City in the Forest:
The Birth and Growth of
Indian Institute of Technology-Madras

Chennai Solidarity Group
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VITAL STATISTICS

- IIT Madras is located in a 625 acre campus that was carved out of the Guindy Forests.
- Between 2001 and 2013, IITM increased the built up area on campus by 52 acres, eating into nearly 8 percent of its forest cover.
- Between 2001 and 2013, around 8100 trees were cut to make way for new buildings and open grounds for blackbucks.
- The IITM campus is subject to intense shockloads, such as when 50,000 people and more than 13,000 vehicles arrive to be part of the Saarang cultural festival.
- Student population resident in IITM is set to increase from 5500 to 8000, taking overall population to 14,400.
- In 2012, about 50 wildlife deaths were recorded, including of blackbucks, an endangered animal that is accorded the status as the tiger under Indian law.
- In 2006, IITM Director M.S. Ananth had stated that a satellite campus will be found to accommodate IIT's growth plans.
- That plan seems to have been abandoned. At least 58 acres (9 percent) more will be cleared within the existing campus to make way for amenities to accommodate the increased student/staff population.
- The expansion plan will claim 10,000 more trees.
- It appears that none of the new construction have the requisite approvals from the Chennai Metropolitan Development Authority, the Supreme Court and the National Board for Wildlife.

Introduction

A tender tentatively valued at Rs. 33 crores was published in the IIT-M website on 19.8.2012, calling for bids for construction of two G+6 blocks containing 48 flats in a wooded area of the Indian Institute of Technology campus. Based on a visual survey of the area identified for the two blocks, it is estimated that anywhere between 60 and 150 trees, including several sandalwood trees, will need to be axed to make space for the apartment blocks. Another notice inviting tenders was posted on the IIT website (tenders.iitm.ac.in) on 24.10.2013 for the construction of 48 flats in a G+8 formation at a greenfield site within the campus. Based on the average tree density data (157 trees/acre), forest clearance for accommodating the building footprint alone is expected to result in the loss of more than 27 trees.

Results of research conducted by members of the Chennai Solidarity Group indicates that 52 acres of forests have been cleared for various purposes between 2001 and 2013. At average tree density of 157 trees/acre, that amounts to 8164 trees cut, not to mention the other associated environmental impacts. Table 1 lists out the various activities carried out, proposed or ongoing that involved clearing of forests, and the extent of area cleared till date. Table 2 lists out the various activities that also entailed a significant impact on the ecosystem, but for which details are unavailable. The last section titled "Maps" contains a set of Google Earth maps indicating the before-after scenarios of various activities involving clearing of forests. Seen together, this information presents a sobering prognosis for the natural ecosystem in the Guindy area.

In 2006, IIT Director M.S. Ananth announced that the institute was looking for land for a second campus and would approach the State Government for the same.[1] It appears that this plan has been abandoned in favour of developing within the existing premises.

In 2012, the Institute announced the finalisation of its masterplan. Alumni who have seen drafts of the masterplan say the Institute planned to add more than 260,000 square metres (58.5 acres) of buildings within the existing premises. That would entail massive forest clearance, and the felling of more than 10,000 trees – assuming average tree density of 157 trees/acre. Even if it were not to entail tree felling, such massive construction would encroach into open spaces critical for the movement and lifestyle of the native population of blackbuck. Further, in the absence of facilities (cooking, sanitation) for construction workers, the very activity of construction could ravage the local environment. A 2006 report has documented open defecation near the lake, and chital that are "drawn to feeding on human faeces in this habitat."[2]

It is not the intent of this report to overemphasise the importance of trees. The natural habitat of IITM would include dense tree cover interspersed with open spaces, grasslands and scrubland conducive to the habits of the native blackbuck. However, the interference with wooded areas, and open spaces to accommodate human conveniences has made the area hostile to the original denizens. Given the ecological contiguity of the premises with the Guindy National Park, it is important to ensure the integrity of this ecosystem as well.

