Our campus?

An environmental update

23 June 2014

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(Green Subcommittee, Faculty Forum)

FF green subcommittee
Our role?

- Want to partner constructively with the administration for **rapid growth** of Institute in a **sustainable** and **green** manner.
  IIT Kanpur has to lead the way in sustainable growth!

- Harish Karnick, Saumyen Guha, Abhas Singh, Amitabha Bandyopadhyay, Sameer Khandekar,.

- Need more people, more participation!

- What we are *not*: Activists, Anachronistic, Negative, Rebels, Regressive, Rigid, ...

Green issues

- **Land**: A non-renewable resource. Must use land intelligently today for future generations.

- **Water & Energy**: The campus survives on bore-wells. Our power consumption is unsustainable. Better conservation and recycling techniques are needed. Awareness and responsibility is required.

- **Biodiversity**: Need to showcase that growth need not be at the expense of nature. Our ethical mandate.

We will talk about Land and Biodiversity. Water and Energy will be addressed subsequently. The newly formed Green Cell will be introduced.

Land use

Land is a non-renewable resource.
IIT Kanpur is only 60 year old.
Has many many more years to go.
Must use land intelligently today.

"**The Institute** celebrates freedom of thought, cultivates vision and encourages growth, but also **inculcates human values and concern for the environment and the society**."

- IIT Kanpur website
www.iitk.ac.in

" **Each IIT** would **establish a Green Office**, which would **carry out Green Audit of** its curriculum and its **institutional management practices**, such as **energy, water, waste,construction projects, natural resource (forest, water, etc.) and biodiversity conservation**.

…

Institutions could network to **evolve a green agenda** in **IITs models of green Habitats**."

- Minutes of the 46th IIT Council meeting; 7 Jan. 2013
https://www.iitsystem.ac.in/IITcouncil/council.jsp

In Open House on master plan convened by Director, there was **broad agreement that the Institute must preserve 25-30% perennially green area** to ensure a healthy environment.

- Jan. 2014 at IIT Kanpur. Minutes not yet circulated.

Minutes by FF are appended at the presentation's end

"... mark a **25% permanently green zone** to protect flora and fauna. This will be an area where **no construction or tangible human intervention will be allowed**, now or in future."

- Minutes of Workshop on Green policy; 18th Jan. '2014 at IIT Kanpur.

https://www.iitsystem.ac.in/IITcouncil/guidelines/Minutes%20of%20workshop%20at%20IITK%20on%20Green%20Policy-SANDHI%20on%2018.01.2014.pdf

