

Status Review of  
**Efficiency** in the  
**Urban Built Environment**

National, state and local - from policy, governance and stakeholders' perspectives, mapping existing gaps and identifying potential opportunities for integration and harmonization

PROJECT OUTCOMES REPORT

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Prepared by



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**About Shakti Sustainable Energy Foundation**

Shakti Sustainable Energy Foundation works to strengthen the energy security of India by aiding the design and implementation of policies that support energy efficiency and renewable energy.

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This report summarizes the findings and outcomes of the project and is to be read along with relevant annexes for more detailed information on particular aspects.

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Rapidly increasing urbanization becomes a reality and immediate challenge in India. The total population of India is 121 Crore and the rural-urban distribution is 68.84% & 31.16%.<sup>1</sup> India has seen a 4% rise in the urban population from 2001 to 2011 and a similar decline in the rural population. The census of 2011 states that there are 53 million plus cities accounting for 43% of India's urban population. As per the census of 2011 the number of towns in India increased from 5161 in 2001 to as many as 7935 in 2011. This is bringing our cities under scrutiny and pressure to transform into efficient and effective spaces for the burgeoning populations.

These populations are housed in, work in, and interact with the urban built environment, providing shelter, services and access to resources. Against the background of cities already struggling to provide adequate shelter and services, is the added responsibility in recent years of a focus on sustainable development, both nationally and internationally - to ensure that this gap is reduced and is made efficient, through enabling policies, effective institutional mechanisms and regulated implementation and monitoring. This current situation facing Indian cities and their built environments laid the base for this current study: to understand how policies formulated at the national level are addressing the concept of efficiency in urban built environments, what the gaps and overlaps are. In the past twenty odd years that sustainable development has been in focus in India, what is the progress and what are the impacts that can be observed on ground?

### Built Environment

The term built environment refers to the human-made surroundings that provide the setting for human activity, ranging in scale from buildings and parks or green space to neighbourhoods and cities that can often include their supporting infrastructure, such as water supply, energy and transport networks and waste management. The built environment is a material, spatial and cultural product of human labour and imagination. The built environment has an impact on human wellbeing. Its structure, form and function, as well as the quality of its natural environmental assets, determine its suitability for living in. The built environment also puts pressure on natural resources, mainly through the use of land, water and energy resources, as well as through the waste that is generated from activities taking place within it. If sustainable development for the country as a whole is to be achieved, change has to first occur at the smallest unit of decision making in our environment: the individual, and the physical spaces he/she can influence: buildings and their environments, such as a place of stay (home), place of work or study (office, school, university, etc). This change can be in the form of lifestyle changes, more informed decision making, etc across the spectrum of the built environment: energy, water, land and transport. While a single building can be defined as a structure with walls and a roof serving its function efficiently, it does not end there. A building stands on a plot of land, needs to have access to clean and adequate resources (air, water, power, etc) and can be freely entered and exited (transport). Services such as water, sewerage, transport, etc connect different individual buildings, and collectively, these form the built environment. While an individual building is the least common denominator for human habitation, and indeed should be the least common denominator for any policy or programme that acts in the

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1. [http://censusindia.gov.in/2011-prov-results/paper2/data\\_files/india/Rural\\_Urban\\_2011.pdf](http://censusindia.gov.in/2011-prov-results/paper2/data_files/india/Rural_Urban_2011.pdf)

urban space, it cannot be considered in isolation. Its connections, services and role in the urban fabric play a key role in how a building is perceived and targeted for different strategies.

## **Addressing the Built Environment in India**

The building sector (and infrastructure) is one of the major consumers of energy in Indian cities. The smallest unit of the built environment is the building, which links up to other buildings and urban services – such as transport, water supply and treatment, etc. Before zooming out to a city level, groups of buildings form communities and neighbourhoods. A building is typically constructed by an individual entity, and ownership rests with a single or multiple numbers of owners. In essence, a city is composed of its buildings, and the function of urban services is to provide and transfer resources, goods and people from one built space to another for work, recreation, education, etc.

The built environment in a city is subject to a number of policies, laws, regulations and handled in different capacities by a range of agencies/players. While each individual component has a clear governance structure in place, the integration of the different components is lacking.

### **Multiple Agencies are Involved in the Built Sector In India**

At the national level, at least four ministries of the central government are involved through different programmes and in different roles. At the state level, relevant departments linked to the respective national level ministries execute the work within their state. At the local level, municipal bodies, development authorities (state government players at the local level), etc are in charge of city activities. The 74th amendment to the constitution assigns regulation of land use and construction of buildings as one of the primary activities of the city in its 12th schedule.

### **Overlapping and Unclear Roles and Responsibilities**

The scope of these policies and by-laws often overlap and sometimes even cut across each other. However, since these are overseen by separate government departments there is often no reconciliation to ensure one common policy frame that has various aspects administered/enforced by various departments – informing the other departments what is being looked at/ advised and administered by another government department . Alternatively, within a larger urban sustainability framework, there may arise issues that are not being adequately addressed by any policy or governance process. Harmonising policies to be addressing the same things and avoiding replication in processes and checks, while also filling gaps that may exist is a requirement for holistically addressing the issue of urban sustainability.

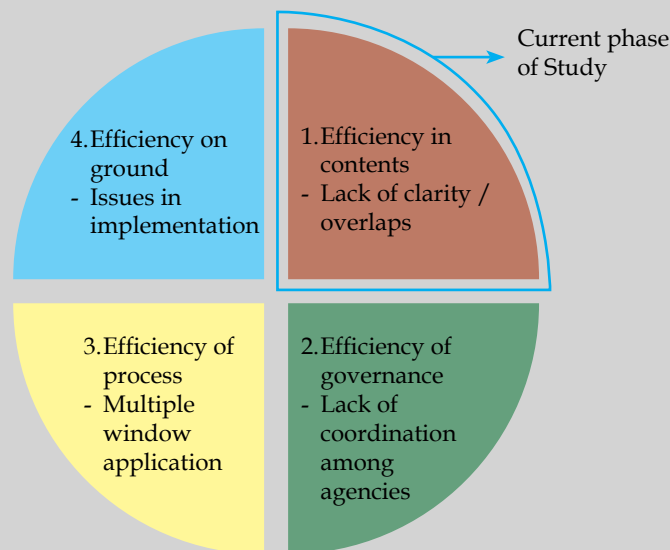
### **Several Policies and Policy Instruments**

There are a large number of policies, regulations and codes currently in play for the built sector such as the National Building Code, the Energy Conservation Buildings Code, environment impact assessments, policies governing housing for economically weaker sections of society, etc. In addition, there are also policies, regulations and guidelines that are applicable to urban systems that support buildings, such as the National Urban Sanitation Policy, the National Action Plan on Climate Change, etc.

Country National Building Code, Energy Conservation Building Code, etc informed by various policies, acts, plans and programmes, additionally influenced at the national level by market based rating systems such as GRIHA

State	Development control regulations, state policies, etc
Regions	Regional plans
City	Master plan
Neighbourhood	Area development plan
Building	Building byelaws

At the national level, codes such as the National Building Code, the Energy Conservation Building Code, the Environmental Impact Assessment, etc regulate the development of buildings at the local level. These codes serve as guidelines to state level development control regulations which incorporate relevant and context-specific aspects of the national codes. These state level development control regulations are further adapted to city specific contexts and issued as building byelaws. These rules are further regulated at the master plan level by the city development plan, city master plan, etc. These are only the initial set of rules and regulations. There are several more that address different parts of the built environment and influence its development and even use. Lastly, each of these rules and regulations is informed by a multitude of national and sub-national policies with different aims, and overlapping and complex interactions. Thus, it is apparent that in order to understand what influences the development of efficient buildings at the local level, it is first imperative to understand and unravel the intentions of this gamut of policies with regards to the urban built environment. For these urban policies to have any success or impact, they ultimately need to address the local urban level of development.



**Figure 1: The Cycle Of Efficiency**

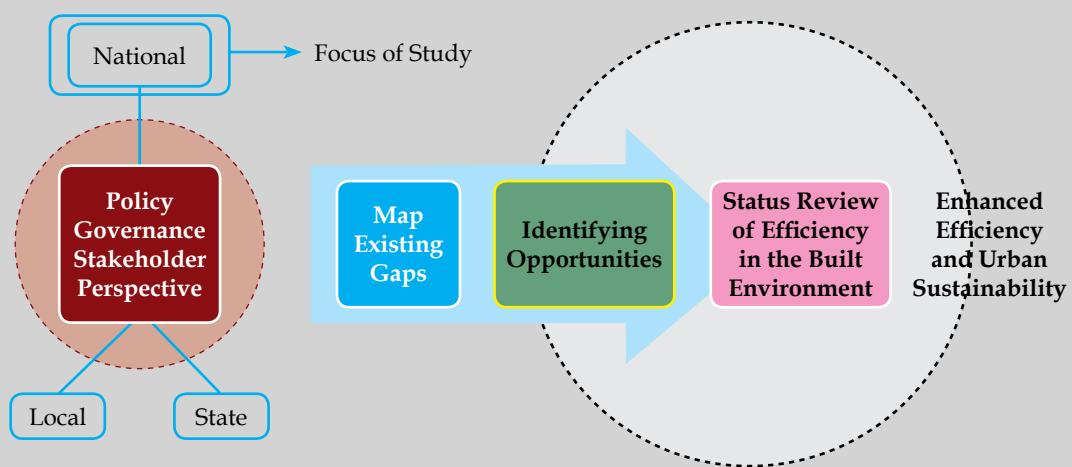
**Primary question: how is efficiency defined and addressed in this gamut of policies, programmes and missions? What are the synergies and overlaps? Are there ways to synergize the different agendas to structure processes better at the local level with a long term objective of effectively increasing efficiency in the urban built environment?**

## **Concept of 'Efficiency' in Achieving Urban Sustainability**

The study's primary premise is that increased efficiency on ground in our city's built spaces would be a first step in leading towards greater energy savings, lowering carbon emissions, improving

quality of life in deteriorating urban spaces and improving the functioning of our cities. While transformative and paradigm shifts in thinking, action and behaviour are required in order to affect serious long term change, increasing efficiency is an important building block towards increasing urban sustainability.

Against this background, the study aimed to identify the obstacles, possible opportunities and options for increasing achievement of efficiency in India’s various urban sectors in order to increase efficiency on ground. Recognising that a multitude of policies, plans and programmes already do exist, the study, undertaken between September 2013 and June 2014, focused on this existing base of knowledge and resources in order to analyse what could be the potential gaps, barriers or roadblocks to achieving efficiency.



