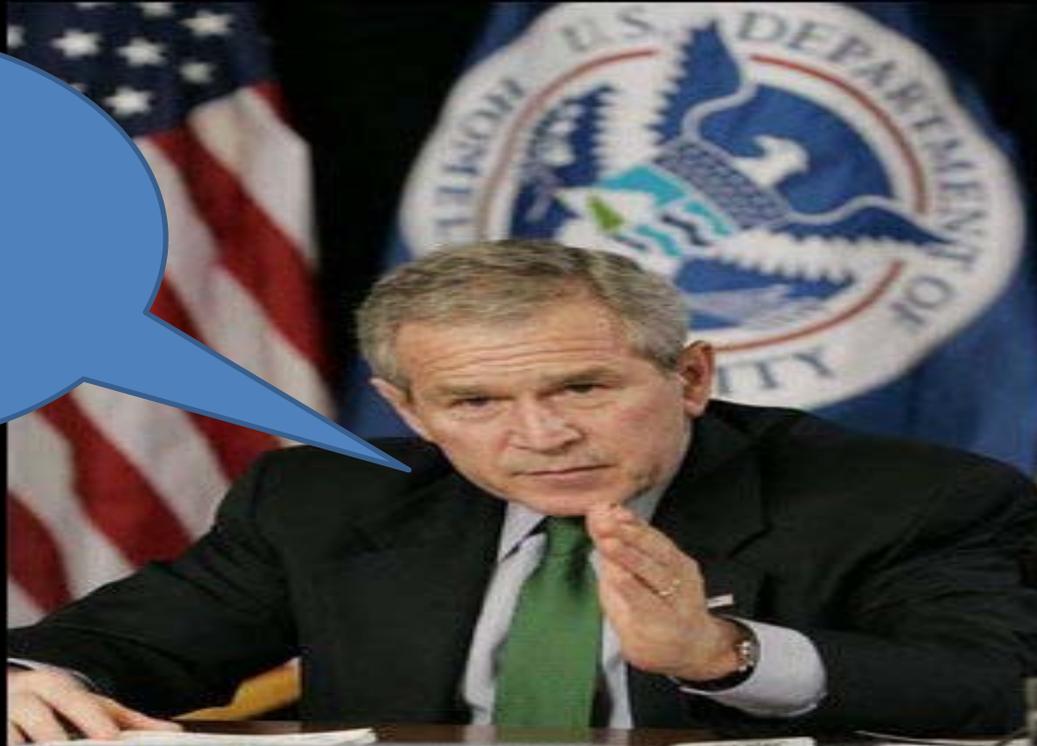
Challenge

- Not every idea can be the best
- Ego

Recommendation

- Agree on parameters
- Agree on structure

I am the decider!



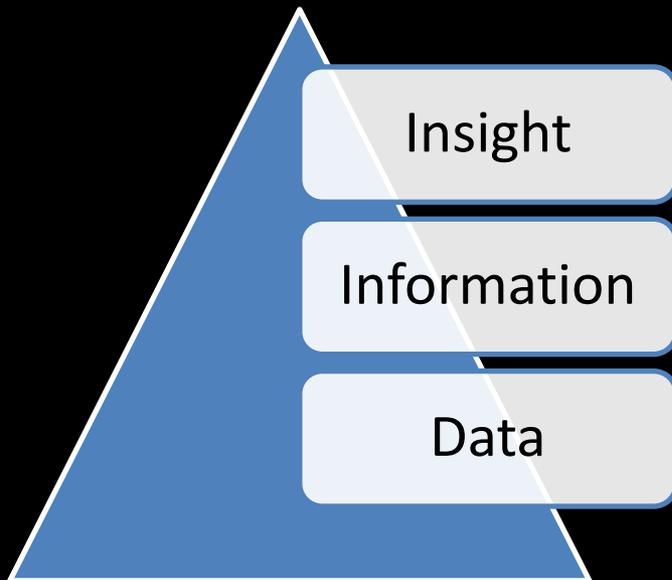
Critical Issue #6: Data

Challenge

- Credible and available

Recommendation

- Trustworthiness
- Availability



Critical Issue #7: Usefulness

Challenge

- Is the metric providing information that is actually being used?

