

BEYOND GREEN DESIGN: Leveraging Non-industrial Bamboo SMEs' Potential for Holistic Sustainability through Design

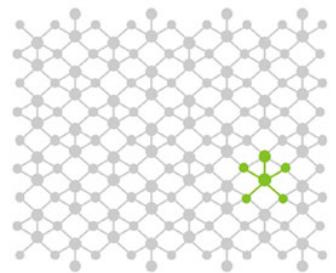


REBECCA REUBENS

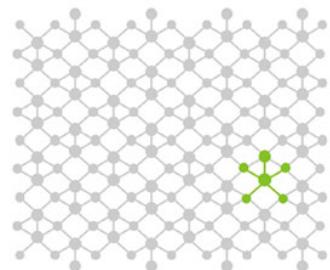
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World Bamboo Congress 10
19th September 2015
Ahmedabad



What is 'sustainability' all about?



industrialization

.er et.8;e)



Goods on the quays of Masthugget waiting to be loaded. 1919. © Sjöfartsmuseet Akvariet



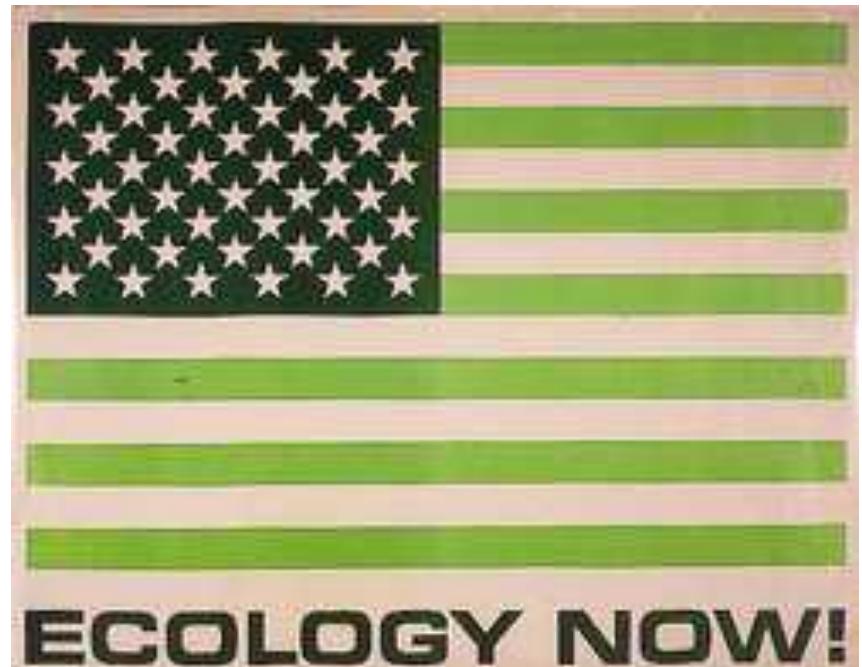
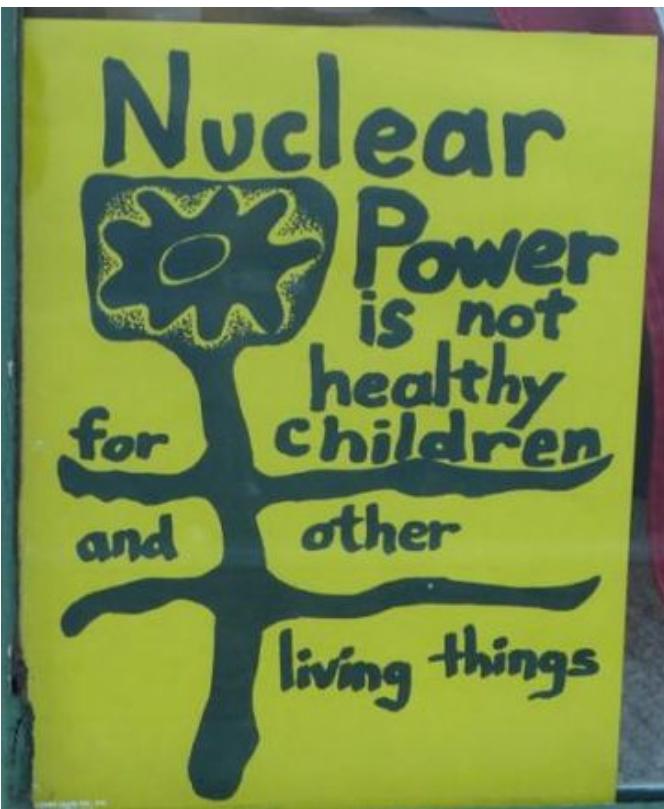


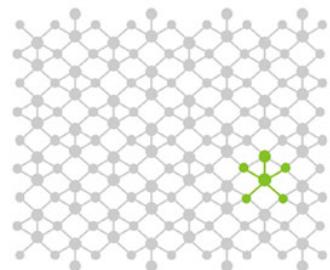
Environmentalism v/s development





Despite environmental activism....





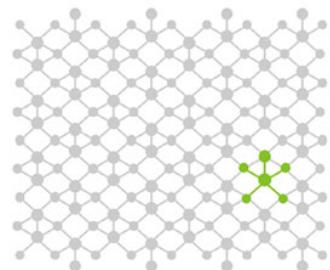
Economy and development still important!!!



Environmental extremists ...
wouldn't let you
build a **house**
unless it looked
like a **bird's nest**.

Ronald Reagan



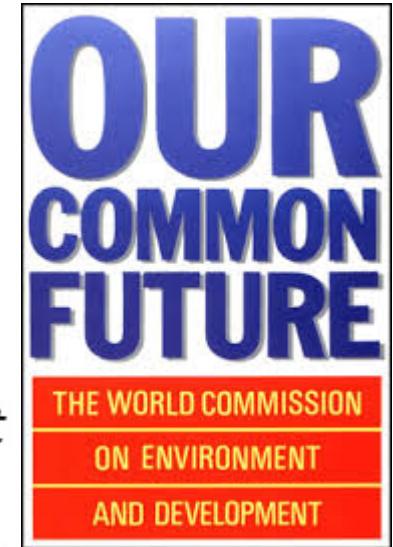


Economic development + environmental protection

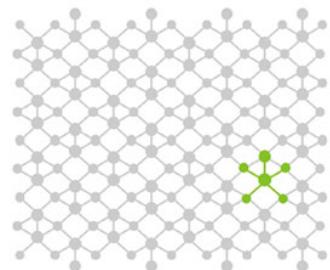


Brundtland-Report «Our Common Future» 1987

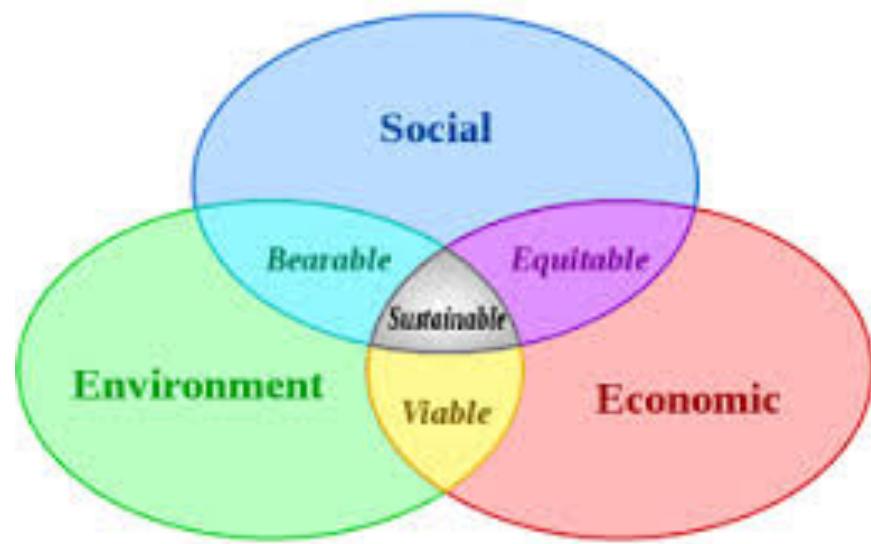
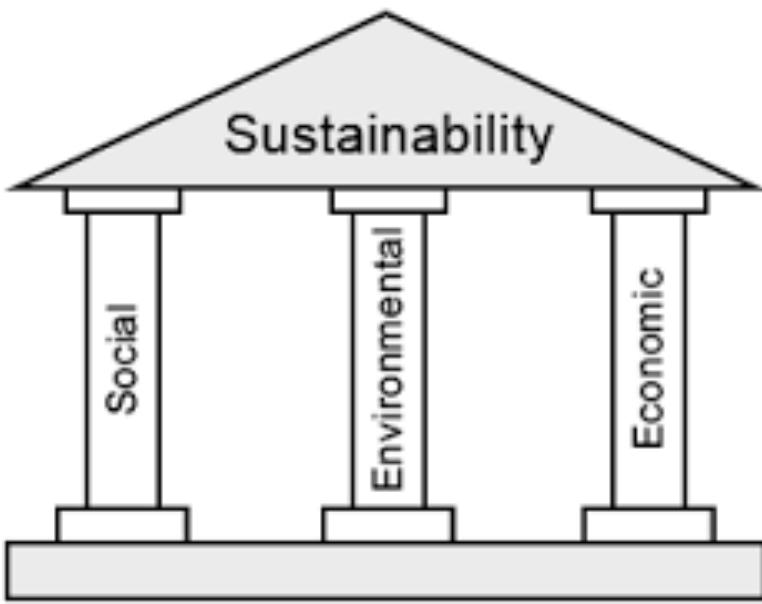
“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

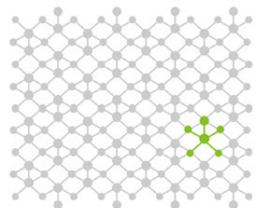


World Commission on Environment and Development (WCED). 1987. *Our Common Future: Report of the World Commission on Environment and Development*. Transmitted to the General Assembly as an Annex to document A/42/427 - Development and International Co-operation: Environment.