The health of the forests in and around the Guindy National Park, including in the Raj Bhavan grounds and IIT, are of interest to all residents of Chennai. The imminent tree felling within the IIT campus, and the massive clear-felling of trees within the Guindy National Park in November 2013 necessitates a closer look at the past, ongoing and proposed construction activities within the

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1   "IIT-Madras Plans a Second Campus." The Hindu. 24.11.2006
2   "Rapid Assessment of Biodiversity in the Campus of Indian Institute of Technology-Madras." Prepared by
     CARE-Earth to IIT Madras. August 2006.
     http://www.iitm.ac.in/sites/default/files/uploads/campus_biodiversity_report.pdf Downloaded on 19.12.2013.

campus and the impact it has had and will have on the habitats and wildlife in the region.

Concerned about the visible increase in built up area within IIT, the Chennai Solidarity Group undertook a research exercise to assess the extent of construction undertaken in the 12 year period beginning 2001, and its impact on tree cover and wildlife. This period was chosen as it coincides with a time of frenzied construction activity that massively increased concrete infrastructure within a treasured and highly sensitive ecosystem.

Crucial matters relating to IIT are shrouded in secrecy. Attempts to confirm land status and availability of building plans were severely constrained by the opacity of the IIT administration and the paucity of information publicly available on construction projects undertaken, their environmental impacts and approvals obtained. It is also not known what – if any – conditions were imposed by the State Government at the time of handing over the lands to set up the IIT. Original papers documenting the transfer of land from the State Government to IIT are untraceable.

However, given the inability of the researchers to confirm many of these figures from official sources, this research can be seen only as indicative and approximate, and as a basis to call for a deeper and more accurate public enquiry.

At the very least, the Institute should suspend all construction and land-clearance activity until the legality of its past construction and the environmental impact of the same is independently reviewed. It should also make available all relevant records to facilitate the verification of the findings of this research. Also, IITM should stand true to its stated vision of safeguarding the ecology of the campus and pursue its legitimate expansion plans at a satellite campus.

Questionable Legalities
The Second Masterplan classifies the entire IIT campus as an "institutional" area. When it was reclassified as "institutional" from "reserve forest, whether it was and whether such reclassification has happened lawfully is not evident as no documents are readily available. RTI requests too have not yet yielded results. Be that as it may, construction within institutional areas would require approvals from local body and/or the Chennai Metropolitan Development Authority. Projects covering total built-up area of more than 20,000 square metres would require Environmental Clearance under the EIA Notification, 2006.[3] Further, Section 3.5.1 of a guidance document issued by the Ministry of Environment & Forests states that "*In pursuance to the order of Hon'ble Supreme Court dated 4th December 2006*
 in Writ Petition (Civil) No. 460/2004, in case any project requiring Environmental
 Clearance, is located within the eco-sensitive zone around a Wildlife Sanctuary or
 National Park or in absence of delineation of such a zone, within a distance of 10 kms
 from its boundaries, the User agency/Project Proponent is required to obtain
 recommendations of the Standing Committee of NBWL.
"[4]

Construction within "Reserve Forest" areas would trigger a different set of approvals from the Forest Department and the Central Government.

The CMDA website states that constructions by "institutions" would need to be cleared directly by the CMDA. No institutions are exempt. Even local bodies, like the Alandur Municipality, and State

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3   Item 8(a), Schedule. EIA Notification, 2006. http://envfor.nic.in/legis/eia/so1533.pdf Downloaded on 19.12.2013
4   "Guidance document for taking up non-forestry activities in wildlife habitats." 19.12.2012. Ministry of
     Environment & Forests. www.moef.nic.in/assets/wl-191212-a.pdf Downloaded 19.12.2013

Government offices like the Commissioner of Police have applied seeking permission for construction of buildings.

Already, between 2001 and 2013, 37 buildings have either been constructed or are in an advanced state of completion within the IIT campus. The combined building footprint area for this expansion project is in excess of 200,000 square metres. The expansion project, involving various constructions and activities since 2006, invokes the provisions of the EIA Notification, 2006, and requires Environmental Clearance and approvals from the Supreme Court and the National Board of Wildlife. None of these clearances and approvals have been obtained.

The CMDA website, though, contains no details about any application having been made by IIT for construction within its campus. It appears that none of the buildings constructed within IIT- M campus have any kind of building plan approval from civic authorities.

