Moulding an Institutional Culture: a Microcosm of Society

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Abstract

Cultural landscapes embody the highest form of man-nature relationship, and are representational of societal culture. One of the most profound tools for a society to propagate its culture is an educational institution – one of its most influential cultural landmarks. An educational institution is not just a conservatory of culture, but a place for cultural exploration, promotion and advancement amongst thinkers and students alike, as well as an incubator of new cultural practices. Tomorrow's leaders and citizens alike are trained in these dedicated havens of exploration, amalgamation and development.

The symbolism of the institute is manifested in its built environment and campus. Institutional landscape is an intrinsic part of the representational value of the institutional culture, and forms an unforgettable part of the residents' memory. Amongst the well-known local spaces are the north lawns at CEPT University and the pigeon path at the National Institute of Design, Ahmedabad. Cultural values are imbibed from the lessons learnt in the landscape, references derived and ambience created as a part of the institution building activity. Many a student has compared situations or places in life to their alma-mater in order to derive analogy or grasp the scale.

Institutions promote excellence based on their ability to offer a conducive environment and culture. Today, knowledge bank, mentors and environment are the weighing scales for an institution's reputation. Landscape becomes a part of the enabling infrastructure, which lends a general ambience and wherein all activities take place. Landscape further provides a medium for exposure to and active appreciation of cultural and environmental aspects, while providing a snapshot of life in an ideal environment – buffered from the travails of the present society. Institutional landscape thus becomes a lasting legacy in the minds of the residents – present and past, of an ideal world that they aspire to achieve through their personal endeavors.

This paper explores design of institutional landscape as a means of establishing and enhancing institutional culture and imbibing ideal societal values. The paper shall demonstrate ideas of cultural landscapes as institution builders through design case studies from institutional projects undertaken by the author. It will outline the role of landscape as a process – designed or natural, observed by campus residents and ideas on landscape communicated as integral to creation of an institutional culture.

Introduction

Universities started as places of religious learning, development & propagation of faith. Art and architecture have been symbols of religion and communities since time immemorial, be it physical (churches, temples) or mythical (bostan, gulistan, hanging gardens). Early institutions directly emulated religious symbols by looking like churches and temples or being situated within them.

As science becomes our new religion, educational & research campuses will become our new temples of faith, producing its new proponents. In a secular and decreasingly religious world, institutions turn to progressive ideas like sustainability for continuation of human race. Every modern university strives to attract following by promoting its agenda through attractive campuses, exhibition of knowledge, community participation – a peep into the ideal life, promotion of arts and existence within nature – the ultimate human aspiration. This cultural instinct sets pace for development of ideal institutional landscapes that have demonstrated the following physical development through change in social patterns:
- courtyard based symbolic religious buildings
- return to nature as respite from dirty & vicious cities

- cities of learning (urban communities)
- technological prowess through architectural innovation
- Sustainable and low energy developments

This paper reviews institution building through ages, its physical construct, the Indian age of institutions and current trends in institution development in India. It focuses on landscape planning and design as a tool for institution building.

Origins of a University from religion – a brief history

A University's prime function is preservation and development of knowledge. In any society, search for and preservation of knowledge requires a huge resource input with no immediate benefits. In smaller societies, knowledge was propagated through inherited folk traditions, without any formal process for knowledge development. Hence knowledge accumulated slowly, many a times being forgotten and redeveloped.

With the advent of agriculture, societies settled and expanded, their output increased and surpluses were available. Availability of time, scale and surplus together gave rise to hierarchy of social management, which was applied through religion in most societies. Religion here is broadly defined as an informal or formal institution or 'leader as god' concept that generates social rules of existence and engagement, followed by everyone.

Religion assumed the responsibilities of preserving and controlling distribution of knowledge, selectively providing its benefits within society and strengthening itself. This in turn reinforced society's belief in religion. As religions started formalizing into large institutions, specialized places for knowledge preservation and development were established. Nalanda, Takshashila, Oxford and Cambridge are all examples of religion based knowledge institutions. From informal preservation and propagation in traditional "guru-shishya" (mentor - student) relationship, these institutions created a formal environment for centralized knowledge collection, storage and controlled propagation.

Evolution of a University in the Indian Context

India is home to several world religions. Buddhism, which originated in India and spread around the world, has a rich history of development of knowledge centres. Gautam Buddha and his disciples chose to tour their entire life spreading the message of Buddhism. Buddhism became more complex as knowledge was accumulated and transferred within the followers. Many kings and kingdoms embraced Buddhism and the new message of enlightenment, especially the downtrodden.

After the demise of Buddha, the tradition of travelling monks continued. In the absence of written codes of Buddhism, various interpretations of Buddhism existed. Wherever monks from differing schools gathered, debates on Buddhism ensued. These informal exchanges were found most when monks needed to take shelter from extreme weather, especially rain.

Laypeople and Buddhist followers started establishing formal 'vassa' or 'avassa' (rain shelters) for the monks at regular distances. As these became places of resting and congregation, monks would use them for debates and meditation. Over time the 'avasaa' transformed into a 'Vihara' – a complex building with a hall for congregation, prayers and debates surrounded by small individual rooms for meditation and self-learning. Viharas expanded infrastructure, having their own wells and storage tanks, expanding from shelters to permanent residences for many monks.

Viharas further transformed into residences - 'Sanghamara' or monasteries, where monks developed as well as refined Buddhism. Over time, and due to pressure from donors – especially kings, study of religion expanded to include medicine, natural sciences, society, etc. The increasing power of knowledge also led to increasing donations and hence increasing size of the institution of monastery.

Nalanda was one of such monasteries established. As more monasteries were added to the complex with each donation, along with stupas and temples, a large campus came into being. The open message of Buddhism also embraced learning of not just science along with Buddhism, but that of other religions as well. The yearning for knowledge and development in a multi-disciplinary environment drew students from afar and foreign lands, creating an international institution.

It is recorded that thousands of students lived at Nalanda, studying a variety of subjects. In order to support this population, local kings provided it with grant of surrounding villages, whose surpluses were provided to Nalanda. At its peak Nalanda was a kilometre and half long campus with several monasteries and temples, and described somewhat exaggeratedly by Chinese traveller Fa-Hsien to have towering buildings that reached the clouds. This exaggerated symbolism helped establish the fame of Nalanda around the world in medieval age.

Physical manifestation of the University - Early Campus Planning

Oxford is one of the oldest Universities surviving till date. It is not a planned campus, but rather a series of successive developments that blend into the urban core.

Figure 1: Nalanda University Campus

Oxford college operated under the aegis of religion as well as monarchy. It propagated and developed religion through knowledge. The first Oxford residential college building, New College, was designed as a quadrangle that provided protection from the city and controlled access. The layout also afforded a distraction free monastic environment for learning, with multiple staircases leading to distributed residential chambers much like a Buddhist vihara, with inward looking windows. A common space was used by the master to teach students, but there was no choice of subjects at that point of time. The quadrangle design was also required for defense from invaders.

As the English kingdom expanded and need for defense reduced, the quadrangle layout was deconstructed in succeeding college designs starting with the Caius Court at Cambridge that had a bounding wall and monumental gate on on side. 16th and 17th century colleges had a U-shaped layout with the president's house in the centre, two bays of residential student quarters, and a central courtyard opening on to the street on the fourth side. This design became the template for all future colleges and thereafter – Universities. It was also the same time when learning systems opened up beyond religion and choice of subjects increased.
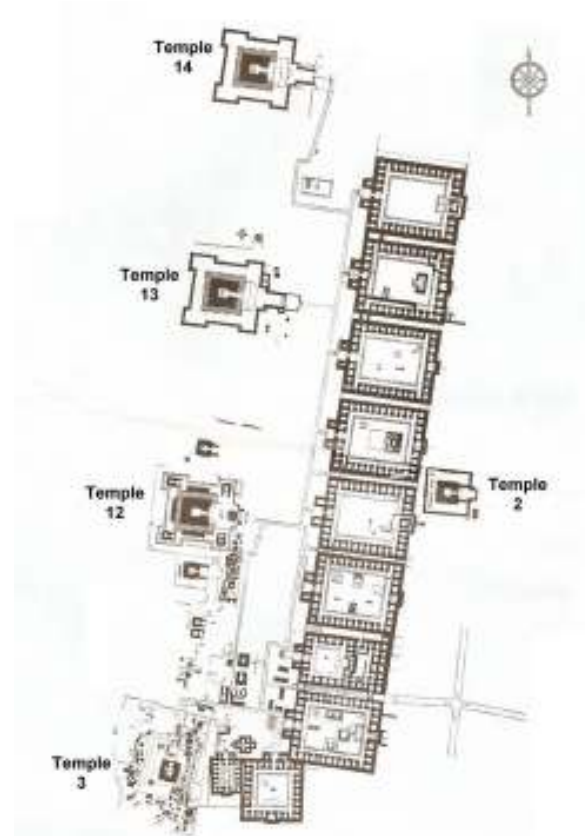

Figure 2: Caius Court, Cambridge

Symbolism of the institution's architectural layout and planning was imprinted in the laypeople's minds, and carried over zealously to the American soil, where Universities were initially established in the same design. Harvard broke this tradition, more out of need, since it was established in a donated former cowshed, and hence known as Harvard yard. Harvard was a solitary building housing all the functions- residential and congregational. At a later period, Harvard did try to establish the open quadrangle by adding buildings in that fashion.