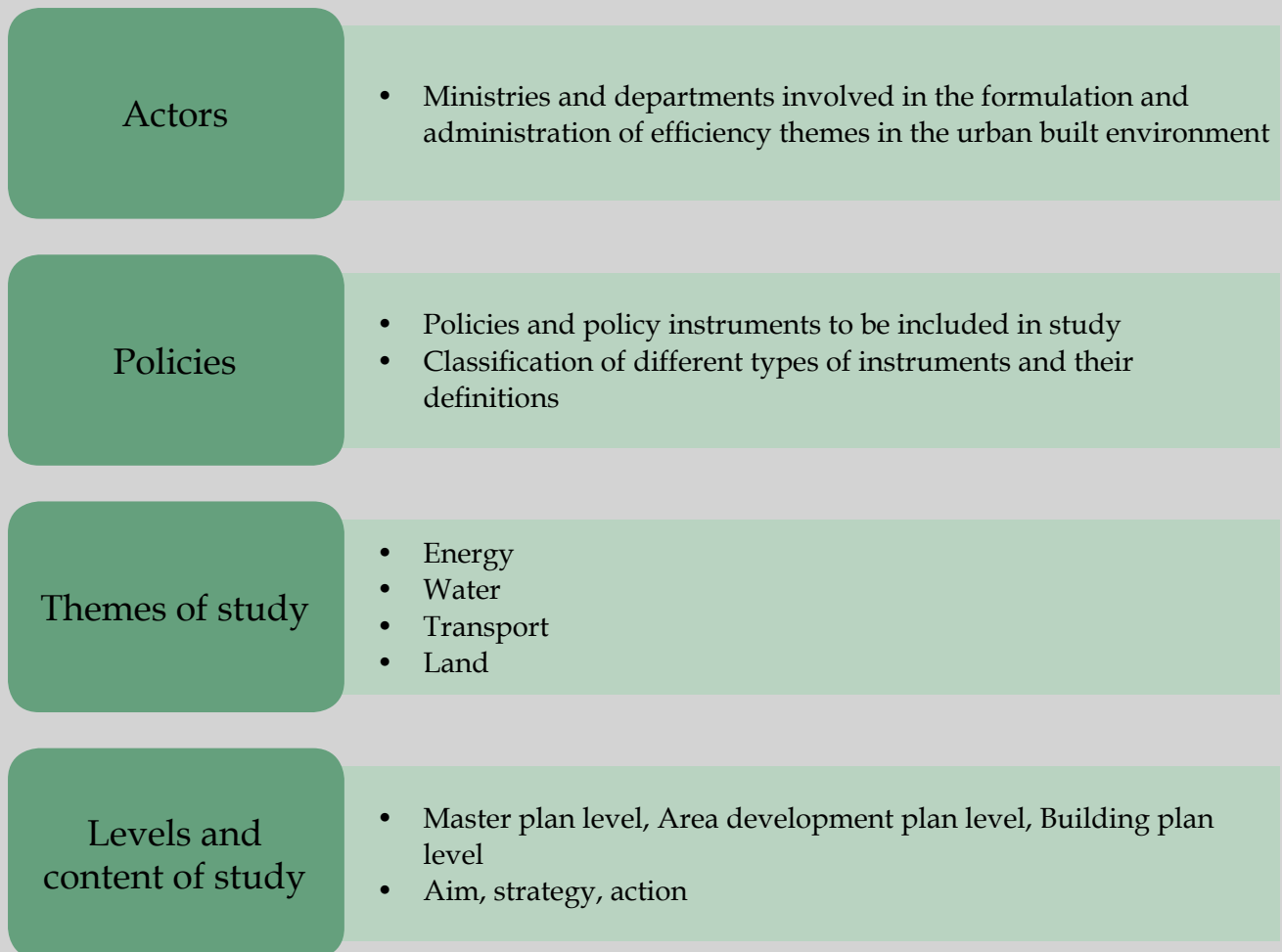
**Figure 2: Project Objectives**



## Approach and Methodology

The team underwent a series of brainstorming exercises<sup>2</sup> in order to arrive at the final scope of the study. At first glance, efficiency on ground is defined by the enabling policies and legislature at the national level, proactive actions taken at the state and local levels of government, ‘baseline’ policies that define basic criteria of access to basic services, supply and distribution of resources in an equal and equitable manner, social development, etc.

After a series of brainstorming exercises, the team was able to narrow down the scope to focus on certain aspects identified as fundamental to the achievement of efficiency in the built environment. These aspects are listed and described below and fleshed out as the overall approach and methodology of the project:



**Figure 3: First Step of Study**

2. The details of the discussions can be seen in Annex 2: “Minutes of the project team meetings”

## In Depth Policy Study

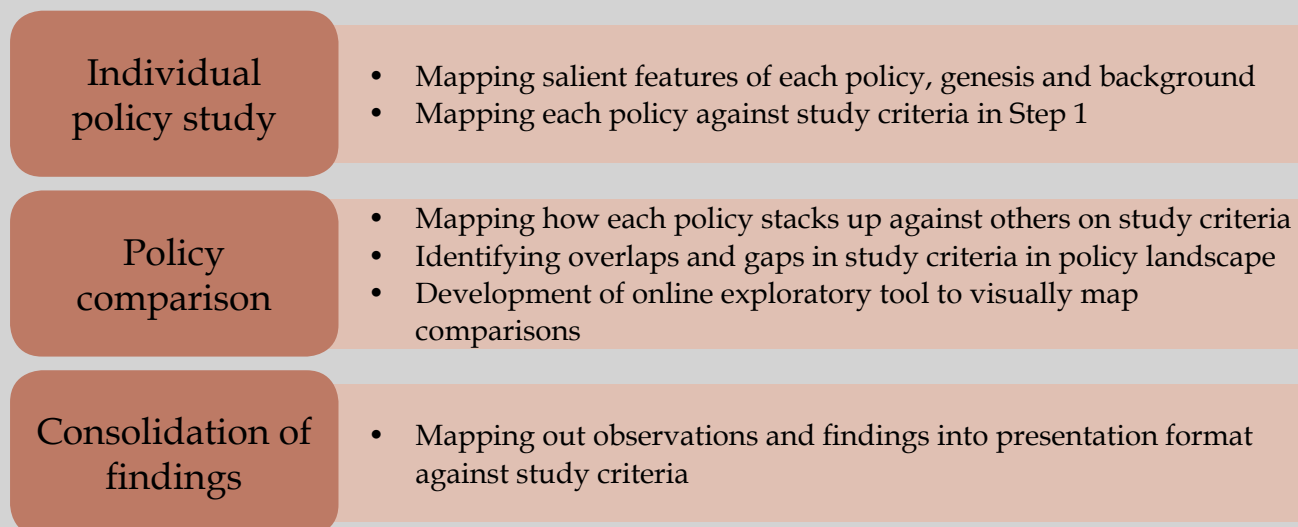


Figure 4: Second Step of Study

## Expert Feedback<sup>3</sup>

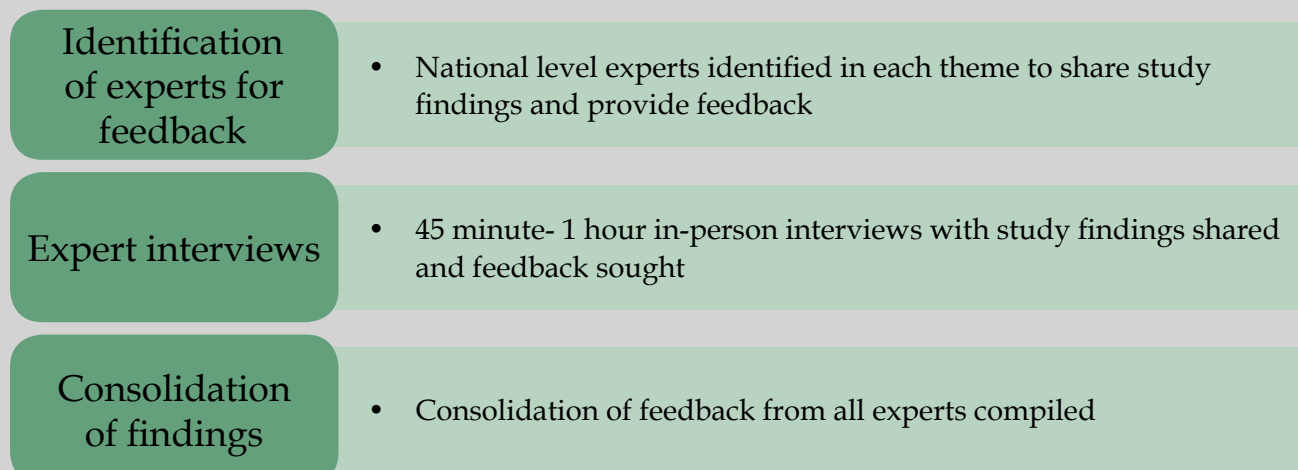


Figure 5: Third Step of Study

## Compilation of Findings and Next Steps

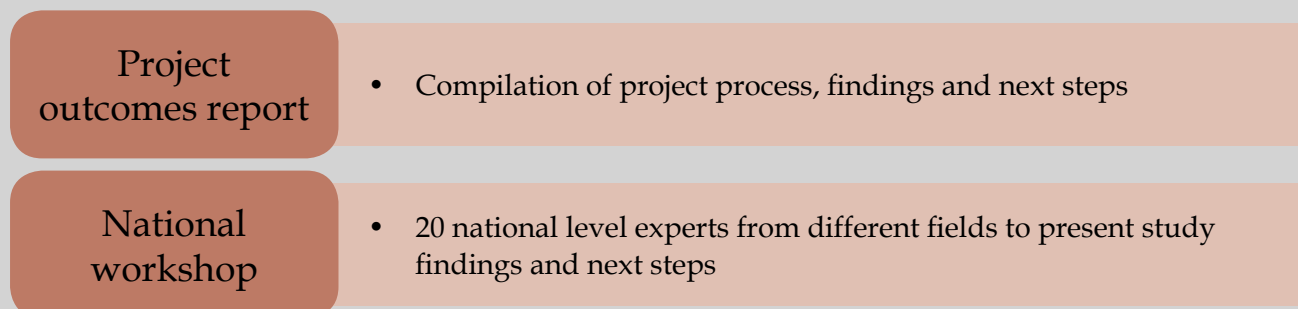


Figure 6: Fourth Step of Study

3. The compiled expert interview discussions, presentation used and outline of interview can be seen in Annex 3: Minutes of Expert Interviews

## Study Criteria

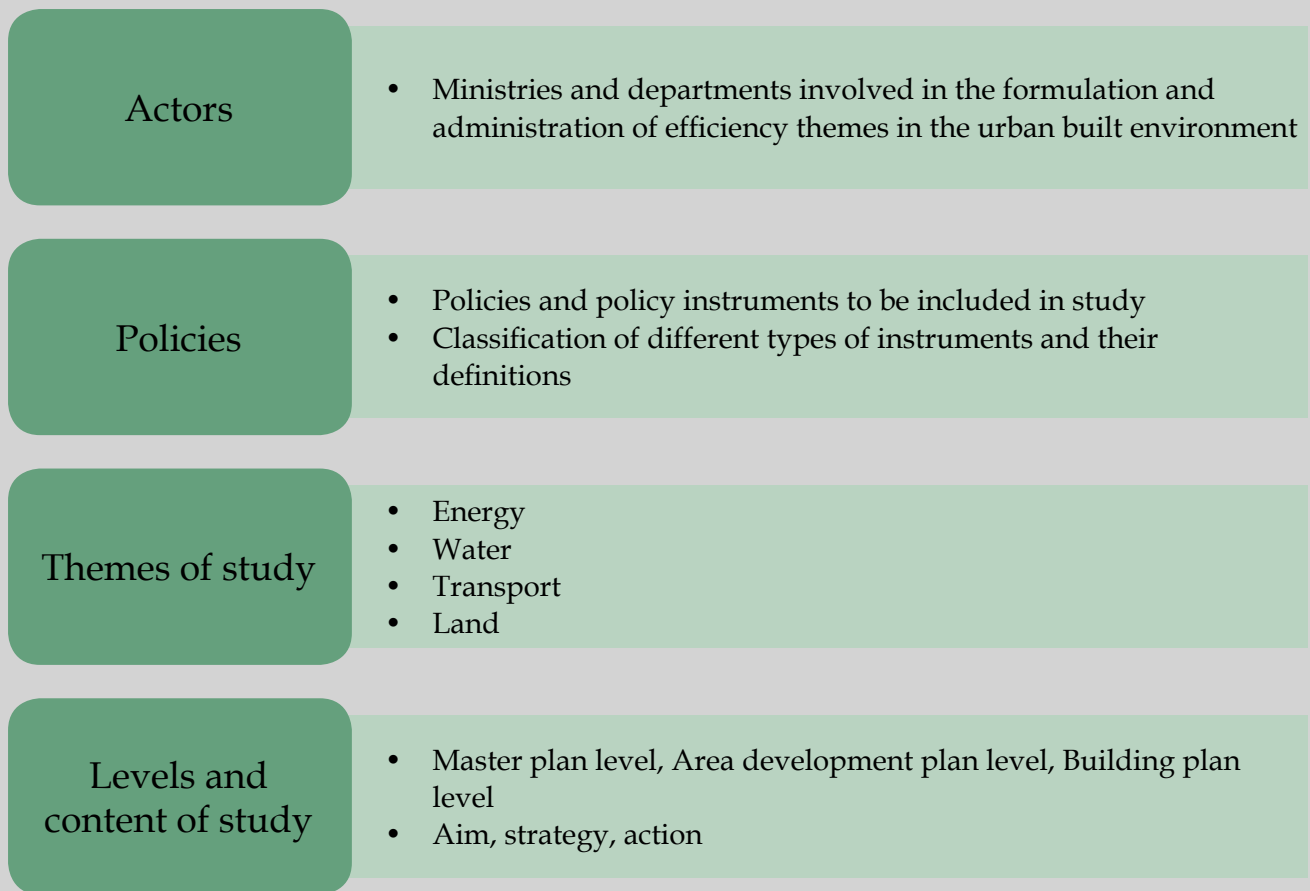


Figure 7: Identifying Study Criteria

### Actors

A total of ten ministries and government departments were included in the study, namely:

- Ministry of Environment and Forests
- Ministry of Housing and Urban Poverty Alleviation
- Ministry of New and Renewable Energy
- Ministry of Power
- Ministry of Road Transport and Highways
- Ministry of Rural Development
- Ministry of Urban Development
- Ministry of Water Resources
- Planning Commission of India
- Prime Minister's Council on Climate Change

A number of ministries are involved in the efficiency space at the national level in various capacities and roles. While some ministries are 'line' ministries for some of the themes in the efficiency dialogue, others touch upon one or more themes due to the mandate of that particular ministry.