An RTI application sent to the Forest Department has not elicited any response. An appeal preferred by this research team was pending before the Appellate Authority at the time of writing.

It is curious as to why IIT chose not to lawfully expand its campus within the 11.6 acre plot in Taramani adjacent to and connected to its current campus. It has instead chosen to divert that land for commercial purposes and has set up a 5-star research park. This has compromised options available to it for accommodating its growing needs without hurting the sensitive ecosystem of the existing campus.

To make matters worse, the IIT Research Park with a proposed built-up area of 108172.2 square metres and a parking area of 31,634 square metres -- itself is illegal. As per the Environmental Impact Assessment Notification, 2006, such a project will require prior Environmental Clearance from the State Environmental Impact Assessment Authority. By the Research Park's own admission, "the first tower of 0.5 million square feet is functioning from March 2010 onwards."[5] It was only on 30.8.2013 – more than three years after opening its project -- that the IITM Research Park management submitted an application to obtain prior Environmental Clearance for its already constructed building and other proposed buildings. On 8.10.2013, the State Environmental Impact Assessment Authority recommended post-facto clearance for the project despite knowing fully well that there is no provision in law for according post-facto clearance.[6] In addition to a prior environmental clearance, which the IITM Research Park still does not have, the existing construction at the Park was constructed without even seeking the approval of the Hon'ble Supreme Court or the National Board for Wildlife.

Just as the State Environmental Impact Assessment Authority has actively facilitated the illegal clearance of the IIT Research Park, the Forest Department and CMDA have turned a blind eye to the goings on within the IIT Madras campus.

History and Legal Status
IIT Madras is the result of an Indo-German agreement that was signed in 1959. The 250 hectare (625 acre) campus was mostly carved out of the erstwhile Deer Park and handed over by the Government of Tamil Nadu. Other parcels of land were acquired from the villages of Taramani and Kanagam. The campus falls within three "Revenue Villages" -- Guindy Park, Kanagam and Taramani, and shares a compound wall with the Guindy National Park. Originally a game reserve,

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5   IITM Research Park website: http://respark.iitm.ac.in/about_us/layout_location.php
6   Environmental Clearance dt/8.10.2013 vide Letter No.SEIAA-TN/F – 1686/EC(8a)/222/2013 Dt: 8.10.2013 .
     http://www.respark.iitm.ac.in/downloads/Environmental%20clearance%20Oct2013.pdf Downloaded on 19.12.2013

the Guindy Park has shrunk in size substantially over the years to accommodate various developments. In 1910, the British Government notified 505 ha of Guindy Forests as "Reserve Forest." Between 1958 and 1977, a large tract of the Reserve Forest was transferred to various government departments to build memorials and educational institutions, including the IITM. In 1977, the remaining lands were transferred to the Tamil Nadu Forest Department, and declared a national park in 1978.[7]

The Institute is a "Society" registered under the Societies Act. The original documents regarding this land transfer were not traceable, and Right to Information applications on the subject to IIT administration, the Tamil Nadu Revenue Department and Forest Department have not yielded any results.

Ecology and Biodiversity
A campus biodiversity report prepared in 2006 reports the presence of 51 species of birds, an equal number of butterflies, in addition to 300 plant species and 12 mammal species. The Blackbuck, an endangered animal, and several threatened fauna like star tortoise, pangolin and monitor lizard are also found here.[8] Barring the institutional status of the IIT premises, the ecosystem within the campus is identical to and as biodiverse and sensitive as the Guindy National Park. Along with the Raj Bhavan complex and the Guindy National Park, the IITM campus is one of the last remaining strongholds of the Southern Thorn Forests and Tropical Dry Evergreen Forests – a type that were once common on the Coromandel coast, but now considered to be very rare. Ecologically speaking, there is no logic to extending different levels of protection to the two areas. A list of species with special status under the Wildlife Act, 1972, which are to be found in IITM can be seen in Table 2.

