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MELUHA – AN ECOTEL HOTEL

TRANSLATING SUSTAINABILITY

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Designed for Sustainability

The Meluha has been awarded the ECOTEL Certification for meeting its criteria and making sustainability integral to the company's business strategy. This article focuses on the strategies used by the Hotel in following the Certification's focus areas of conservation of resources (Energy and Water) and reduction in landfill waste, which also had the benefit of financial savings (more than Rs. 83 lakh saved from waste reduction alone in 2013/14). In addition, it is also socially responsible.

About the Hotel

Meluha, The Fern, An ECOTEL Hotel is a 141-room business hotel in Hirannadani Gardens in Mumbai. This is a 250-acre residential township with neo-classical architecture close to Powai Lake. The entire township integrates elements of sustainability in its planning, which includes a sewage treatment plant that recycles waste water and rainwater harvesting.

FIGURE 1: HIRANANDANI GARDENS

FIGURE 2: THE MELUHA

Energy Efficient Features

The hospitality sector consumes a high amount of energy and most of this energy is derived from fossil sources, increasing the sector's contribution to global warming. Additionally, this high consumption leads to a concomittant high operational expense for energy.

Design and Construction

The design of The Meluha with its unique parabolic shape brings architectural interest as well as energy efficiency to the hotel. The building is oriented to face the northeast direction allowing sunlight to illuminate the hotel while limiting direct penetration through an effective sun protection system comprising of a double facade of external arches and columns and internal walls and double glazed windows. The large glass windows have a U-Value of 1.7 $W/m^2/K$ (reduces the heat loss or gain by 30% as compared to single glass). Thus, while this design allows use of daylight as natural light, eliminating the need for artificial lighting (leading to increased energy thereby expenses), the building envelopes save the energy requirement for air-conditioning and lighting. The rooftop, responsible for heat gain through solar radiation, has a three-layered insulation of natural resource COBA (clay brick).

Briefly, **Power and Energy Management** is done by having a power factor close to unity; installing a BMS; metering of incoming energy and submetering of all main consumption areas with regular followups; and staggering of operations to non-peak hours of electricity.

Reduction in consumption is achieved by:

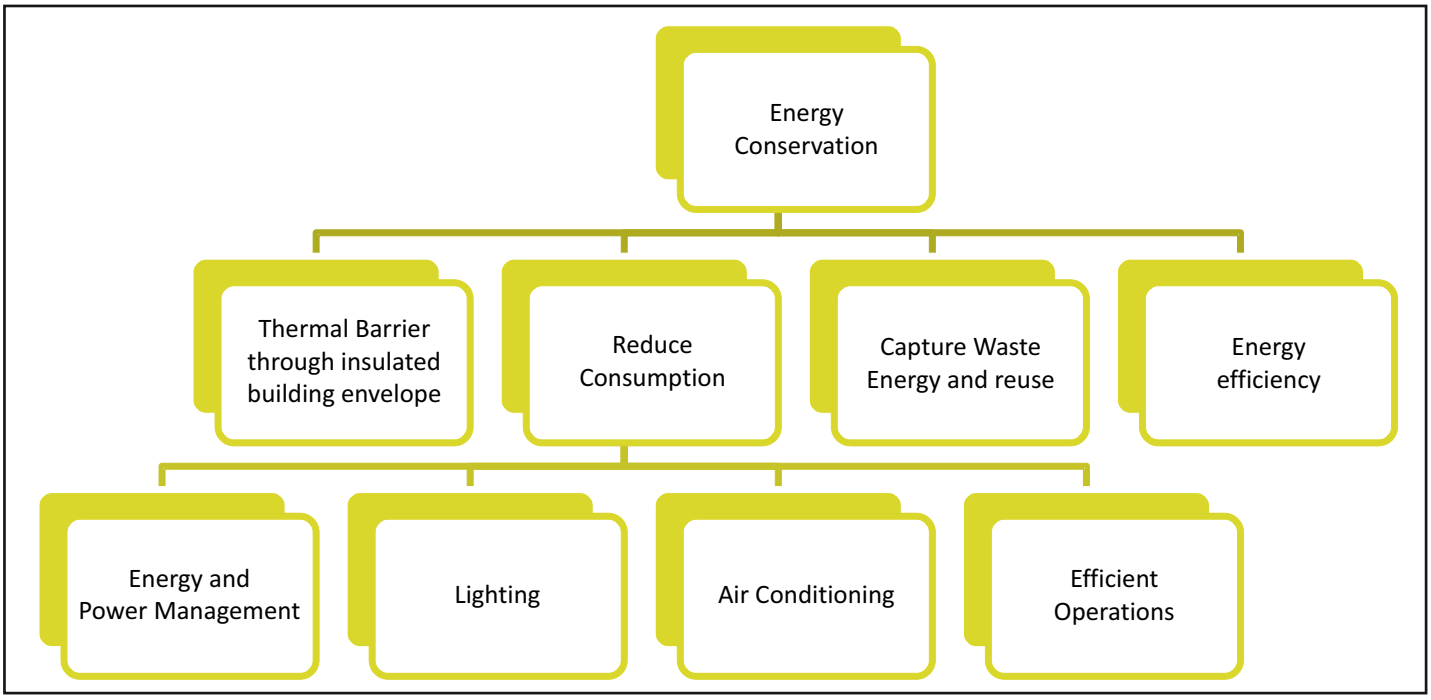
- ***Energy efficient lighting*** in the form of LEDs and PL lamps with appropriate control like dimmers and sensors in public toilets.
- ***Demand driven and technologically-advanced Air conditioning.*** The HVAC, usually the major energy consumer in every building, has 3 STL (storage thermal latent) tanks. Ice is made at night at lowest tariff rates and the main chiller plant is shut down during the highest tariff period.