Another institutional design that modified the tradition was Princeton – a conservative college that believed in living afar from society for pure learning. The Princeton building was established far from the road and an open space between the building and road came to be known as campus (Latin for open space), being the precursor to the modern day use of the word campus. The campus came to be used by students for recreation.

Thomas Jefferson pioneered another design change at the University of Virginia by adding a mall around the campus that connected several buildings and enclosed the campus. Each building had a master and student accommodation along with teaching spaces, with the presidents' house at the centre.

Figure 3: Comparison of American College Layouts

Increasingly, 17th and 18th century cities came to be seen as places of vice and moral derogation, due to which universities wanted to disassociate themselves with urban life. This concept was first promoted by special women's colleges promising solace in untouched nature. These institutions highlighted the idea of an independent community in a secure environment (read as a single connected building for women's safety) far away from the city where ladies could co-habit and learn without undue urban influences.
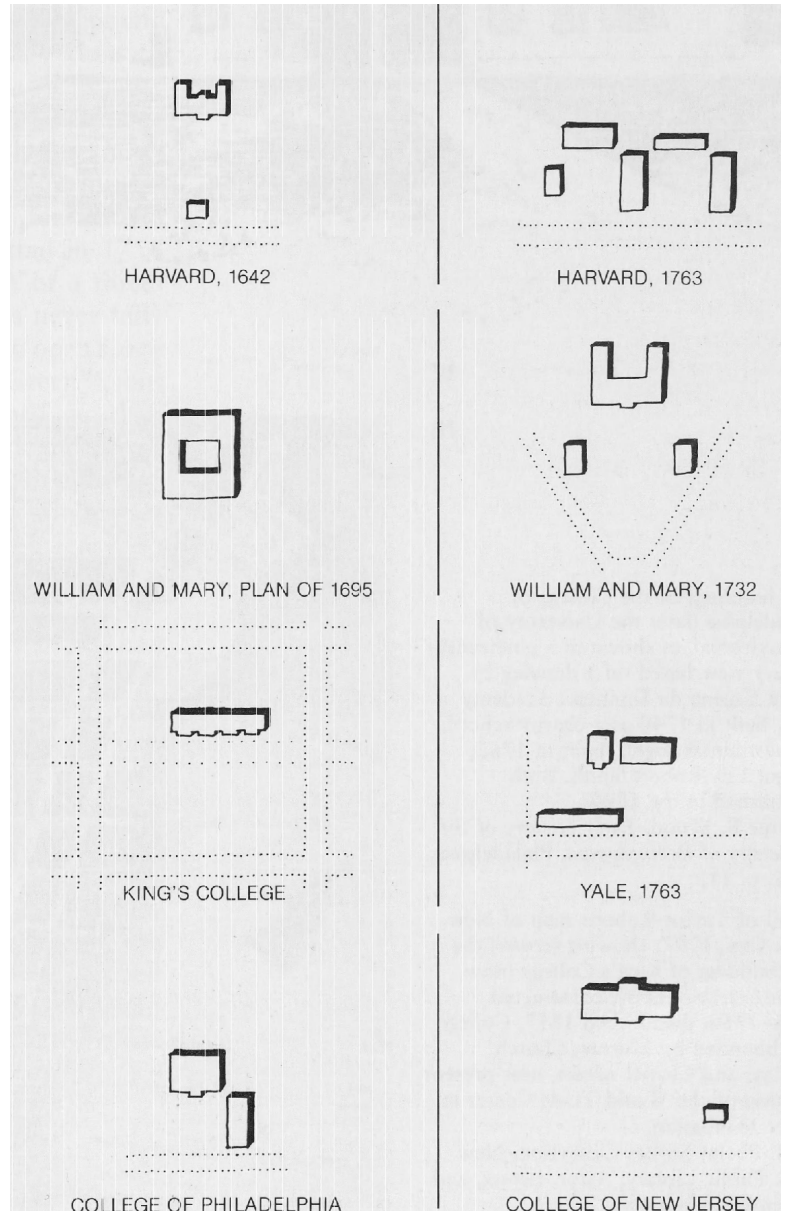

Figure 4: University of Virginia by Thomas Jefferson

General universities and colleges saw merit in this system, and started developing campuses in pristine natural environments. Frederick Law Olmstead designed a picturesque campus master plan for Stanford University that idolized the English movement. The master plan remained unbuilt, yet influenced the design of many subsequent universities. Olmstead's design integrated the community and university into one large picturesque natural township, creating a model educational city having shared spaces and resources with community. The buildings were envisaged as secondary elements hidden in the landscape, with separate units for each field of education. The campus encouraged pedestrian movement through natural spaces. This template and its modifications have been followed to present day for establishment of several new universities around the world.
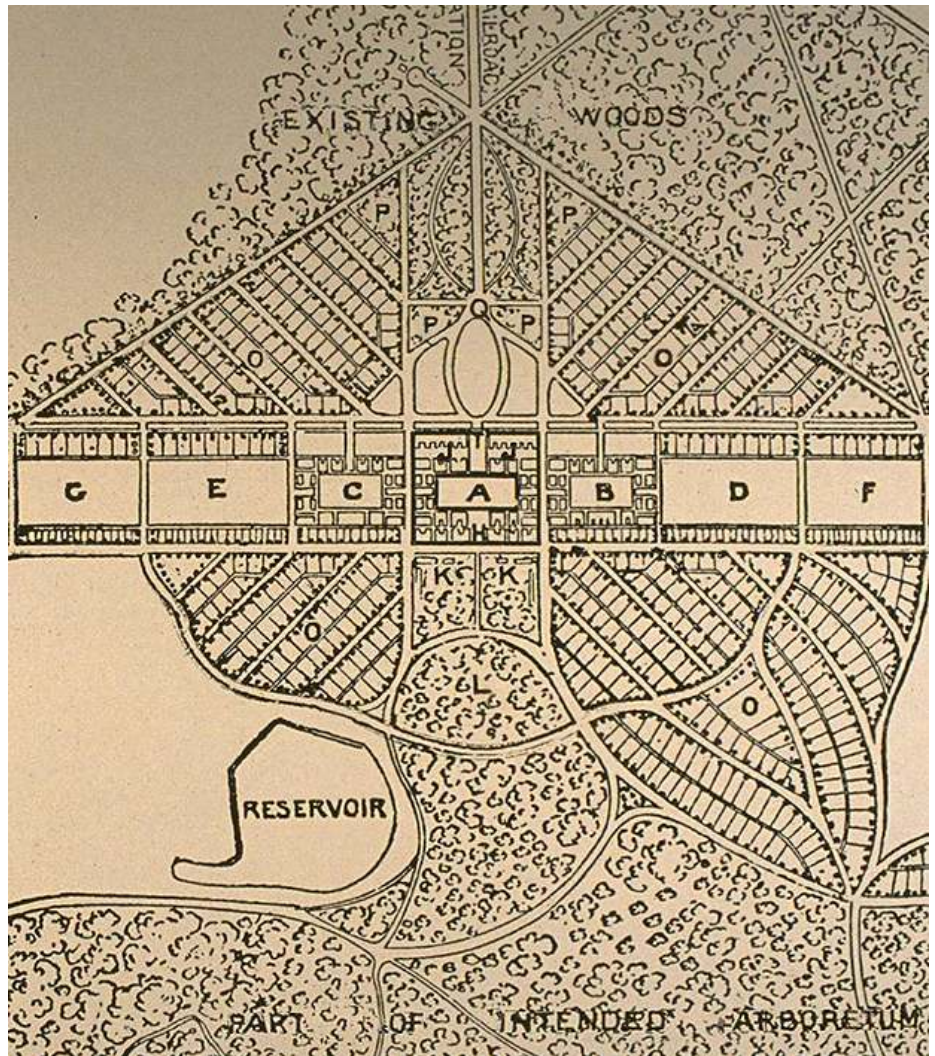
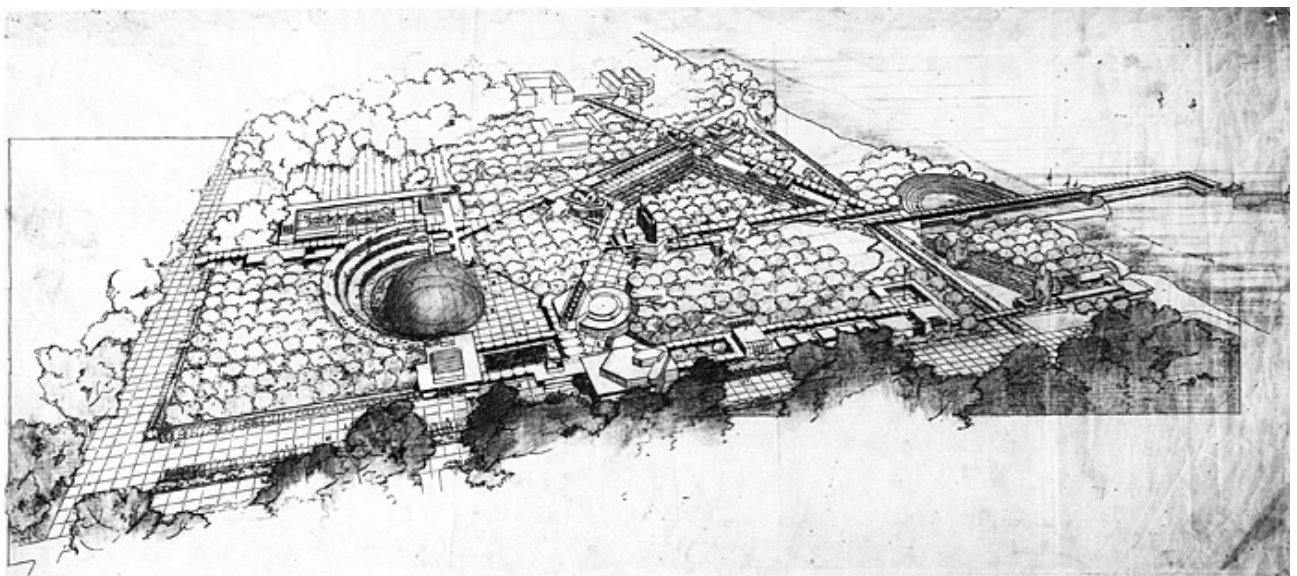Figure 5: Stanford University Masterplan by FL Olmstead

