SVAGRIHA

SMALL

VERSATILE

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Association for Development and Research of Sustainable Habitats
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Need

Source: http://www.skittsal.com/bilder/home03_hotel_big.jpg

GRIHA

- Green Rating for Integrated Habitat Assessment (GRIHA) created by TERI in 2005 and endorsed by Ministry of New and Renewable Energy in 2007
- Green building rating based on 34 criteria
- Extremely detailed rating system
- Involves a lot of due diligence to ensure implementation on site

what about small scale construction?

Source: http://realty.konni.in/konnihouse2.jpg

Source: http://www.skittsal.com/bilder/home03_hotel_big.jpg

And the cumulative impacts….

Source: http://v23.lscache1.c.bigcache.googleapis.com/static.panoramio.com/photos/original/16384620.jpg

SVAGRIHA

Simple

Versatile

Affordable

- Dedicated design-cum-rating tool designed for buildings with built-up area less than 2500 sqm.

- 14 criteria covering categories: landscape, energy, water & waste, materials and lifestyle

Criterion number	Criterion name	Points
1	Reduce exposed, hard paved surface on site and maintain native vegetation cover on site	6
2	Passive architectural design and systems	4
3	Good fenestration design for reducing direct heat gain and glare while maximising daylight penetration	6
4	Efficient artificial lighting system	2
5	Thermal efficiency of building envelope	2
6	Use of energy efficient appliances	3
7	Use of renewable energy on site	4
8	Reduction in building and landscape water demand	5
9	Rainwater harvesting	4
10	Generate resource from waste	2
11	Reduce embodied energy of building	4
12	Use of low-energy materials in interiors	4
13	Adoption of green Lifestyle	4
14	Innovation	2
Total		50

Sub-Group	Maximum points	Minimum points to be achieved
Landscape	6	3
Energy	21	11
Water & waste	11	6
Materials	8	4
Others	4	1

Points achieved	SVAGRIHA Rating
25-30	★
31-35	★★
36-40	★★★
41-45	★★★★
45-50	★★★★★

Advantages

- A simplified system which assists architects in designing as well as rating the building

Composite
Solar Chimney/Wind Tower
Courtyards
Water bodies for evaporation
Reduced solar access
Building/Site planning to increase cross ventilation (layout of windows in the rooms and building for wind flow)
Earth berming
Thermal mass to reduce heat gain/loss
Dense vegetation cover to moderate micro-climate
Cavity walls
Terrace Garden/Green Roof
Roof insulation using clay pots(mutkas)
Design according to site slopes
Light shelves
Internal distribution of spaces to be carried out such that buffer spaces like store rooms, staircases, toilets etc. are located on the eastern and western facades
Cool roofs in the form of terrace gardens/roof ponds etc. (high reflective paint finish would not be accepted here)
Geothermal cooling/heating
Ventilators

Advantages

- A versatile system: no specific criteria is mandatory, only points in each category are

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Landscape	6	3
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Materials	8	4
Others	4	1

Advantages

- Designed for different climatic zones and incorporates regional variations
- Entirely calculator-based tool with pre-fed data

Criterion 1 | Criterion 2 | Criterion 3 | Criterion 4 | Criterion 5 | Criterion 6 | Criterion 7 | Criterion 8 | Criterion 9 | Criterion 10

>> Rainwater Harvesting <<

Points Attempted: 3 | Maximum Points: 4

Calculate

1. *Rainwater Capturing*

Location: Bhopal

Average Daily Rainfall (mm): 21.9

Building Type: Commercial

- Residences
- Commercial
- Hostels
- Hotels (upto 4 stars)
- Hospitals (beds less than 100)
- Restaurants

Total population size

Total building water requirement over 2 days (litre)

Surface Finish	Area (sq. m)	Effective Rainfall (mm)
Conventional Roof	20	416.1
Roof Garden (200-500 mm thick)	2	8.76
Concrete / Kota paving	1	20.805
Gravel	2	32.85
Brick Paving	10	186.15