Finally, need to reserve space for future growth. IIT Kanpur is less than 60 years old. Need to look ahead also. Cannot spread horizontally arbitrarily now.
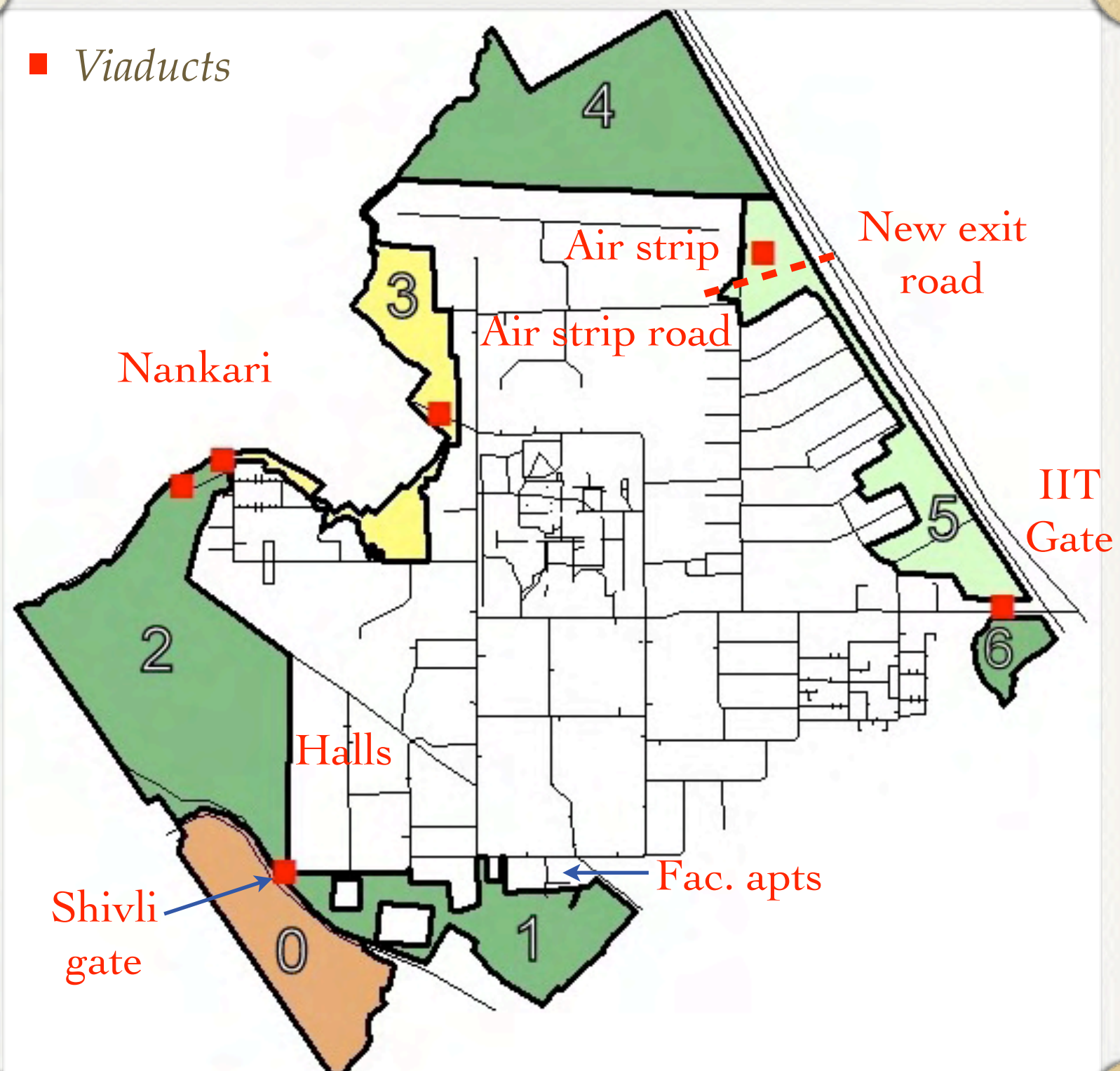
But, what is the ground reality?

25 % pristine green cover is nearly impossible!

- Only **areas 2** and **4** are pristine. Together are ~**17%** of campus area. (~70 ha.)
- Connecting **areas 5** and **1** by *viaducts* increases green area to ~**23%**.
  - *Viaducts* allow animal movement below roads.
- If **area 6** is added with viaduct, we get **24%**.
- **Area 3** can act as connecting zone. Needs redevelopment as green area. Currently brownfield.
- **Area 0** used for hazardous waste disposal. Neither green nor contiguous.

■ *Viaducts*

Air strip

New exit road

Air strip road

Nankari

IIT Gate

Halls

Fac. apts

Shivli gate

Urgent need to safeguard green zones.

Permanently green zones need to be demarcated immediately.
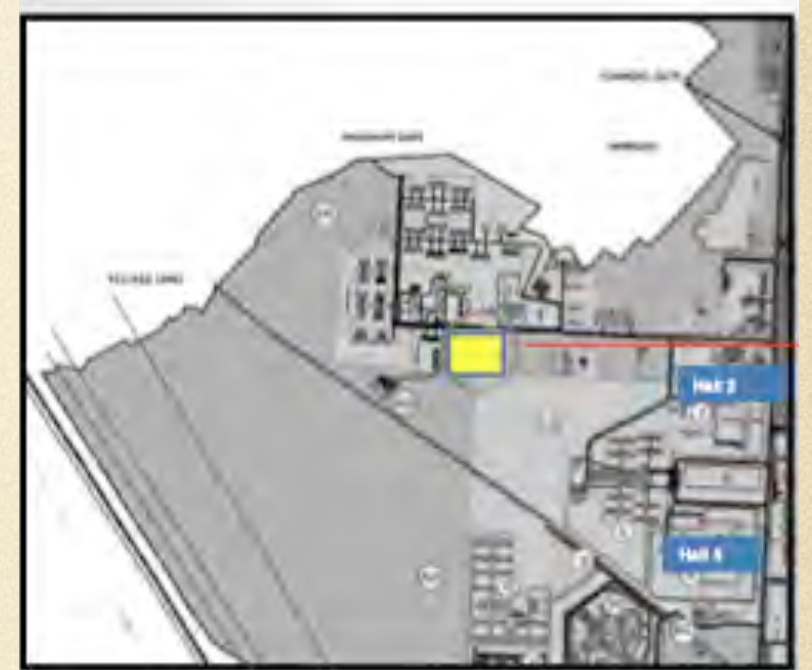
However,...