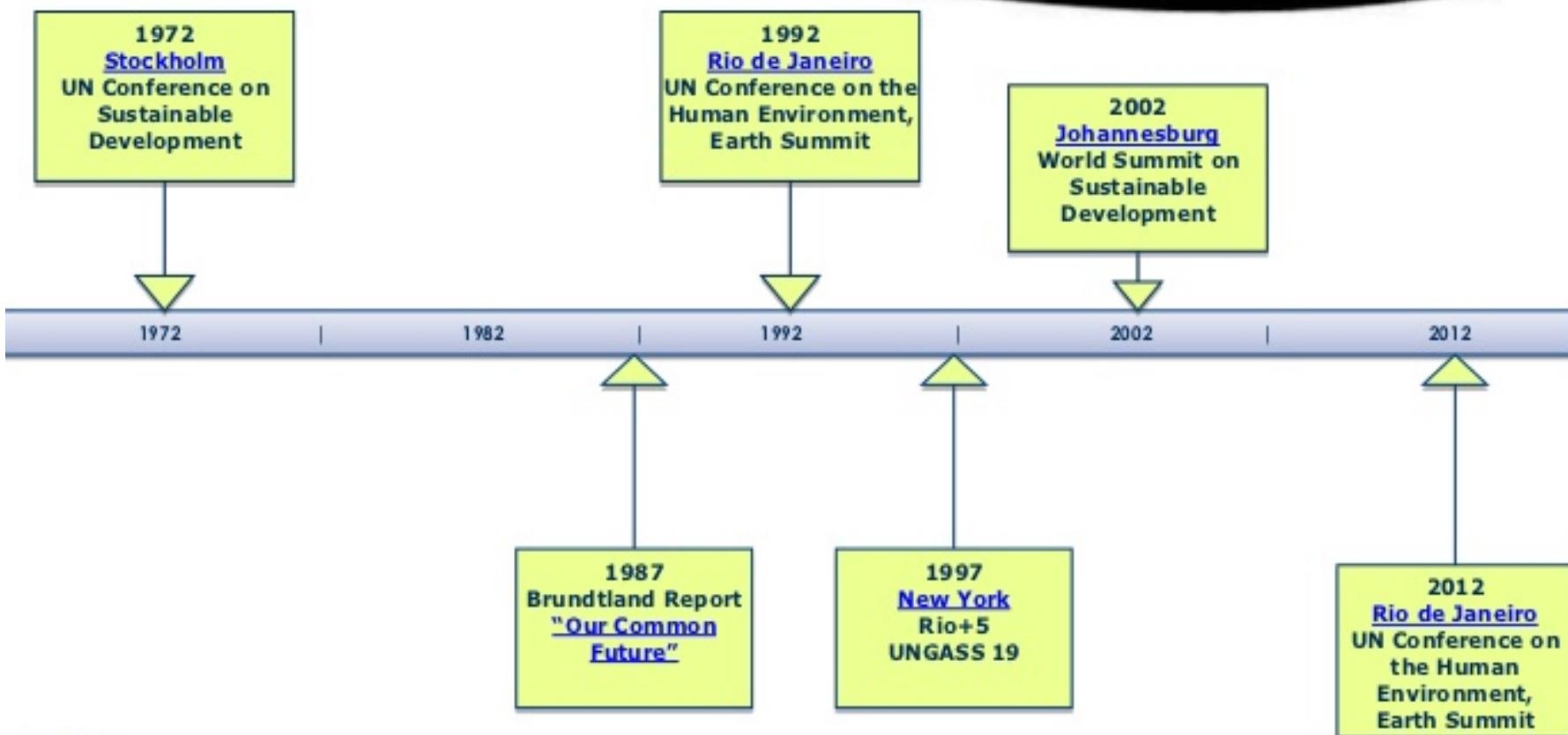


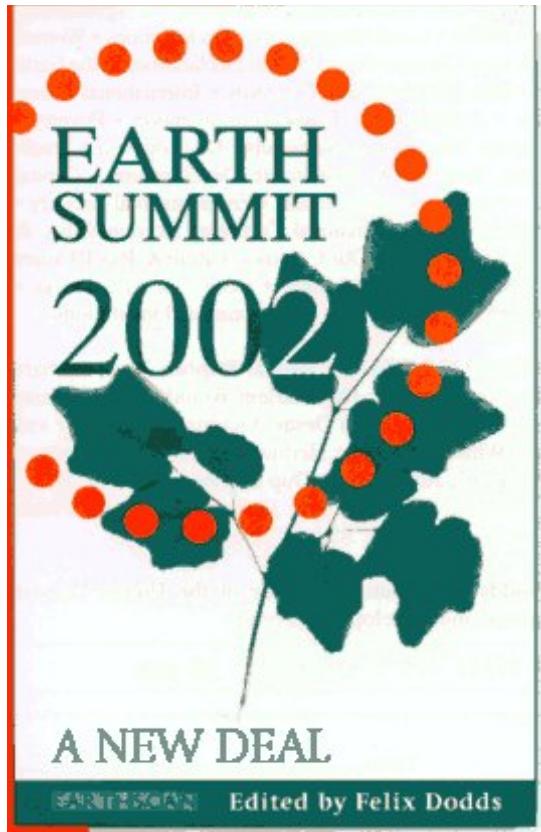
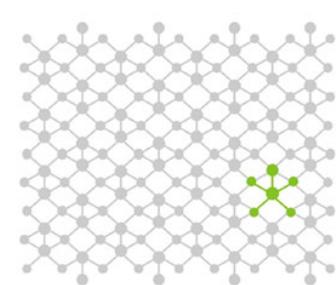
Sustainable development





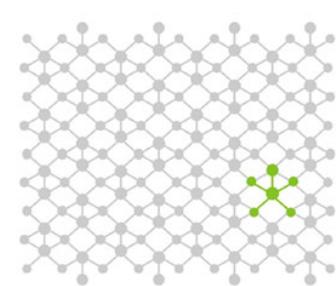
The story so far.....



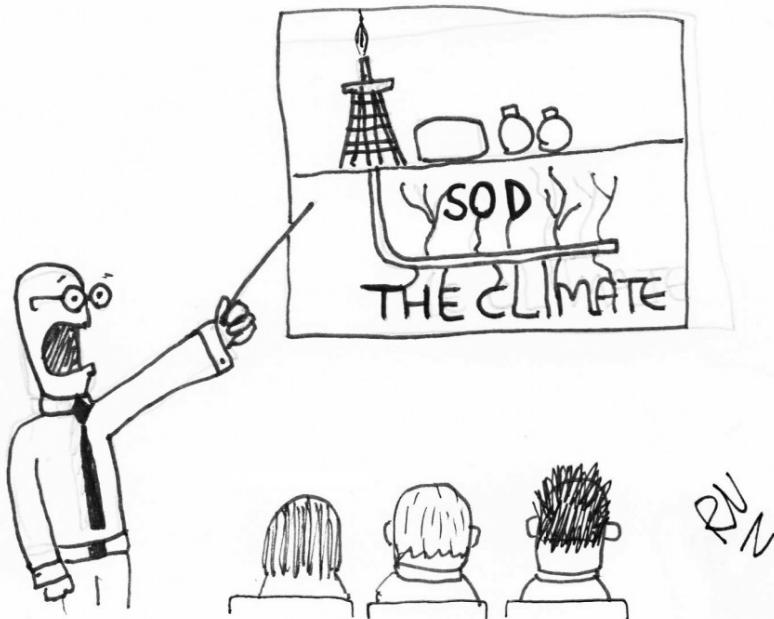


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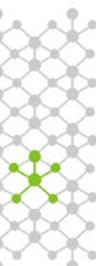


GOVERNMENT BACKS FRACKING

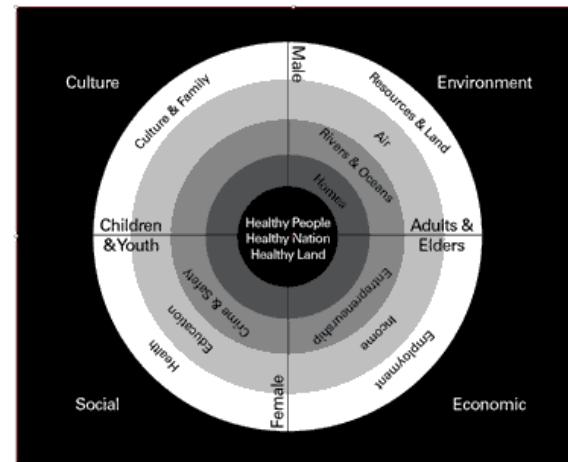
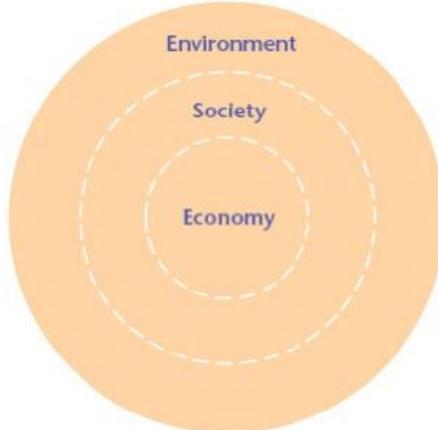
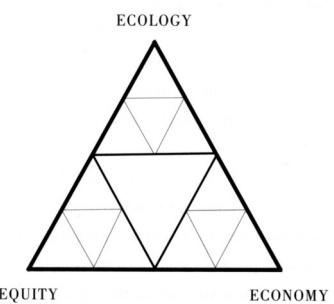


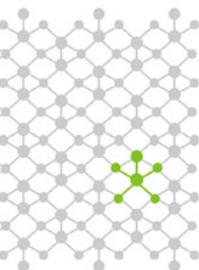
"WE MUST PUT AN END TO OUR FOSSIL FUEL DEPENDENCY...AS SOON AS WE HAVE EXPLOITED OUR ENTIRE SUPPLY"





Innovation in sustainability becomes decentralized





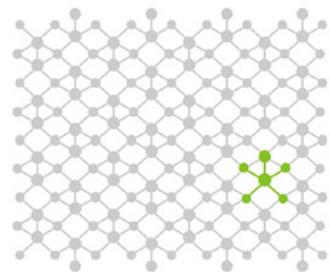
sustainability: an emerging megatrend



Megatrend:
“A fundamental shift in the competitive landscape that creates inescapable threats and game changing opportunities ... profoundly affects companies’ competitiveness and even their survival”

Harvard Business Review, May, 2010

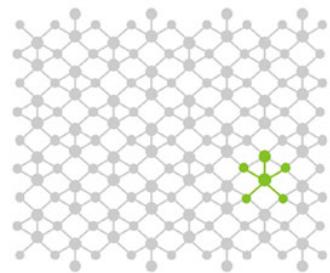
- **Globalized workforces and supply chains** have created environmental pressures and liabilities
- **Intensified competition for natural resources**
- **‘Externalities’** such as CO2 and water are soon **becoming material** to investors
- **Consumers** seek sustainable products and services
- **Governments are interceding** with unprecedented levels of regulation
- **Explosion of innovation** in energy efficiency, renewable power, resource productivity, pollution control etc.



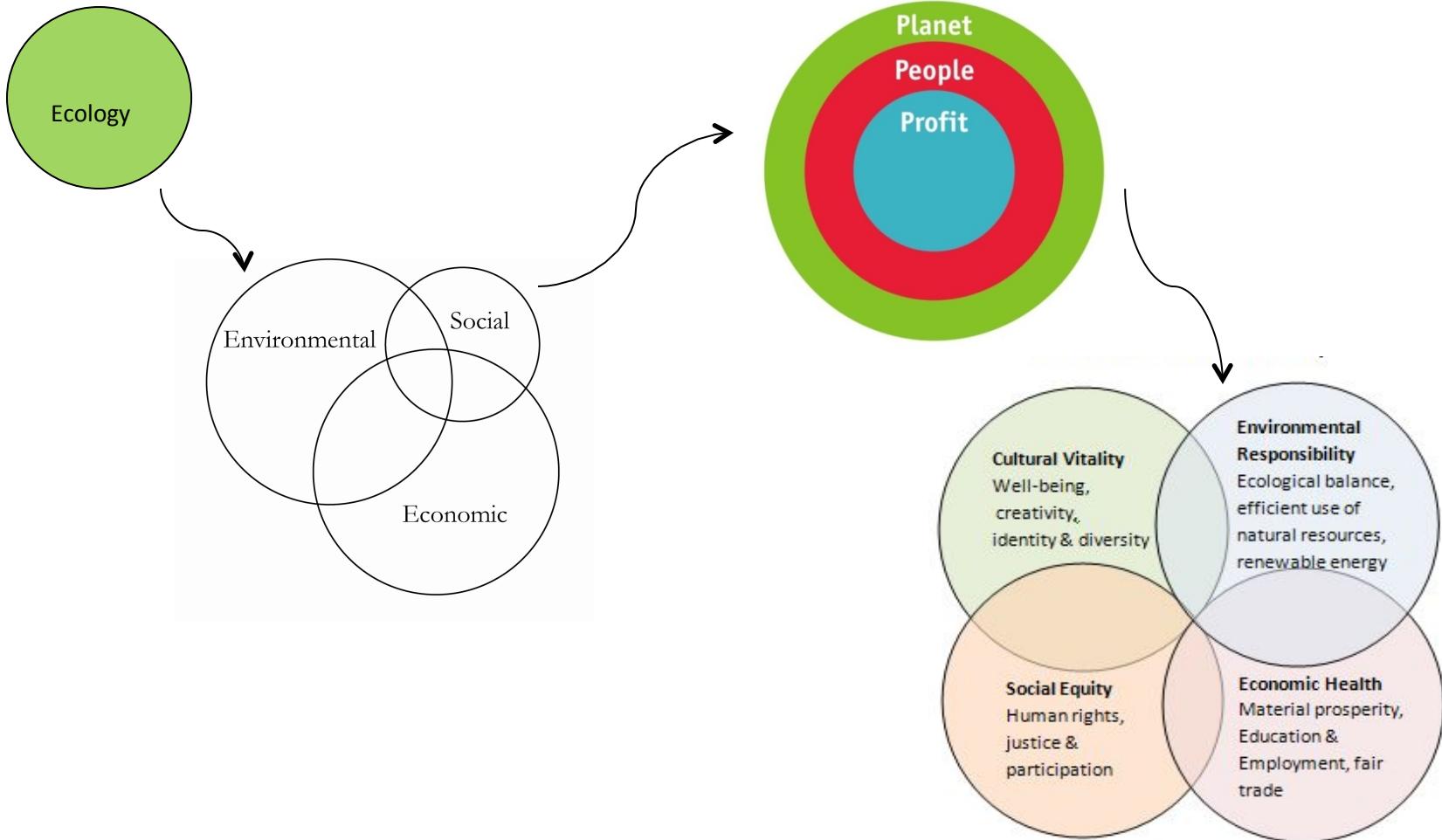
who is onboard?