Total water collected from roof in 2 days (litre): 664.665

Size of the rainwater harvesting tank (litre): 550

Examples of criterion

Urban Heat Island Effect (UHIE)

Source: http://www.globalchangeblog.com/2010/04/city-dwellers-of-the-future-urban-heat-island-warming-may-be-as-large-as-doubling-co2/

http://imgcash5.imageshack.us/img181/1695/sonycamv746xx1.jpg

Total paved area =

Site Area – (Building footprint + Landscape area)

Criterion 1 | Criterion 2 | Criterion 3 | Criterion 4 | Criterion 5 | Criterion 6 | Criterion 7 | Criterion 8 | Cri

>> Reduce UHIE and maintain native vegetation cover on site <<

1. *Urban Heat Island Effect*

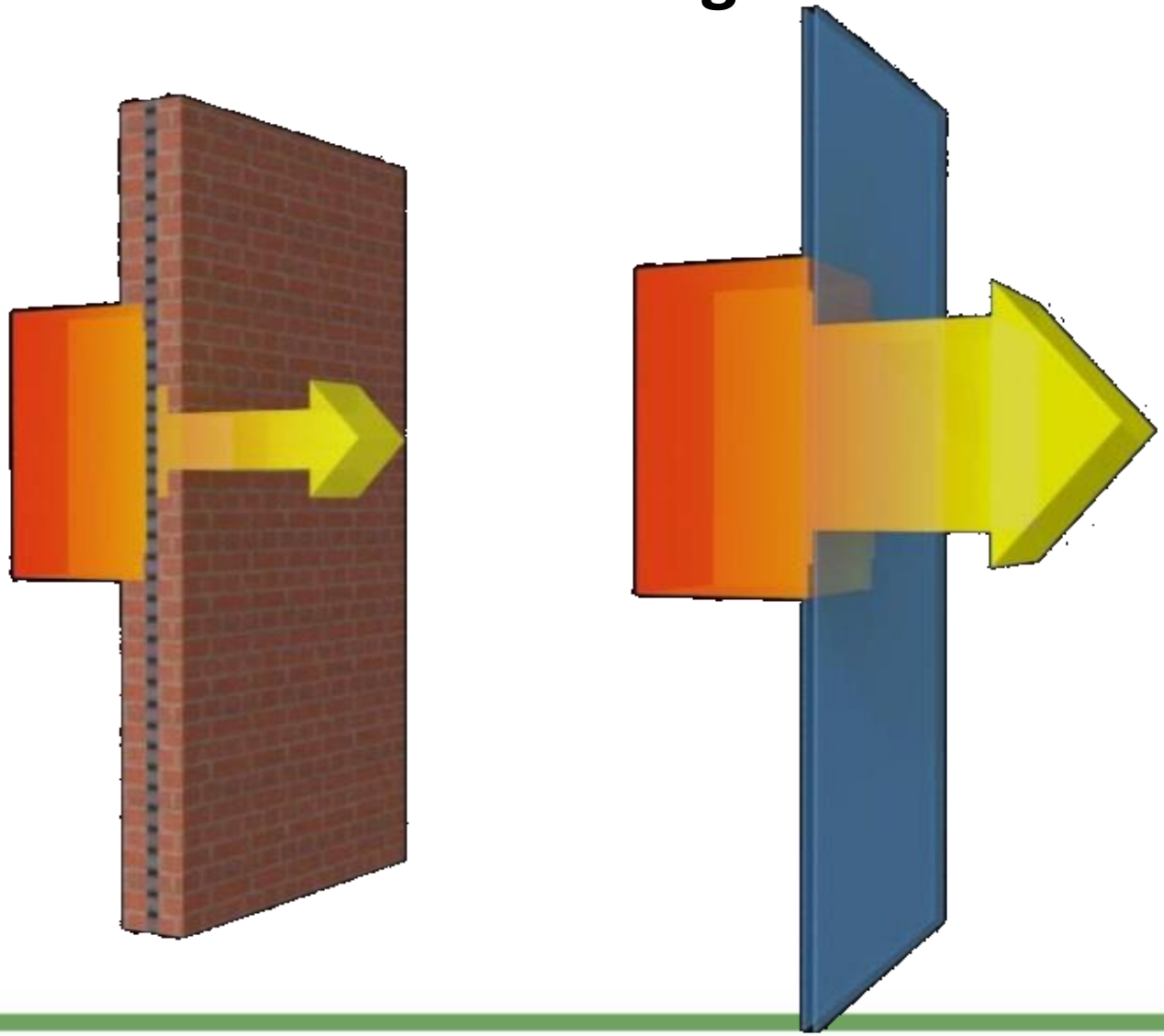
Total site area of the project		1000	sqm.
Area covered by the building footprint on the ground floor		450	sqm.
Total area under garden/landscape		200	sqm.
Total paved area on your site which	is a combination of both	200	sqm.