Figure 6: Florida Southern College by FL Wright

Symbolism in Universities

As several universities came into being, they competed for membership, growth and attraction of talent. Physical symbols became important to attract following and create a sense of belonging. Religion again provided an ideology – the grand temples, churches and mosques as dominant symbols in any old city were emulated by Universities. European universities had literally started inside religious buildings, and hence copied their character.

American universities started on the same symbolic note, but as the progressive culture demanded freedom from the European threads, traditional Greek & Roman building styles were emulated to create grand forms that symbolically connected to the roots of knowledge. These ideas continued till the International Architectural Style was adopted by free thinking new European Universities like Beux-Arts Ecole and Bauhaus, and brought to the American soils via Frank Lloyd Wright's design for Florida Southern College through sweeping modernist forms and buildings.

University as a city

The next phase of change in physical design of a University was required due to location of many universities within tight urban areas and introduction of the middle-class automobiles. While urban universities were relegated to high-rise large floor-plate buildings, suburban universities where students commuted from cities started being designed around internal road networks and large parking lots with long walking distances.

This led to development of individual courses based buildings having specialization & distributed across campus along with complementary student housing accessed only through automobile. As students were distributed, affinity for specific areas and buildings – all parts of the same university, led to formation of varied student groups.

The student-master relationship diluted with mass-communication based education, and the need for supplementary self-education and peer-supported education came into being. Universities responded by creation of student amenities for congregation and learning, food and daily rations, complemented with recreational and sports facilities to create a truly student oriented building complex. In parallel, importance of sport in universities, especially in the USA, led to development of large sports and fitness complexes as attractions for potential students.

Such increasing scale truly led to the phrase 'University town' where a university became a community with its own complexity, infrastructure variety of land uses, residential areas and scale reaching thousands of residents. University design gained ideas from urban planning for traffic and development management. At some point, it was realized that a truly complete master plan could never be created since the objectives of the University changed every few decades. New university designers imbibed organic growth models in their design, thus truly reaching the design scale and complexity of a city.

Summarizing global institutional development

Universities have progressed from small isolated units to large city scaled campuses. The symbolic focus for knowledge that was represented via iconic architecture has continued to modern day, complemented by several ideas at different points of time, ranging from nature, connectivity, urbanism, technology and now sustainability. Starting from Olmstead's master plans, landscape has increasingly played an important role in campus design, and evolved from a mere backdrop to one of the foundations on which sustainability of the institution rests. Landscape planning contributes to the campus master plan on an equal footing, establishing many cultural idioms that contribute to the place making and image of the institution.

Independent India's Institutional legacy

Continuing from traditions of ancient universities like Nalanda and Taxila, knowledge arose from religion and was subsequently shared by the ruling class or their private institutions. Several rulers also established colleges and universities for their populace, many of which are in function till date. These were mostly converted from old palaces and houses, and in some cases showcase buildings like the Kala Bhavan at the Maharaja Sayajirao University of Baroda, that symbolized the state's architecture. The Europe educated rulers introduced European architecture not just in their cities but also in educational institutes.

As independence dawned on India, its foreign educated leaders embraced institution building for development based on their experiences abroad. The grand vision of the first few decades has led to establishment of world class institutions like the Indian Institutes of Technology, Management and Science, as well as a strong space research program and institution. Further, several national and regional universities were promoted and funded, creating a network of education accessible to the vast Indian sub-continent.

The institution builders also followed symbolic gestures of their European and American counterparts, creating grand buildings and campuses, often involving renowned foreign architects and their Indian proteges. The public desire to dissociate from the old rulers led to embracing of the modernist architectural style, famously brought by Le Corbusier into design of Chandigarh and Louis I Kahn into the Indian Institute of Management at Ahmedabad. The age and ethos of Indian institution building has been well documented by Kanvinde in his book on Indian Campus Planning.

Several institutional prototypes developed and co-existed within the vast Indian landscape - unitary buildings, tightly knit urban campuses, suburban campuses, vehicle oriented campuses as well as campuses within nature. Modern Indian institutions have largely followed and kept pace with the global institutional paradigm of physical design.

As India established its identity the global arena post liberalization, another wave of institution building had arrived. This wave was led not by government funded institutions, but independent corporate campuses, foreign universities and autonomous bodies, not limited to education but expanding into cutting edge research. The thirst for a globally acceptable identity was visible in several corporate campuses that dwarfed the scales of established universities. Questions regarding identity through architecture have been well presented in Rahul Mehrotra's book on Indian Architecture.

The latest wave of institution building vies with and sets pace for global competition, not being content with following the world, but experimenting to create examplary campuses. An overview of campus design briefs in design competitions for new campuses demand not just a physical program to be satisfied, but new ways of providing experience, establishing a new ideology, creating a new symbolism - becoming true torch bearers of the future.

Designing a modern university is equivalent to future exploration & experimentation – path setting for modern areas. The intent of a university landscape becomes imbibement of values that society considers ideal in students.

Perception of a modern Indian Institutional Campus
An institutional campus in India is envisaged as an ideal city developed far from fast-paced cyclic urban life, having a strong sense of belonging to its region, vehicle free campuses with open access to most areas, social transparency & acceptance across all categories in the true democratic sense. Ideal surroundings also include natural preserves for recreation, buffers and vistas, leveraging a secluded environment that helps one focus on their work & thoughts, free from any distractions – mainly vehicles, noise & advertisement hoardings.