Recommendation

- Partner with end-user upfront
- Focus on a select few



Critical Issue #8: Measure Change

Challenge

- What matters?

Recommendation

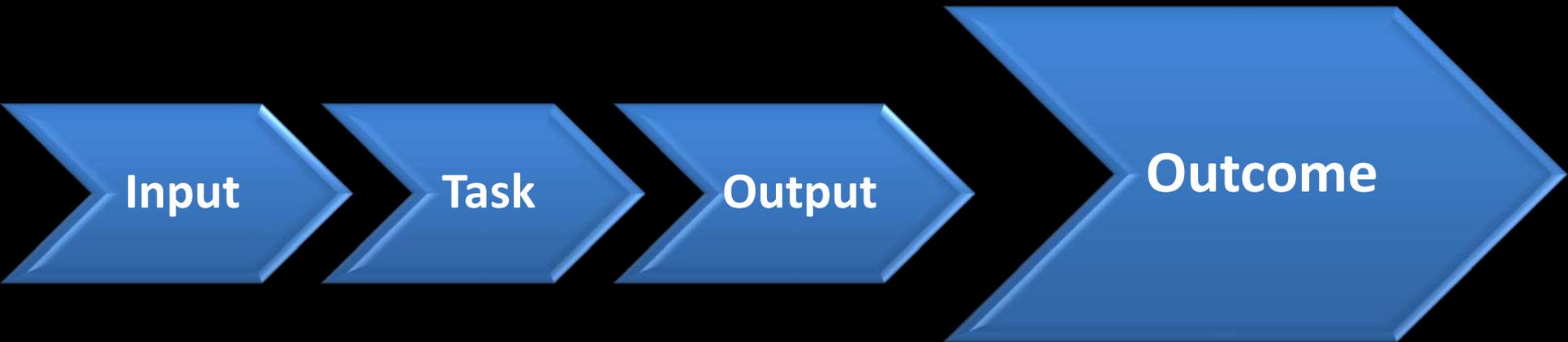
- Results

Input

Task

Output

Outcome



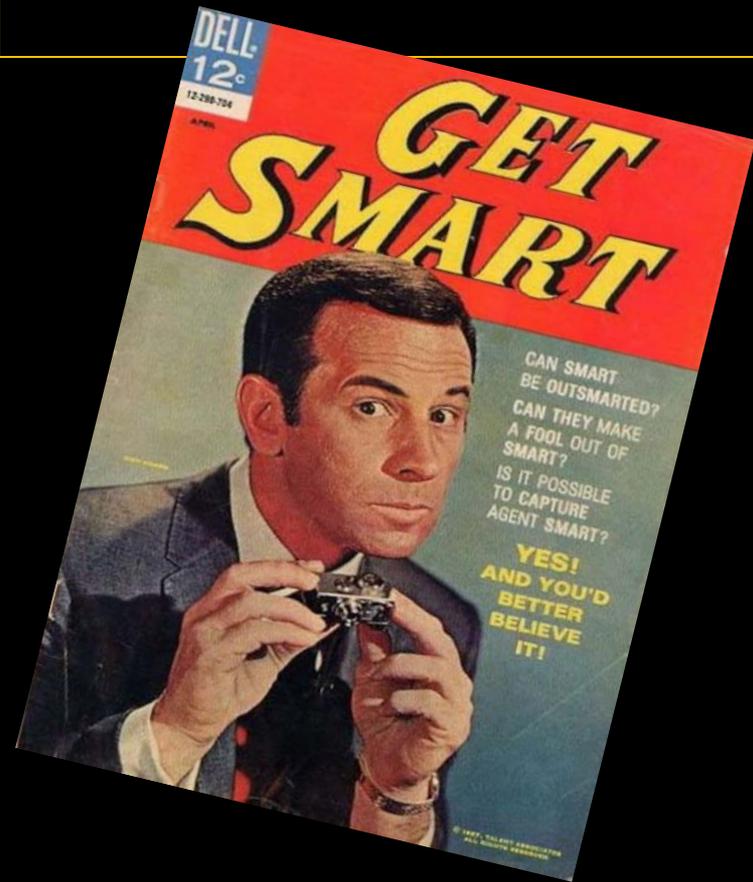
Critical Issue #9: Measure How?