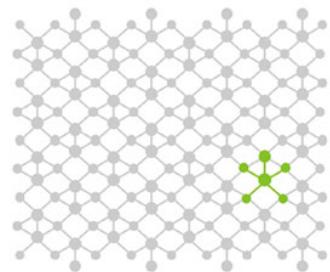
- **EVERYONE!** because Climate Change and the Energy Crisis are permanent
- **Consumers** because it's personal
- **Companies** from SMEs to large corporates because it is affecting the way they do business
- **Mainstream investors, banks and economists** are factoring sustainability related issues into rates and strategic and financial decisions
- **Politicians** are reacting
- **Governments** are cracking down regulatory frameworks like never before
- **Mainstream media** are covering and promoting sustainability



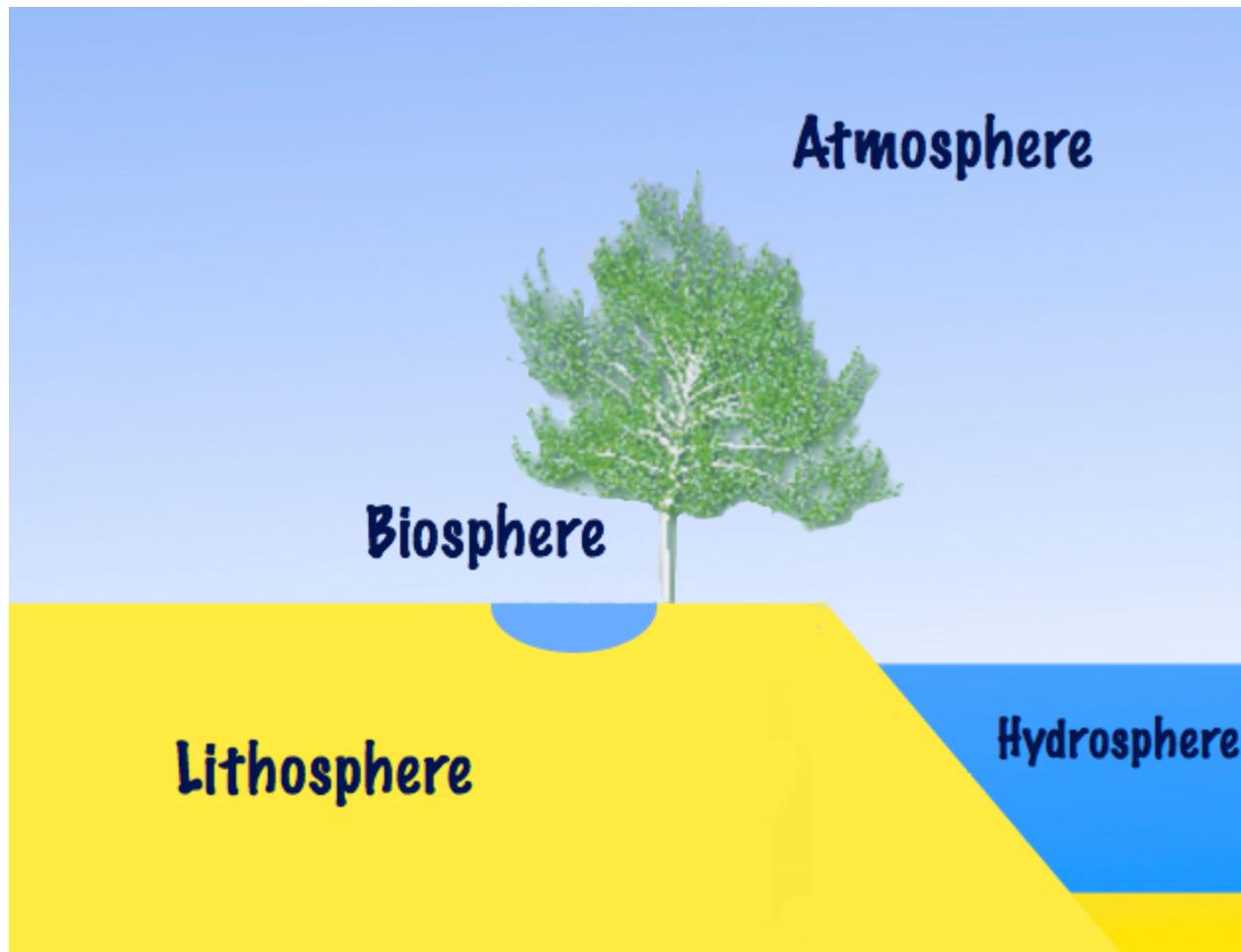


expanding scope of 'sustainability'





Why renewable materials

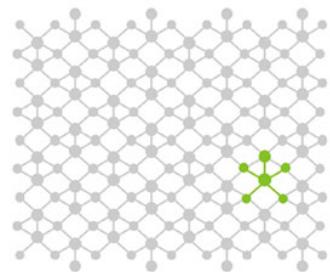




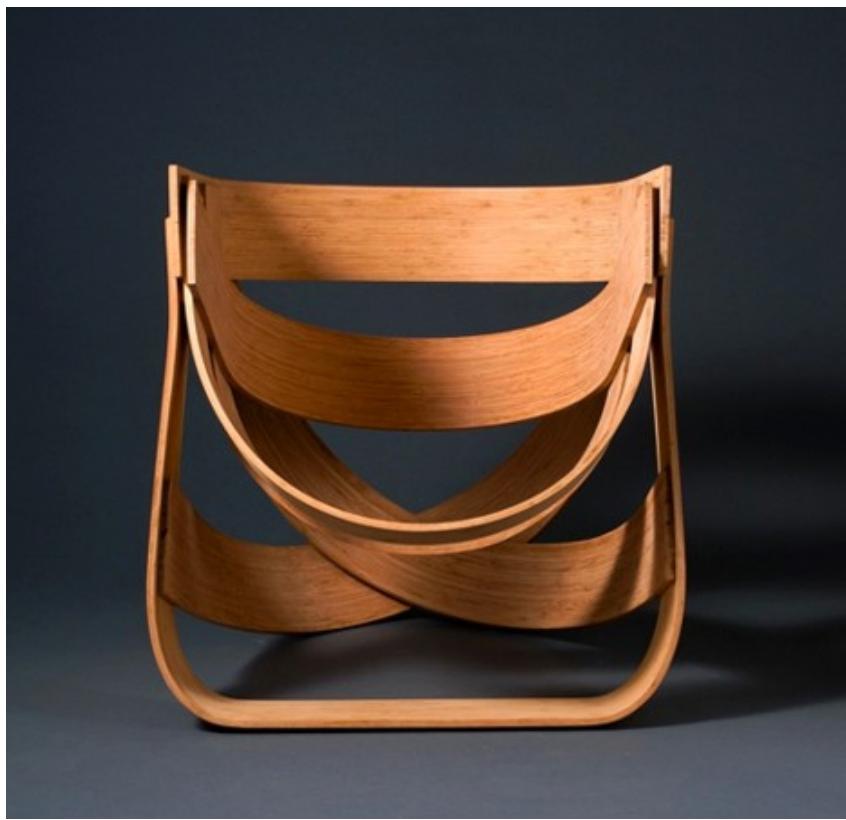
bamboo: the poster child for renewable materials

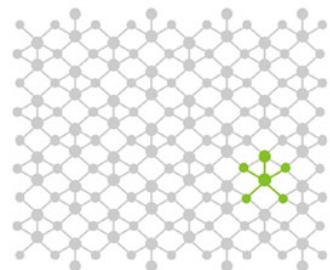
- **Highly renewable**
 - fastest growing species on the planet, and regenerates without replanting if harvested and managed properly.
- **Does not cause deforestation**
 - viable timber replacement material
- **Mitigates water pollution**
 - Its high nitrogen consumption makes it a good solution for wastewater treatment
- **Prevents soil erosion**
 - Due to its underground rhizome network
- **Restores degraded lands**
 - Bamboo forests produce 30% more oxygen and greater biomass than hardwood forests of the same size





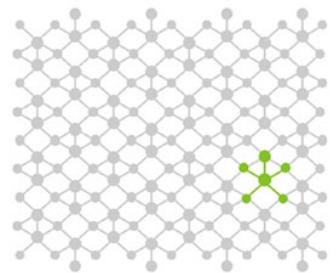
contemporary applications of bamboo





laminated bamboo products

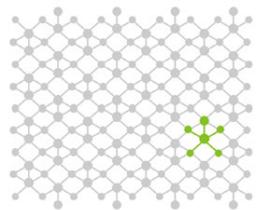




potential to provide livelihoods for the economically poor communities

- Easy to process
 - Linear fibers
 - Does not require capital intensive infrastructure to process
- Available
 - Easily available in the natural environment
- Inclusive
 - Light, so can be processed by women
 - Part of cultural tradition of marginalized groups who have skills that can be built upon



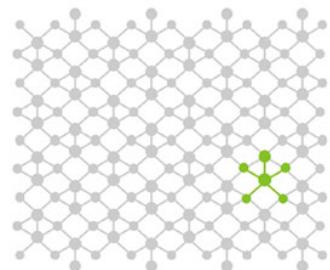


The gap between sustainability markets and producers



?





what direction should design for sustainability with bamboo take?



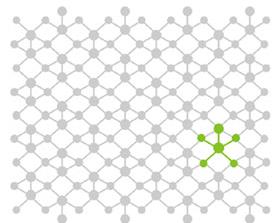
Industrial

Transplant the inherent unsustainabilities of
industrialization?