The Meluha has identified opportunities for **energy**

FIGURE 3: STRATEGY FOR ENERGY CONSERVATION – THE MELUHA

Building envelope an effective thermal barrier	Power and Energy Management	Lighting and control	Air Conditioning	Energy captured for heating and cooling	Energy efficient equipment
Building designed to face northeast to maximise capture of natural daylight as the sun is in the northeast quadrant over the Mumbai sky for six months (especially summers when the day length is longer). Since lights are not used in the lobby and restaurants during the day, it led to a savings of 26,713 kWh and ₹2,04,083 in 2013/14.	Power factor close to unity is maintained.	LEDs and PL/T5 lights are used throughout the hotel.	HVAC has 3 STL (storage thermal latent) tanks, whereby ice is made at night at lowest tariff rates and the main chiller plant is shut down during the highest tariff period, leading to an annual saving of 68,328 kWh and ₹8,62,656.	Waste heat from AC plant is recovered and transferred through the desuper heater, enabling a saving of 25° in heating hot water, leading to an annual saving of 1,66,402 kWH and ₹14,40,000 in 2013/14.	Variable speed devices (VSDs) are present to control pumping systems.
Architecture incorporates external arches and columns that provide shade and reduce heat transfer. The large glass windows have double glazed glass with U-value of 1.7 w/m2/k that reduces heat gain through glass.	General equipment scheduling is done to stagger non-essential work to off-peak hours.	Dimmers are used in lobby and restaurants to vary the brightness and save on energy. This led to an annual saving of 91,579 kWh and ₹7,92,154 in 2013/14.	In public areas with large occupancies like banquets, conferences, demand based ventilation is achieved by installation of Air Quality Sensors.	Instead of 8 chillers at 8 outlets for staff to drink water, a cold water line is passed next to the chilled water line of the AC cooling the water centrally. This led to an annual saving of 4,022 kWh and ₹34,793 in 2013/14.	Pipework is well insulated to retain the heat in the boiler pipes and cold in the AC chiller pipes.

FIGURE 4: STRATEGIES FOR ENERGY CONSERVATION



efficiency, which is essentially more productivity with same energy input. Thus, energy efficient equipment has been used in Food and Beverage and engineering. **Variable speed devices** (VSDs) on motors have been installed to for pumping efficiency in vertical transportation of water.

Energy from heating and cooling is captured and not wasted as explained in Figure 3. Figures 3 and 4 provide an overview of the strategies for energy conservation at the Meluha, which has moved beyond mere compliance to identifying and implementing opportunities for sustainability.