The environment has fewer distractions from the learning mode, in the sense that there are very few children, facilities are paid for or subsidized & there is no struggle to access basic amenities – maximizing

time available to focus on one's thoughts & work. These activities together also increase recreation in various ways, including nature observation, appreciation exploration & interaction.

Established campus culture tunes itself to explore finesse and complexities of nature over entire year, provides a focused view & appreciation to be pondered upon & absorbed or imbibed, which has previously not been possible in urban areas. The monastic idea then continues as a theme to liberate the individual from worldly life & reside into a greater life – albeit not completely bereft of luxuries & distractions, but providing adequate time & energy to concentrate on interacting with society, community & nature.

All master planners of the day try to integrate & preserve this strength of the institutional cultural landscape via creation of spaces for impromptu discussions between students & faculty, recreational spaces, activity spaces, nature walks, nature buffers & preserves, separation of vehicular areas, vistas of natural areas, etc. Together, these create an idealized world that any student in a normal urban institute will never experience.

Self-learning is also encouraged, leading to an individual search for mentors & inspirations – human and non-human, physical and metaphysical – an environment that fosters ideas & thoughts that transcend the boundaries of normal urban life. Physical constructs may differ from being a central academic zone to distributed individual buildings with integrated student residences across the campus, but the ideal of rootedness to nature & community is never lost on the master plan.

Also taking roots are various political movements & ideas for an ideal community & country, whereby democratic ways of decision-making are observed in process directly, partaken of and community strength is experienced as well as strengthened. Hence, the university also becomes one of the first locales where an individual learns &, on virtue of compact community, partakes of social politics.

Modern universities thus take the path of leading the nation & becoming ideal communities for living – providing the society at large with a physical & social template to be emulated or integrated. Universities, funded by the society & state, are experimenting with campus developments that provide the next leap of development of the city – self-sustenance, energy conservation & generation, net-zero development, etc – experimental ideas that will help currently faltering cities modify their trajectories to integrate sustainable development.

Designing a modern Institution
Today, India is a young confident nation, proud of its heritage and competing globally with the world's best. It no longer needs the veil of westernization or borrowed satisfaction through western symbolism. India is developing its own art, aesthetics and symbolism that it flaunts through newly acquired prosperity. Institutions are the leading symbols of Indian knowledge, competitiveness and prosperity and intend to demonstrate it through renewed institution building.

The physical manifestation of this ethos leads to dissociation from western symbols, and yearning for new Indian ness, demanding new forms of art and architecture or those derived from ancient Indian culture. This identity inculcates progressive thinking, yearning for knowledge, a new social program and very importantly an embracement of natural systems against the backdrop of global warming and pollution.

Modern institutions promote learning environment that inherently allow appreciation and preservation of nature to future citizens, as well as practical demonstration of sustainable lifestyles and cities through on-campus experiments and initiatives. As an example, the newly established Nalanda University at Rajgir, Bihar, where in the author consults, has declared that it will create a net-zero campus - one that balances natural resources over its life cycle. To this end, the campus is exploring new technologies and experimental systems not implemented anywhere in the world till date, even in likes of Masdar Net-Zero City, Abu Dhabi.

The initiative is highly symbolic, but not merely so. The institution also wishes to inculcate a genuine respect for its surroundings by conserving water, developing technologies that will aid surrounding small farmers, creating a local market that provides services to the university and supports the surrounding communities economically, as well as generating its own energy in the long run by using waste and the sun.

Respect for nature, and search for ways of achieving a sustainable balance are being increasingly accepted in the public domain through pioneering support of such institutions. It promotes research on sustainable communities and cities, ultimately providing a new urban development template.

No longer do institutions delve on picturesque surroundings that replace the native landscape with a foreign look. Design briefs increasingly demand completely native plantation, ban on exotic weeds, low water footprints and complete re-use of waste water in landscape. It is more important for the campuses to blend in the natural surroundings, or create a preserved natural area in absence of such surroundings. Long term landscape upgradation strategies are being accepted against mass forestry promoted earlier, and respect for the correct process rather than outcome has allowed many experiments to be practiced.

In view of such positive developments, the landscape becomes one of the symbols of institutional identity, not relegated into an aesthetic background, but brought to the forefront of awareness and acceptance.

The author is currently working on two institutions of national importance, both of which have design briefs that promote walkable vehicle free campuses, complete segregation and reuse of waste, water conservation and complete recycling, use of renewable sources of energy, and minimum damage to environment as requirements of development. These two cases are presented hereafter.

Landscape of Indian Institute of Management Udaipur – stewardship of natural resources
The site of the proposed new campus of the Indian Institute of Management Udaipur (IIMU) is nestled in a degraded portion of the Aravallis just outside Udaipur. The terrain is hilly with a large part of the site having steep slopes of the order of 45 degrees and above, creating several local ridges and depressions. Existing landscape consists of exposed laminar rock covered by straggly scrub, which denotes advanced stages of forest degradation due to grazing and other human impacts. The region receives 650mm of rainfall, and high runoffs generated from barren steep slopes in the site drain into a seasonal stream that dissects the site from North to South forming a 50 metres deep central valley and dividing the site into two distinct parts.
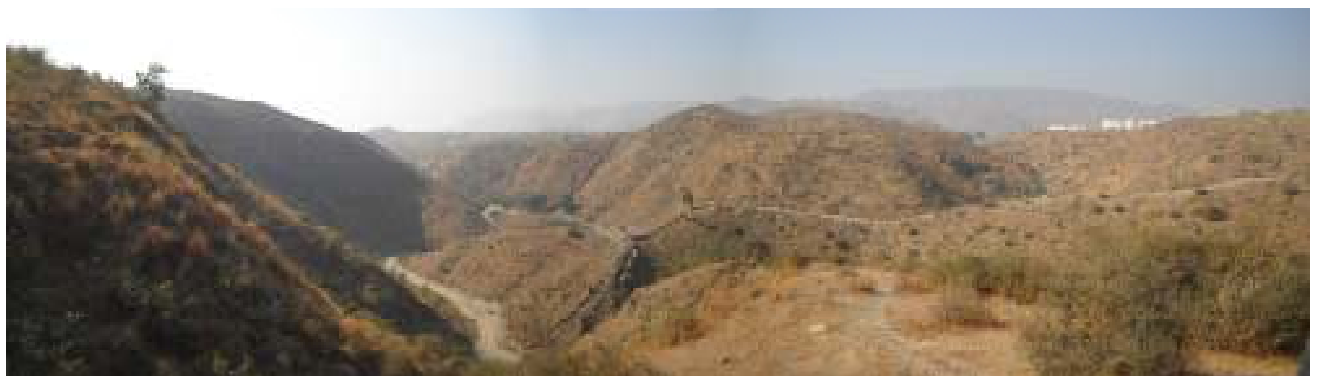

Figure 7: Proposed site of the Indian Institute of Management Udaipur

Landscape Planning
IIMU development master plan is based on critical analysis of ecosystem services demand, striving to reduce its ecological footprint by incorporating strategies like 100% rainwater harvesting and wastewater reuse, use of solar energy to reduce overall power demand, recycling organic wastes, landscape up gradation and

development for strengthening ecosystem services. Landscape is envisaged as a complete ecosystem which includes the human society as an equal partn   Figure 4: University of Virginia by Thomas Jefferson   lanced manner. Proposed techniques of landscape development provide adequate involvement opportunities for local people who have been using the site for foraging, grazing, fuel wood and flora based products.