Craft

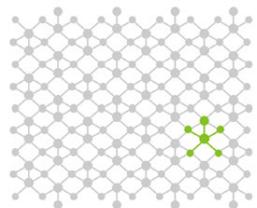
Transplant the inherent sustainability from craft PCS



‘Craftspeople’

- Extends to traditional artisans and craftspeople, in regions with a strong preindustrial production to consumption traditions
- Have been and still are employed in craft for their communities, trade, export
 - Skilled master craftsman
 - Wage worker
 - Local tradesperson
 - Part time agricultural worker
 - Landless artisan





Value Chain



Traditional value chain

Growing – harvesting – transporting- innovating - processing- marketing

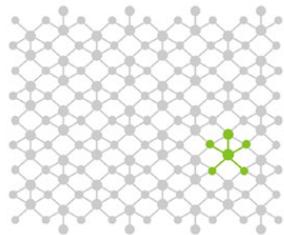


Technology intensive/industrial value chain

Growing – harvesting – transporting- innovating ~~- processing - marketing~~

Craft leverages abundant material + productive labor force

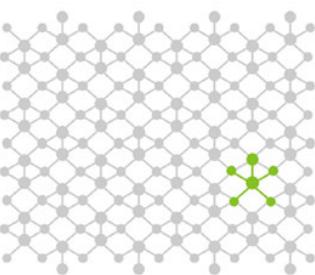
Need for strategy to leverage craft holistically
as a vehicle for holistic sustainability through creative and cultural economy



Why innovation for developing countries?

We are a production hub now
but for **how long without**
innovation?

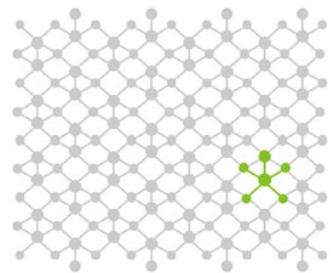
Raw materials.....manufacturing.....innovation



Why sustainability design for developing countries

We have

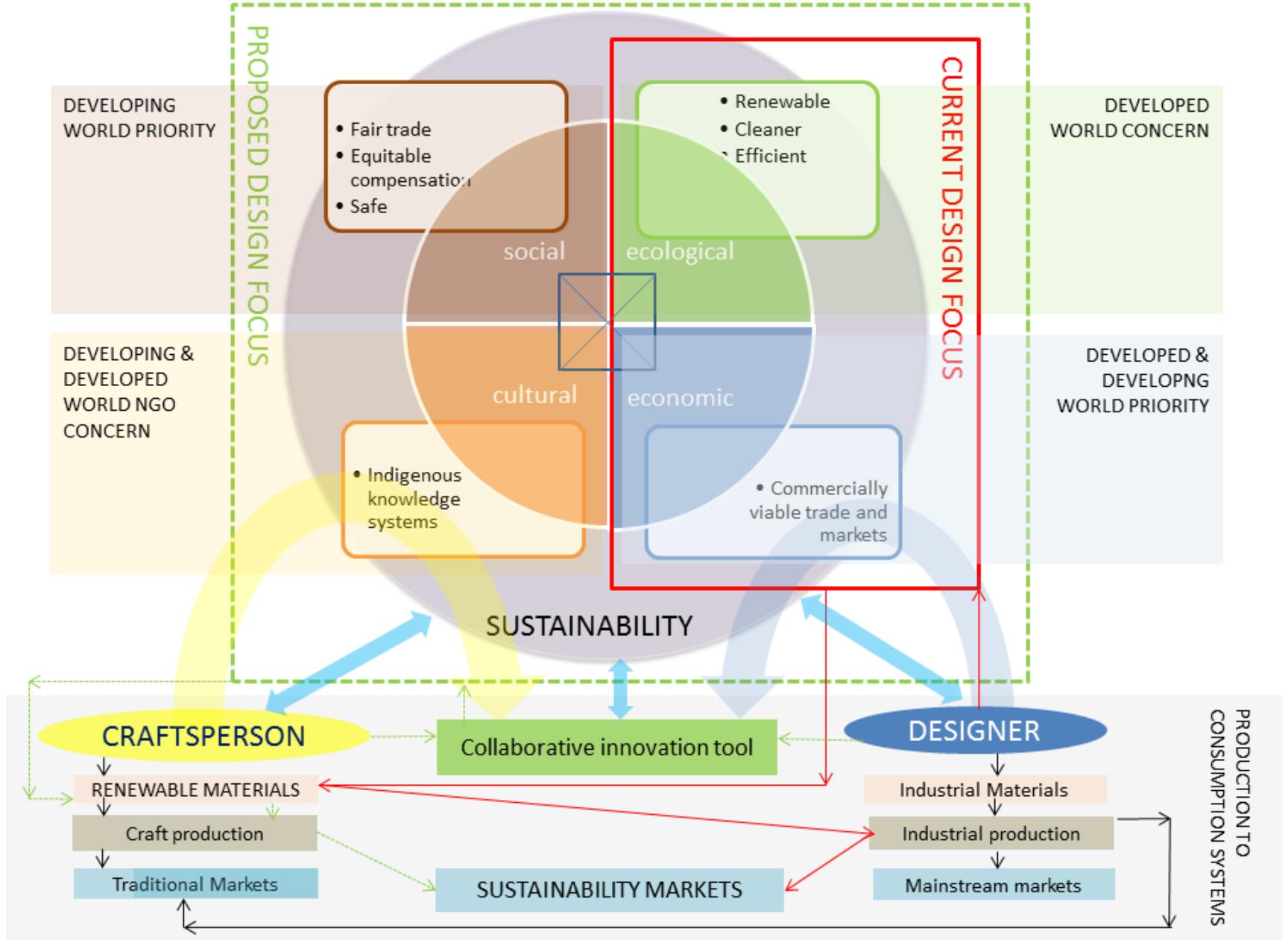
- renewable materials
- labor
- markets
- **innovation**

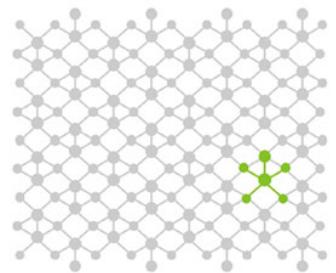


Difficult for designers to navigate

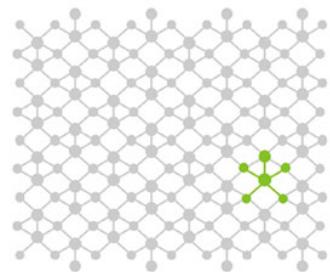
Sustainability is not within traditional design domain

Craft is not within traditional design domain





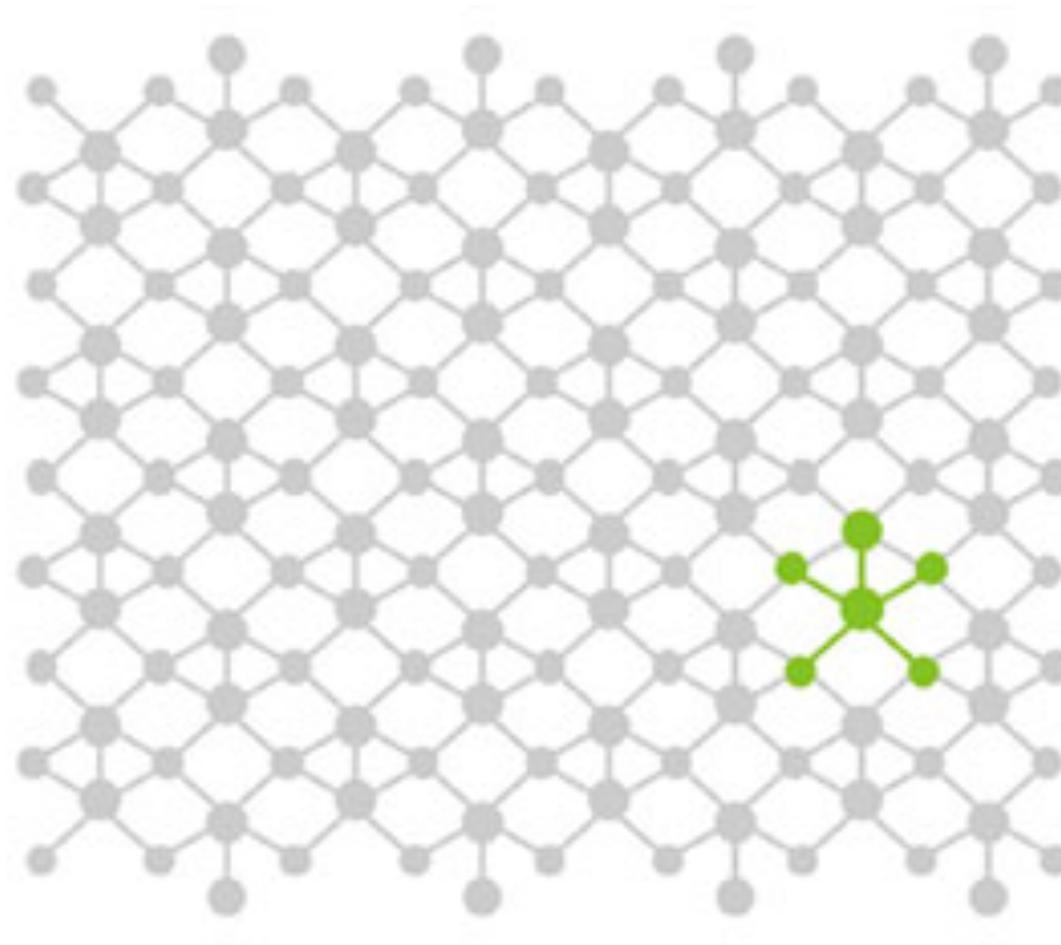
How sustainable are current design efforts towards sustainability?

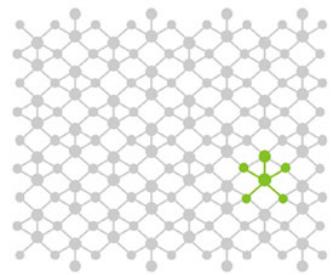


Not very.....

1. Lack of knowledge about sustainability
2. Lack of holistic oversight on PCS
3. Failure to incorporate sustainability at a strategic level
4. Failure to include sustainability criteria in the design brief
5. Lack of a collaborative design process
6. Lack of tools
7. Failure to keep designers in loop till the end

The Rhizome Approach

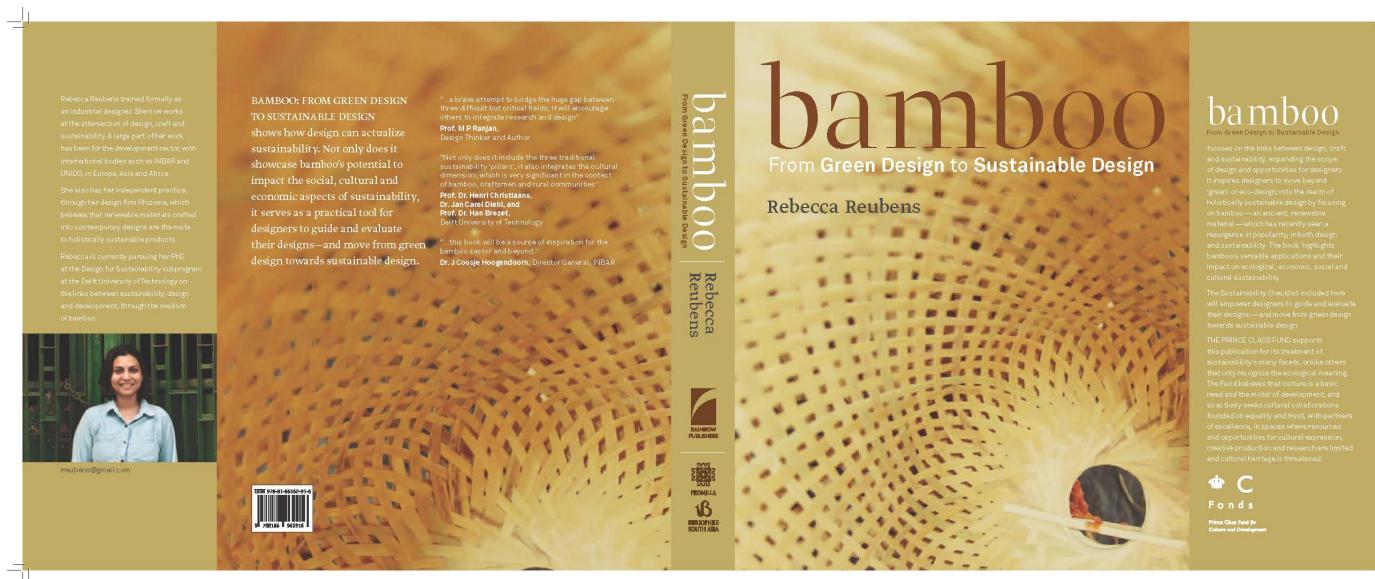


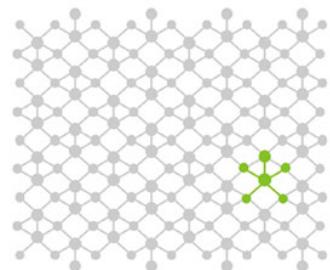


STEP 1

Lack of knowledge about sustainability

- Provide designers with information on sustainability
- Reading material
- presentations