Constructions planned encroach into leftover green belt

New(er) sports complex

Engine research center
(4000 sq. ft. for **one** faculty!)

International students hostel

New exit road

Many of these constructions NOT in master plan!

New Type III flats

Way forward?

- Construction canNOT stop. Needed for Institute's growth.
- However, with inclusive and constructive debate it is possible to construct efficiently and intelligently and limit impact on environment.
  - *Examples*: Research building; Faculty Club; Type III flats (to some extent, location may be improved).
- Institute's Green Cell has to play an important role. It **must** regulate construction and related activities.
- Emulate IITM, IITB, etc. that house larger populations with much smaller footprint.

Neelgai

Issue

- Many (SIS, Workers, faculty, etc.) claim/know that IIT Kanpur is quietly herding its Neelgai out of the campus into surrounding farmlands.

- Disturbing posts (with evidence) on social networking sites (Facebook).

- This is unethical, a potential legal threat, and cause for possible vigilante action and social embarrassment.

- FF representatives and Chairperson, Green Cell met Director in this regard in May.
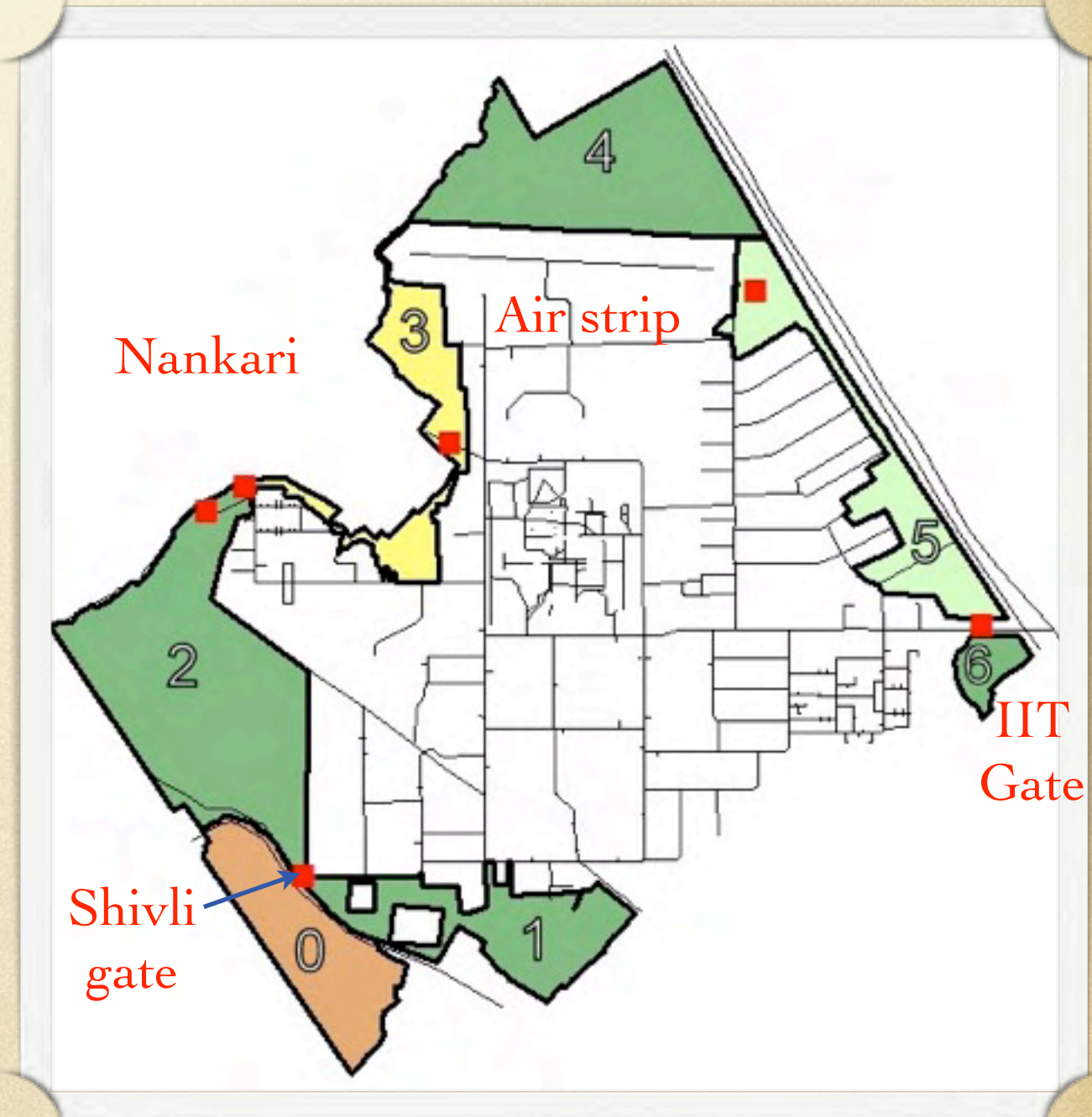
Status