Total Paved Area: 350

2. *Tree Cover*

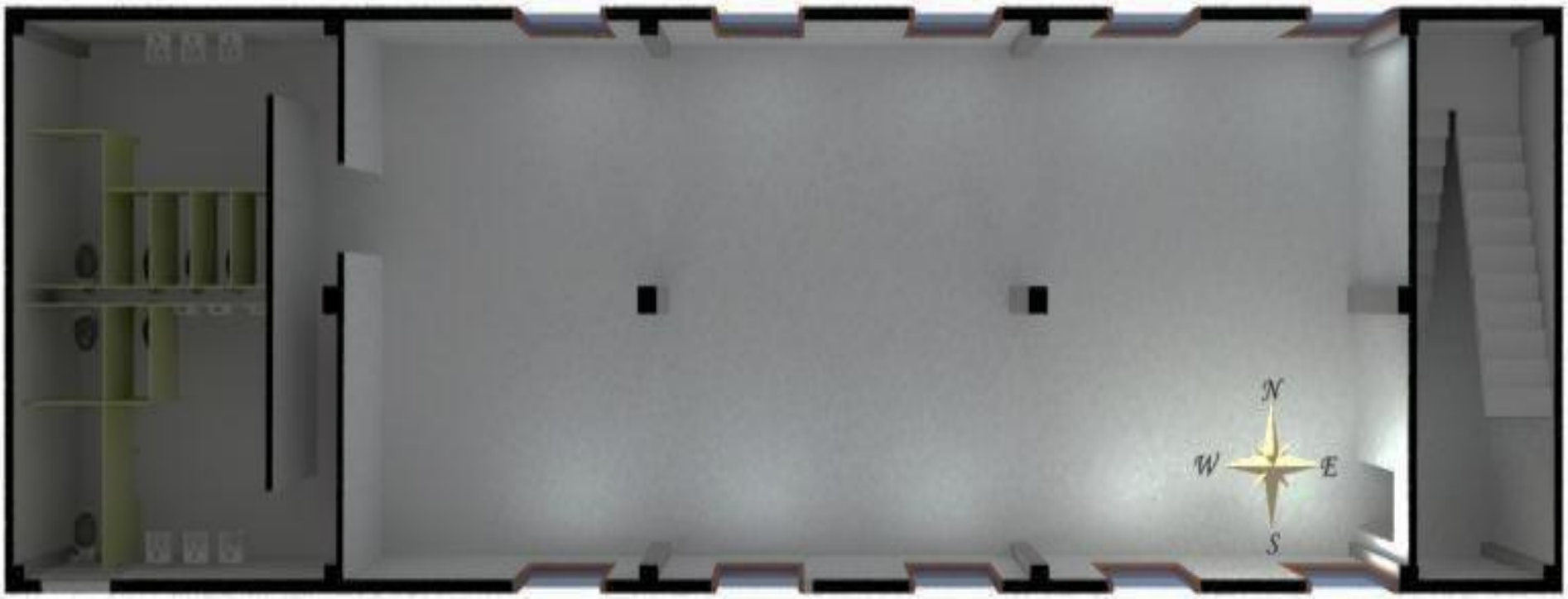
Are there existing mature, native trees on your site ?	
How many mature trees exist on your site ?	1
How many of these trees are in the perimeter zone of your site ?	0
Are you protecting all the trees in the perimeter zone?	