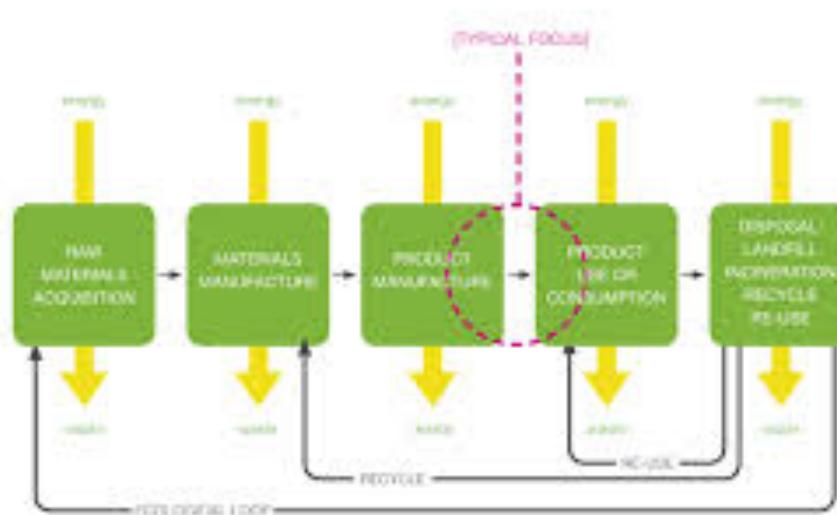


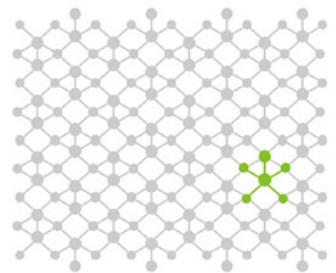
STEP 2

Lack of holistic oversight on PCS

- Experiential learning
- Vantage view-point
- Not just specialized 'design' responsibility

PRODUCT LIFE CYCLE



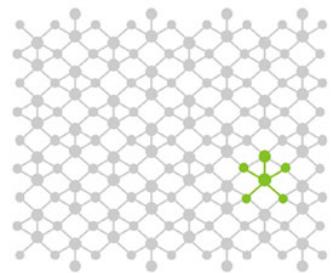


STEP 3

Failure to incorporate sustainability at a strategic level

- Including sustainability into the organizational blue print
- Counteracting myths such as 'sustainability is more expensive'
- The rationale to go beyond compliance





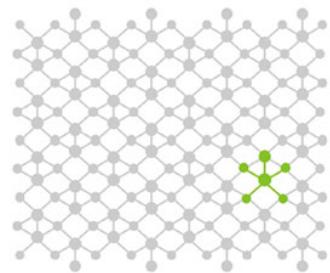
STEP 4

Failure to include sustainability criteria in the design brief

- Sustainability is seen as an expensive add-on
- Not required by legislation
- How do you include it?
- What do you include?

HOLISTIC SUSTAINABILITY CHECKLIST

MATERIAL CONSIDERATIONS	Ecological	Social	Cultural	Economic
1 Renewable materials	•			
2 Minimally treated materials	•			•
3 Recyclable materials	•			•
4 Recycled materials	•			
5 Local materials	•	•	•	•
6 Fairly traded materials		•		
7 Ecologically certified materials	•			
8 Non-toxic materials	•	•		
9 Less/no materials from intensive agriculture	•			
► PRODUCTION CONSIDERATIONS				
10 Minimum materials	•			•
11 Minimum production steps	•			•
12 Renewable energy for production	•			
13 Minimal energy for production	•			•
14 Low-emission-techniques	•	•		
15 Proper management of production effluents and waste	•	•		
16 Reduce/reuse production waste	•			•
17 Indigenous treatments and processes	•	•	•	•
18 Consulting indigenous communities on production issues that affect them		•	•	
19 Safe and healthy work environment		•		•
20 Fair wages and benefits to producers		•		•
21 No child labour		•		
22 No forced labour		•		
23 Fair working hours		•		
24 Freedom of association and collective bargaining		•		
25 No discrimination		•		
26 Local employment opportunities		•	•	•
► DISTRIBUTION CONSIDERATIONS				
27 Minimum product volume and weight	•			•
28 Minimum and clean transport	•			•
29 Local PCS	•	•		•
30 Minimum packaging	•			•
31 Reusable packaging	•			
32 Recyclable packaging	•			•
33 Packaging made from low-impact materials	•			
► CONSUMER USE CONSIDERATIONS				
34 Minimum/clean energy during usage	•		•	•
35 Minimum consumables	•			•
36 Safe to use		•		
37 Customizable	•		•	•
38 Easily upgradable	•			•
39 Classic design	•		•	
40 Minimum and local maintenance and repair	•	•	•	•
► END-OF-LIFE HANDLING CONSIDERATIONS				
41 Reduced material complexity	•			
42 Biodegradable	•			
43 Easy to disassemble	•			•
44 Reusable	•		•	
45 Recyclable	•			•
46 Promotes/uses local recycling systems	•	•	•	•

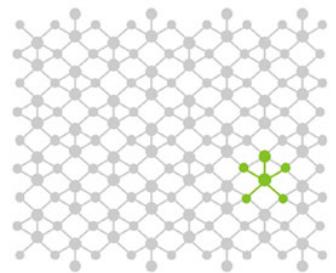


STEP 5

Lack of a collaborative design process

- Throwing over the wall
- Who is responsible for the final design?





STEP 6

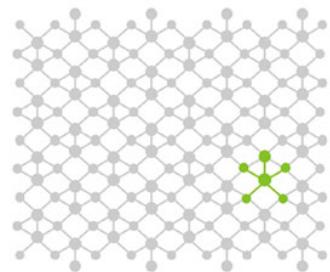
Lack of tools

- How do you design sustainably?
- How do you know to which extent you have succeeded?

Ecodesign-D4S-C2C-Natural Capitalism-LCA-SLCA-Meta Design- Design Activism

HOLISTIC SUSTAINABILITY CHECKLIST

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28 Minimum and clean transport	•			
29 Local PCS		•		
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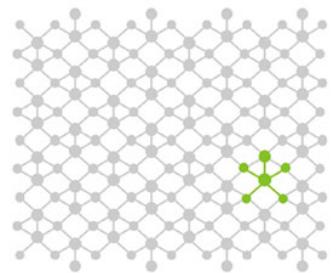


STEP 7

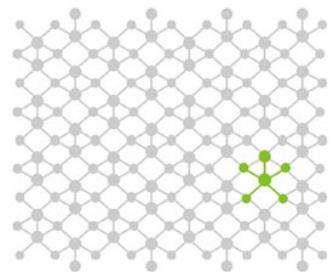
Failure to keep design team in loop to the end

- Keep designers in loop till product actualization
- Designers to coordinate upstream and downstream implications





Actualizing the Rhizome Approach



Space Making Craft Workshop, Ahmedabad

14 days

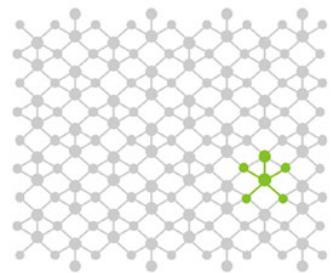
3 design institutions

2 NGOs

24 designers

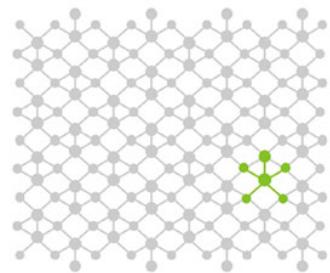
24 craftspeople

4 facilitators



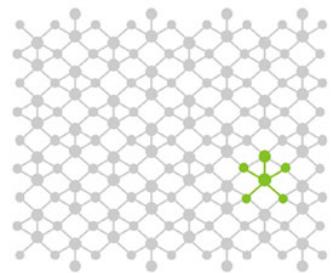
sharing the learning: with educators





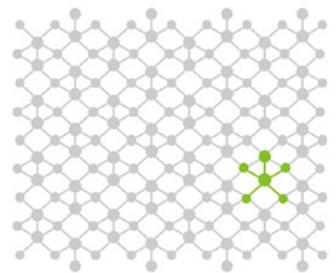
sharing the learning: with collaborative innovators





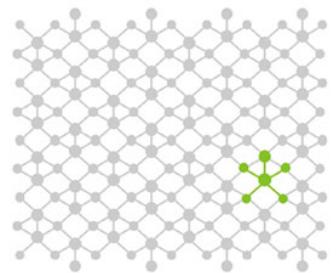
sharing the learning: with design-craft teams





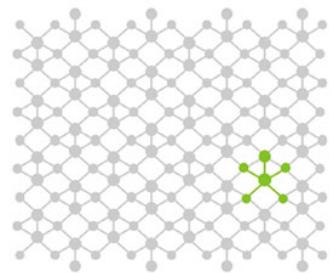
sharing the learning: with technical institutions





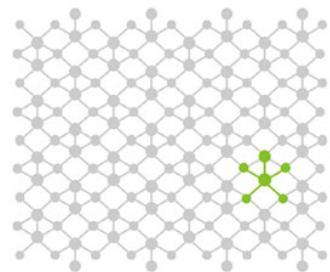
sharing the learning: with SMEs





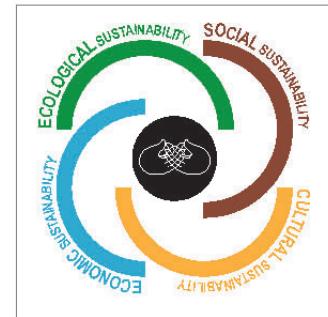
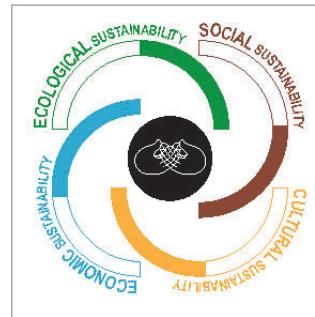
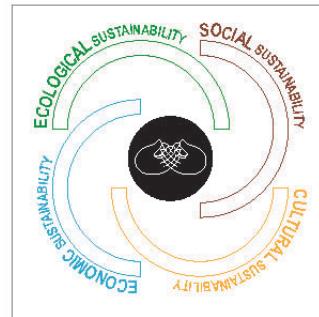
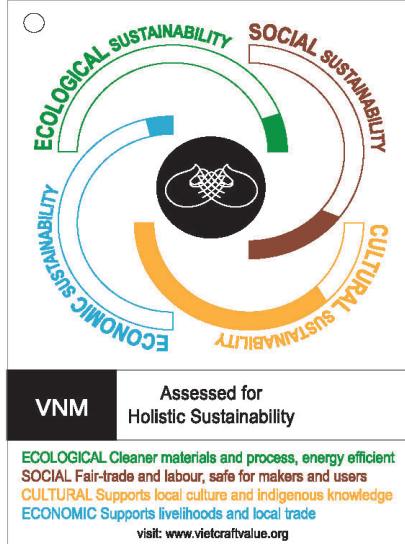
sharing the learning: with entire PCSs