- Director clarified that this action does NOT have his sanction, but is suo moto action by others.

- It was agreed that

  - PIC Security (Prof. Braj Bhushan) will be instructed that NO Neelgai be evicted in this manner. As per Director's office, oral instructions to this effect have been conveyed to Prof. Braj Bhushan.

  - A scientific and humane solution to the Neelgai issue will be found.

  - For this, Green Cell will form a sub-committee.

A win-win solution?

- The Institute resident scholar, Shri. Bikram Grewal has suggested that a sanctuary within the campus can prevent man-animal conflict.
- The perennially green zone can be such a sanctuary.

Green Cell

Mandated by IIT Council.

Formed under office order DIR/IITK/2013/00-89.

Professor in-charge: Prof. Purnendu Bose (CE).

IIT Council guideline:

https://www.iitsystem.ac.in/IITcouncil/guidelines/Green%20Agenda%20&%20Action%20Plan.pdf

Status

- Currently, auditing various environmental parameters.
- Plans to mark perennially green zone by end of summer.
- IITK was allotted 1100 acres by GoI for academics.
- It is possible to achieve that purpose and maintain
  - 20-30% land as perennially green area.
  - 50-40% land as maintained open space.
  - ~30% land as constructed area including roads.
- Strongly advocates brownfield and multistory construction.
- However, its role and say in guiding construction is unclear. **Where and how will it intervene/approve?**
- **Construction flowchart will have to be modified.**

Construction?

Towards a more efficient process

Present Scenario

ISPAC

(Institute Space Planning and Allocation Committee)

(A) Allocation of Constructed Space

(B) Allocation of New Space – New Footprint

(C) Temporary sheds/Temporary constructions

(D) Proactive planning for new spaces/ re-structuring

- **For new spaces (new footprint) demand comes from:**

  - individual faculty members (via HoDs)

  - group of faculty members (via involved HoDs or Dean RnD)

  - departments and IDPs

  | Some Departments have 'active' local space committees |

  - Institute administration (DD/All Deans/ Hostels/Faculty apartments/Parks/Lecture Halls etc.)

  - Functional units (GATE/JEE/Library) and IWD (Roads/Water Tanks/Pump rooms/)