Water Conservation

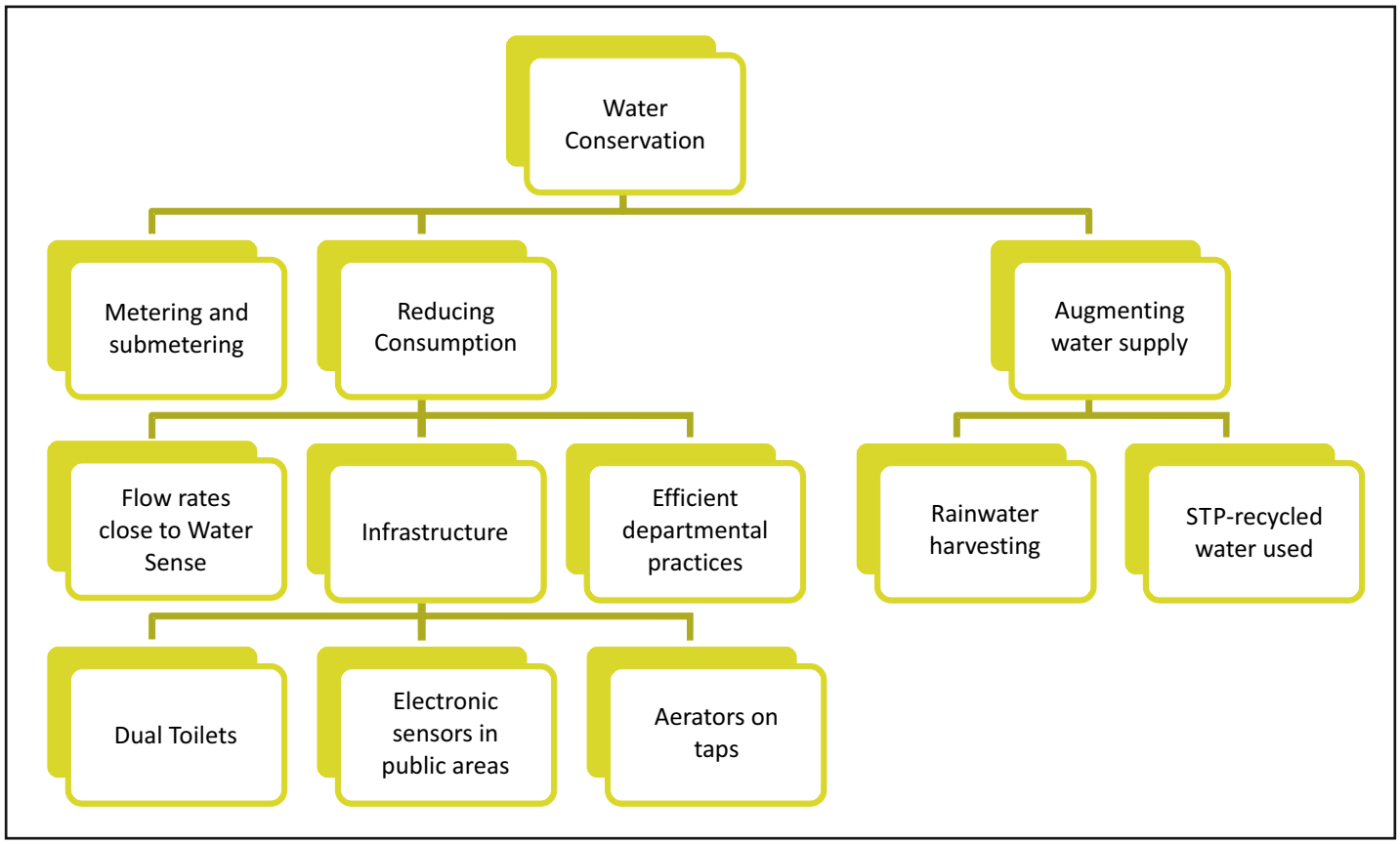
At the Meluha, water consumption is monitored daily which includes total water entering the hotel through all sources and consumption of areas by sub-meters. Reduction in water consumption is done by:

- Employing ***sensors*** in public toilets,
- ***Low-flow fixtures or aerators*** on showerheads and taps, which reduce the flow of water, and
- ***Dual toilets***, with high and low water settings.