According to the IIT-M website, "The Institute has sixteen academic departments and a few advanced research centres in various disciplines of engineering and pure sciences, with nearly 100 laboratories organised in a unique pattern of functioning." Ironically, the same website lists its "Vision" as follows: *To be an academic institution in dynamic equilibrium with its social, ecological and economic environment striving continuously for excellence in education, research and technological service to the nation."*

Human Population Pressures
Since it was established more than 50 years ago, the student population resident in the campus has increased from 1500 to 5500. The updated "Masterplan" for the campus envisages a further increase of student population to 8000.[9] A back-of-the-envelope calculation suggests that total campus population including students, staff, faculty and workers could exceed 15000 post-expansion.

In addition to this base population, the campus environment is also subject to severe shockloads. Every January, during IIT's cultural festival Saarang, more than 50,000 people and at least 14,000 vehicles visit IIT in five days. During such times, blackbuck habitats – open spaces – are converted to parking lots.

From a low-key, culture-rich student event called Mardi Gras, the festival has changed with the times to become what it is now – a commercial advertising platform for MNCs, and a monument to

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7   "Ecology and Management of Chital and Blackbuck in Guindy National Park, Madras." T.R. Shankar Raman, R.G.K. Menon and R. Sukumar. Journal. Bombay Natural History Society. Vol. 93 (1996). http://blackbuck.files.wordpress.com/2009/10/raman-menon-sukumar-jbnhs.pdf
8   "Rapid Assessment of Biodiversity in the Campus of Indian Institute of Technology-Madras." Prepared by CARE-Earth to IIT Madras. August 2006. http://www.iitm.ac.in/sites/default/files/uploads/campus_biodiversity_report.pdf Downloaded on 19.12.2013.
9   "Masterplan ready for IIT-M Expansion." 29.9.2011. The New Indian Express. www.newindianexpress.com/cities/chennai/article368408.ece

conspicuous consumption. A garbage audit of the Rs. 50 lakh Saarang 2005 revealed that the festival generated 3.5 tonnes of non-biodegradable trash over four days.[10] This was temporarily stored in an area frequented by Chital (spotted deer) and Bonnet Macaques. Over the years, the size and impact of Saarang too has increased. Saarang 2013 boasted a price tag of Rs. 1.6 crores. According to a student organiser, that makes it the "most spent on a college festival."[11]

The key concern is whether from being a forest in the city of Chennai, IIT is becoming a city inside a forest. The resident population and the facilities required for them do not come without an impact on the ecology and wildlife. Roads, hostels, houses, laboratories, classrooms, auditoria, playgrounds, parking lots and garages, water tanks, water and sewage treatment infrastructure, electricity distribution infrastructures such as substations and transformers are all activities that take away land from trees and wildlife.

An increased campus population also means more traffic movement, increased garbage and sewage, increased construction and therefore increased pollution during construction and a reduction in tree cover and habitat space for animals and birds. The spread of concrete also changes the hydrology of the area as rainwater run-off increases reducing the groundwater recharge potential, and heightening the problem of flooding. Such flooding will also alter habitats affecting spaces for wildlife and their movement. Noise during campus events such as the decibel-heavy proshows of Saarang, or during Diwali or New Year festivities can be traumatic to wild animals.

According to Prakriti, IIT's nature club, more than 50 wild animal deaths had been recorded in IIT in 2012. This number includes deer, monkeys and black bucks -- an endangered species accorded the same level of protection as the tiger.

Assessing Construction Activities and Impact on Green Cover

The period 2001 to 2013 has witnessed at least 41 significant construction projects, of which four are proposed. More are expected. Wherever available, official information regarding building footprint areas have been taken. In instances where official information is not available, such as for the 11 km "boundary road" that was constructed by dumping construction debris, an approximation by visual inspection has been relied upon. To calculate "area cleared of trees" at greenfield sites, this report has taken the entire foot-print area as area to be cleared of trees. For construction coming up in areas where existing buildings are to be demolished and built upon, the "area cleared of trees" is assumed to be half the total footprint area.