Challenge

- How do you express what matters?

Recommendation

- SMART Outcomes



SMART statements

Specific

Measurable

Achievable

Relevant

Time-bound



**Social – 10% reduction in rate
of residential foreclosures
between January and
December 2011**







**Economic – increase the level
of employment by 5000
people for those making over
\$40,000/year between
January and June of 2012**



Environmental – reduce the amount of methane released from industry by 90% between January and December 2012.



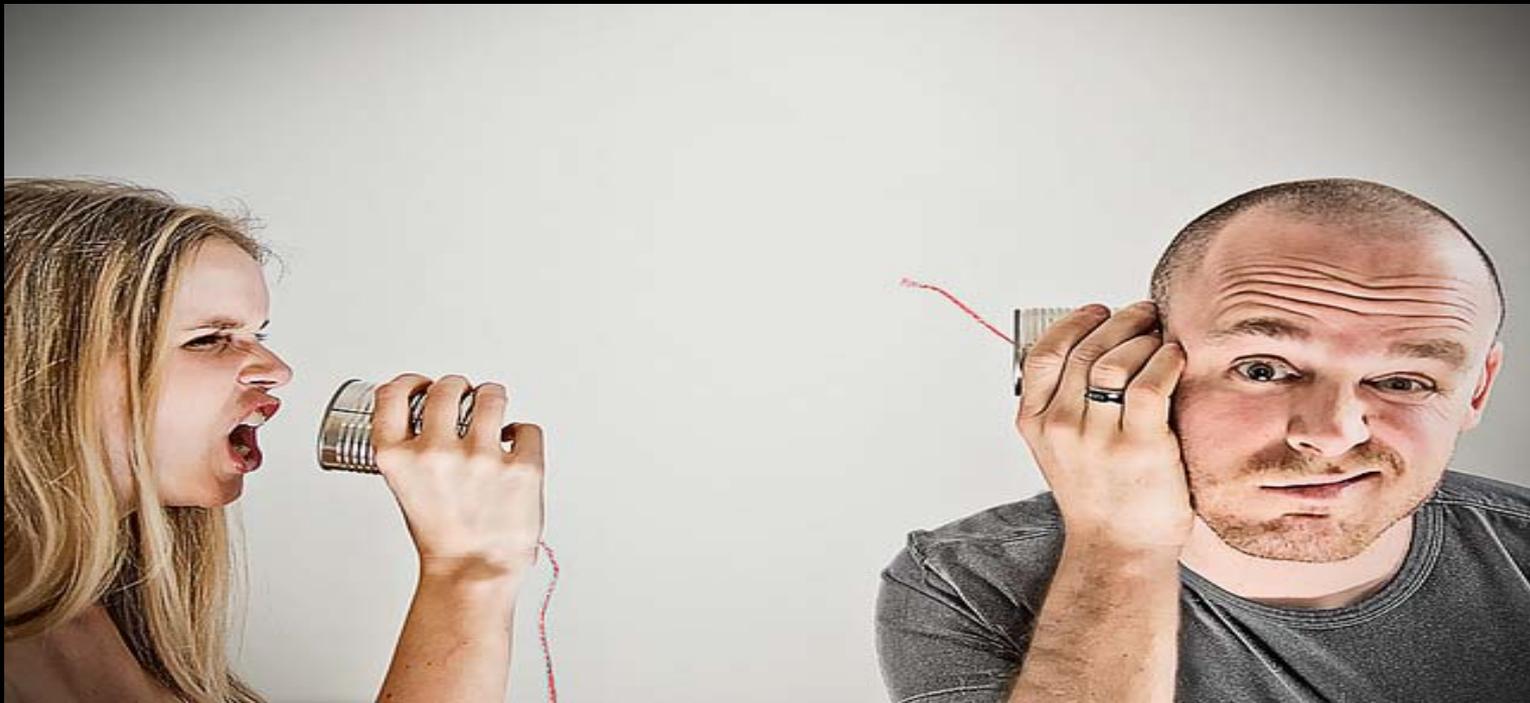
Critical Issue #10: Communicating Results