The water supply is augmented by **using recycled water in the Hotel**. By virtue of its location, the entire wastewater generated in the Hiranandani Garden Complex, is sent to a sewage treatment plant (STP) for treatment. About 20% of the treated wastewater, on an average, is received back in the hotel and used for gardening, plumbing and washing basement areas.

Additionally, **rainwater harvesting** is done during the monsoon months with the heavy rains falling on all surfaces channelised into collection chambers, treated and reused. The rainwater harvesting potential is 5948.045 m^3. Figure 5 presents the strategies employed at The Meluha for water conservation.

FIGURE 5: STRATEGIES FOR WATER CONSERVATION



Waste Management

Waste is anything that cannot be reused again, while something that is reused is a resource. The ECOTEL Certification encourages reduction in generation of landfill waste and the lifecycle approach to products used.

The Meluha generated 9,248 kg of waste in 2013/14; of this, almost three-fourths was wet waste on an average and the rest dry. The wet waste is vermicomposted or sent to piggeries. Strategies for reduction of waste include:

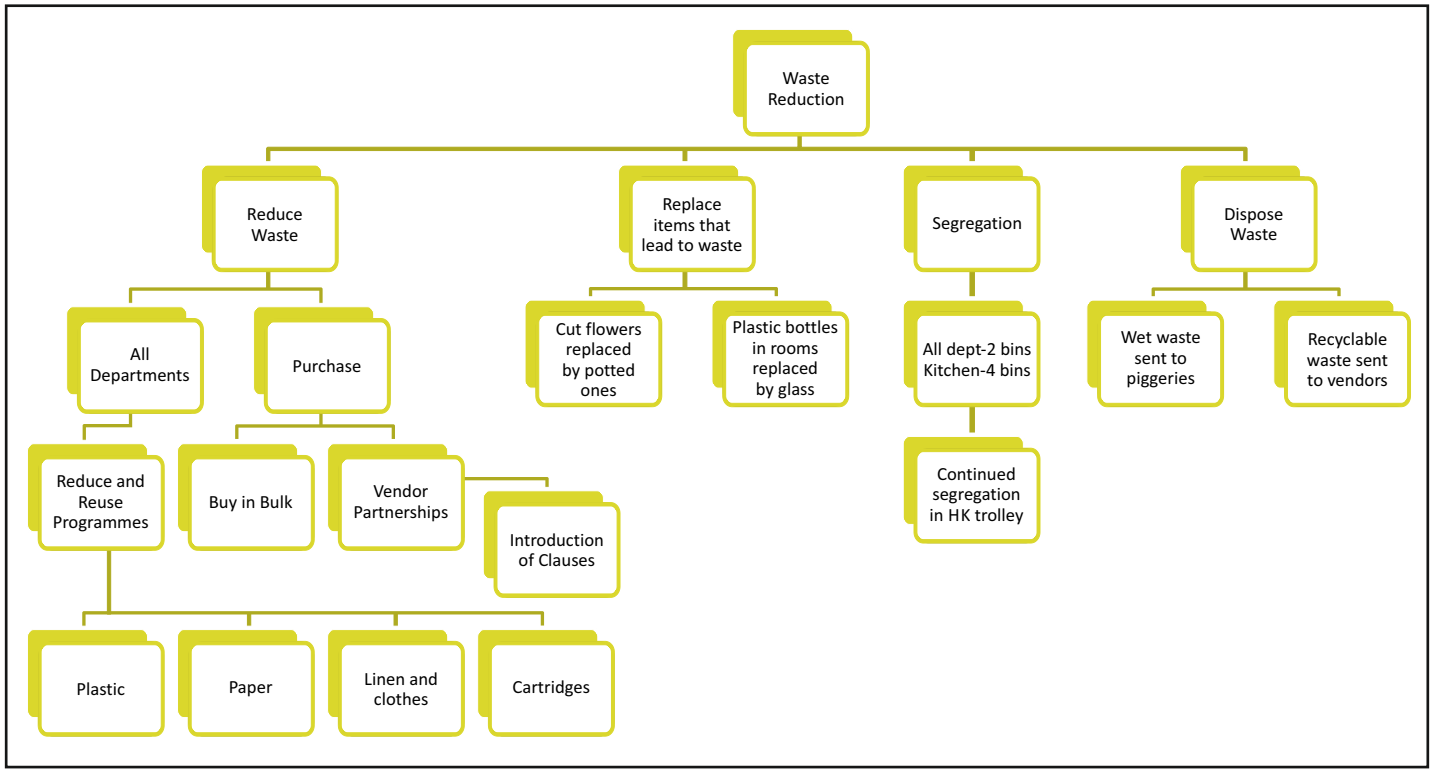
Reduction at source, which has the added benefit of monetary savings. The Meluha employs the following measures: (i) Buying in bulk to reduce packaging waste from multiple small packages; (ii) Partnerships with vendors to ensure packaging waste is returned to vendor; (iii) Introduction of clauses in its contract to restrict suppliers from bringing products into the hotel in reusable plastic bags with delivery done in biodegradable bags; and (iv) Reuseable Crates for bringing vegetables into the hotel from vendors.