To calculate the tree density, this report has relied on two figures.
a) the total number of trees as reported by the Tree Census conducted by the Tamil Nadu Forest Department in 2012.
b) to calculate the extent of land occupied by buildings, roads and open spaces, this report has relied on a published study by the Indian Institute of Technology that uses 2011 data. [12]

As per the latter report, 49 percent of the 625 acre IIT campus was covered with forests; 24 percent was built-up; open spaces covered 19 percent; roads 5 percent, and water bodies spread over 3 percent. For the purposes of calculating tree density, built-up areas, open spaces, roads and water bodies are excluded as they are devoid of trees. In effect, all the trees in IIT stand on 306.25 acres of

10 "By product of Youth Fetes" 15.8.2005. The Hindu. www.hindu.com/2005/08/15/stories/2005081515770500.htm
11 "IIT's Saarang Comes with Rs. 1.6 crore price tag." 18.1.2012. The New Indian Express.
    http://www.newindianexpress.com/cities/chennai/article332889.ece
12 "Air Quality Monitoring, Inventory and Source Apportionment Study for Chennai." Project Summary Report.
    Chemical Engineering Department, IIT Madras. (Undated – post 2011). http://www.cpcb.nic.in/Chennai.pdf

land.

Further, to get a sense of whether or not vegetation was pre-existing at the various sites, Google Earth images before and after construction have been relied upon. Google Earth images have also been used for quantification of area cleared of vegetation, and to get a visual perspective on the extent of tree felling.

Table 1
Activities Involving Clearance of Forests and Extent of Forests Cleared
in IIT-Madras Campus between 2001 and 2013 (Google Earth assessments)

Year	Building/location	Cleared area, m²	Proposed/ongoing/completed
2013	D type	0	Tender (not started)
2013	B type **	0	Tender (not started)
2013	Quark building**	0	Tender (not started)
2013	Biotech + Sustain**	0	Tender (not started)
2013-	2 boys hostel complexes + gym + stadium	24640	Hostels on-going, Gym completed, stadium built
2013	Community Centre**	1305	Completed (2013)
2013	Shopping Centre**	1786	Completed (2013)
2013	Bus shelter (Velacharry gate)+ petrol pump	6030	Completed (2013)
2013-	New academic complex + canteen**	9825	On-going
2012-14	New Girls Hostel	5700	On-going
2013	New G type (3 blocks)-II**	3198	Completed (2013)
2013	New Chemistry block	2880	On-going
2013	National Centre for Combustion Research	5000	On going
2011	Water Sump (Metro water)	2824	2011
2011	Engineering Design Dept**	2385	Completed (2011)
2011	New C2 (4 blocks)	14125	Completed (2011)
2011	Owzone shed (near JKtemple)	2288	
2011	IIT Water Sump near main gate	1092	
2010	Sports Complex **Blackbuck corridor**	2120	Completed (2010)
2009	Area cleared for blackbuck habitat Taramani Guest House	2664	
2009	Biotech	5500	Completed (2009)
2007	Himalaya Mega Mess **Blackbuck habitat**	17876	Completed (2007)
2006	Water tank (children's park area)	201	Completed (2006)
2006	Waste Water treatment system	594	
2005	Creche	1560	Completed (2005)
2005	4 boys hostels (Pampa +3) **Blackbuck habitat**	34320	Completed (2005)
2005	G type (4 numbers)-I	1292	Completed (2005)
2005	Bose-Einstein Guesthouse expansion	770	2005
2004	Electric substation	200	Completed (2004)
2004	Taramani Guest House extension	6138	Completed (2004)
2004	Area cleared near Chemplast Stadium	4875	Completed (2004)
2004	Near Velachery gate (electric substation)	2464	Completed (2004)
2004	Area cleared for Blackbuck habitat near Student Activity Centre	14490	2004

2004	Commnunications lab	3600	
2004	Boundary road	33000	2004
2004	Dean (students) office	840	Completed (2004)
2003	Electric substation (across Himalaya)	306	Completed (2003)
2002	CCW office **Blackbuck habitat**	7800	Completed (2002)
2002	NMR facility	748	Completed (2003)
2002	Vindhya Mess	1764	Completed (2002)
	Total	**2,26,200**	

** *Buildings which came up in an area partially cleared by demolition of existing structures and clearing additional area*

Assumptions used to estimate the number of trees cut:

Total area of the campus = 625 acres

Total green area remaining= 625x0.49 = 306.25acres

Total no of trees on campus (as per the tree census 2012, girth >30cm) = 48,000 in 306.25 acres