- Small demands → Usually no user committees

- Large demands → User committees are set up

Present Scenario

ISPAC collects such demands

Harmonizes/categorizes them

Checks, in general, that they do not violate the master plan
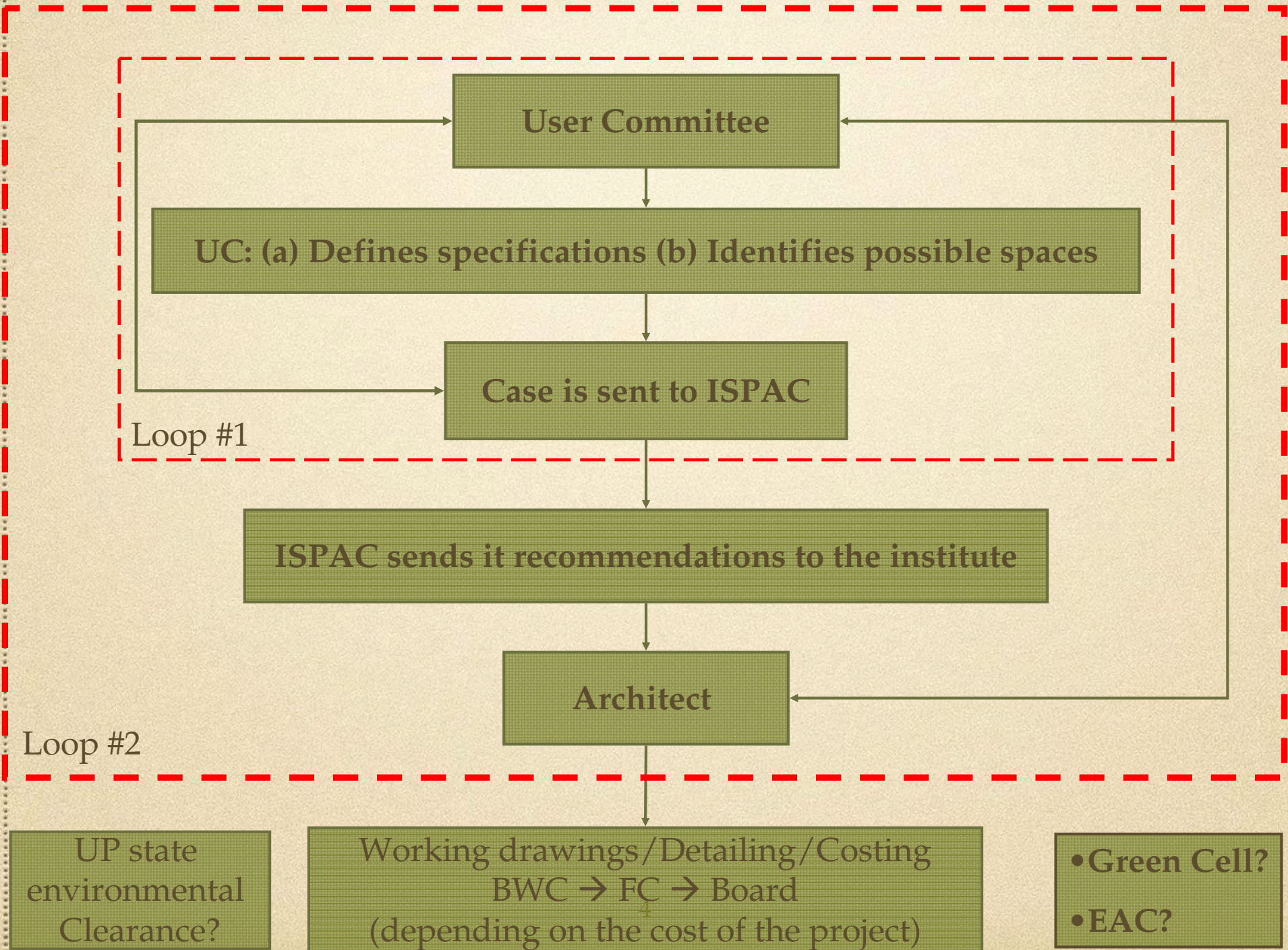
Meets at regular intervals (as per the demands)

Takes decisions, starts discussion, asks for clarifications…..

If the demand for space is small and is well justified by documents and supporting arguments by HoD and other stakeholders, the ISPAC takes a decision and allots new footprint.

If the demand for space is large there is an algorithm through which it passes.

Construction loops

Loop #1

User Committee

UC: (a) Defines specifications (b) Identifies possible spaces

Case is sent to ISPAC

ISPAC sends it recommendations to the institute

Architect

Loop #2

UP state environmental Clearance?

Working drawings/Detailing/Costing
BWC → FC → Board
(depending on the cost of the project)

- **Green Cell?**
- **EAC?**

Shortcomings in the present model

Loop #1

- ISPAC looks at buildings on a case-by-case basis.

- There is no 'holistic harmonization' of construction activities across the institute.

- In view of the two new committees (GC and EAC), relevant 'green' input and due diligence process must be done.

- Although ISPAC deliberates on these issues but it has limited scope.

Loop #2

- User-committee and architect loop is seen to be weak, on many occasions.

- This leads to apparently 'ill-designed' buildings and IWD is 'blamed'.

- User committees have 'local' agenda and do not have the objective function of 'global' requirements/limitations/policy framework. There is no accountability with UC after the building is made.

- After the user committee OKs the plan, the community does not come to know that new building has been finalized and its on its way.