In a region having low rainfall and no current surplus water reserves, the first step is to develop a resilient water balance that will allow the campus to sustain and develop itself. The next step is to examine the status of biodiversity in the region, and allow IIMU to steward the development of a climatically suitable climax forest in the long run, which will increase biomass, provide adequate renewable resources and enhance the regional ecosystem. The final step looks at integration of society within the landscape envelope, not just by creating physical resources for consumption, but also generating a landscape imagery that integrates the campus intrinsically with the region. The site is proposed to have three landscape zones – social zone which includes the built areas, public and outreach zone for general public and surrounding community and forest zone which shall be a largely undisturbed ecosystem.
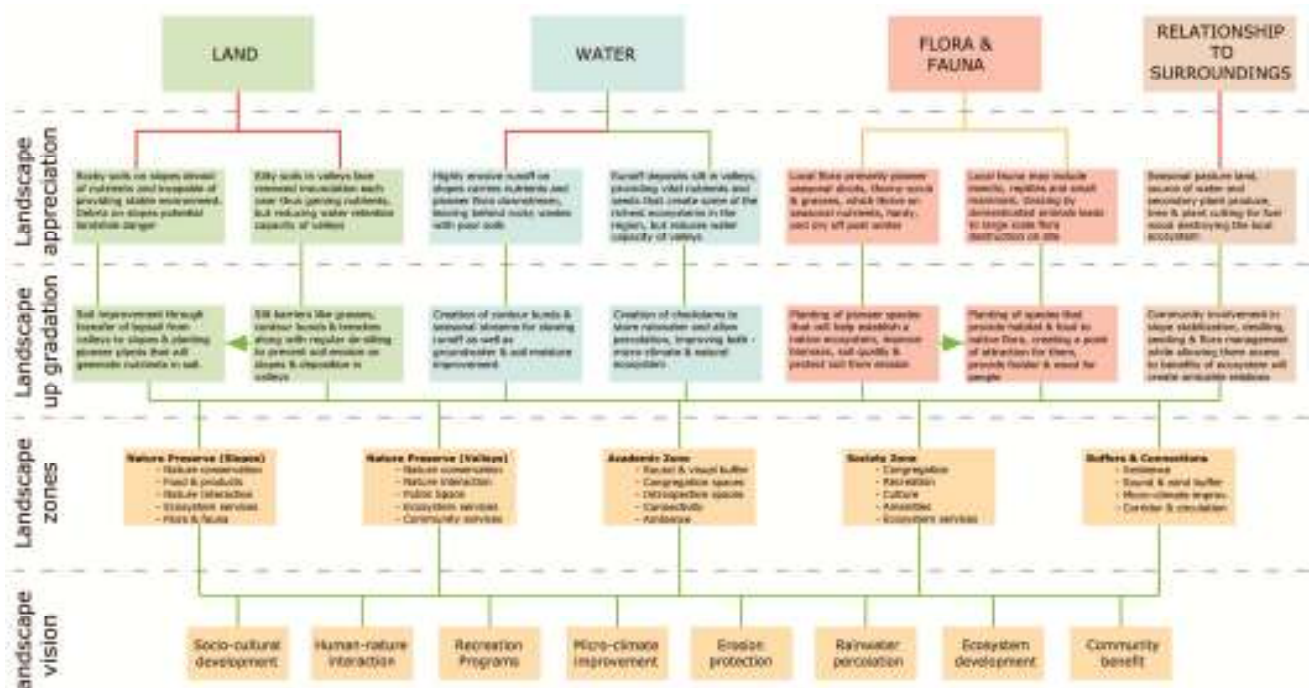

Figure 8: Proposed landscape strategy for IIMU Campus

Water Systems – keystone of development
The master plan takes inspiration from local water management culture, and reinvigorates it. Taking cue from Udaipur – city of lakes, a successful example of rainwater harvesting in a water starved region, landscape of IIMU activates itself around rainwater harvesting systems. An elaborate exercise to determine the campus water budget in a sequential manner allows one to manage water resources for initiating landscape up gradation processes immediately, followed by diversion of surplus water from established landscapes to human needs as the campus is populated. Balance reverses and rainwater are diverted for human consumption while treated wastewater is supplied to landscape. Water balance of the campus aims to supply the entire water demand by rainwater harvesting measures proposed on-site, along with substantial support from treated sewage water that will be generated after the campus is operational.

Storage of rainwater is a critical factor since no natural water body exists on-site while the aquifer cannot facilitate such large quantities of annual injection and withdrawal. If one examines creation of check dams in valleys to store rainwater, standing water presents a formidable force in itself waiting to be unleashed,

making traditional dam structures at once expensive and difficult to manage for an institution. Hence, another direction is being explored by excavation of lakes in valley beds in lieu of check dams, and balancing it with the earthwork filling required for construction on the hilly site. This concept is also in line with the overall strategy of transferring accumulated topsoil in valley beds to slopes and hilltops for establishment of vegetation. Seasonal rills were identified leading from micro-catchments on higher elevation to those on lower elevations, allowing establishment of water storage locations for each micro as well as macro catchment.

Lake development for each macro catchment will be supported by critical erosion control measures like contour trenches, contour bunds, pitching and vegetative barriers to prevent silting of these reservoirs. Another line of defence against silting shall be creation of smaller gabion-bund based check dams in each micro-catchment, which will filter silt, spread soil moisture in micro-catchments and allow seepage of rainwater to macro-catchment lakes over a period of few months. Since smaller reservoirs are proposed to dry out by end of winter, annual de-silting can be taken up to transfer accumulated silt back to the slopes.

The final part of this scheme links all reservoirs to central lake by means of a solar pumping system. Central lake in front of academic block is envisaged as a public place open to people of the region for recreational activities. This lake shall receive water daily from all water bodies, and in turn be used for withdrawal of daily water requirements of the campus. While other water bodies in the campus shall turn into wetlands by end of summer, central lake shall only lose a few metres of water depth, which shall be replenished with the first few rains. While natural percolation is undisturbed in all lakes except central lake, biodegradable consumption-safe evaporation control chemicals shall be used to prevent losses.
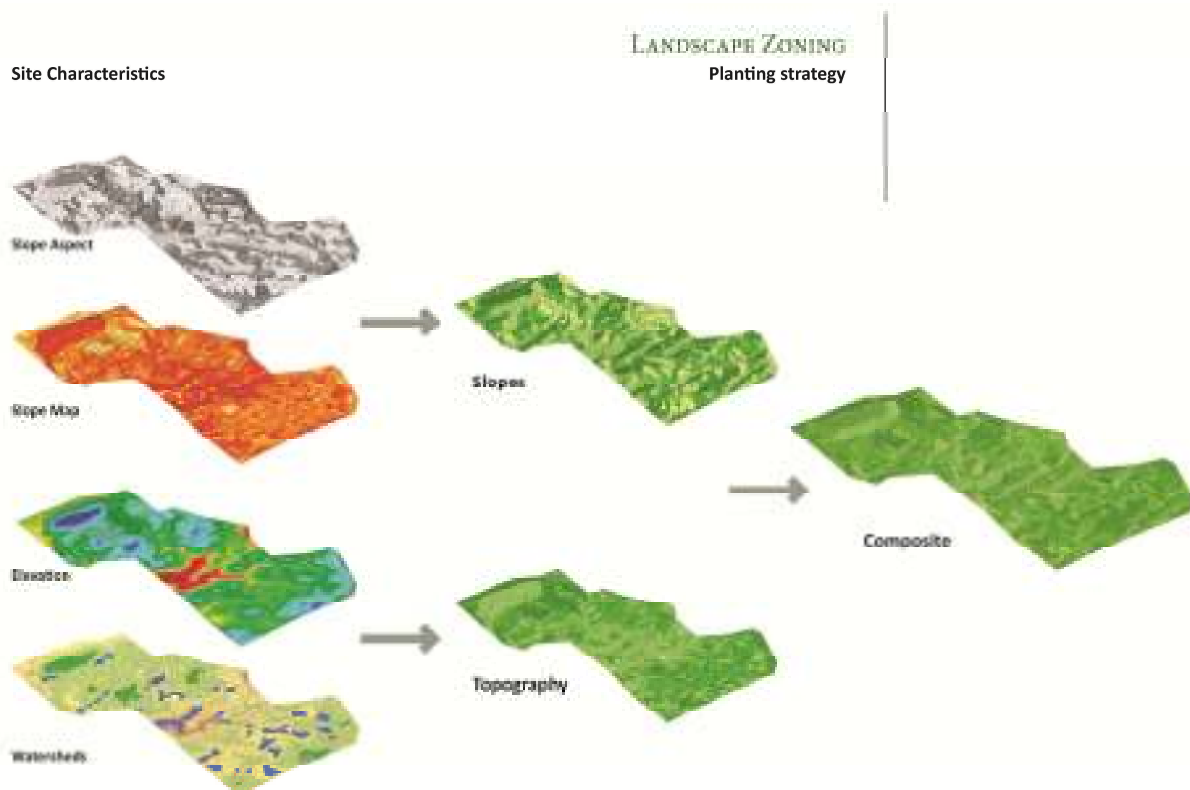

Figure 9: Natural Resource Analysis for IIMU Campus

Resilience has been achieved in water balance by using only 36% of last 50 years' average annual rainfall even on steep slopes, and augmenting capacity through slow runoff from silt barriers and micro-catchment reservoirs.