Trees per acre (per 4046.9 m^2) = 157

Total Area cleared between 2001 and 2013 = 2,26,200 m^2

For structures B1, B4, B16, B20, B29, B34, B35 and B36, Total area cleared is taken as half of the rest since they came up after removing existing buildings and for B27 and B28 are considered for trees cut only, no construction came up = 226200-15536=

Therefore, Approx. area cleared of existing forest and trees = 210664 m^2 = 52 acres

Approx. no of trees cleared = 52 acres x 157 trees = 8164

Table 2: List of activities involving clearing of forests not included in Table above for lack of sufficient information

- Concrete car parking shelters for C/C1 type houses : ~ 20 numbers (each approx.. 25 m^2)
- Concreted parking areas
- Electric sub-stations
- Waste management sheds
- Concrete Cycle Parking areas
- Concrete car parking and cycle parking areas
- Annexes to many academic buildings
- Extensions to hostels (8 Boys hostels- old mess area is reconstructed into 6 floors)
- Medical Materials lab
- Composites technology center (extension)
- Research Park Road creation
- Disturbances around the oxidation pond and surroundings
- Increase in on-campus, non-academic facilities and amnesties (recreational, food,shopping,sports, events etc.)

Table 3: List of various animals belonging to different Schedules of Indian Wildlife Act that are found in IITM campus

- ## Schedule I:

  - Black Buck (*Antelope cervicapra*)
  - Pangolin (*Manis crassicaudata*)
  - Peregrine Falcon (*Falco peregrinus*)
  - **Butterflies:**
  - Pierrot, common *(Castalius rosimon)*
  - Blue Tiger *(Tirumala limniace)*
  - Crow, spotted Black (*Euploea crameri*)
  - Eggfly, Danaid (*Hypolimnas misippus*)
  - Short-banded sailor

- ## Schedule II:

  -
  - Bonnet macaque (*Macaca radiata*)
  - Asian Palm Civet *(Paradoxurus hermaphroditus)*
  - Jackal (*Canis aureus*)
  - Cobra (*Naja naja*)
  - Common Indian Monitor Lizard (*Varanus varanus*)
  - Indian Gray Mongoose (*Herpestes edwardsii)*

- ## Schedule III:

  - Chital (Axix axis)

- ## Schedule IV:

  - Five-striped plam squirrel (*Funambulus pennanti*)]
  - Hare (Black Naped) (*Lepus nigricollis)*
  -

This list does not include trees and plants and insects, frogs,other than butterflies

MAPS
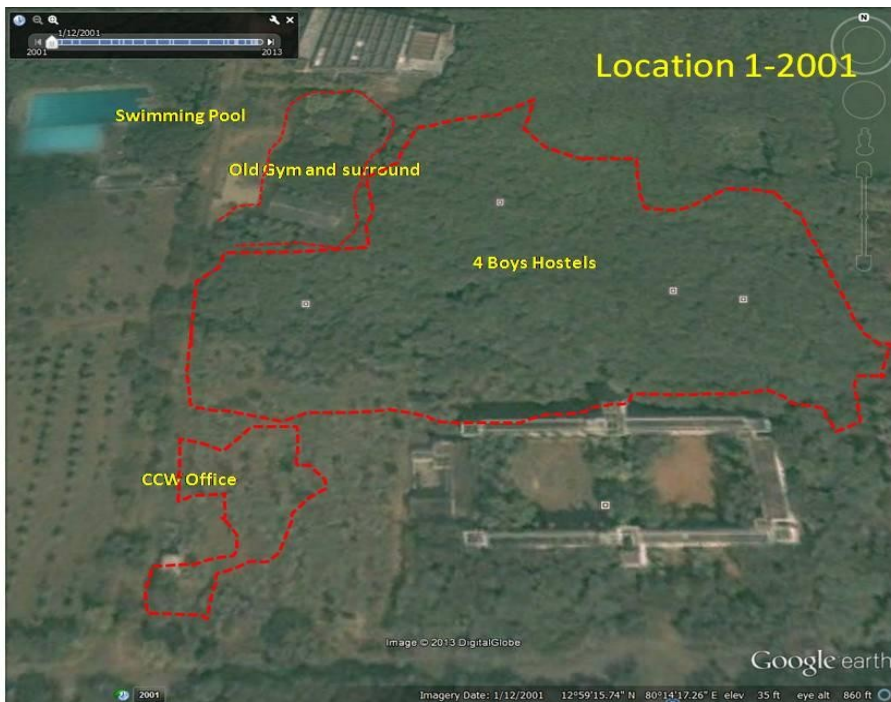## Google Earth Maps (Before Commencement of Activity v. After Clearing of Forests)

