A small green seedling with several leaves is growing out of a crack in a dark, textured surface. The background is a bright, hazy sky with a large, glowing orange and yellow light source, possibly the sun, creating a lens flare effect. The overall scene conveys a sense of resilience and growth in a challenging environment.

Adaptation
Dr. Shyamli Singh

Types of Adaptation



Adaptative



Reactive

How Does Adaptive Planning Occur?

- **Anticipatory Adaptation**

- Taking **proactive** steps to reduce the risks associated with climate change for individuals, communities , and ecosystems



- **Reactive Adaptation**

- Dealing with climate impacts after-the-fact

Both are ways of adapting to climate change, however...



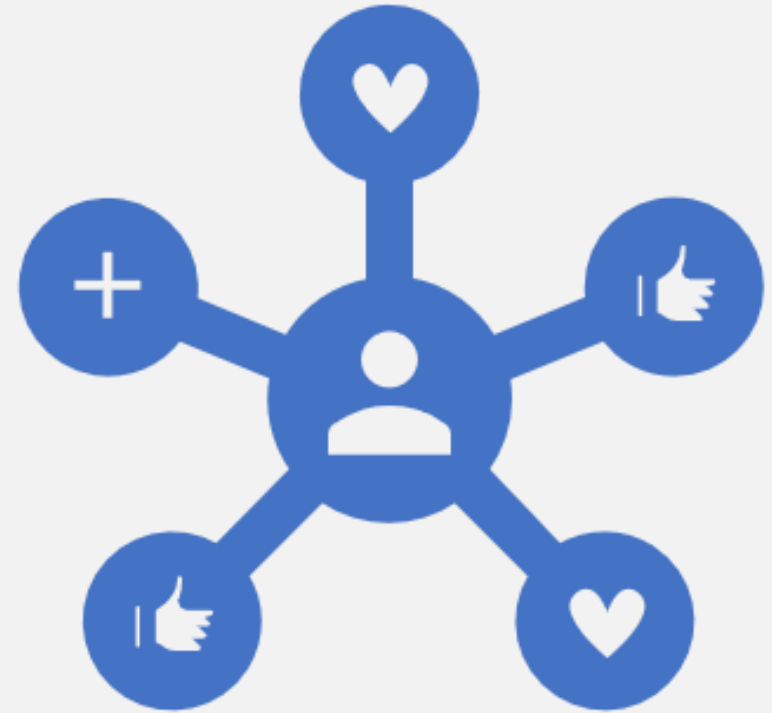
Thoughts on Adapting to Climate Change

-
- Adapting to climate change is not a one-time activity
 - There is no “one-size-fits-all” approach to managing climate change impacts



Transition to a Sustainable Lifestyle with the Earth Charter!

***We better start
re-looking at our
lifestyles***



The Ecological Footprint

MEASURES

how fast we consume resources and generate waste



Energy



Settlement



Timber & paper



Food & fibre



Seafood

COMPARED TO
how fast nature can absorb our waste and generate new resources.



Carbon Footprint

Built-up land



Forest

Cropland & pasture



Fisheries

How much water do we use?

Per capita water supply- 50 to 200 litres/day

Understanding Water Footprint Better!

- Lot of water is used for drinking, cooking and washing, but even more for producing things such as food, paper, cotton clothes, etc.
 - The water footprint is an indicator of water use that looks at both direct and indirect water use of a consumer or producer.
 - The water footprint of an individual, community or business is defined as the total volume of freshwater that is used to produce the goods and services consumed by the individual or community or produced by the business.
-



We ourselves do not know our Water Footprint !

The FAO estimates that 70% of the world's water is used for agricultural purposes.

It takes approximately 15,000 litres of water to produce one kilogram of meat.

It takes approximately 1,500 litres to produce a kilogram of wheat.

Approximately 3,000 litres per day are needed to satisfy a person's daily nutritional needs - that estimate, of course, depends on the foods that are used to meet those needs.

Pure
chocolate
2400 liters
as a world
average!.





Calculation..

- Composition of dark chocolate: 40% cocoa paste (water footprint 33260 litres/kg); 20% cocoa butter (water footprint 50730 litres/kg); 40% sugar (water footprint 1526 litres/kg).
- We then can calculate: $40\% \cdot 33260 + 20\% \cdot 50730 + 40\% \cdot 1526 = 24060$ litres/kg = 2400 liters for one 100gr chocolate bar.
- The water footprint of milk powder is 4600 litres/kg, so that milk chocolate will have a bit larger water footprint (about 2500 litres for one 100gr chocolate bar) than dark chocolate when total cocoa content remains the same.
- Most crucial for the water footprint of chocolate is the cocoa paste and cocoa butter content.