Flora – ecosystem up gradation

Once lakes are activated, each catchment will be further strengthened by establishment of pioneer vegetation, contour bunds and trenches that will reduce the runoff velocity and prevent surface erosion. A strong maintenance cycle supported by employing local people will ensure vegetation establishment in a decade or so. Outreach areas shall be dedicated to growth of fruit and minor forest produce bearing plants as well as fodder grasses that sustain the local community.

The site was mapped for slope gradients, aspect, areas exposed as well as protected from wind and sun during each season. A planting palette is being developed for each of the mapping parameters in order of natural succession for each ecosystem. For example, steep slopes are proposed to be planted with deep rooted perennial grasses with high biomass value in order to hold transferred soil and increase its nutrient content.

The immediate requirement of increasing overall biomass on site is achieved through use of rapidly growing grasses and shrubs along with nitrogen fixers, in order to allow the permanent vegetation to be planted after two-three seasons in a naturally rich soil media. Ecological resilience is also being factored in by including drought hardy plants and those having minimal evapotranspiration losses, wind-breaks, fire-breaks, plants capable of growing on rocky-gravelly areas along with a rich mix of plants with varying speeds of growth and life-cycles to enable self-healing in times of stress or natural aberrations.

Society & Landscape – resources & imagery

The final directive is to generate stewardship of community development, which shall be in form of knowledge and resources both. Hence, the plant palette shall include fodder grasses as well as plants that provide fuel wood, seasonal fruits and other minor forest produce to be collected and used by locals as a part of the maintenance strategy. The campus shall thus become a source of sustenance and development for the surrounding population, creating a symbiotic relationship.

IIMU's stewardship of regional landscape needs to be reinforced with the experiential landscape of the campus. The focus of this strategy is establishment of two large civic zones, one each in west and east campus. These zones will cater to a variety of civic and recreational needs through active and passive recreation, exhibition and performance areas, and congregation areas as well as sports facilities. In addition,
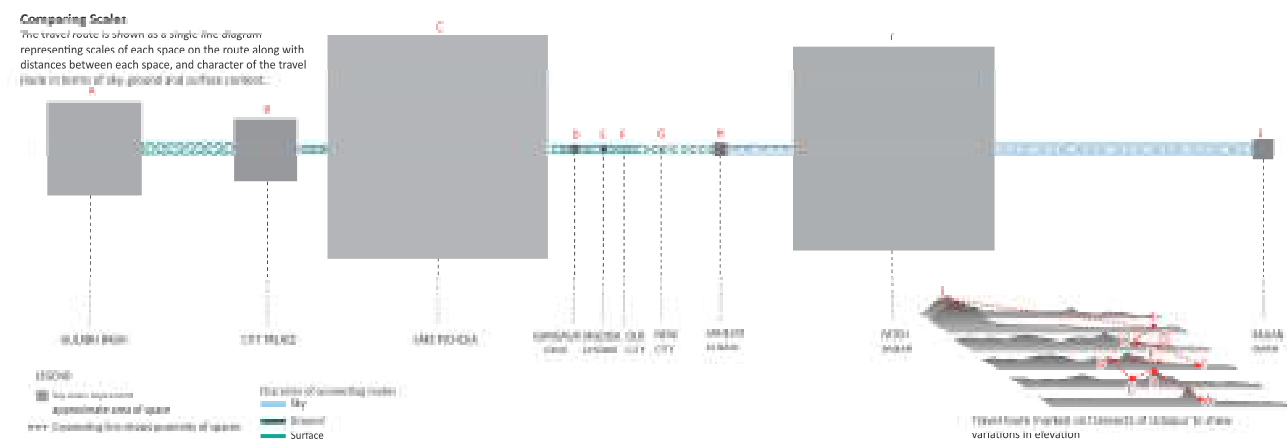

Figure 10: Mapping Udaipur as a tourist path

these areas shall also allow recreational trekking within a part of the campus, providing exposure to the campus stewardship initiatives and exploration of biodiversity expected to settle in after a decade or so. The centrepiece of this zone shall be the central lake that will generate a complementary passive recreation and social activities.

The language of landscape imagery is proposed to be consistent with that of a hilly city, and the design team has documented Udaipur's old city to understand the various facets of urbanity that makes traditional towns a haven for social interaction. Taking inspiration from great public places encountered in Udaipur old city, the master plan derives formulae for overlapping uses and utilization of public spaces within the campus.

Figure 11: Mapping tourist path at Udaipur City Palace

Movement in the hilly site will be negotiated through creation of multi-activity spines that allow one's vision to fluidly change between ground plane and the sky in designed sequences reminiscent of hilly fort cities like Udaipur and Chittorgarh. Variety and interest will achieved by modulating the proportions of datum, sky and vertical surfaces along the movement spines and in sequential nodes within each district. The open spaces character of a hot arid town consisting of shaded narrow streets and tight openings: "chowks" provide an eccentric grid for the campus as it blends itself within the site topography. Taking further inspiration, the campus is designed as a delightful non-motorized transit community that is traversed by various pedestrian priority streets, pedestrian only walkways and bicycle ways that promote a healthier campus lifestyle and
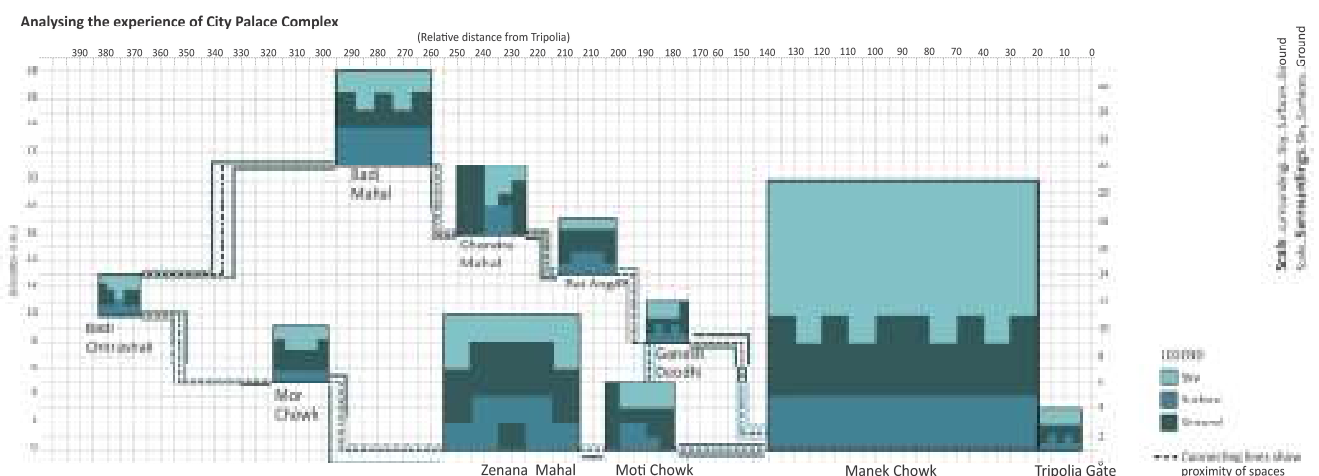

Figure 12: Perceiving scales and natural elements at City Palace Udaipur

generate interactions not just amongst people, but also with the landscape.

Vistas from each part of the site shall be emphasized by creation of pause spaces, plazas and change of movement directions. Exploration of nature shall be encouraged by creating informal trails within the afforestation areas. The material palette is completely composed of native stones and plants that blend into the surroundings with ease. Seasonal as well as diurnal changes are being analyzed, to be included as a part of the landscape system providing subconscious connections to the landscape.

Overall, the proposed master plan strategies will allow users to balance their life inside and outside buildings, experience and appreciate the idea of sustainable natural neighbourhoods, and very importantly- imbibe values of partnership with nature for future development.