Replacing non-biodegradable/ difficult to recycle waste by biodegradable/easy to recycle options include: (i) Mulshi Natural Spring water packaged in glass bottles is served in guest rooms instead of plastic ones. The empty bottles are sent back to the supplier after consumption; additionally, water purified in-house is kept in the guest rooms. About 123,417 bottles of plastic from rooms alone were reduced in 2013. (ii) Fresh Flowers are completely not used and have instead been replaced by potted plants.

Segregation of Waste leads to greater recycling as materials are easier to remove and resources can get reused. Segregation and weighing of waste is routinely followed at The Meluha with regular follow-up and appropriate strategies for reduction of landfill waste. A tie-up with vendors ensures safe disposal of segregated waste.

Figure 6, overleaf, presents the strategy for reduction in waste to landfill along with responsible disposal. Figure 7 presents a summary of the measures used for reducing waste along with the rationale for reducing the specific waste

FIGURE 6: STRATEGY FOR REDUCTION IN LANDFILL WASTE GENERATION



because of its environmental impacts. Additionally, the financial impacts or savings are presented for reducing the waste.

Green Purchasing and Community Development

In addition to conserving resources, the Meluha demonstrates a deep commitment to both social and environmental excellence through partnerships that culminate in community development and also women's empowerment through its daily operations.

1. Green Purchasing or procurement – Green purchasing or procurement plays a key role in ensuring sustainable supply chains that are considered critical to business success. According to the USEPA[1], more than three-quarters of GHG emissions originate in the supply chain. Hence, sustainable supply chains are a business imperative, critical to the success of the entire organisation. This philosophy of environmental and social excellence is embedded in the purchasing decision at The Meluha with supplier chain sustainability a driver of competitive advantage. The result is: (i) Guest stationery and envelopes are made from Meerseen-Paper, which has 50% recycled post consumer content (pcc); (ii) Stationery material used for office work is of 80 GSM TNPL paper, which has 75% pcc; (iii) All amenities used in guestrooms are herbal; (iv) Biodegradable chemicals with low environmental impact are purchased from Buzil Rossari for use by Housekeeping and Kitchen Stewarding; and (v) Organic grains are sourced from Saatvik. Saatvik is a Small and Medium Enterprise (SME) that engages farmers in sustainable farming practices.

2. Improving lives, empowering women and aiding community development – Purchasing at The Meluha is intrinsically linked to aiding in community development and improving the quality of lives of the people. By giving preference to local people, the hotel encourages entrepreneurs from disadvantaged communities to become empowered suppliers.

The Meluha and Rodas, sister concerns, together source 1,200 *chappatis* (Indian bread) per day for their staff from **Ruma Kitchen** – a small group of women – and have, thus, significantly empowered and improved the lives of these women. The women are middle aged and completely dependent for their livelihood on these hotels. At the rate of ₹1.80/chappati (1.8 x 1,200 = ₹2,160/day), these ladies earn ₹64,800 (2,160x30)/month. The chapattis are freshly delivered twice a day during meal times.

The Meluha sources its guest amenities from **Express Marketing**, an orgnanisation that employs women for packing.