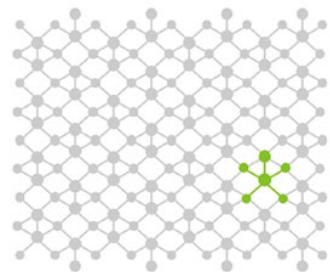




Govt of Vietnam + UNIDO

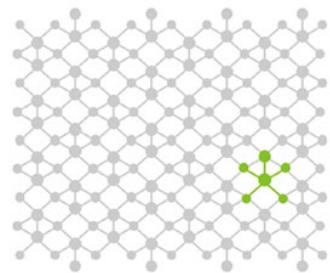
assessing and
branding
sustainability
in bamboo
sector





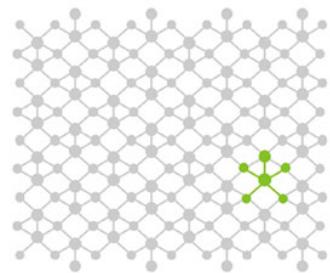
3 steps of labeling scheme

- 1. Standard setting**, or identifying criteria to be met
- 2. Certification**, or assessing to which level that standard is being met
- 3. Labelling**, or communicating the results of the assessment, including the assessment criteria with or on the product



HOLISTIC SUSTAINABILITY CHECKLIST

MATERIAL CONSIDERATIONS	Ecological	Social	Cultural	Economic					
	1 Renewable materials	2 Minimally treated materials	3 Recyclable materials	4 Recycled materials	5 Local materials	6 Fairly traded materials	7 Ecologically certified materials	8 Non-toxic materials	9 Less/no materials from intensive agriculture
10 Minimum materials	•								•
11 Minimum production steps	•								•
12 Renewable energy for production	•								
13 Minimal energy for production	•								•
14 Low-emission-techniques	•		•						
15 Proper management of production effluents and waste	•	•							
16 Reduce/reuse production waste	•								•
17 Indigenous treatments and processes	•	•	•	•					•
18 Consulting indigenous communities on production issues that affect them		•	•						
19 Safe and healthy work environment		•							•
20 Fair wages and benefits to producers		•							•
21 No child labour		•							•
22 No forced labour		•							
23 Fair working hours		•							
24 Freedom of association and collective bargaining		•							
25 No discrimination		•	•						
26 Local employment opportunities		•	•	•					•
DISTRIBUTION CONSIDERATIONS	Ecological	Social	Cultural	Economic					
	27 Minimum product volume and weight	•			•				
28 Minimum and clean transport	•								•
29 Local PCS	•	•							•
30 Minimum packaging	•								•
31 Reusable packaging	•								
32 Recyclable packaging	•								•
33 Packaging made from low-impact materials	•								
CONSUMER USE CONSIDERATIONS	Ecological	Social	Cultural	Economic					
	34 Minimum/clean energy during usage	•		•	•				
35 Minimum consumables	•								•
36 Safe to use		•							
37 Customizable	•			•					•
38 Easily upgradable	•			•					
39 Classic design	•			•					
40 Minimum and local maintenance and repair	•	•	•	•					•
END-OF-LIFE HANDLING CONSIDERATIONS	Ecological	Social	Cultural	Economic					
	41 Reduced material complexity	•							
42 Biodegradable	•								
43 Easy to disassemble	•								
44 Reusable	•			•					
45 Recyclable	•								•
46 Promotes/uses local recycling systems	•	•	•	•					•



Standard setting

MATERIAL CONSIDERATIONS

Traditional material-selection parameters include function, appearance, reliability, service life, environment, compatibility, production viability, and cost.⁷ The Sustainability Checklist proposes the following supplementary parameters towards sustainability.

1» RENEWABLE MATERIALS

ECOLOGICAL SOCIAL CULTURAL ECONOMIC

Given that Earth has finite natural resources, renewable materials are growing increasingly important to ecological sustainability. While a lot of organic materials regenerate, the time frames required for their renewability differs.⁸ Materials from the biosphere (that grow on the earth) such as bamboo or sea-grass are renewed more quickly than those from the lithosphere (under the surface of the earth) such as coal. Among these, some biosphere materials, such as bamboo, renew faster than other biosphere materials, such as wood. Materials that are more renewable should be used, and exhaustible materials should be substituted as far as possible.⁹

2» MINIMALLY TREATED MATERIALS

ECOLOGICAL SOCIAL CULTURAL ECONOMIC

Minimizing the treatments required to prepare raw materials reduces emissions and energy consumption, thereby impacting ecological sustainability. Minimizing treatments also positively impacts economic sustainability, as reducing the processes reduces the overall cost.

3» RECYCLABLE MATERIALS

ECOLOGICAL SOCIAL CULTURAL ECONOMIC

Recyclable materials positively impact ecological sustainability by reducing the burden of disposal, and inputting existing material into a fresh life cycle. Recyclable materials are valued economically as inputs into another material life cycle even after their original use and so also positively impact economic sustainability. To facilitate easy recyclability, the product should comprise of a single material as far as possible.¹⁰ If this is not possible, materials with a similar end-of-life paths, such as biodegradable materials, should be used. Materials that are difficult to separate, including compound materials, laminates, fillers, fire retardants and fibre-glass reinforcements should be avoided.¹¹ Add-on elements like stickers, which complicate the recycling process, should also be avoided.¹²

4» RECYCLED MATERIALS

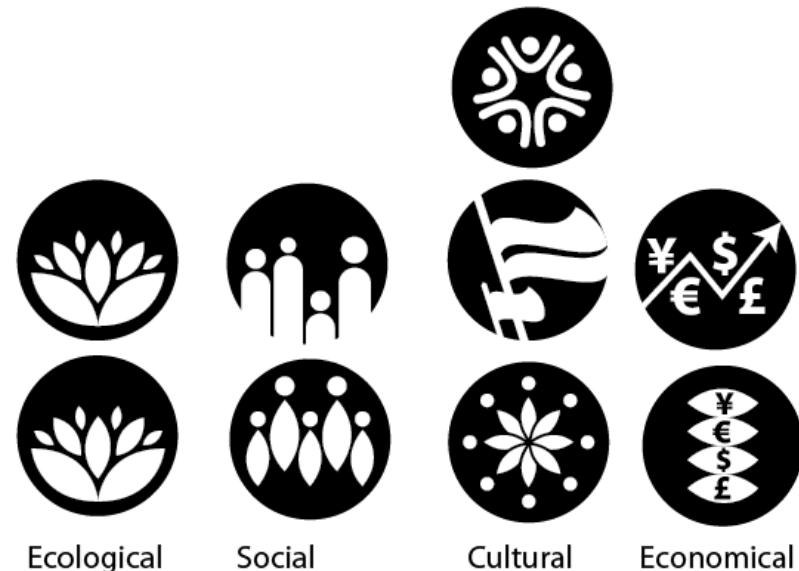
ECOLOGICAL SOCIAL CULTURAL ECONOMIC

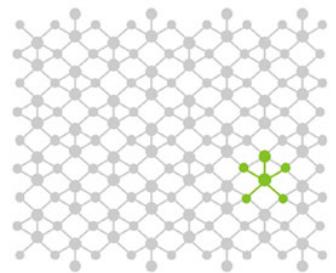
The use of recycled input materials positively impacts ecological sustainability since they reduce the need to harvest fresh materials for production. Wherever possible, virgin materials should be replaced by recycled materials, especially in functions that do not require high mechanical, hygienic or tolerance.¹³

5» LOCAL MATERIALS

ECOLOGICAL SOCIAL CULTURAL ECONOMIC

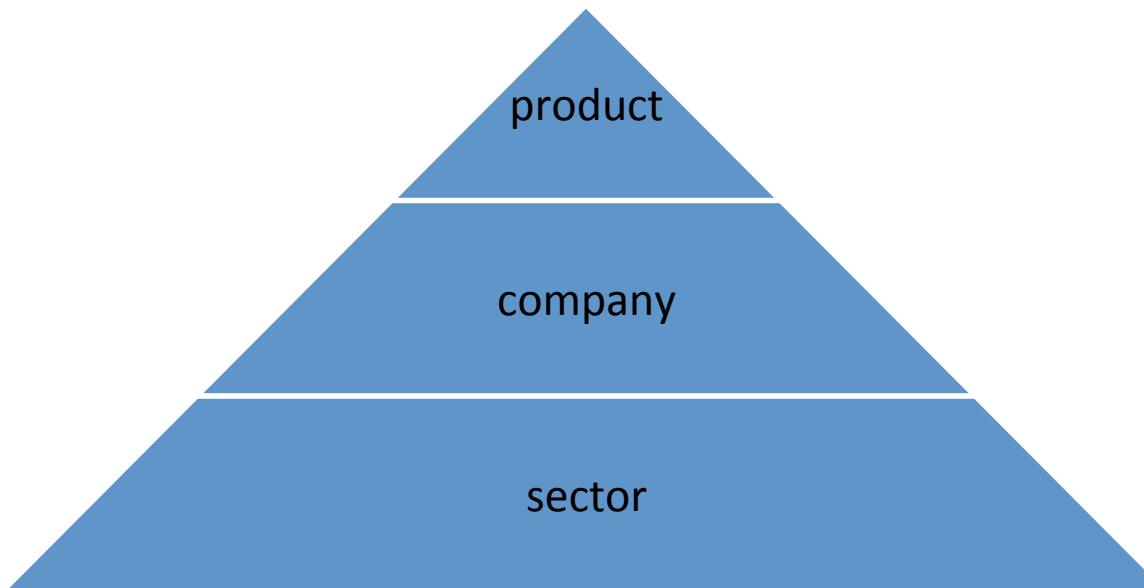
Using local input materials positively impacts the social, economic, cultural and ecological tenets of sustainability. Supplying local materials gives indigenous and local communities a source of livelihood (economic sustainability), and therefore the opportunity to sustain their social and cultural practices. Since environmental degradation caused by unsustainable practices such as over-extraction directly affects local communities, they tend to be more conscientious and, therefore, ecologically sustainable.

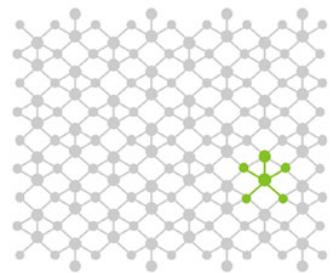




assessment

What will be assessed?

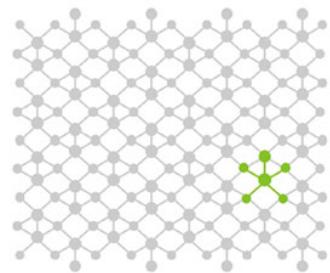




assessment

Who will assess?

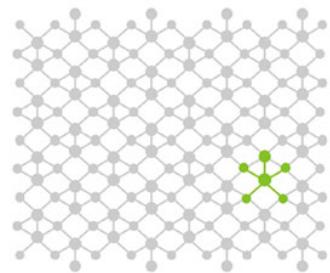
- 3 evaluators
- Preferably institutions
- Cross section – institutional subordinates, peers, superiors: 360 degrees



assessment

How to assess?