Landscape of Nalanda University - A Sustainable Initiative
Indian Government has proposed an international University near the site of the former Nalanda University that will revive its former glory as an international centre of knowledge. The proposed Nalanda University lies in an area bestowed with rich natural resources. Institutions in this region have a history of successful co-existential relationships with surrounding human and natural environment, which have resulted in a vibrant
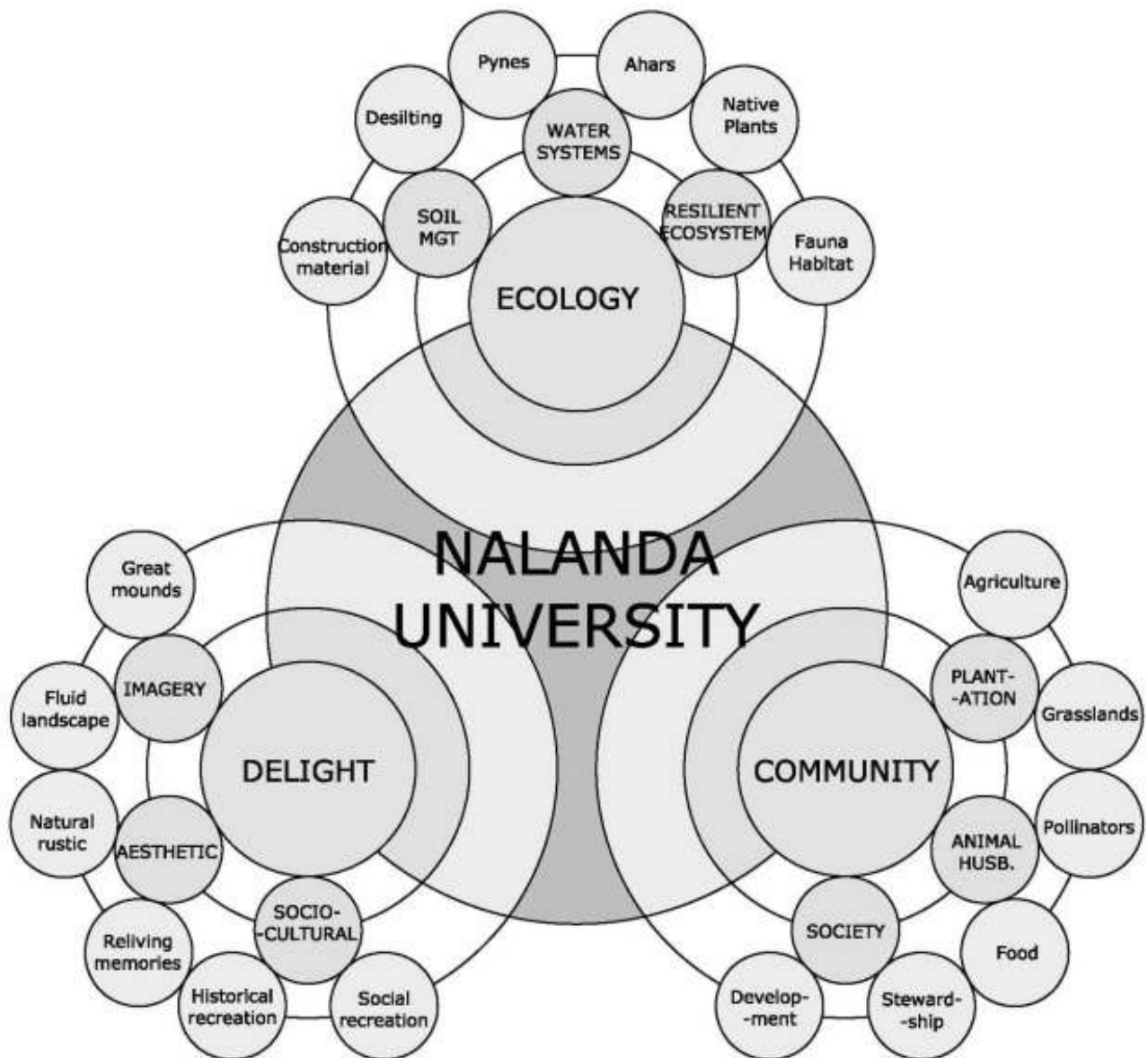
Figure 13: Landscape master plan concept for Nalanda University

cultural heritage. Nalanda University must look at a landscape that acts as a steward to its region of influence through a comprehensive program encompassing ecology, community and culture.

The region has a rich ecosystem based on the Gangetic flood plains dominated by hot-humid climate, alluvial geology, rich clayey soils, high groundwater table, flat terrain and sub-tropical dry deciduous forests. Human society is overwhelmingly agrarian with a long history of smaller administrative units supporting a group of villages, and shrinking size of land-holdings. Traditional agriculture can thrive naturally without any support, but modern mechanized and bio-engineered agriculture requires enormous resources that strain the ecosystem. As the region moves from traditional to modern systems, the ecosystem is experiencing increasing stress.

While modern aspirations cannot be subdued, it is imperative to replace modern command-control engineering based systems with community driven participatory systems, especially to enliven the human-nature connect that is fast diminishing.

The landscape of Nalanda University is poised to become a resilient ecosystem that provides varied native experiences while traversing the University to encourage pedestrian and non-motorized transit along with multiverse outdoor academic and recreational activities; and also benefits the University's surroundings by stewarding a native culture based landscape interaction process. The landscape development process shall integrate establishment of outreach centres in the surrounding rural areas that will aid in dissemination of
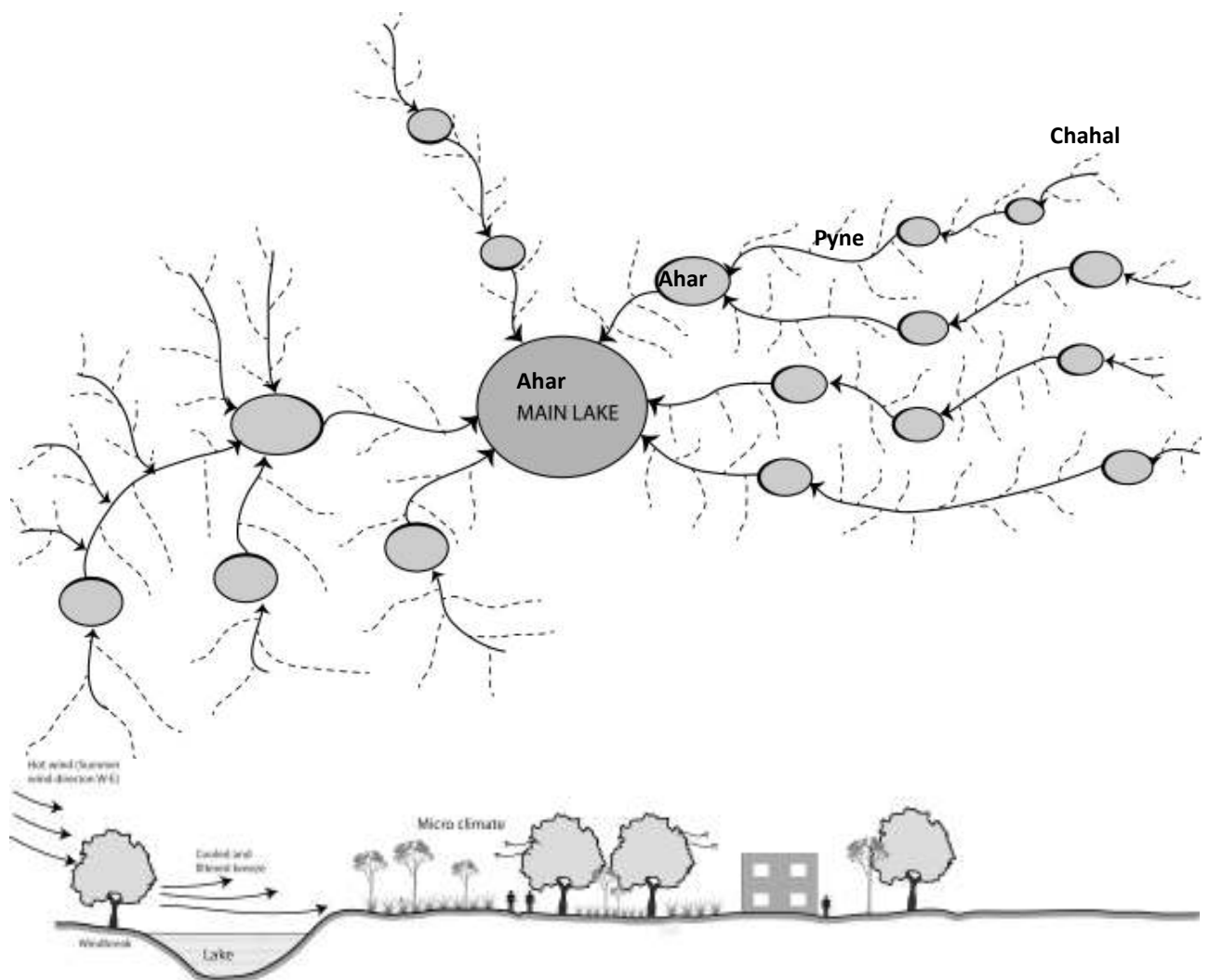

Figure 14: Water Management System for Nalanda University

technologies and systems based on ongoing research at the University.