In May 2014, India saw parliamentary elections. Post the elections, the new government undertook the merging of certain ministries that were felt to be working towards the same larger goal to enable a more integrated approach. The new merged ministries were appointed a joint minister but retained a separate secretary, indicating that while goals were to be aligned, the functioning of the ministries for administrative matters would continue as before. The new merged ministries are listed below:

- Ministry of Environment, Forests and Climate Change
- Ministry of Urban Development
- Ministry of Housing and Urban Poverty Alleviation
- Ministry of New and Renewable Energy
- Ministry of Power
- Ministry of Road Transport and Highways
- Ministry of Rural Development
- Ministry of Water Resources
- Planning Commission of India (dissolved)
- Prime Minister’s Council on Climate Change

The merging of ministries is an important point of consideration for two reasons: the first being because they now enable the themes of efficiency and sustainable development to be handled in a more integrated manner, and the second because the action of merging would result in realigning of priorities for the government, and certain aspects which may have had priority in the past, may not continue to do so in the merged system. This result may impact the efficiency dialogue and needs to be analyzed from that angle.

## Roles of Different Levels of Government

As outlined earlier, the subject of efficiency in the built environment spans different themes and spatial aspects. These themes are addressed through policies, regulations, etc formulated by different ministries of the Indian government. Additionally, the constitution of India outlines a set of functions/responsibility areas for the different levels of government through lists of constitutional provisions. These lists are of three types: central lists, state lists and concurrent lists. Central and state lists outline functions of the national government and state governments respectively, while the concurrent list outlines functions that are to be jointly handled by the central and state government. This listing is important to study, as it details out which level of government can influence which aspect of built environment efficiency. The lists have been organized to show which themes and sub themes are addressed in which list.

### Central List

Theme and sub theme	List aspects
General	<ul style="list-style-type: none"> <li>■ Delimitation of cantonment areas, local self-government in such areas, the constitution and powers within such areas of cantonment authorities and the regulation of house accommodation (including the control of rents) in such areas.</li> <li>■ Industries declared by Parliament by law to be necessary for the purpose of defence or for the prosecution of war.</li> <li>■ Industries, the control of which by the Union is declared by Parliament by law to be expedient in the public interest.</li> </ul>

Theme and sub theme	List aspects
Energy	<ul style="list-style-type: none"> <li>■ Regulation and development of oilfields and mineral oil resources; petroleum and petroleum products; other liquids and substances declared by Parliament by law to be dangerously inflammable.</li> <li>■ Regulation of mines and mineral development to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest.</li> </ul>
Water	<ul style="list-style-type: none"> <li>■ Regulation and development of inter- state rivers and river valleys</li> </ul>
Transport	<ul style="list-style-type: none"> <li>■ Railways.</li> <li>■ Highways declared by or under law made by Parliament to be national highways.</li> <li>■ Shipping and navigation on inland waterways, declared by Parliament by law to be national waterways, as regards mechanically propelled vessels; the rule of the road on such waterways</li> <li>■ Carriage of passengers and goods by railway, sea or air, or by national waterways in mechanically propelled vessels.</li> </ul>
Land	<ul style="list-style-type: none"> <li>■ Ports declared by or under law made by Parliament or existing law to be major ports, including their delimitation, and the constitution and powers of port authorities therein.</li> <li>■ Airways aircraft and air navigation; provision of aerodromes; regulation and organisation of air traffic, and of aerodromes; provision for aeronautical education and training and regulation of such education and training provided by States and other agencies.</li> <li>■ Ancient and historical monuments and records, and archaeological sites and remains, declared by or under law made by Parliament to be of national importance.</li> </ul>

### State List

Theme and sub theme	List aspects
General	<p>Local government, that is to say, the constitution and powers of municipal corporations, improvement trusts, district boards, mining settlement authorities and other local authorities for the purpose of local self-government or village administration.</p> <p>Industries subject to the provisions of Entries 7 and 52 of List I.</p> <p>Works, lands and buildings vested in or in the possession of the State.</p>
Energy	<p>Regulation of mines and mineral development subject to the provisions of List I with respect to regulation and development under the control of the Union.</p>
Water	<p>Public health and sanitation; hospitals and dispensaries.</p> <p>waterways and traffic thereon subject to the provisions of List I and List III with regard to such water-ways; vehicles other than mechanically propelled vehicles.</p> <p>Water, that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and water power subject to the provisions of Entry 56 of List I.</p>

Theme and sub theme	List aspects
Transport	Communications, that is to say, roads, bridges, ferries, and other means of communication not specified in List I; municipal tramways, ropeways, inland
Land	<p>Agriculture, including agricultural education and research; protection against pests and prevention of plant diseases.</p> <p>Land, that is to say, rights in or over land, land tenures including the relation of landlord and tenant, and the collection of rents; transfer and alienation of agricultural land; land improvement and agricultural loans; colonization.</p> <p>Land revenue, including the assessment and collection of revenue, the maintenance of land records, survey for revenue purposes and records of rights, and alienation of revenues.</p> <p>Prisons, reformatories, Borstal institutions and other institutions of a like nature and persons detained therein; arrangements with other States for the use of prisons and other institutions.</p> <p>Burials and burial grounds; cremations and cremation grounds.</p> <p>Libraries, museums and other similar institutions controlled or financed by the State; ancient and historical monuments and records other than those declared by or under law made by Parliament to be of national importance.</p>

### Concurrent List

Theme and sub theme	List aspects
General	<ul style="list-style-type: none"> <li>■ Protection of wild animals and birds.</li> <li>■ Factories.</li> </ul>
Energy	<ul style="list-style-type: none"> <li>■ Electricity.</li> </ul>
Water	
Transport	<ul style="list-style-type: none"> <li>■ Shipping and navigation on inland waterways as regards mechanically propelled vessels, and the rule of the road on such waterways, and the carriage of passengers and goods on inland waterways subject to the provisions of List I with respect to national waterways.</li> <li>■ Mechanically propelled vehicles including the principles on which taxes on such vehicles are to be levied.</li> </ul>
Land	<ul style="list-style-type: none"> <li>■ Transfer of property other than agricultural land; registration of deeds and documents.</li> <li>■ Forests.</li> <li>■ Ports other than those declared by or under law made by Parliament or existing law to be major ports.</li> <li>■ Archaeological sites and remains other than those declared by or under law made by Parliament to be of national importance.</li> <li>■ Acquisition and requisitioning of property.</li> </ul>

Through this study, it can be seen that the themes of efficiency are handled in a complex manner by different levels of government. Water is purely a state level subject, however, the other themes are handled at both levels in different capacities, lending a level of complexity to the themes being addressed at the urban level.

## Policies and Policy Instruments



**Figure 8: The Complex Policy Landscape in India**

The various policies, acts, schemes, etc initiated and enacted by the government are housed under a particular ministry or department within a ministry. After a review of each ministry and the policies within it, the project team arrived at the following set of policies that have a bearing on efficiency at the urban local level. The criteria used for including a policy or an instrument within the review of this study were:

- The policy must address the subject of efficiency (either wholly or in reference to one or more of the identified themes of efficiency)
- The policy must address the subject of urban efficiency
- The policy must address the subject of efficiency at the local level (master plan, area development, building plan level)

If all the criteria above were met, the policy was included in the review process. The studied policies (by ministry) are listed below<sup>4</sup>:

### Ministry of Environment, Forests and Climate Change

- National Environment Policy
- Environment Protection Act
- Environmental Impact Assessment Notification

### Ministry of Urban Development

- National Policy on Street Vendors
- National Urban Renewal Mission
- Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act
- Model Municipal Byelaws
- National Urban Transport Policy
- National Slum Policy
- National Building Code of India
- National Mission on Sustainable Habitat

4. Detailed information about each policy, and the classification and definition of policy instruments is available in Annex 4: "Policy Sheets"

### Ministry of Housing and Urban Poverty Alleviation

- National Urban Livelihoods Mission
- Rajiv RinnYojana
- Basic Services for Urban Poor Sub-mission
- National Housing and Habitat Policy

### Ministry of New And Renewable Energy

- National Solar Cities' Programme
- National Solar Mission

### Ministry of Power

- National Electricity Policy
- National Mission on Enhanced Energy Efficiency
- Energy Conservation Act
- Energy Conservation Building Code

### Ministry of Road Transport and Highways

- Motor Vehicles Act

### Ministry of Rural Development

- Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act

### Ministry of Water Resources

- National Water Mission
- National Water Policy

### Planning Commission of India (Dissolved)

- Integrated Energy Policy

### Prime Minister's Council on Climate Change

- National Action Plan on Climate Change

## Themes of Study

As described in Chapter 1, the built environment in a city consists of the building itself and the land and services and resources that contribute to its efficient functioning. Thus, four themes of study for assessment of the policies and instruments were identified. Namely:

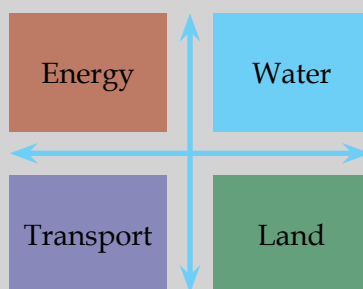


Figure 9: Themes of Efficiency in the Urban Built Environment



To understand the measure of efficiency within these four themes, a set of sub themes were developed for each theme. These sub themes condense specific clauses in policies and discourses globally about efficiency into three key steps: reduction of consumption, increase of efficiency of use, increase/promote renewable or alternate sources of supply. Therefore, for each theme, the identified sub themes were:

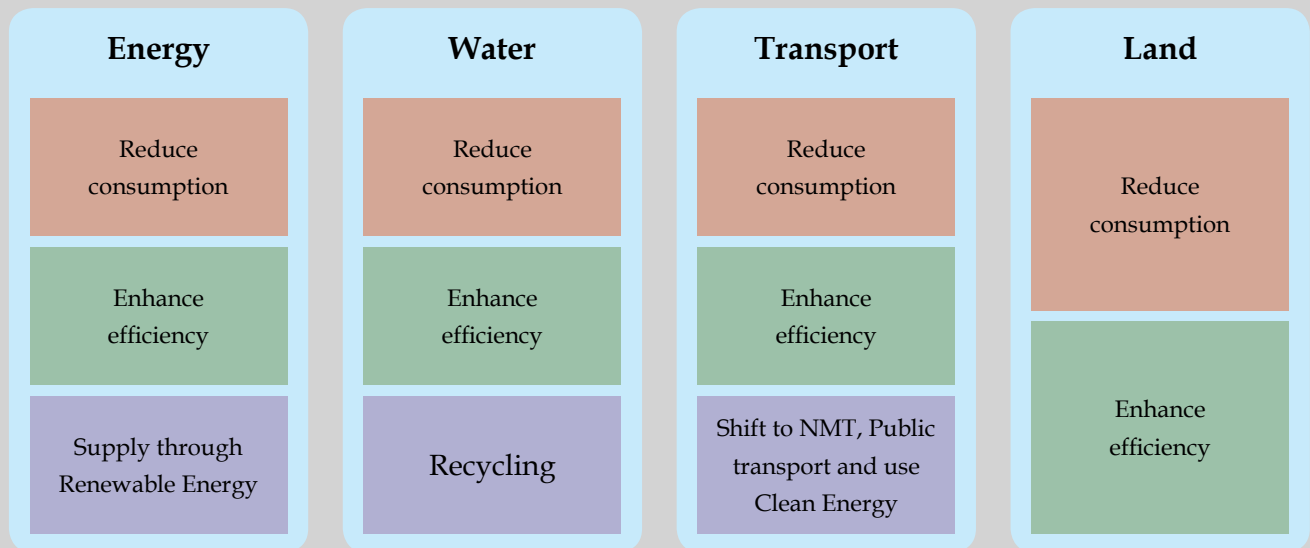


Figure 10: Sub Themes Under Themes of Efficiency

### Levels and Aims of Study

Each policy or policy instrument was studied at two levels to understand its content. Firstly, it was studied to understand which local tool or tools it primarily targeted: master plan, area development plan, building plan. Once the tools primary level of intervention was identified, the project team then worked to identify whether the clauses that referred to any of these local levels were in the form of aims/goals, strategies or actions. Based on this two step level of study, the extent of local reach of each policy could be identified.