Challenge

- Information that's actionable

Recommendation

- Be effective
- Remember the audience



**Environ-
ment**

Economy

GDP

Waste

Investments

Air
Pollution

inflation

Climate
Change

PPI

poverty

**Social
Care**

employ-
ment

Policy valuation:



Environment

Economy

GDP

Waste

Investments

Air Pollution

Innovation

Climate Change

Policy valuation:

very good

good

ok

medium

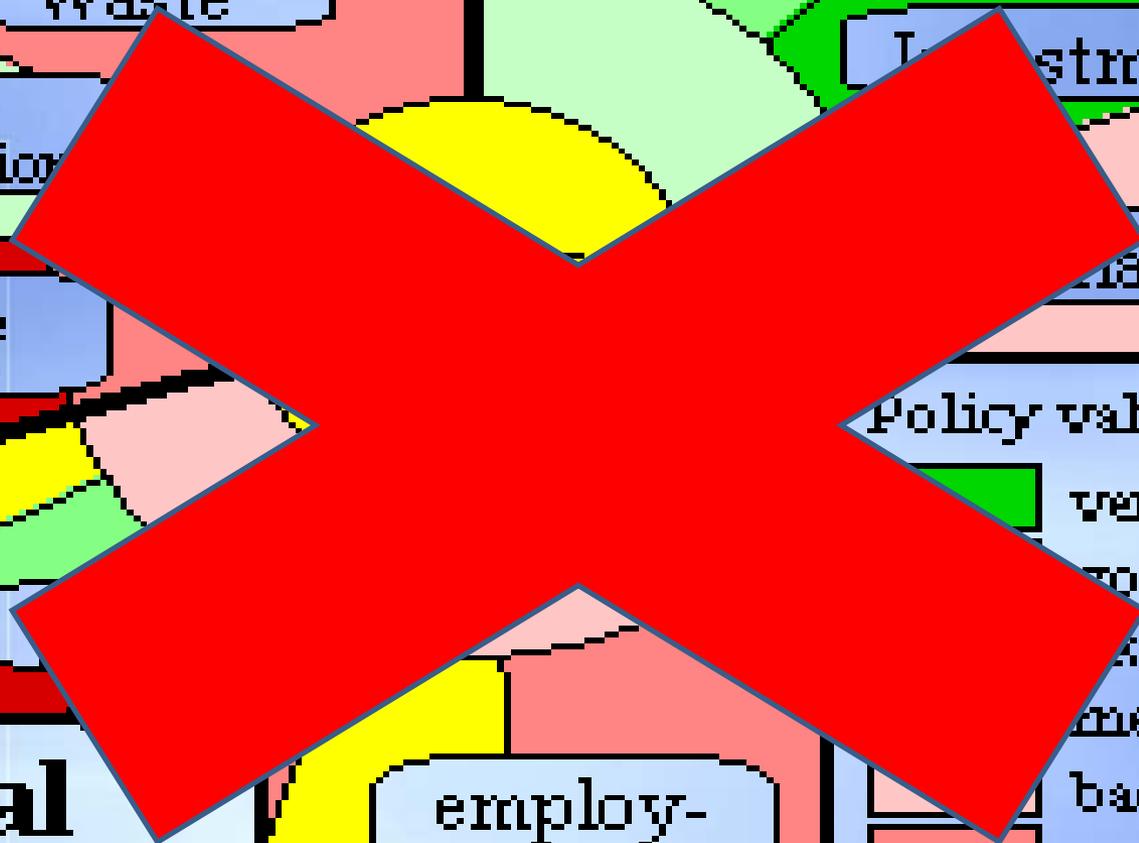
bad

very bad

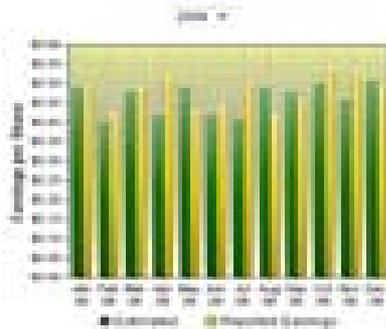
crisis

Social Care

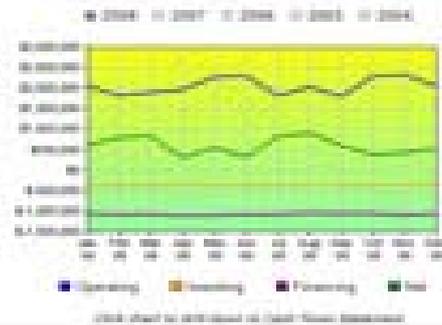
employment



Financial: Earnings Per Share



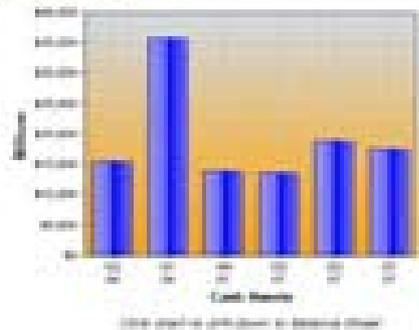
Financial: Cash Flow



Financial: Liabilities by Quarter



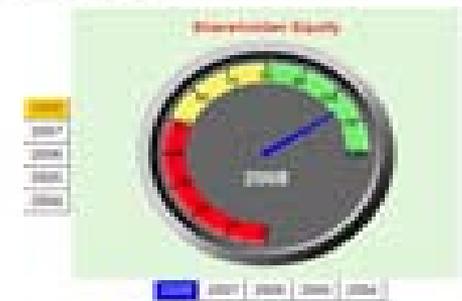
Financial: Assets by Quarter



Financial: Asset Liability Comparison



Financial: Shareholder Equity



Financial: Key Assets

Asset	2004	2007	2008	Change
Cash and equivalents	10,000	10,000	10,000	0
Trade receivables	2,000,000	2,000,000	2,000,000	0
Prepaid expenses and receivables	1,000,000	1,000,000	1,000,000	0
Investments	1,000,000	1,000,000	1,000,000	0
Property, plant, and equipment	10,000	10,000	10,000	0
Intangible assets	10,000	10,000	10,000	0
Goodwill	10,000	10,000	10,000	0