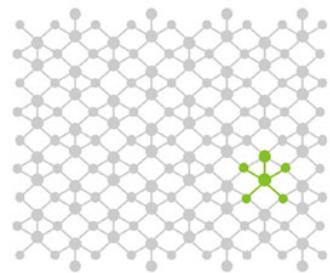
- 3 evaluators will grade 1,2 or 3 against each parameter of the holistic sustainability checklist
- Final score per parameter is the average of the 3 scores
- Score reflected in the parameter it affects
- 4 mini lists – ecological, social, cultural, economic
- Weightage is possible for each criteria



assessment

Why scoring?

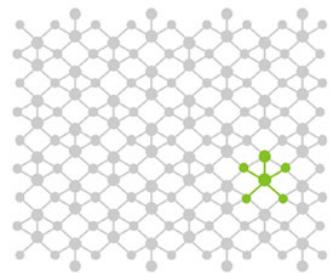
- Because even low scorers are reflected and not removed from the initiative
- Reflect trade offs between economic, social, ecological and cultural factors
- Low scores motivate to score better



assessment

Benchmarks and stringency

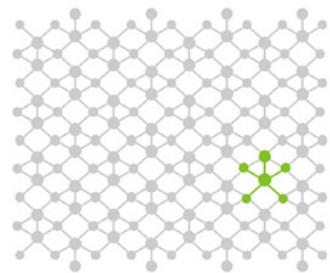
- Against directive from implementation agency of possible benchmarks
- As stringent as possible
- Stringency levels to be tightened and reviewed annually or at regular intervals



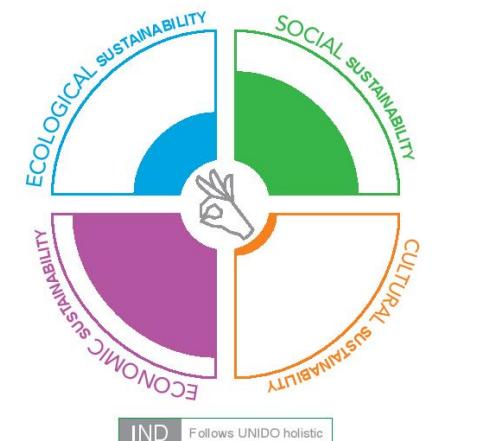
assessment

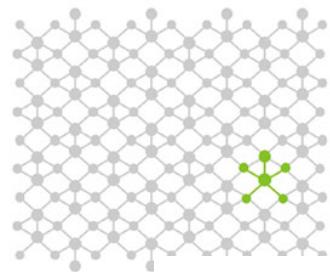
Minimum compliance criteria

- Non-negotiable criteria
- Decided by implementation agency based on statutory regulations and international norm
- 'kick-out' criteria



Communication





Communication



ECOLOGICAL Cleaner materials and process, energy efficient
SOCIAL Fair-trade and labour, safe for makers and users
CULTURAL Supports local culture and indigenous knowledge
ECONOMIC Supports livelihoods and local trade



ECOLOGICAL Cleaner materials and process, energy efficient
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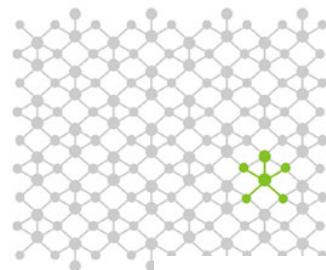
ECOLOGICAL Cleaner materials and process, energy efficient
SOCIAL Fair-trade and labour, safe for makers and users
CULTURAL Supports local culture and indigenous knowledge
ECONOMIC Supports livelihoods and local trade

Colour Variations:

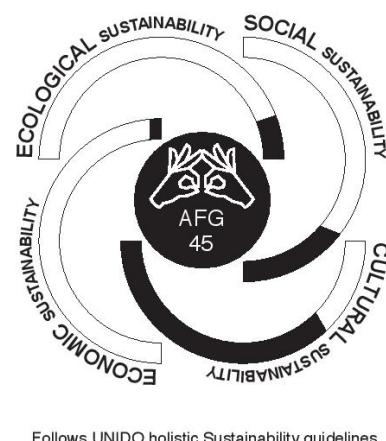
Left: Different tones of the SAME colour. But because of gradation in colour it may convey different message of heirarchy.

Center: Single colour. Shows all sectors are on same level. Sustainability green; obvoius choice.

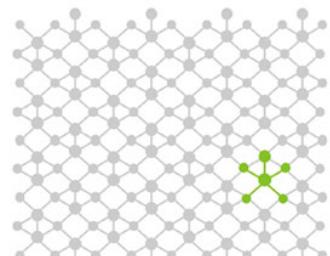
Right: Different sectors are colour coded, indicates individuality. Colours are in same tonal values.



Communication



Different ways to show overall grade. Universally accepted measures like Tick Marks, Thumbs Up, Stars and another option of showing actual score. (Generated by computer)



Communication



Follows UNIDO holistic Sustainability guidelines

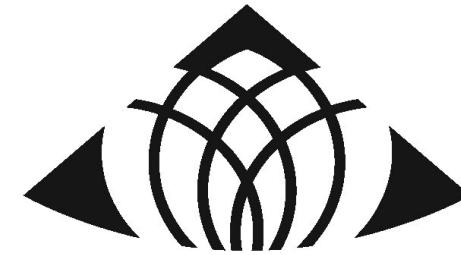
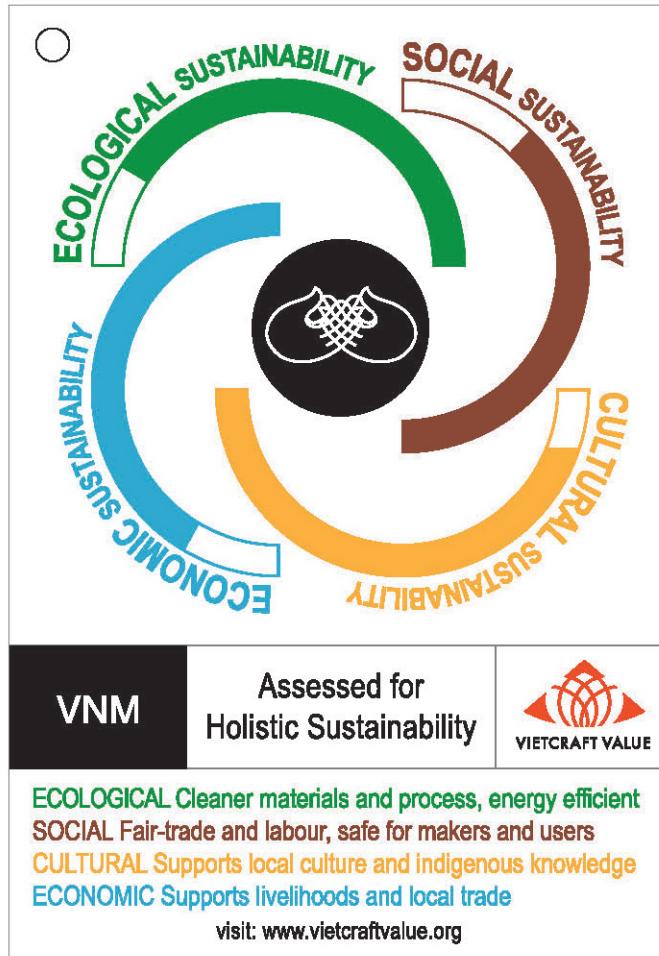
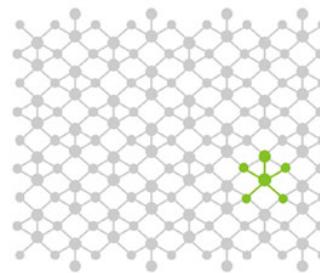


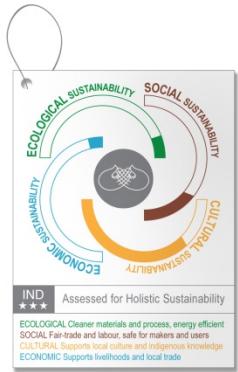
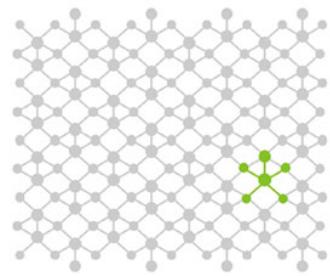
Follows UNIDO holistic **SUSTAINABILITY** guidelines



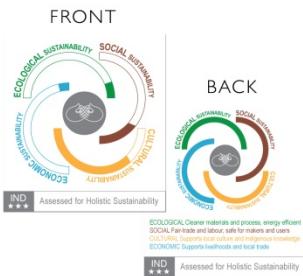
Follows UNIDO holistic Sustainability guidelines

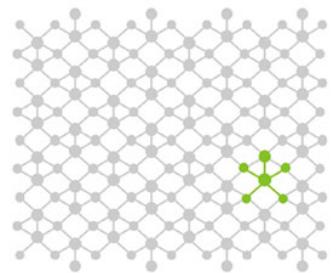
Different ways to incorporate word 'Sustainability'



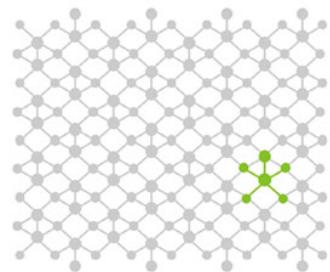


Application





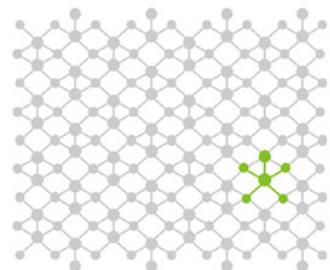
The Rhizome Approach in practice through Rhizome's practice



Gandhi Ashram Store



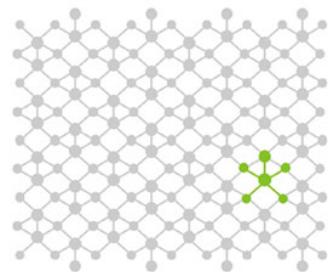
Gandhi Ashram
Store
Ahmedabad



Phu Do



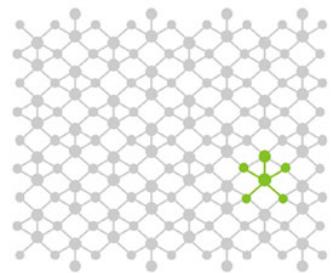
Rebecca Reubens rreubens@gmail.com www.rhizomedesign.co.in