Conclusion

The Hotel has a vibrant workforce that is motivated and trained to go green with the Green Team, a special group of people who drive the hotel's sustainability programme. The Hotel regularly conducts sustainability-related knowledge and skill training. Information flows have been changed in the direction of sustainability to engage people who have

[1] *USEPA 2010. Managing Supply Chain Greenhouse Gas Emissions: Lessons learned for the road ahead*

FIGURE 7: FINANCIAL IMPACT OF WASTE REDUCTION –THE MELUHA

Rationale for Policies Employed	Measures employed	Financial Impact in ₹ (2012/13)	Financial Impact in ₹ (2013/14)
Plastic Reduction - Most plastic waste is not recycled and finds its way into oceans, choking and depleting entire marine populations due to their toxic effects. The world's greatest landfill, in the northern Pacific Ocean, has 46,000 pieces of floating plastics/square mile of the ocean.	Unused toiletry is carried forward by Housekeeping.	₹11,507	₹4,20,970
	Room keys are reused by Front Desk for guests.	₹25,60,326	₹29,49,270
	Straws are provided on guest request by F&B.	₹11,507	₹27,726
	Plastic stirrers are provided on guest request by F&B.	₹4,299	₹1,595
Paper Reduction - Paper leads to landfill waste as well as reduction in trees when it is not from sustainable sources.	Key Jackets of room cards are reused by Front Office.	₹3,15,447	₹3,41,985
	Newpapers are given to guests on request.	₹23,640	₹50,100
	White boards are used in all the kitchens to write the specials of the day .	₹1,146	₹1,259
	Electronic certificates are mailed to guests for rewarding energy savings.	₹28,567	₹1,55,264
	Paper for advertising is reduced by F&B.	₹3,00,106	₹2,59,022
	Paper and cardboard boxes are reused by Security, Account and Purchase.	₹40,038	₹44,586
	Pencils are reused in banquets.	₹18,620	₹10,032
Food Waste Reduction - Globally, approximately 1.3 billion tonnes or about a third of the food produced in the world for human consumption is lost or wasted each year. The impact is financial and environmental as rotting food in landfills creates methane, which is 23 times more potent than Carbon dioxide as a greenhouse gas (GHG) and contributes to climate change.	Fruit baskets are given on request only and not automatically in every room. Food Waste is vermicomposted and sent to piggery as well.	₹16,31,717	₹19,07,530
	Plants are grown in-house.	₹45,600	₹65,600
	Fresh Flowers are not bought.	₹7,69,600	₹7,68,000
Cloth Waste Reduction - Decomposing clothing releases methane. The dyes and chemicals in fabric and shoes can leach into the soil, contaminating both surface and groundwater. Also, 11 million tonnes of textiles can take about 126 million cubic yards of landfill space.	Discarded linen, towels, bath robes, duvet covers, and pillow covers are recyled into wiping cloths and dusters, thus, saving on costs of new dusters.	₹46,423	₹45,540
	Old uniforms are reused for casual workers in the back-of-the-house areas or given to Orphanages.		
	Newspaper bags are reused.	₹6,19,182	₹7,16,940
Miscellaneous Reduction - The plastics used in printer cartridge decompose very slowly (between 450-1000 years). Ink cartridges also may also leak ink harming the environment and miniature life.	The printer cartridges are refilled at a contractual rate.		
Total Savings at The Meluha by Reduce, Reuse, Recycle practices		₹68,83,505	₹82,26,643
Total Earnings by selling scrap to vendor		₹1,65,332	₹1,17,336
GRAND TOTAL (SAVINGS + REVENUE)		**₹70,48,837**	**₹83,43,979**

internalised the need for such sustainable initiatives. Furthermore, the employees have innovated during the course of their daily operations to effectively implement sustainability.

The Meluha stands testimony to how a hotel can successfully translate sustainability as interpretted for hotel operations by the ECOTEL Certification into effective design and operations. The ECOTEL Certification enables hotels to become sustainable by primarily reducing the environmental impact of their business and becoming financially more viable and socially responsible.

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THE ECOTEL CERTIFICATION enables hotels to become sustainable by primarily reducing the environmental impact of their business and becoming financially more viable and socially responsible. The Certification is granted to hotels upon checking a range of earth-friendly practices across five parameters, known as 'The Five Globes': Sustainability Commitment, Waste Management, Energy Management, Water Management, and Employee Education and Community Involvement.

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About the Authors

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