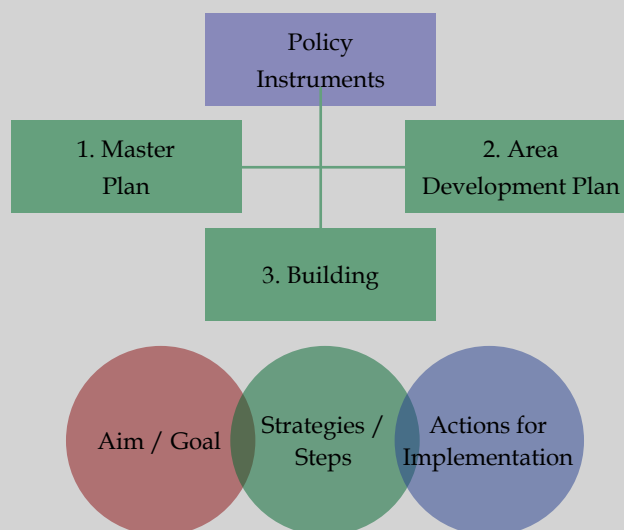


Figure 11: Levels and Types of Actions in Policies



while some policies are more comprehensive. For example, the Energy Conservation Building Code (2007) focuses entirely on the energy theme, while the Environment Protection Act covers all four themes.

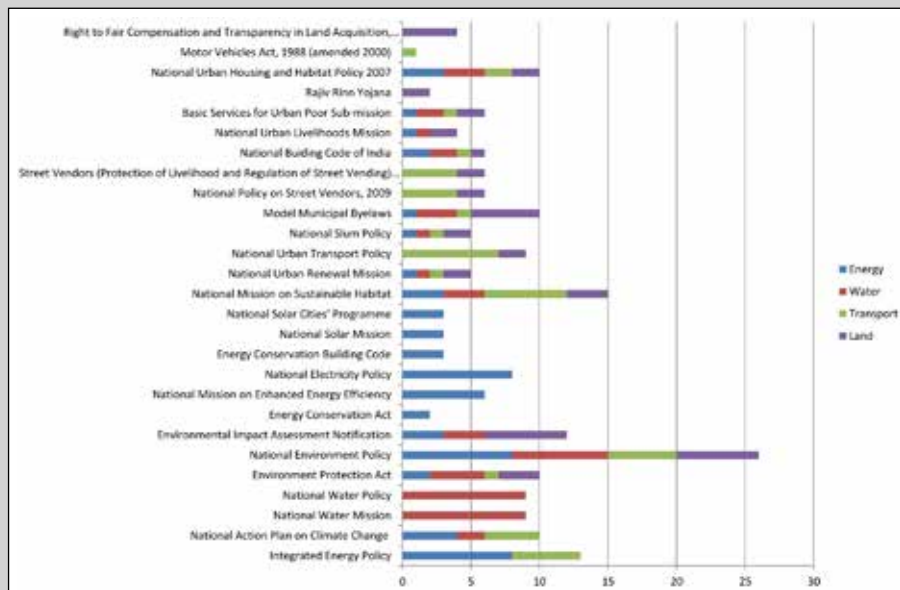


Figure 13: The Themes Addressed by The Different Policies Included in the Study

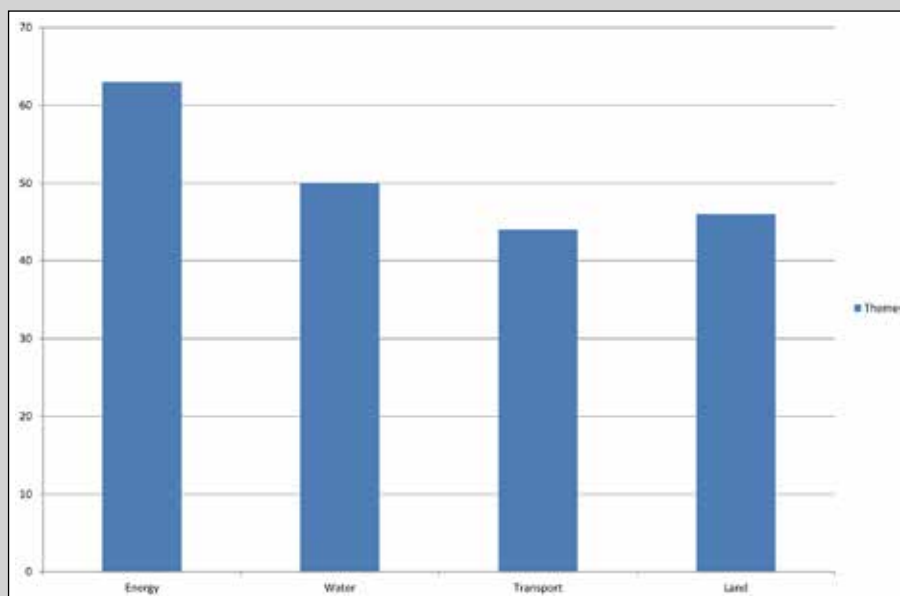


Figure 14: Theme Reference Counts in the Studied Policies

### Levels in the Policy Landscape

The area development plan level is the least addressed level in the policy landscape. However, the other two levels are quite often referenced in the policies for efficiency in the urban built environment.

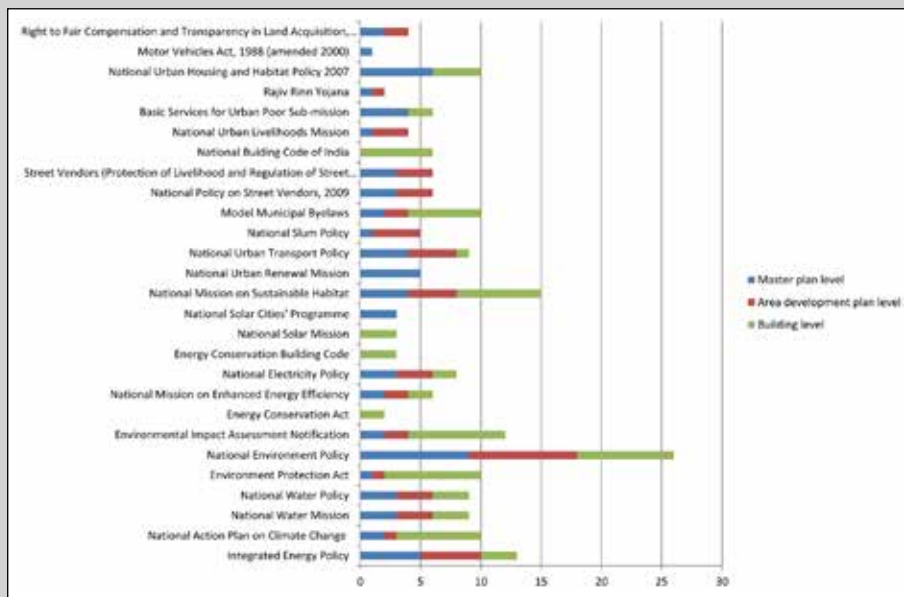


Figure 15: Level Reference Count in the Studied Policies

## Types of Actions Listed

Of the different types of actions listed in the policy landscape studied, strategies are listed the most often with over 90 mentions. Goals are the least often articulated.

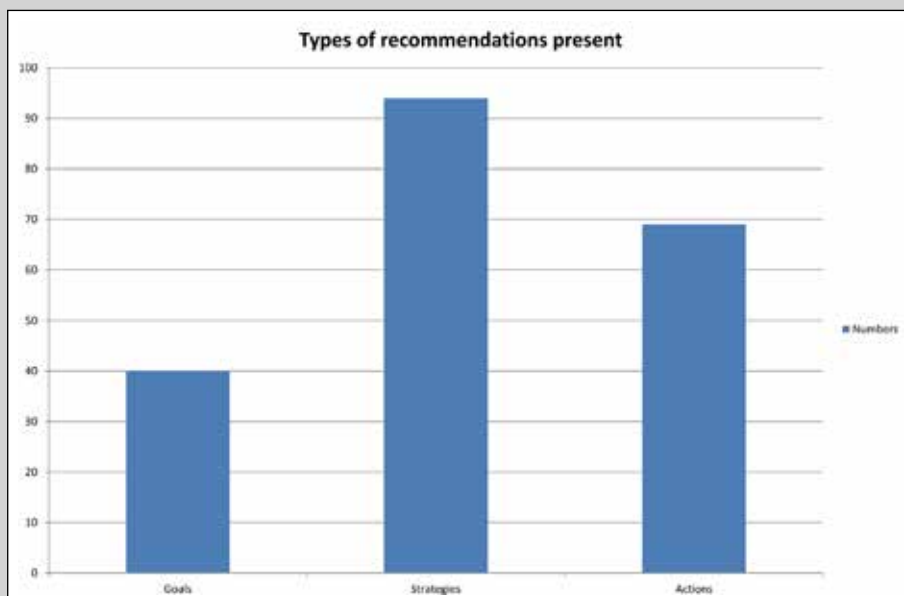


Figure 16: Action Reference Counts in Studied Policies

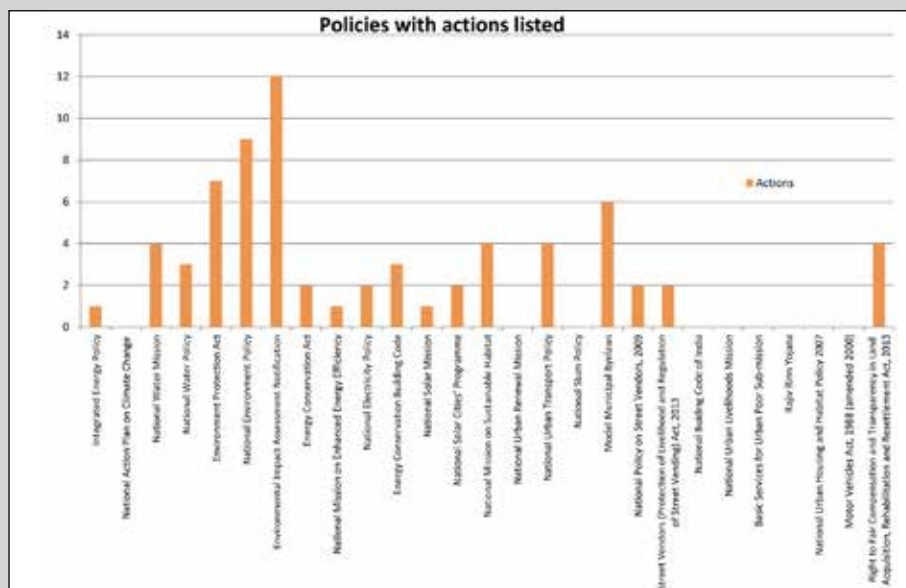


Figure 17: Number of Policies with Actions for Implementation Listed

## Observations and Findings from Theme and Level Analysis

- The most comprehensive policy across themes and levels is the National Environment Policy, followed by the National Mission on Sustainable Habitat under the National Action Plan on Climate Change.
- The most addressed themes are energy and water with sixty four and fifty instances in total, but the other themes are not too far behind, with land at forty six and transport at forty four.
- The most comprehensive energy-related policies are the National Environment Policy, the Integrated Energy Policy, the National Mission on Enhanced Energy Efficiency under the National Action Plan on Climate Change and the National Electricity Policy.
- Water has the least number of dedicated policies, and the strongest are the National Water Policy and the National Water Mission under the National Action Plan on Climate Change.
- The National Urban Transport Policy and the National Mission on Sustainable Habitat are most comprehensive in addressing transport-related aspects.
- Land has no dedicated policies for management, but the Land Acquisition Act and Policy focus on land issues. However, the National Environment Policy and the Environmental Impact Assessment Notification address land efficiency related issues the most comprehensively.
- Goals and aims are articulated the least in the majority of policies, with recommendations being primarily in the form of suggested strategies or actions.
- The Environmental Impact Assessment Notification, National Environment Policy and the Environment Protection Act are the most action oriented policies at the local level
- Of the energy focused policies, the topic that is addressed the least in direct terms is that of increasing promotion of renewable energy at the local level
- Of the land focused policies, reducing use of arable land in terms of land use planning at the local level in urban areas is not addressed sufficiently
- Water focused policies, while containing an equitable distribution of sub themes, speak more in terms of goals and strategies and less in terms of actions that could be taken at the urban local level.
- Alternate fuels and technologies are the least mentioned sub theme of the transport related policies. However, it is important to note here that they are also covered to an extent under the energy policies