Ecology

Proposed landscape shall integrate techniques of traditional agrarian landscape development along with value engineering based on latest technology and research. A native ecosystem shall also provide adequate resilience against the unpredictable climatic regime and reduce negative impacts of floods and droughts as well as related economic stress. The landscape shall be an approximately equal composition of dry-deciduous woodland dominated by Shorea robusta (sal) and Terminalia species, fruit orchards and agro-horticultural fields. The landscape pattern is derived from traditional water management systems of "Ahars, Pynes and Chahals" which will channel, collect, store and recharge rainwater for subsequent use throughout the year. This network shall be reinforced with plantation rows providing shade (to reduce evaporation losses), wind-breaks and micro-climate normalization (by preventing excessive wind flows) as well as providing small wildlife habitats and corridors along water channels. The Ahar system shall demonstrate traditional community participation techniques where round the year maintenance like de-silting, water timing and phasing, etc will allow equitable water distribution and optimal use. Combined with a crop cycle that

Figure 15: Sustainable Natural Resource management at Nalanda Campus

promotes use of non-water-intensive crops and rejuvenation of soil nutrition throughout the year, the system shall result in better produce and help the surrounding community move away from destructive cash crops to achieving self-reliance by organic locally tuned farming techniques. In return, this shall allow the native ecosystem to thrive and grow without dangers of water stress, soil damage and weed infestation from non-native species. Special emphasis shall be laid on traditional pollinators like honey-bees through apiary development and soil organisms like earthworms through vermicomposting. Water bodies shall be used for native fish cultivation that shall balance the diet through additional protein intake and alternative food source. The flexibility of the system shall allow water bodies to transform into wetlands with high water tables in times of droughts that will allow subsistence agriculture, plantation or fodder farms along with drought-hardy species mixed into the landscape that will provide much-required plant products. Alternatively, the University has been established on high plinths to allow mitigation from frequent floods ,and system of Ahar-Pynes shall drain out water from human occupied areas to low-lying plantation areas. Further, there is possibility of testing the reservoir capacities based on changing climate and desilting cum deepening or allowing natural siltation to create a natural balance.

Community

Symbiotic relationship with surrounding community is intrinsic to the success of Nalanda University and shall be achieved through community up gradation based on Nalanda's knowledge stewardship. It is necessary to balance the community's modern aspirations with traditional self-sustenance mechanisms. In a society rapidly moving from primary to tertiary occupations, any agrarian economy needs to be injected with the latest technological infrastructure and knowledge bank, a responsibility that Nalanda University can easily take up as a part of its academic pursuits.

While exposing the community to modern agricultural principles, research based initiatives on localizing the modern systems through reinforcement by traditional resilient systems shall be undertaken. This shall essentially incorporate outreach centres spread across surrounding rural centres that provide shared community infrastructure and resources like water system, equipment, warehouses, and nurseries, supplementing agriculture with apiaries, pisciculture, minor forest produce from edge plantation and wind-breaks and fruit orchards. An outreach centre shall be established in Nalanda University which shall help communities revive traditional secondary occupations based on home food processing industry, handicrafts, etc. Nalanda's primary role shall be value additions based on research, stewardship and hereditary transfer of local knowledge for future generations.

Delight

The pride of any culture lies in its arts and landscape. Nalanda University can automatically chart the revival of the local community by demonstrating local arts, culture and landscape as an intrinsic part of its development program. These can be reinforced as economy generation activities by allowing its outreach
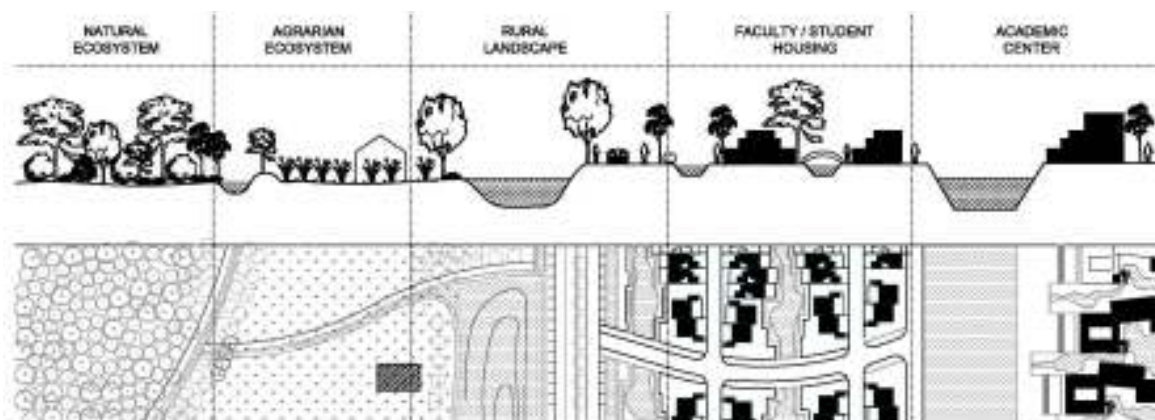

Figure 16: Landscape transect through Nalanda Campus

program to allow for controlled rural homestay tourism with the local community that will allow students and researchers alike to understand and absorb their surroundings and research foundations. The landscape allows adequate year round shade and micro-climate improvisation to allow for comfortable pedestrian and non-motorized transit within the University campus, and encourages University residents and students to experience native outdoors through range of active and passive landscape interactions allowing for recreational and formal activities spread across the campus. This focus on propagating local ecosystems allows the University to truly blend with its surroundings as an institution and enables users to experience the true conditions of the region, while demonstrating potentials of sustainable ecological inserts for development.

The proposed landscape of Nalanda University amalgamating landscape infrastructure, patterns, corridors and systems shall present an imagery that can be described as follows:

Nalanda University is imagined as a set of great mud-plinths arising out of a fluctuating water body in a fluid terrain, carved to create introspective spaces and clustered to generate dialogue. This great vista is set in a rustic traditional landscape generated by large swathes of agrarian landscape, woodlands as well as low-lying areas that seem to blend into one another seamlessly; and the entire landscape is overlain with a series of man-made swales that direct rainwater to embankment reservoirs. As one enters the University, one travels through dense shaded plantations of mangoes, sal & dense bamboo clusters, with water lilies, birds and small animals abounding in shallow waterholes formed in the rainwater swales, crossing them through rough wooden bridges, stepping over stone paths raised over the viscous soils. One treads with care over these obstacles, while being immersed in deeply intertwined nature as one before reaching the destination – the University

Landscape Program
Landscape of Nalanda University is proposed to provide an equitable mix of agrarian landscape, fruit orchards and native plantation all laid in pattern with the network of landscape infrastructure consisting of water system, windbreaks and climate modifying vegetation. Agrarian landscape shall consist of an ever-changing vista that is guided by a technologically driven and resilient crop cycle based on major crop growing seasons in the region. Crop cycles shall be converted to crop combinations based on consumption parameters and soil enrichment from time to time. This shall include use of cover crops that can be ploughed back into the soil or used as fodder or legumes for nitrogen fixation.

Nalanda, with an approximate population of 7,000, shall require about 2000 acres of land to generate food for its annual consumption. It is imperative that community partnerships be created from the beginning in order to guarantee food procurement supported agrarian economy to the surrounding region, which will help stabilize the surrounding villages and make them an inter-dependant part of Nalanda's life cycle. Additional partnerships can extend to orchard and compensatory timber plantations as a part of net-zero development approach of the university.

Conclusion
These two case studies define and promote a campus landscape as a steward of local ecology and culture, in addition imbibing benefits of knowledge to improve and conserve them. The institutions have consciously set this brief as a part of the landscape program, so that the current students are exposed to sustainable lifestyle as an extrinsic part of their development, and also experience life within nature as against current Indian urban areas which have banished nature.

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