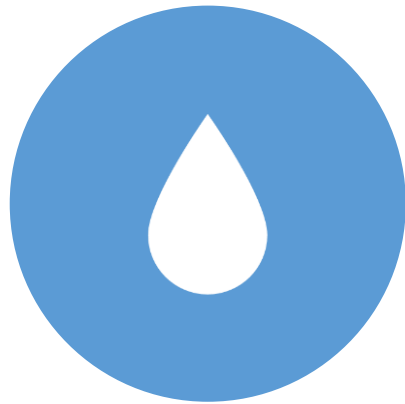
Drinking tea instead of coffee would save a lot of water. For a standard cup of tea of 250 ml we require 30 litres of water.



Globally, the annual cotton production evaporates 210 billion cubic meters of water and pollutes 50 billion cubic meters of water. This is 3.5 % of the global water use for crop production



Understanding Water Footprint Better...



BLUE WATER
FOOTPRINT



GREEN WATER
FOOTPRINT



GREY WATER
FOOTPRINT

Ethical difference of
causing emissions
for survival needs
compared to
emissions caused **for**
luxury consumption



Food, shelter and clothing are universal survival needs, whereas excessive meat eating, large air-conditioned houses, and sizeable wardrobes, fall into the category of luxury

Is change possible?

	Long Ago	Recently	Present Status
Trophy Hunting	Stylish	Questionable	Strictly Regulated
Smoking In Public Places	Stylish, Normal	Annoying, Inconsiderate	Forbidden
Child Abuse as a method of Upbringing	Advised	Questionable	Forbidden
Overconsumption	Elite Affair	Everyone's aspiration and Right	Questionable



Examples of Cultural Transformation

A photograph of a sea turtle resting on a sandy beach. The turtle is facing left, with its head and front flippers visible. Its shell is dark with a pattern of lighter, reddish-brown spots. The background shows a sandy beach with some coral and seaweed. The lighting is bright, suggesting a sunny day.

Creating
Sustainable
Future!

My Contribution

Lifestyle Changes



Waste

- *Refuse*
 - *Reduce*
 - *Reuse*
 - *Recycle the materials used in production and consumption systems and ensure that residual waste can be assimilated by ecological systems*
 - *Refurbish*
-



Refuse

This means **not accepting products**, because of the material they are made of, their packaging, or the contamination they create when thrown away (like batteries, disposable dishware or plastic packaging).



Reduce

Only buy things which we absolutely need. We should also reduce the amount of energy and water we use.

Reduce waste

Immediate Choice: Buy less packing

Tougher Choice: Recycle

Change Choice: Buy goods that can be repaired

Reuse

Use packaging which is returnable or reusable. Donate clothes, games and kitchenware you no longer use, as well as books and magazines.

Recycle

When solid waste is sorted, its value increases. Therefore, if we separate our trash and send it to a collection center, it can then be sold to businesses that recycle cans, plastic, paper and glass.



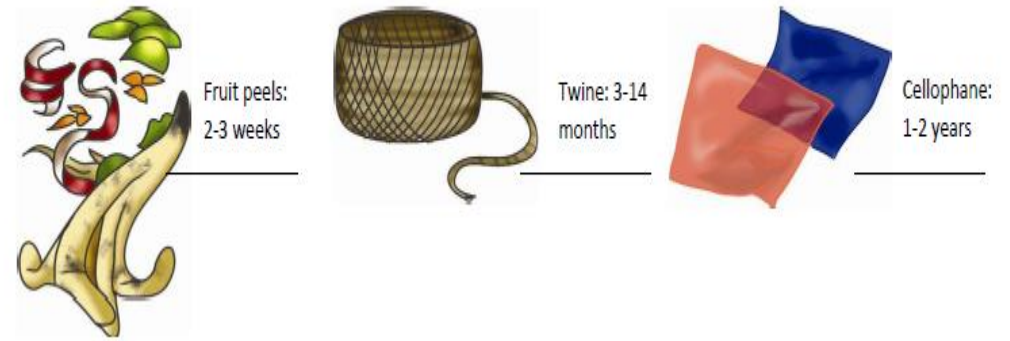
Recycle



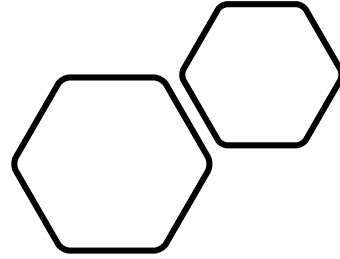
What can be reused or recycled?

- Newspapers, phonebooks, magazines, printing cartridges, carpet, manuals, books, aluminum cans, glass bottles and plastic...

Time required for the decomposition of various solid waste



Composting



- Main source of methane is rotting organics
- By keeping the organics out of landfills we could virtually eliminate the methane released from them, significantly reduce leachate and keep our climate cooler
- Organics make 1/3 of the municipal waste!

Energy

Maximize adoption of
Green buildings

Maximize use of natural
light

Sensible use of geysers,
blowers ,heaters, AC

Switch off!!