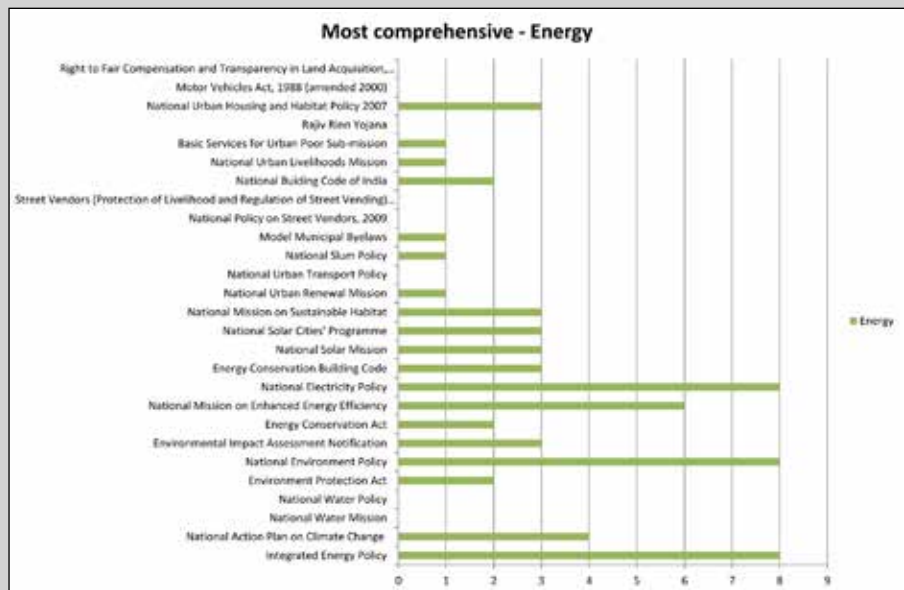


Figure 18: Policies Addressing the Energy Theme

## Policies that Deal with Energy

Eighteen policies deal, at some level, with the subject of energy in the built environment at the local level. This is in line with the knowledge that energy needs to be addressed across various spectra even if the theme of the policy is not directly about energy. For example, policies such as the Integrated Energy Policy or the Energy Conservation Act focus very directly on the subject of energy as a cross cutting theme across sectors and a fundamental need. Other policies, such as the National Urban Housing and Habitat Policy or the National Building Code of India, make reference to the fact that energy is a fundamental issue that needs to be addressed in order to achieve the objectives of these particular policies (housing and proper built environment, respectively).

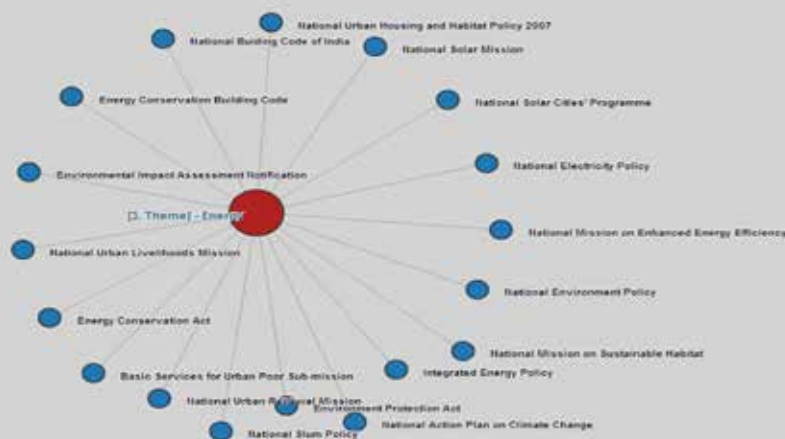


Figure 19: Policies that Deal with Energy

## Ministries Involved in Energy

While the Ministry of Power and Ministry of New and Renewable Energy are directly involved with the subject of energy (these ministries have also been merged under one independent minister in the current national administration), other ministries that deal with urban built environments also have a role to play: such as the Ministry of Urban Development and the Ministry of Housing and Urban Poverty Alleviation (also merged under the current national administration). A total of seven ministries are involved and have some role to play in the energy sector in urban built environments.

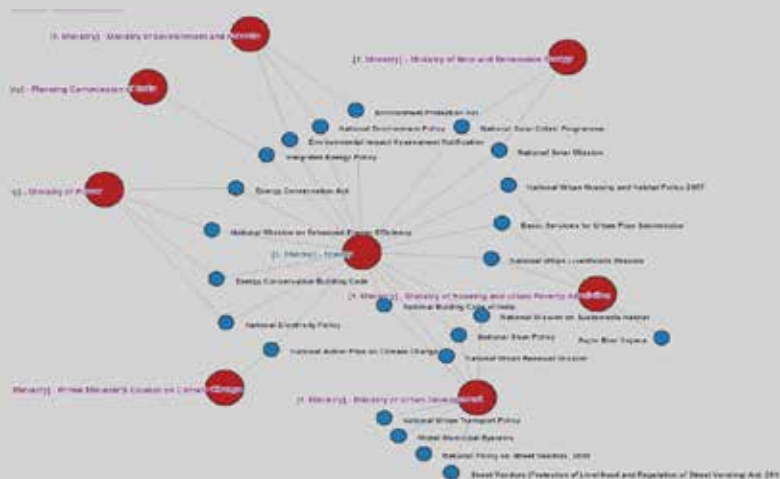


Figure 20: Ministries Involved in the Energy Theme

## Sub-themes Addressed by Energy Related Policies

Of the eighteen policies that do address the theme of energy at the local level in some form or the other, a spread of sub-themes can be observed. While ten policies do address all the three sub-themes that have been identified as the criteria for efficiency in the energy theme, four policies only address one sub-theme (enhance energy efficiency) and three policies do not speak of supply of energy through renewable or non-conventional sources. The most addressed sub-theme is enhance efficiency (addressed by all policies), and the least addressed is supply through renewable sources (eleven policies address).

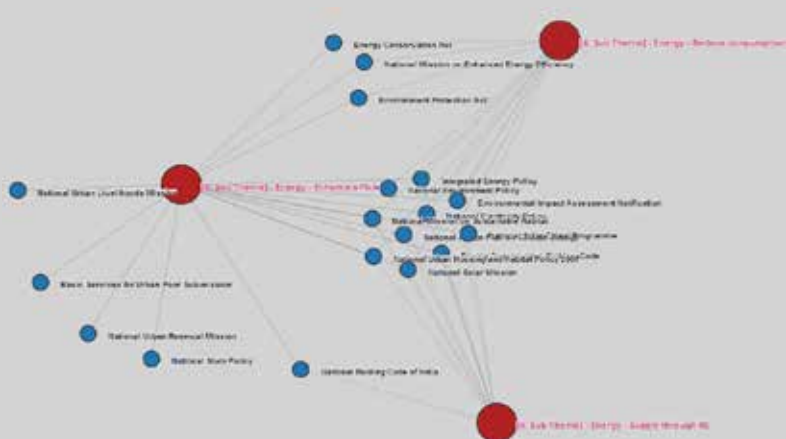


Figure 21: Energy Sub-themes Addressed by Policies

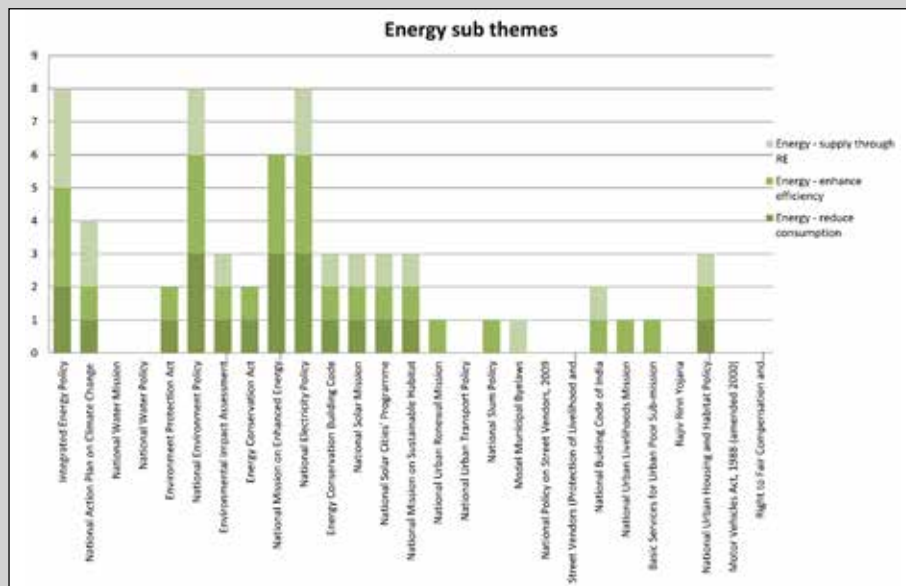


Figure 22: Energy Sub-themes Addressed by Policies - Graph

### Levels Addressed by Energy Related Policies

A study of the local levels addressed by the energy related policies points to an indication of the reach of energy related policy individually and as a collective group. Fourteen of the eighteen policies address only one level of the three. Only four policies address all three levels (three of these four policies also deal with all sub-themes in energy), and the area development plan is the least addressed level of reach. Feedback from expert interviews suggests that while the master plan level may be referenced greatly in the subject of energy, it is often only on paper and not in practice, and key aspects such as land allocation for energy plants are glaring omissions.

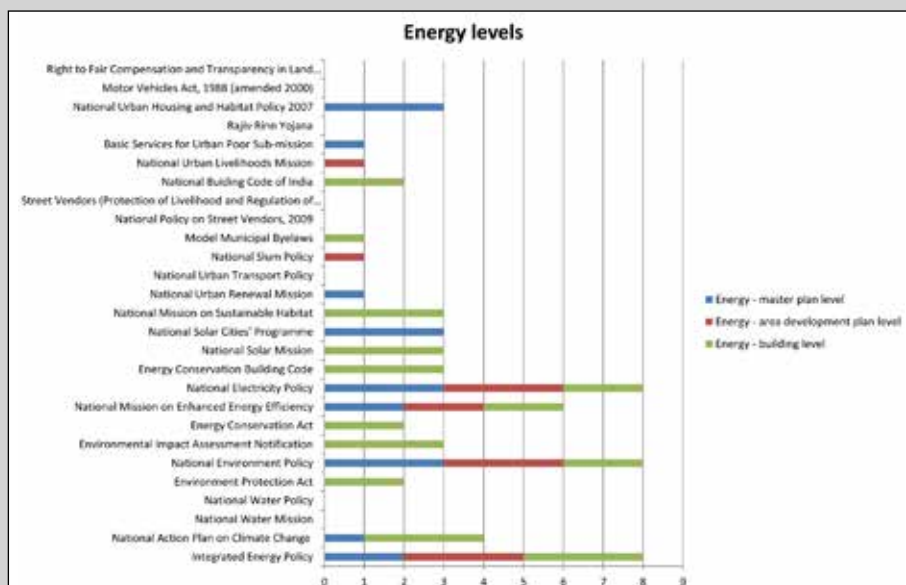


Figure 23: Levels Addressed by Energy Policies



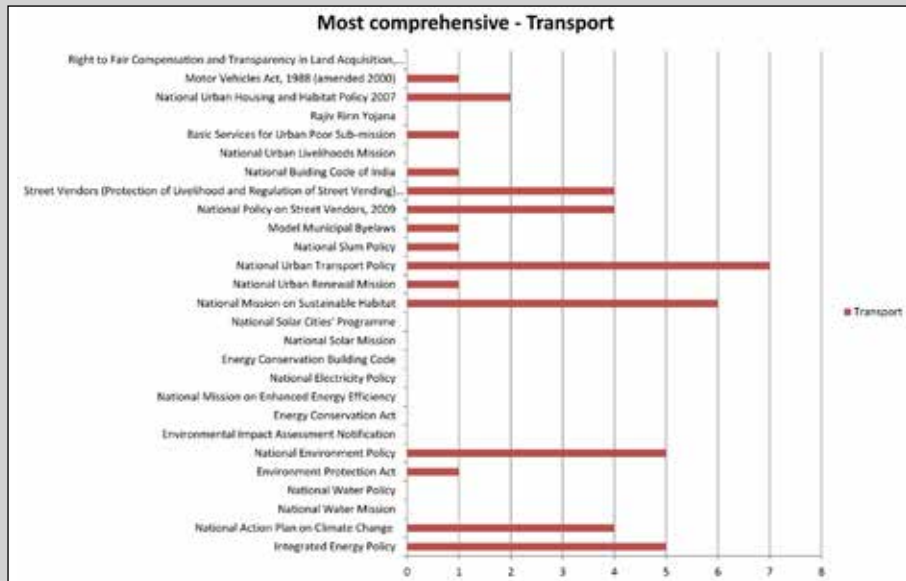


Figure 24: Policies Addressing the Transport Theme

## Policies that Deal with Transport

Fourteen policies deal, at some level, with the subject of transport in the built environment at the local level. Considering that transport and access is a theme that cuts across several issues in the urban built environment, the least number of policies address the subject. While there are policies such as the National Urban Transport Policy and the Motor Vehicles Act that focus very directly on the subject of transport as a key building block of the urban built environment, other policies, such as the National Urban Housing and Habitat Policy or the National Building Code of India, make reference to the fact that transport is one of the issues that needs to be addressed in order to achieve the objectives of these particular policies (housing and proper built environment, respectively).