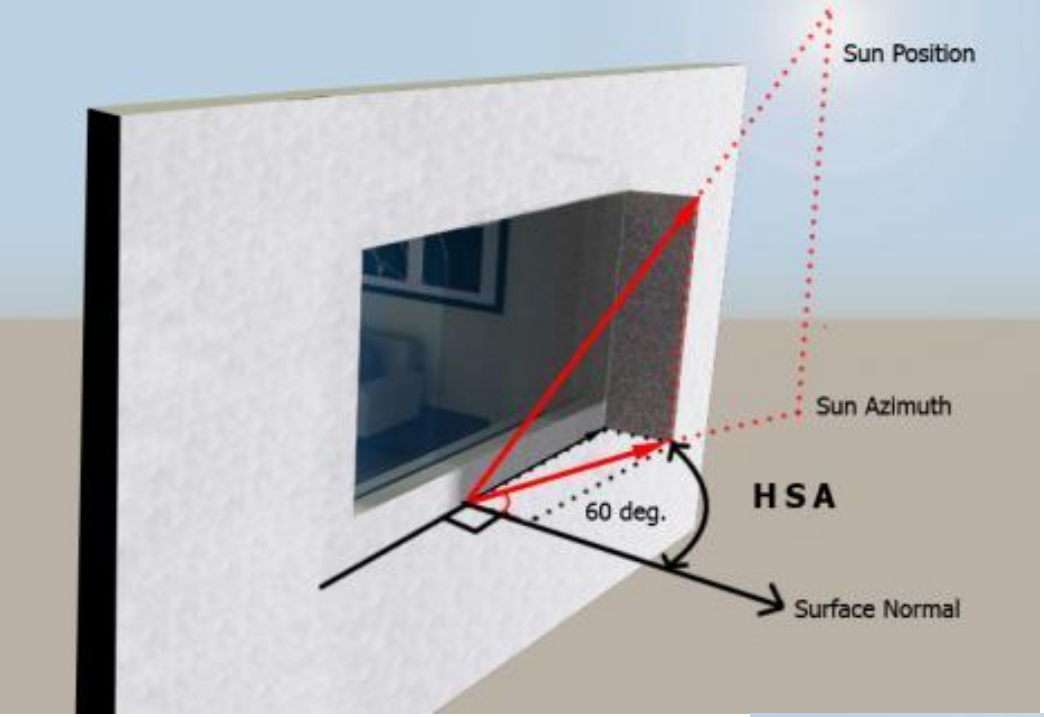
Direct Heat Gain through fenestrations



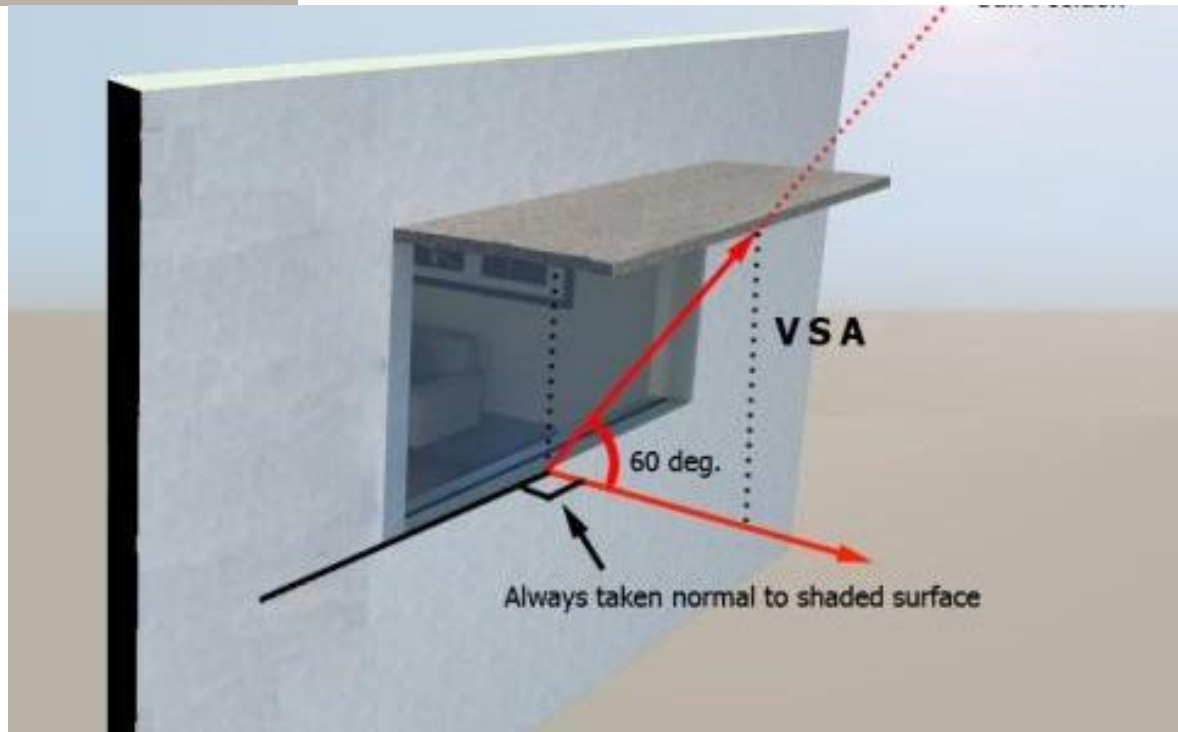
Direct Heat Gain through windows depends on three aspects:

Orientation





Shading Devices
&
Glass Specifications



Direct Heat Gain through fenestrations =

Window Area

X

Insolation (dependent upon orientation)

X

SHGC of the fenestration (dependent upon shading & glass specifications)

- Enter the details in the tool
- The tool calculates the overall reduction in direct heat gain through fenestrations
- The more the reduction, the better the design.

Total Maximum Points 48 Total Points Attempted 37 Project Details Upload Files Criteria Selection Exit

Criterion11 Criterion 12 Criterion 13 Criterion 14

Criterion 1 Criterion 2 Criterion 3 Criterion 4 Criterion 5 Criterion 6 Criterion 7 Criterion 8 Criterion 9 Crite

>> Good Fenetration design for reducing direct heat gain and glare while maximising daylight pe

Points Attempted 1 Maximum Points 6

Fenetration Design Strategies

Latitude 25 ropped fra es: 0 Stop Reset

Total External Wall Area (sqm) 0

Capture len th: 0 Seconds

Orientation						Window Area (sqm)	Base Case SHGC	Direct Heat Gain
North	Add Windou	Frame size:	748 x 640			0	0.68	0
South	Add Windou					46.89	0.64	33370.68
East	Add Window	Compressio	Microsoft	deo 1		0	0.64	0
West	Add Window	Record audi	Disabled			0	0.64	0
South - West	Add Window	Press Print S	en to stop vi	o capture		0	0.64	0
South - East	Add Window					0	0.64	0
North - West	Add Window				Cancel	0	0.64	0
North - East	Add Window	3294	0	0	0	0	0.64	0
				Total	13035.42			33370.68
				Reduction	60.94			

Daylight Area

Use of PPC

Is 100% of the cement being used for building superstructure are PPC? No

Reduction in embodied energy

Floor

Total area of all floor slabs (sq.m.) 0

Total floor slab area with low-energy strategy (sq.m.) 0

Identify from the list the low-energy roof composition used RCC slab

Wall

Identify the total sq.m. of wall area 0

Identify the total sq.m. of wall area with low-energy materials 0

Identify from the list the low-energy wall composition used Kiln fired bricks 230 mm thick wall