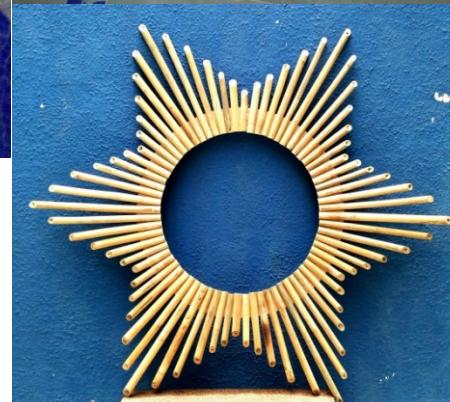
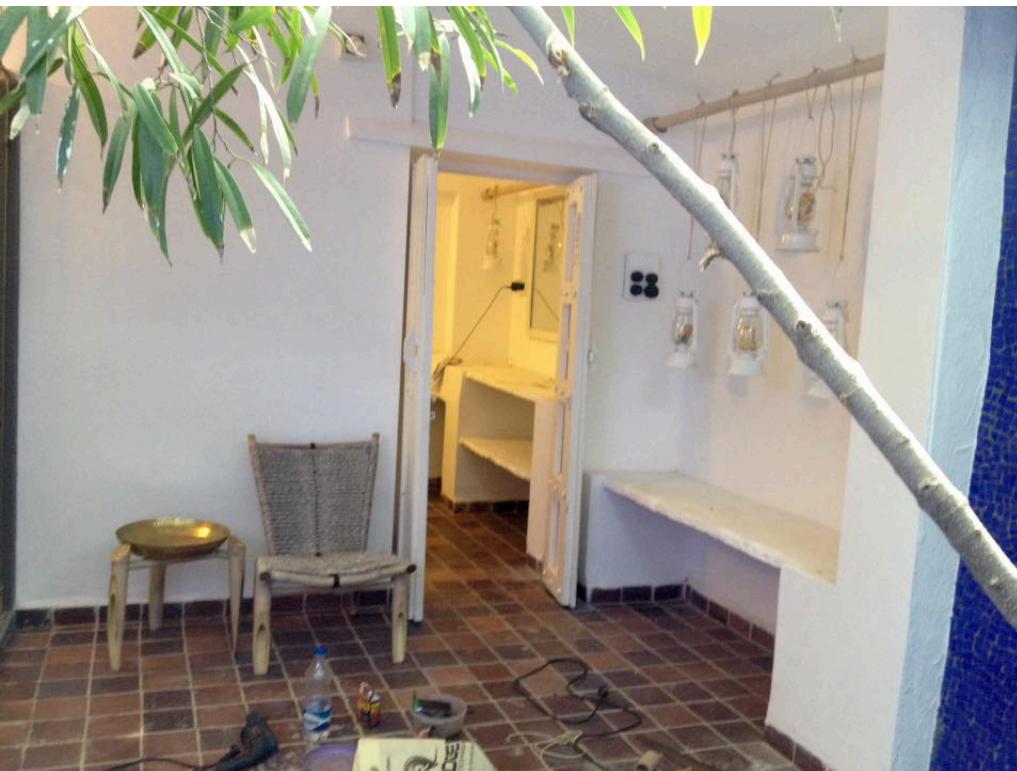
Tripura Bamboo Mission

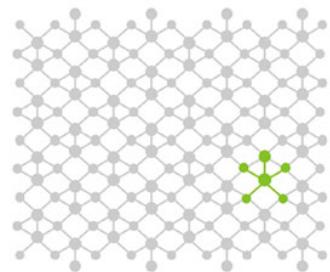


Design of spa products for TBM – flooded with market enquiries



Rann Riders



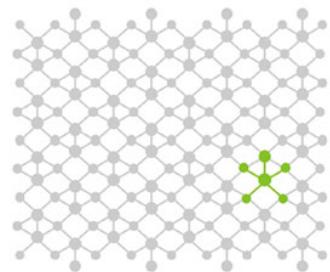


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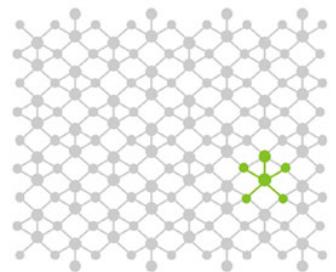


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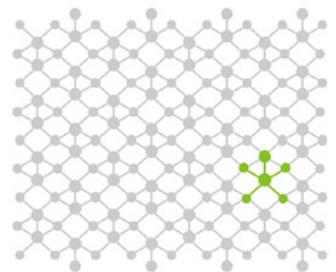


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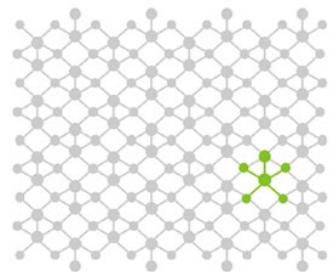


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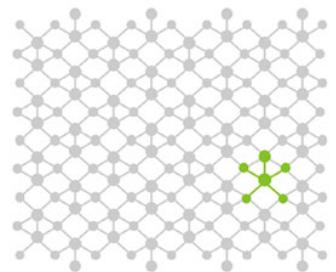


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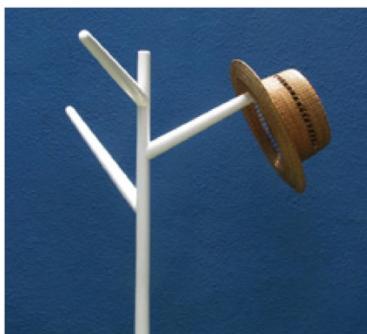
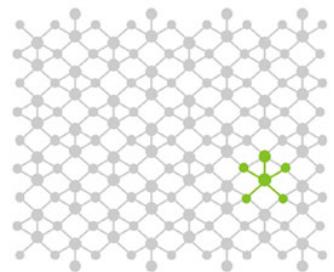


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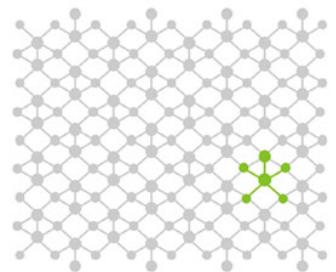


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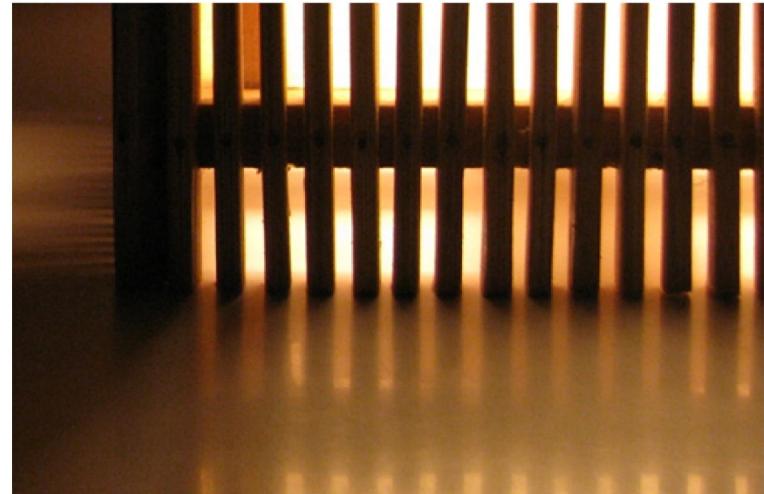
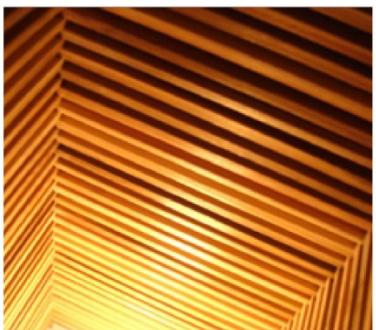
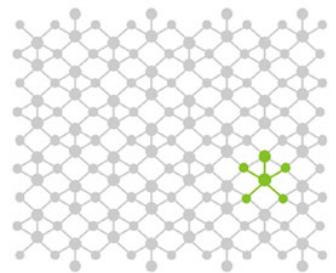


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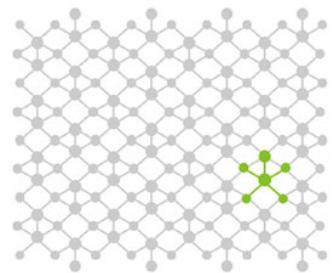


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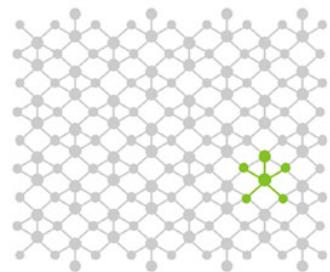
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The logo consists of a green rhizome node icon with three lines extending from it, followed by the word "rhizome" in a lowercase, sans-serif font.

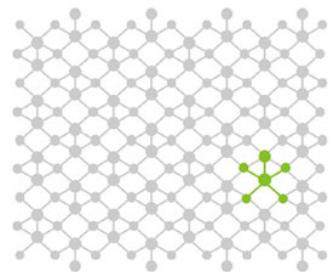


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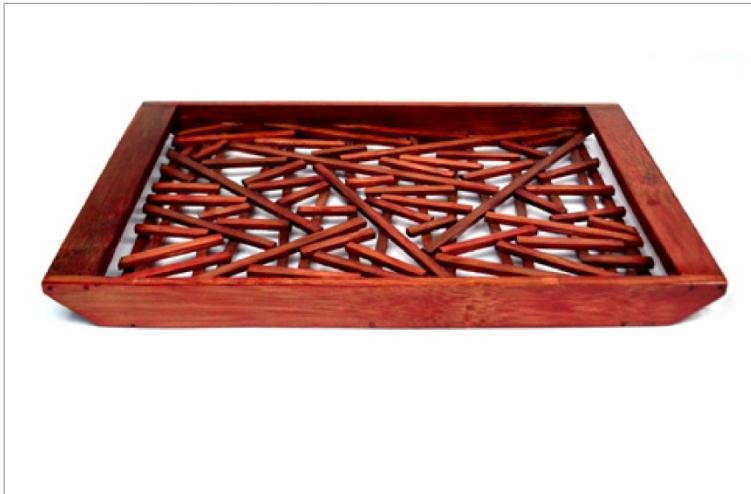
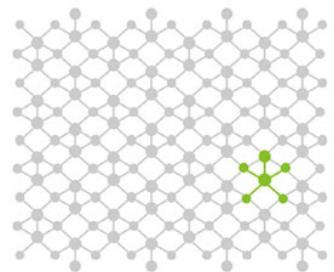


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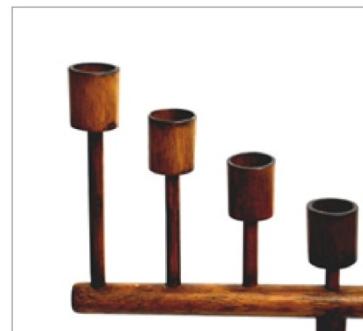
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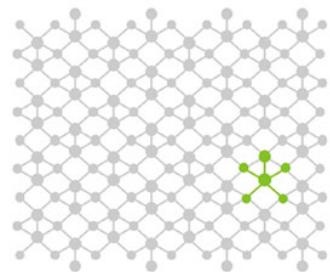
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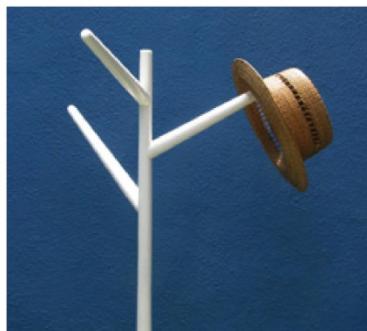
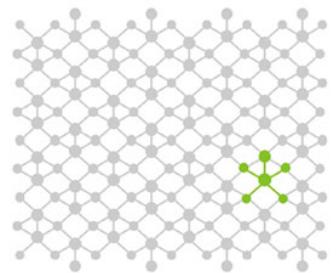
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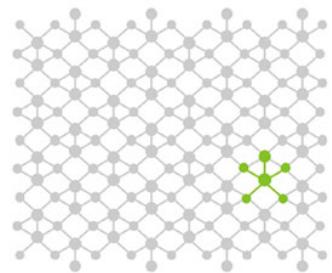


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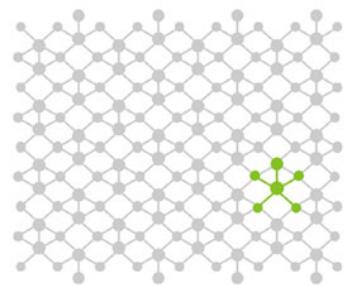


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thank you!



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