MAP 1: Zoom-out image containing various activities involving large-scale clearances

Source : Google Earth, History, accessed in Dec.2013

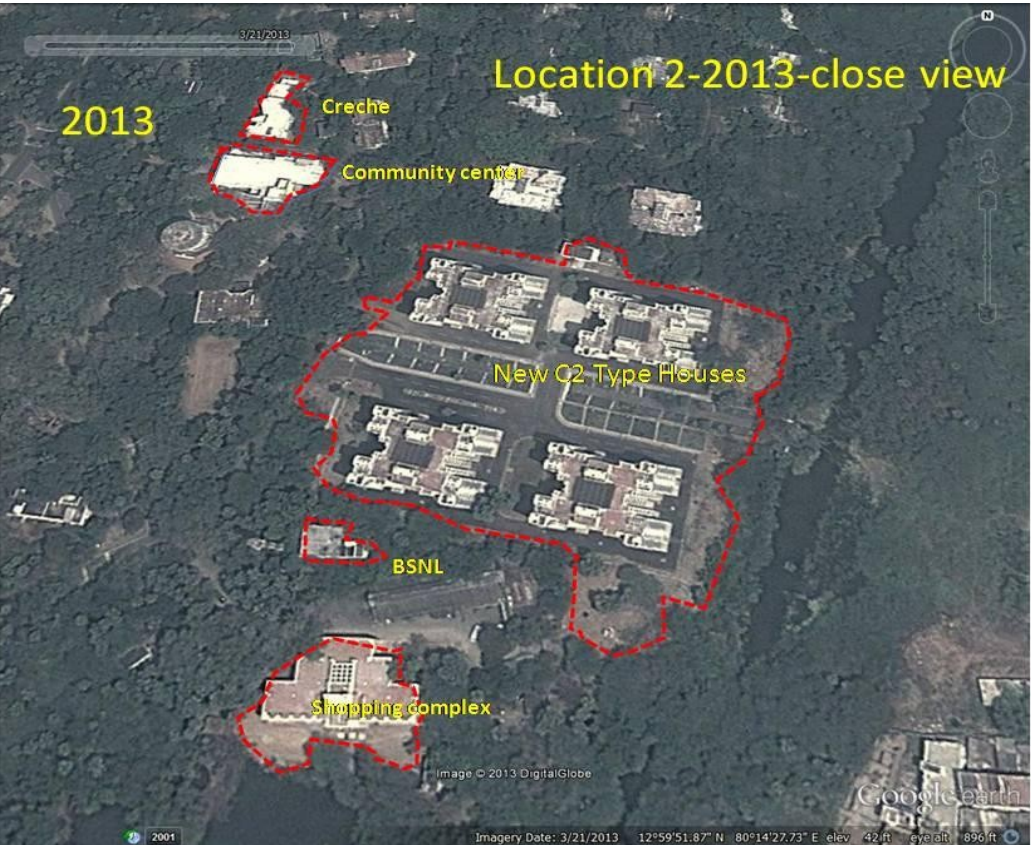**MAP 2:** Before-after of Boys Hostel, CCW, Gym and Surroundings

MAP 2: Continued (2013)

MAP 3: C2 Type House and Shopping Complex

MAP 4: Forests Cleared for Blackbuck habitat, Himalaya Mess, Girls Hostel

Location 3-2001

Black buck habitat

Girls Hostel

4 boys hostels

Blackl buck area

Himalaya Mega mess

CCW-built in2001

Location 3-2013

Black buck habitat

Girls Hostel

OAT

Blackl buck area

Himalaya Mega mess

MAP 5: Forests Cleared for New Boy's Hostel. New Playground