Shortcomings in the present model
Some other observations

- **Can a common policy formulation be done so that all the committees adhere to it?**

- **Can an expert consultant be hired who provides Green Suggestions, after looking at the architects plan?**

- **Can individual RnD/non-RnD projects be given separate new footprints?**

- **Unless 'average' space is allotted to each faculty member, can individuals get unusually large new spaces (foot prints)?**

- **In the emerging scenario, how do we bring in the Green Cell and the Environmental Advisory Committee?**

- **We have to be pragmatic enough that projects are not delayed.**

Possible Improvements?

Suggestion #1 → Strengthen Loop #1

- **Constitution of ISPAC be modified by inclusion of the following:**

    - Chairman GC or his nominee

    - PICs Civil/EE/HVAC be invited members (as needed)

Constitution of GC be modified by inclusion of the following:

    - Chairman ISPAC or his nominee

    - Convener, Environmental sub-committee of the FF

ISPAC recommendation notes, along with User Committee requirements must be immediately forwarded to GC and EAC so that they can raise relevant suggestions for the Loop #2 processes.

Possible Improvements?

Suggestion #2 → Strengthen Loop #2
Institute Building Clearance Committee (IBCC) be constituted
This committee meets AFTER Loop #2

SE IWD should make a detailed presentation of new building to this committee, after specs and location has been finalized by the User Committee and the Architect.

- Chairman EAC (Director)
- Deputy Director
- Chairman GC
- Chairman ISPAC
- Chairman User Committee
- External expert on Green Buildings/ Environmental issues

After this the institute can approach the UP state Environmental sub-committee for the mandatory clearance.

Clearance from this committee essentially means that the building is now finalized in all respects/ specifications/ location/ size/ area coverage etc. and is ready for construction subject to approvals from remaining statutory bodies and availability of finance.

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Requests

- Minutes of Open House on Master Plan be circulated.

- 25% perennially green zone be marked before new construction.

- Comprehensive and transparent space audit.

- Green Cell constitutes subcommittee for Neelgai issue.

- Construction flow be streamlined and transparent.

  - Include Green Cell as a regulatory body.

  - Aim for brownfield construction exclusively.

  - Make UCs accountable for final construction.

  - Seek expert opinion and environmental rating on final plans.

  - Min. volume of constructed space per unit area be imposed.

- New IITK website should have separate regularly updated section on green initiatives.

Thank you!

Questions/Suggestions/Criticism?

Acknowledgements

Bharat Lohani (CE)
Purnendu Bose (CE)
Kripa Shankar (IME)

I. **Land usage and biodiversity**: Need to restrict construction footprint to allow future expansion. 25% contiguous area to be kept as green should be inviolate, now and in future. Conserve wetlands, which are budding places for animals. Policy to handle wildlife on campus should be developed.

II. **Waste**: Recycling mechanism of domestic and official liquid and solid waste. Specify safety protocols for departments such as Chemistry, and BSBE for handling chemicals.

III. **Energy**: Airconditioning policy needed. Better construction will reduce heat load. Reduce use of glass in construction. Use of Solar power and biogas. Electricity usage should be metered in offices and labs.

IV. **Water**: Rainwater harvesting to be implemented throughout the campus. Address decreasing ground water levels on campus by ensuring natural and artificial recharge mechanisms. Rejuvenate dried and silted aquifers on campus. Need for clean surface water bodies on campus. Regulate water use: Drip irrigation could be extensively used. Trees preferred over lawns. Educate and trained manpower to maintain the rainwater harvesting infrastructure: frequent cleaning of filters.

V. **Construction**: Audit of existing old buildings for safety, energy and green footprint. Identify inefficient building. Demolish and reconstruct. Why not have G+12 storeys as opposed to G +6? What limits us at a particular number of storeys? Why do we limit to local contractors? Is that why we cannot incorporate more storeys or better efficiency in buildings? It's a fallacy to assume that net zero Carbon buildings are always expensive. Personal experiences indicate that IWD estimates for work often turn out to be unrealistically high. This should be addressed. TERI suggests ways to make buildings energy efficient.

VI. **Transparency**: Dissemination of Master Plan among community. Apart from planned construction, the master plan should also incorporate guiding principles for any future construction and renovation needs. Mechanisms for taking and considering feedback from the community should be devised. Uploading all data related to construction, energy and water consumption, waster, and space allocation should be uploaded on the website for greater transparency.