Figure 25: Policies that Deal with Transport

## Ministries Involved in Transport

While the Ministry of Urban Development and Ministry of Road Transport and Highways are directly involved with the subject of transport, other ministries that deal with urban built environments also have a role to play: such as the Ministry of Environment and Forests and the Ministry of Housing and Urban Poverty Alleviation. A total of six ministries are involved and have some role to play in the transport sector in urban built environments.

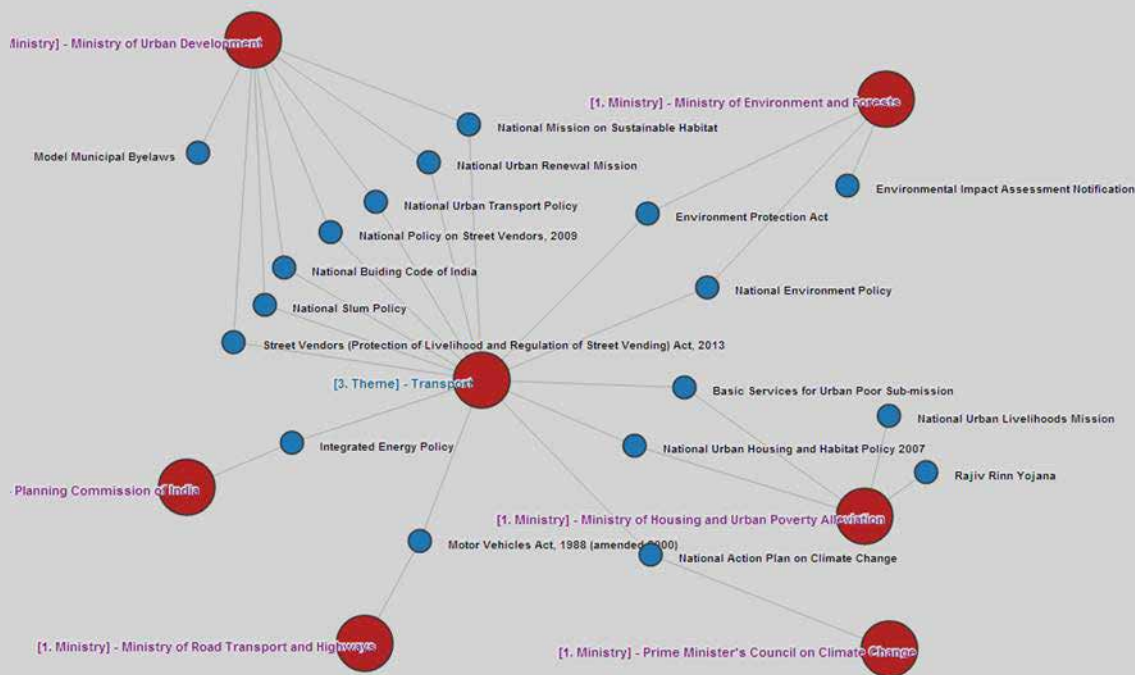


Figure 26: Ministries Involved in Transport

## Sub-themes Addressed by Transport Related Policies

Of the fourteen policies that do address the theme of transport at the local level in some form or the other, a spread of sub-themes can be observed. While only four policies do address all the three sub-themes that have been identified as the criteria for efficiency in the transport theme, six policies only address one sub-theme and nine policies do not speak of alternative fuels and alternative technology development in the urban transport sector. The most addressed sub-theme is enhance efficiency (addressed by thirteen policies), and the least addressed is supply through alternative fuels and technologies (five policies address).



four policies also deal with all sub-themes in transport), and the building plan is the least addressed level of reach. Feedback from expert interviews suggests that while the master plan level may be referenced greatly in the subject of transport, the key overlooked aspect is the linkage of landuse planning and transport planning.

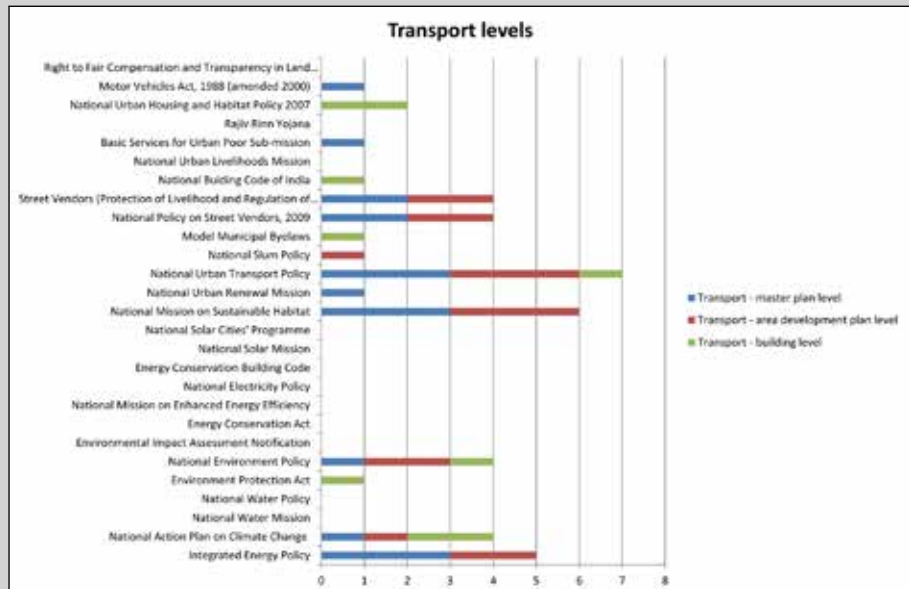


Figure 29: Levels in Transport Addressed by Policies

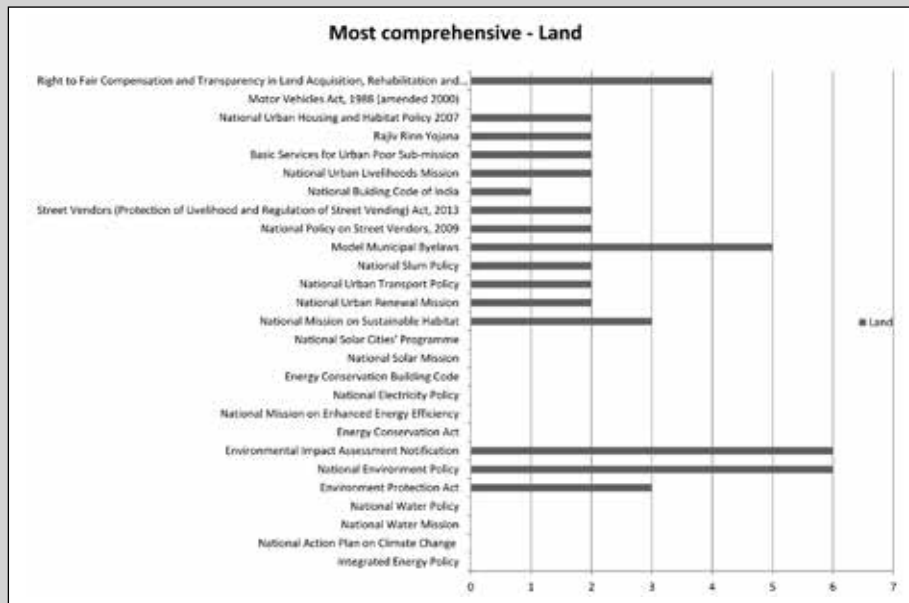


Figure 30: Policies that Address the Land Theme

### Policies that Deal with Land

Sixteen policies deal, at some level, with the subject of land in the built environment at the local level. As all urban development requires land to be built on, the large number of policies touching upon the subject is in line. What is important to note that beyond the Land Acquisition Policy and Act, there is no policy that focuses specifically on the subject of land as a resource to be managed in urban development.



Figure 31: Policies that Deal with Land

## Ministries Involved In Land

While the Ministry of Urban Development and Ministry of Housing and Urban Poverty Alleviation deal with the most number of policies that touch upon the issue of land (these ministries have also been merged under one independent minister in the current national administration), the key land related policy is under the Ministry of Rural Development. A total of four ministries are involved and have some role to play in the land sector in urban built environments.

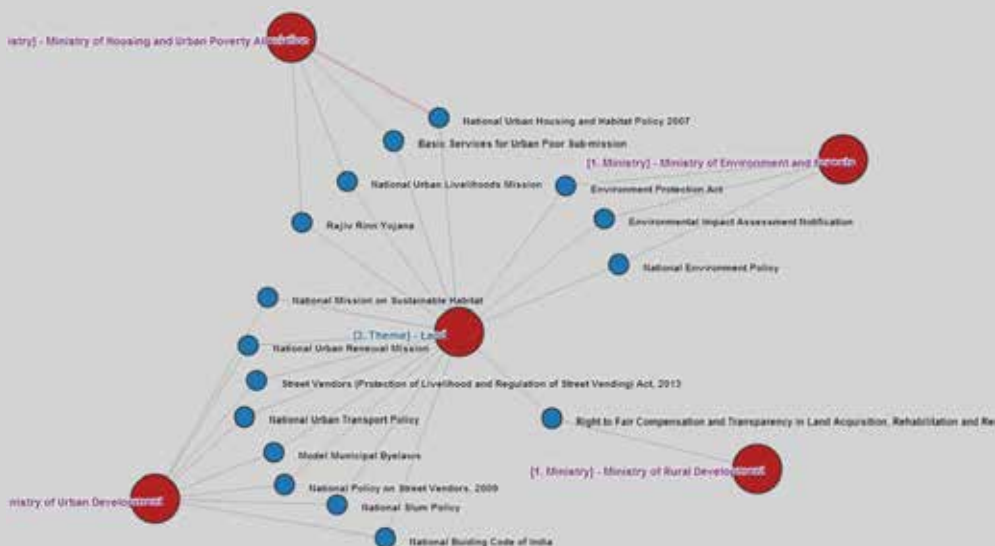


Figure 32: Ministries Involved in Land

## Sub-themes Addressed by Land Related Policies

Of the sixteen policies that do address the theme of land at the local level in some form or the other, a spread of sub-themes can be observed. While only six policies do address both the sub-themes that have been identified as the criteria for efficiency in the land theme, ten policies only address one sub-theme of efficient use of land.

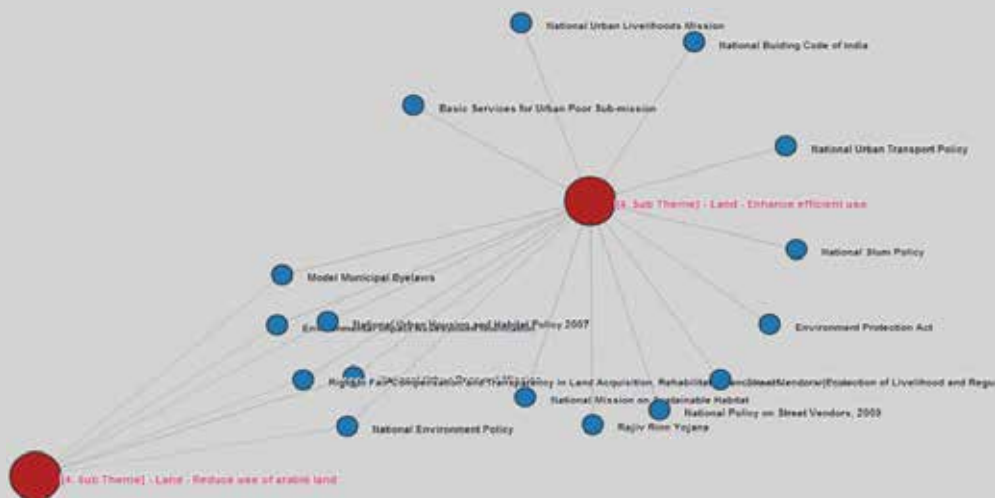


Figure 33: Subthemes under Land Addressed by Policies

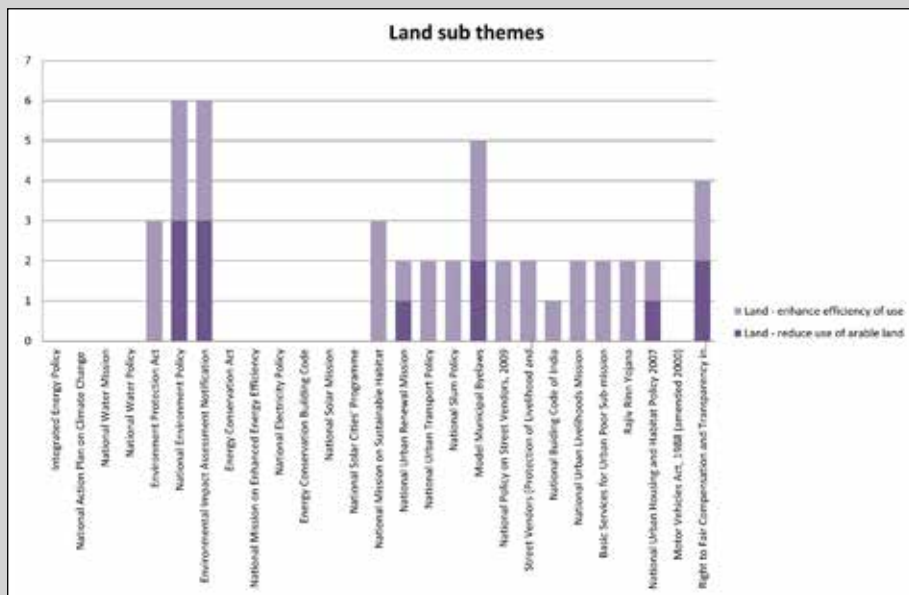


Figure 34: Sub-themes Under Land Addressed by Policies - Graph

### Levels Addressed by Land Related Policies

A study of the local levels addressed by the land related policies points to an indication of the reach of land related policies individually and as a collective group. The land theme shows different results from energy and transport in that a majority of the policies touch upon multiple levels of intervention at the local level (master plan level, area development plan level and building plan level). Only two policies address one level only. All three levels are fairly equally referenced across the policies. Feedback from expert interviews suggests, as in the case of transport, that the key overlooked aspect is the linkage of landuse planning and transport planning.