Design Case 0

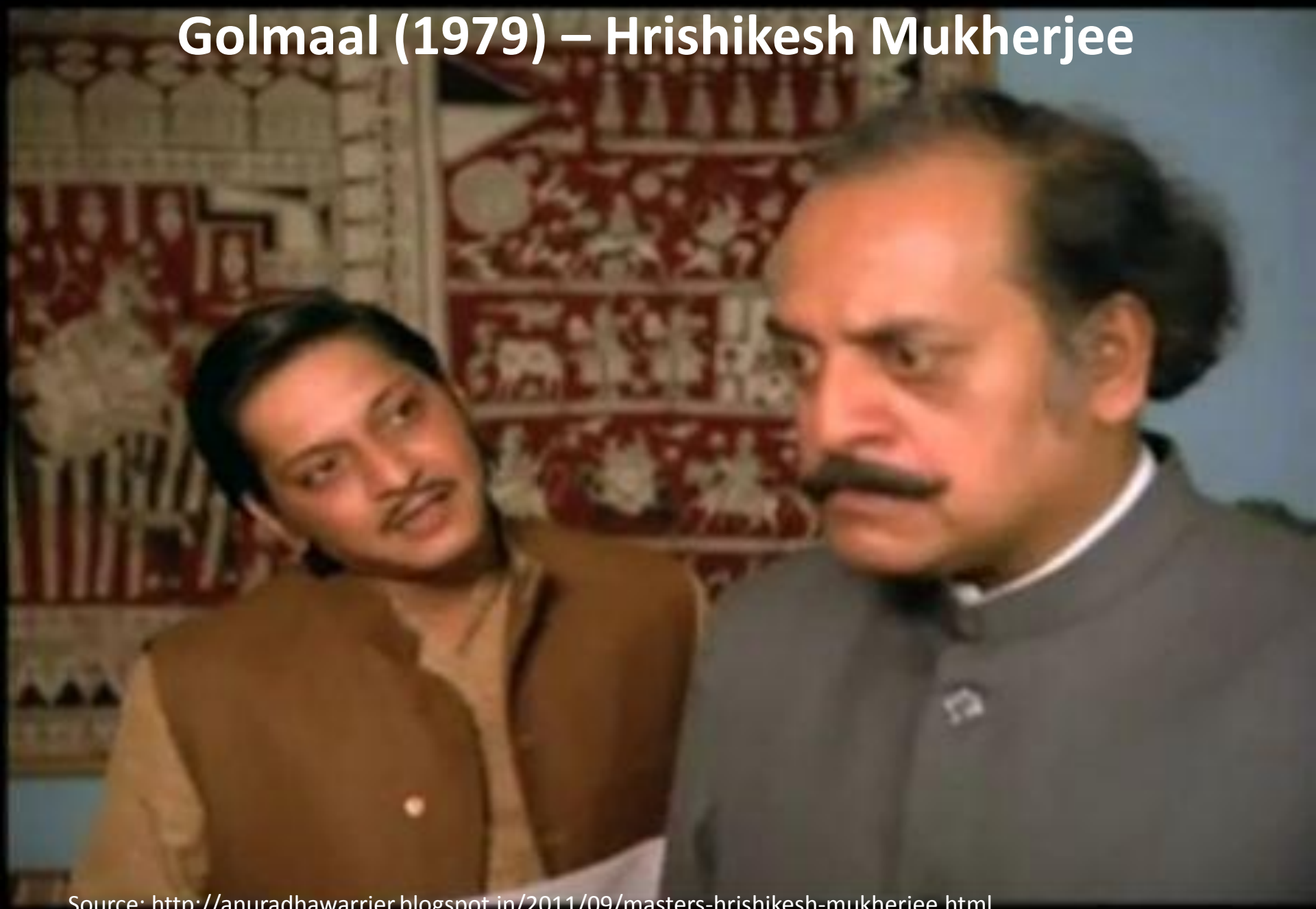
Base Case 0

Percent Reduction in embodied energy 0

Calculate

* Note: For calculations, convert all half brick thick walls made of regular fired clay bricks into one brick thick walls. For example, if 100 sq. m. of walls made of regular fire clay bricks in the

Golmaal (1979) – Hrishikesh Mukherjee



Source: http://anuradhawarrier.blogspot.in/2011/09/masters-hrishikesh-mukherjee.html

Thank You