Other assets	10,000	10,000	10,000	0
Total assets	5,000,000	5,000,000	5,000,000	0

Financial: Key Liabilities

Liability	2004	2007	% of Eq
Accounts payable	1,000,000	1,000,000	20%
Debt	1,000,000	1,000,000	20%
Accrued liabilities	100,000	100,000	2%
Deferred tax liabilities	100,000	100,000	2%
Other liabilities	100,000	100,000	2%
Minority interest	100,000	100,000	2%
Long-term debt	100,000	100,000	2%
Shareholders' equity	4,000,000	4,000,000	80%
Subordinated debt	100,000	100,000	2%
Total liabilities	4,000,000	4,000,000	80%

Financial: Asset Comparison



EN 5

How is the DVRPC Region performing?

Tree cover of all types throughout the region decreased by 11%.

WHAT WE TRACK

EN 5: Has the region's tree cover increased or decreased?
Has the region's heavy tree canopy (the most beneficial type) increased?

INDICATOR

Acres of tree cover.

In *Destination 2030*, DVRPC created a goal to increase the region's heavy tree canopy, which provides a higher level of environmental benefits – such as stormwater runoff and carbon sequestration. Additionally, municipalities can pass tree protection ordinances that protect mature trees. Tracking heavy tree canopy over time would help DVRPC determine the effectiveness of local development controls.