Figure 35: Levels Addressed In Land Themed Policies

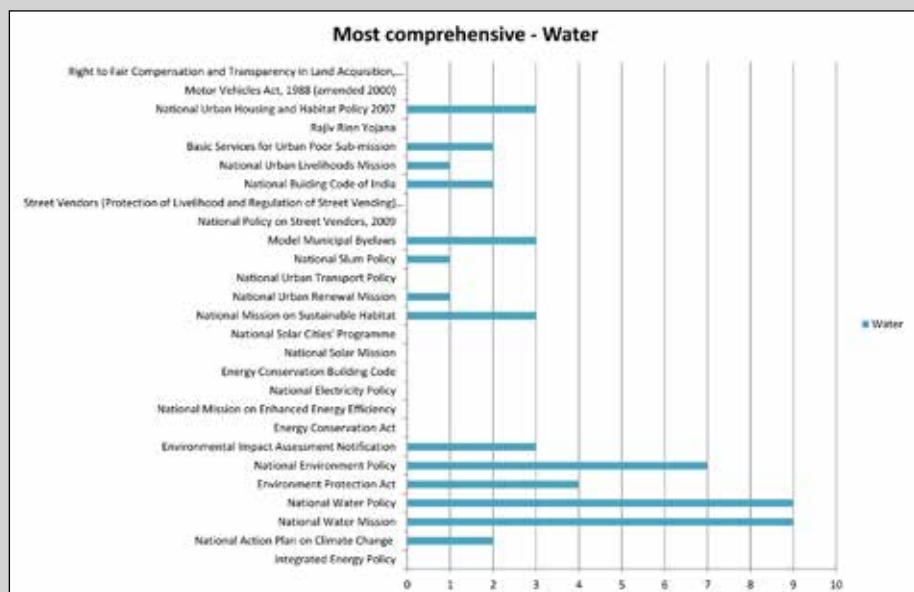


Figure 36: Policies Addressing the Water Theme

### Policies that Deal With Water

Thirteen policies deal, at some level, with the subject of water in the built environment at the local level. While there are policies such as the National Water Policy and the National Water Mission that focus very directly on the subject of water as a key building block of the urban built environment, other policies, such as the National Urban Housing and Habitat Policy or the National Building Code of India, make reference to the fact that water is one of the issues that needs to be addressed in order to achieve the objectives of these particular policies (housing and proper built environment, respectively).

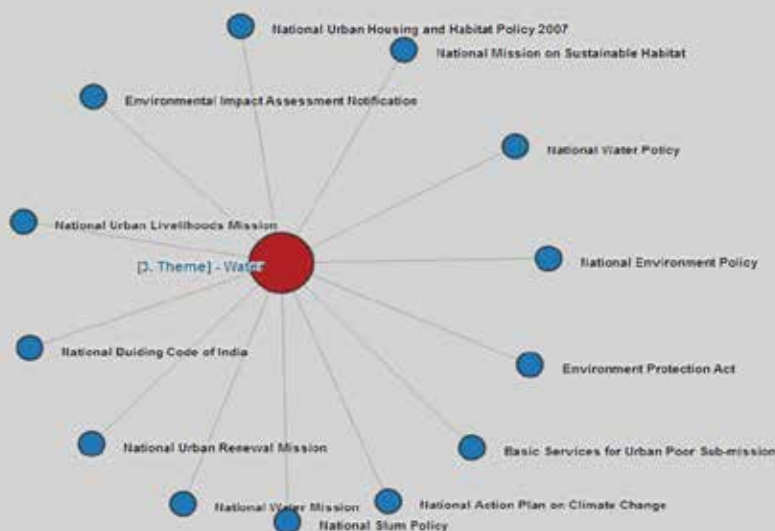


Figure 37: Policies that Deal with Water



## Ministries Involved in Water

While the Ministry of Water Resources is the flagship ministry of water related issues in the country, and houses the two key water related policies, other ministries that deal with urban built environments also have a role to play: such as the Ministry of Urban Development and the Ministry of Housing and Urban Poverty Alleviation (also merged under the current national administration). A total of five ministries are involved and have some role to play in the water sector in urban built environments.

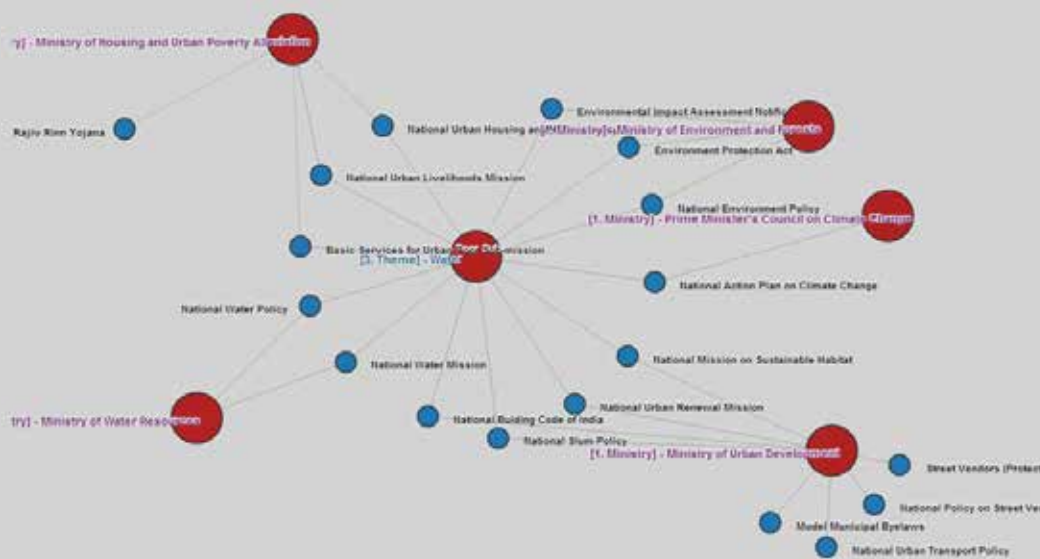


Figure 38: Ministries Involved in Water

## Sub-themes Addressed by Water Related Policies

Of the thirteen policies that do address the theme of water at the local level in some form or the other, a spread of sub-themes can be observed. While six policies do address all the three sub-themes that have been identified as the criteria for efficiency in the water theme, three policies only address one sub-theme and five policies do not speak of augmenting supply of water through recycling and rain water harvesting. The most addressed sub-theme is enhance efficiency (addressed by all policies).

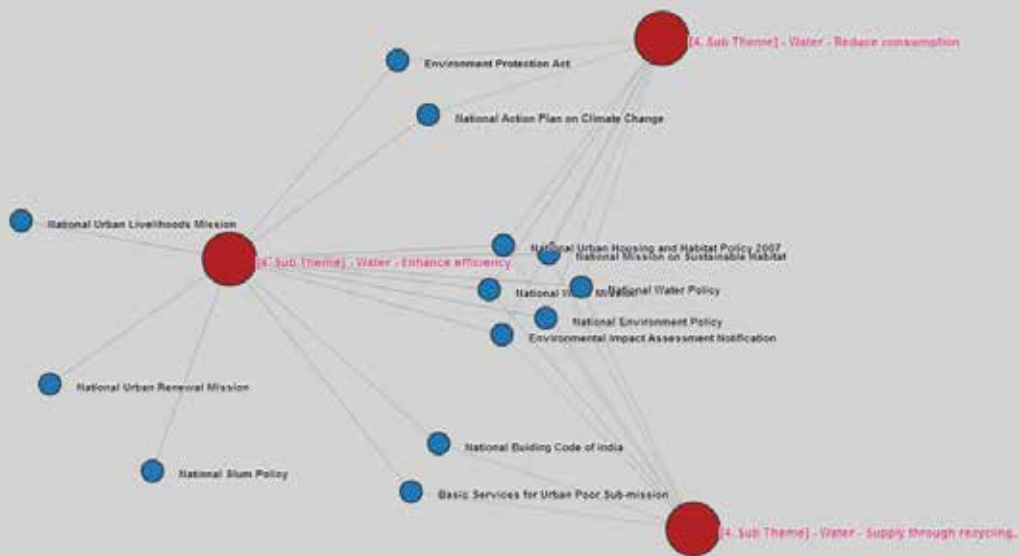


Figure 39: Sub-themes of Water Addressed in Policies

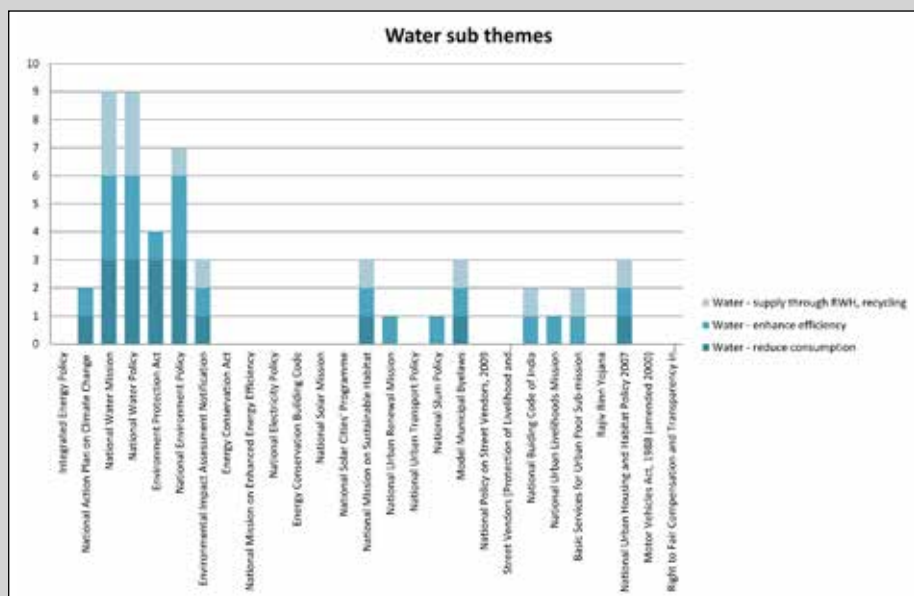
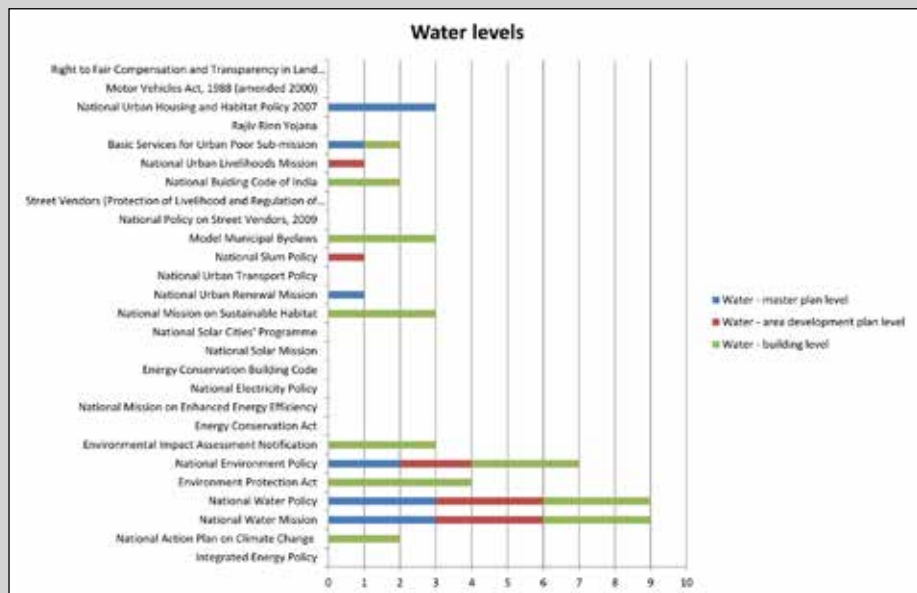


Figure 40: Sub-themes of Water Addressed in Policies - Graph

## Levels Addressed by Water Related Policies

A study of the local levels addressed by the water related policies points to an indication of the reach of water related policies individually and as a collective group. Ten of the thirteen policies address only one level of the three. Only three policies address all three levels (these three policies also deal with all sub-themes in water), and the area development plan is the least addressed level of reach. The building level of intervention is greatly addressed in the policies for water efficiency, suggesting that the focus is on individual, user level conservation strategies at the moment.