Live Examples



World's largest solar steam cooking system at a temple town of Tirupati for 15000 people



**Environment & Earth
Science Building , IIT Kanpur**



TCI Building, Haryana



Hitkarini college, Jabalpur

**Illustrations of few
Green Buildings**



DTU DEVELOPED SOLAR CAR FOR PARTICIPATION IN WORLD SOLAR CHALLENGE 2011 AUSTRALIA



Small Steps to conserve water

- Turn off the tap while brushing this saves 6L of water per minute
 - Place a cistern Displacement device in the toilet cistern to reduce the volume of water during each flush
 - Always use full loads of washing machine and dish washer
 - Fix a dripping tapthis could save 15 liters of water a day
 - Install a water butt to your drainpipe and use the water collected to water your plants, clean your car and wash your windows.
-



Transportation

- Walk or cycle wherever and whenever you can avoid cars
 - Use Mass /public transport systems
 - Form Carpools
 - Combine or reduce trips
 - Use fuel-efficient vehicle
 - Avoid clutch driving , rash driving and maintain speed limits
 - Use biofuels, such as ethanol or biodiesel
-



Transportation

- Encourage shifts from road to rail transport and from private to public transport systems
- Promote more fuel efficient vehicles, hybrid vehicles (which use electricity rather than fuel)
- Develop agro fuels, above all second generation ones
- Encourage non-motorized transport, such as cycling and walking
- Adapt land-use and transport planning to carbon constraints.

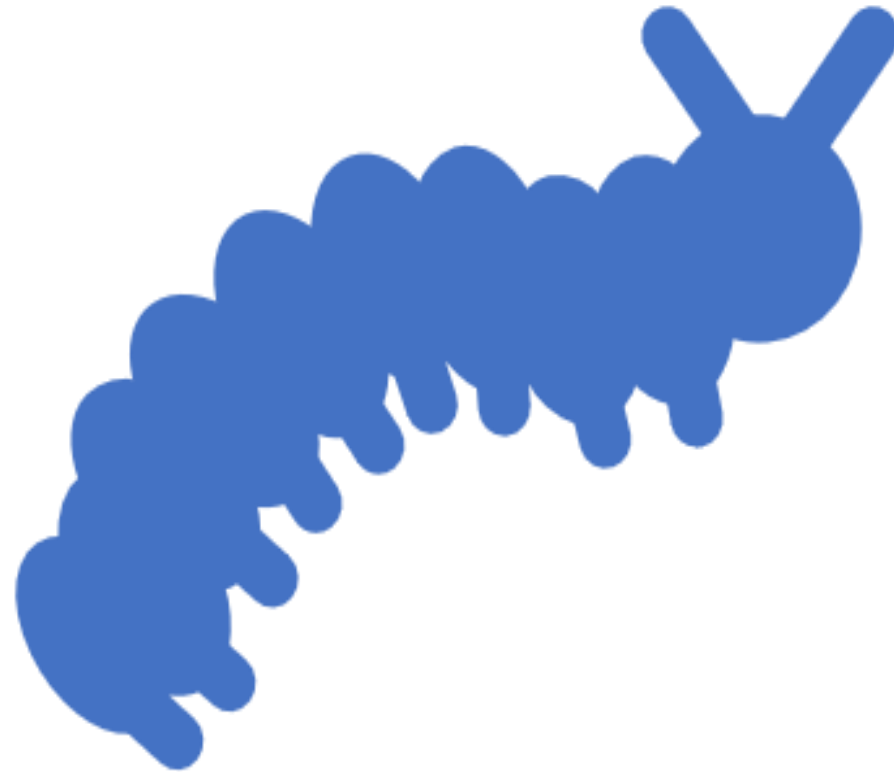


- How sustainable is your present lifestyle?

- You visit:
<http://www.myfootprint.org>

- to find out!

- Get your data out now AND
Calculate



Quiz

1. What are the two main policy responses to climate change?

- (a) mitigation and adaptation (b) wait and watch (c) Business as Usual (d) mitigation and development

2. What is the Vietnamese practice to protect against monsoonal rains?

- (a) building homes on stilts (b) building homes on slopes (c) building underground homes (d) building homes on hilltops

3. When was Adaptive capacity defined by the IPCC?

- (a) 2014 (b) 2017 (c) 2019 (d) 2012

4. What are Co-benefits?

- (a) the positive effects (b) the negative effects (c) the neutral effects (d) the ill effects

5. Where is the world's largest solar steam cooking?

- (a) Temple town of Tirupati (b) sun temple Konark (c) Batu caves in Malaysia (d) Duomo di milano in Italy

References

1. Adaptation to climate change

<http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2016/11/Working-Paper-255-Fankhauser.pdf>

2. Climate Change and Adaptation

https://iisd.org/pdf/2005/climate_adaptation.pdf

3. Adaptation to Climate Change in Developing Countries

https://www.researchgate.net/publication/23966336_Adaptation_to_Climate_Change_in_Developing_Countries

Thank You
For your time
and attention....