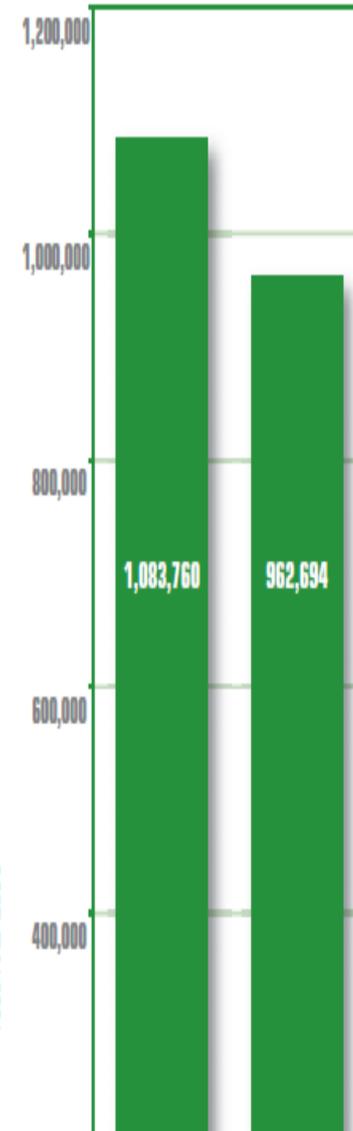
DVRPC established a requirement to maintain overall data quality by using uniform data sources and data years for the region's counties in New Jersey and Pennsylvania. Because of disparate data sources and collection years, DVRPC must use a modified indicator – “acres of tree cover” – rather than “heavy tree canopy.” Until NJDEP and PADEP release land cover data that is comparable, DVRPC will use American Forests data.

Heavy tree canopy (data available only for New Jersey) also decreased by 4%.

Tree Cover		Change 1993 to 2000	
1993	2000	Absolute	Percent
1,083,760	962,694	121,065	-11.20%

SOURCE: AMERICAN FORESTS, 1993 AND 2000

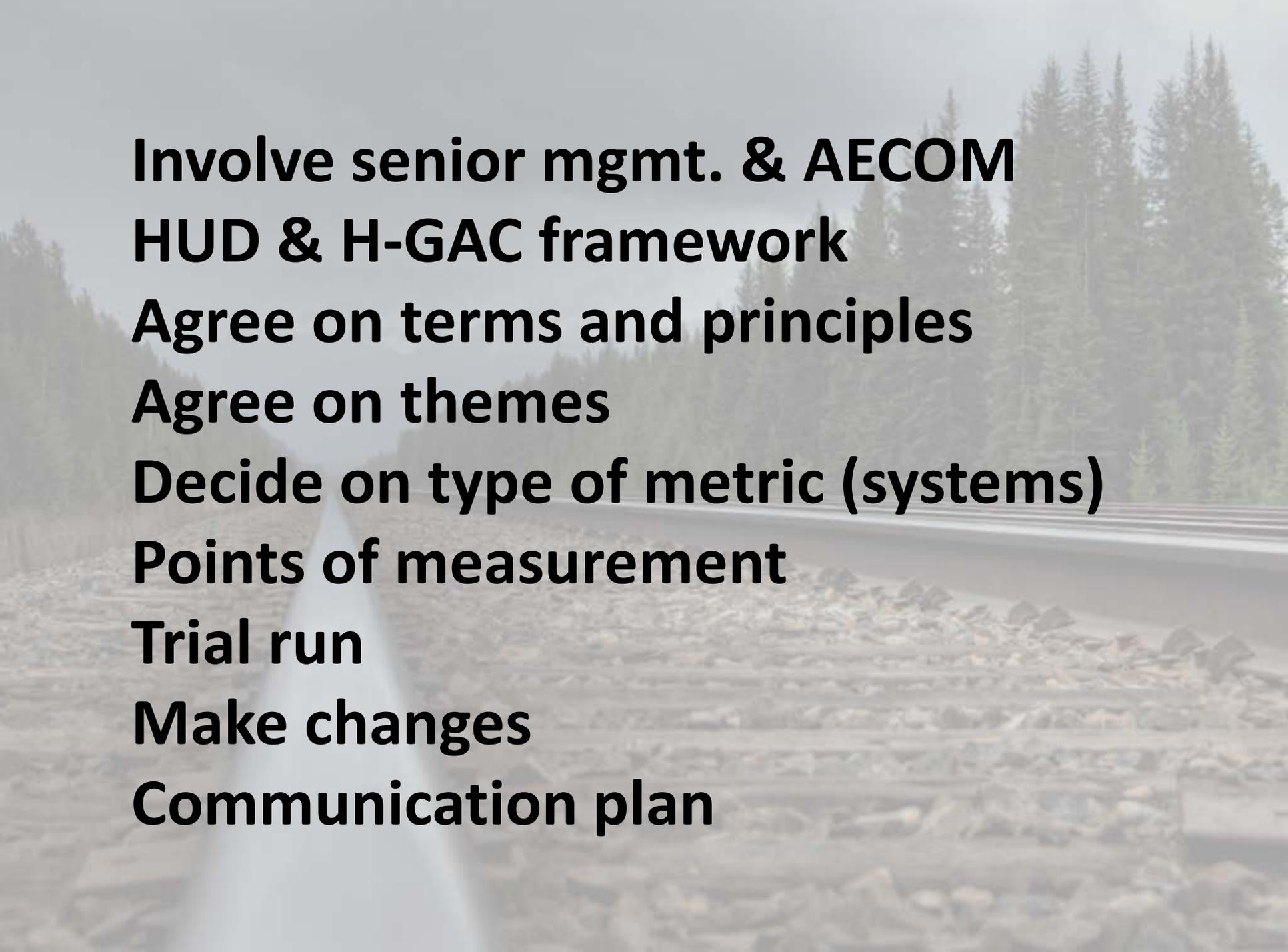
TREE COVER IN DVRPC REGION



1993 AND 2000

Looking Forward





Involve senior mgmt. & AECOM

HUD & H-GAC framework

Agree on terms and principles

Agree on themes

Decide on type of metric (systems)

Points of measurement

Trial run

Make changes

Communication plan

Questions



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Metrics and the Regional Plan for Sustainable Development

- Evaluate scenarios
- Develop priority implementation strategies
- Track progress over time

Metrics

- Reflective of
 - public input
 - regional priorities
 - Transects
- Multi-step process for development
 - first set of workgroup meetings in November
 - second set of workgroup meeting after public meetings

November Meeting

- Goal: To develop draft metrics
 - Starting point will be results from kick-off meeting discussions
 - Technical workgroups use these goals to develop list of potential metrics
 - Transect workgroups evaluate goals from all technical workgroups for applicability and develop any transect specific metrics

Example

Goal	Potential Metrics
All residents of the region have access to a variety of widgets that meet their unique needs.	Number of widgets per capita
	Percentage of population within ½ mile of a widget
	Percentage of annual income spent on widgets.
	Number of widgets per acre.
	Percentage of residents who own widgets.
	Number of people who are satisfied with their level of access to widgets.

Interim Assignment

- Goal: Refine draft metrics using metrics checklist
 - Will receive feedback from:
 - Public meetings
 - Governmental Advisory Committee
 - Transect groups

Example

Goal	Potential Metrics	Metric Evaluation
All residents of the region have access to variety widgets that meet their unique needs.	Number of widgets per capita	Low scoring
	Percentage of population within ½ mile of a widget	High scoring
	Percentage of annual income spent on widgets.	High Scoring
	Number of widgets per acre.	Moderate Scoring
	Percentage of residents who own widgets.	High Scoring
	Number of people who are satisfied with their level of access to widgets.	Low scoring

Meeting #2

- Goal: Develop SMART statements for refined list of metrics
 - quantifiable measures for progress
 - not requirements
 - Can be refined over time as improved data becomes available

Example

Goal	Metrics	SMART statements
All residents of the region have access to variety widgets that meet their unique needs.	Percentage of population within ½ mile of a widget	75 percent of residents are located within ½ mile of a widget by 2040.
	Percentage of annual income spent on widgets.	Residents of the region spend less than 15 percent of annual income on widgets.
	Percentage of residents who own widgets.	80 percent of residents will own widgets by the year 2040.