**Figure 41: Levels Addressed in Water Policies**

## Inter Linkages Between Themes

Studying the inter linkages between the different themes at different levels becomes important as the synergies between the different themes and policies becomes integral to integrated impact on ground. Some of the key observations and findings in this section are:

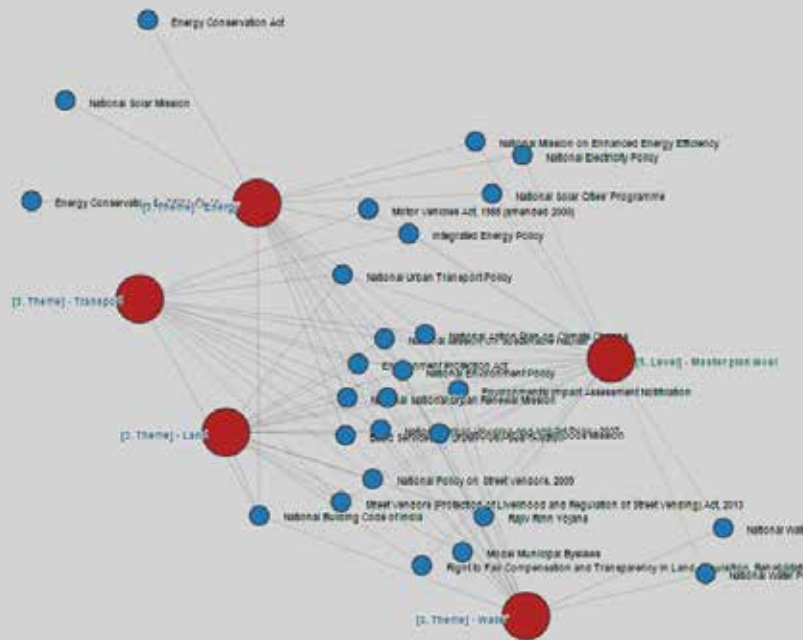


Figure 42: Four Themes at Master Plan Level

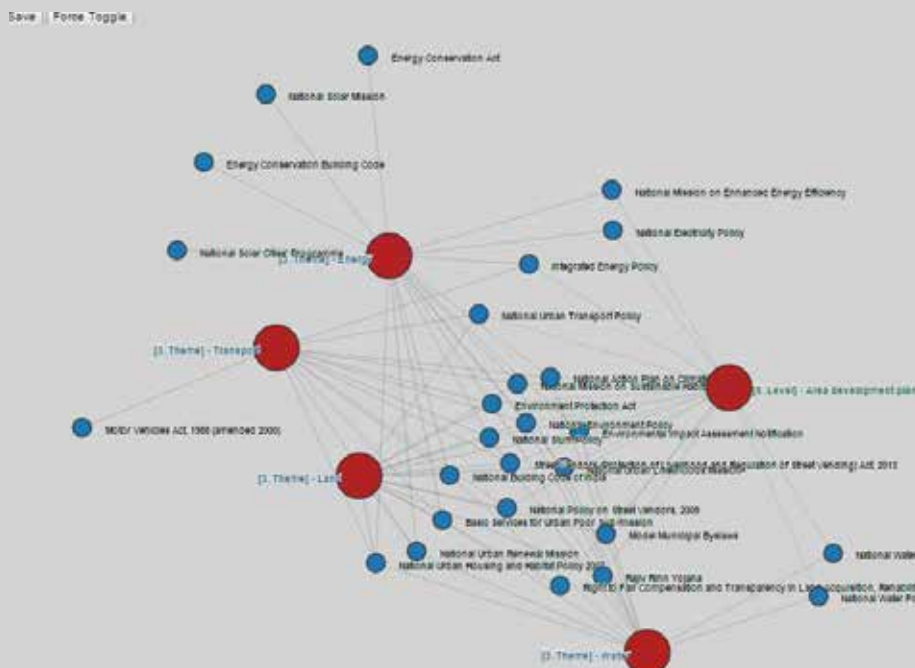
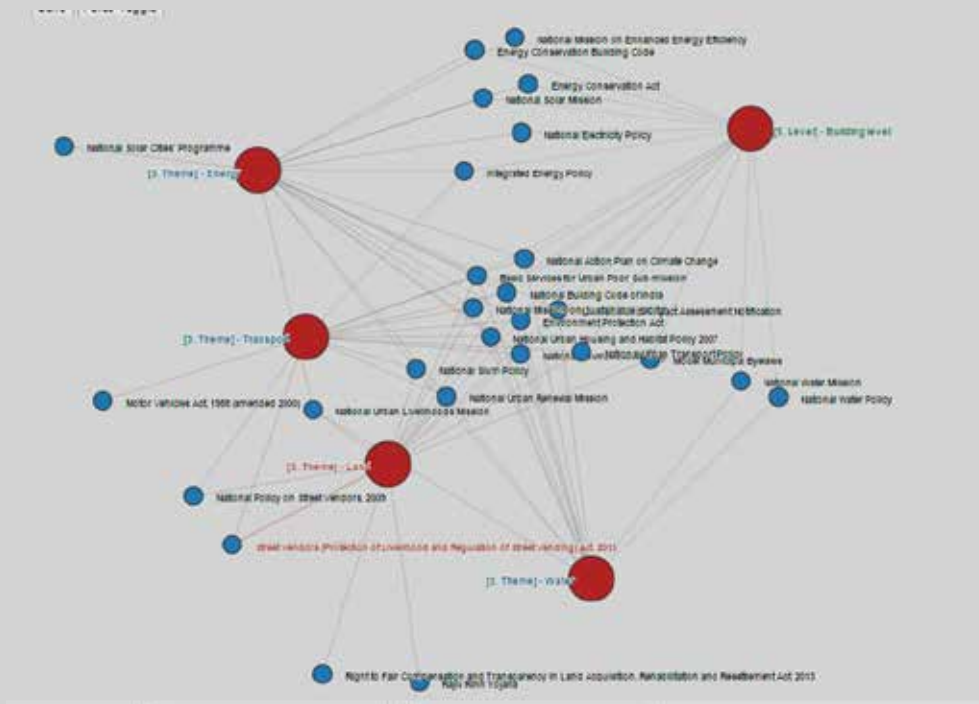
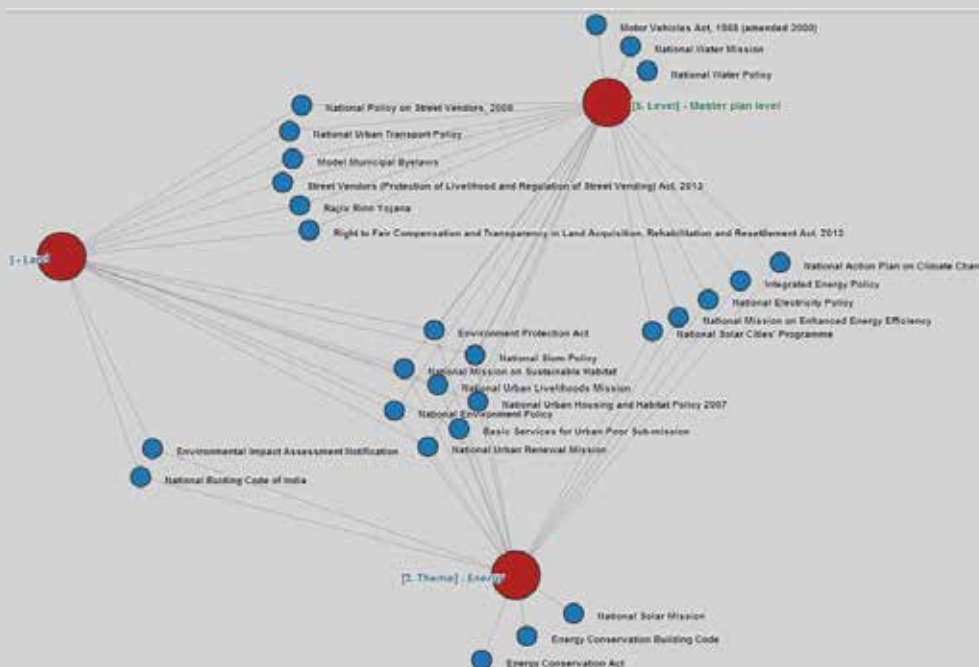


Figure 43: Four Themes at Area Development Level



**Figure 44: Four Themes at Buildings Level**

- Key energy related policies, such as the Integrated Energy Policy or the Electricity Policy typically do not speak of land at the master plan level



**Figure 45: Image Showing Inter Linkages between Land and Energy at the Master Plan Level**

- The National Urban Renewal Mission does not address the building and area development plan levels and restricts its focus and recommendations to the city level or master plan level across themes

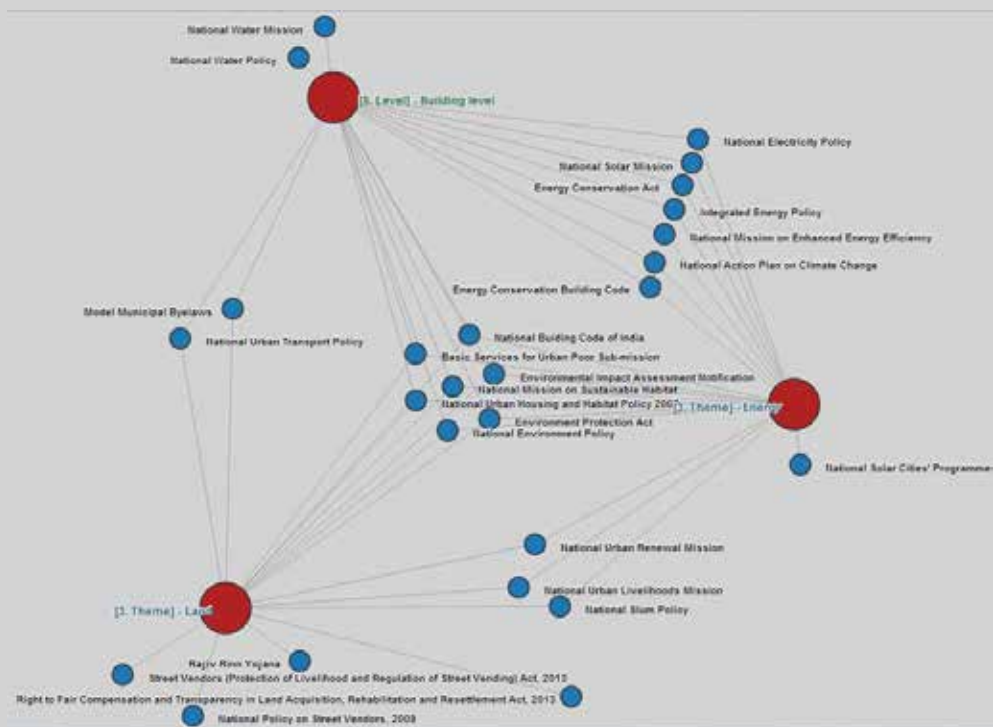


Figure 46: Image Showing Linkages between Land and Energy at the Building Level

- The National Action Plan on Climate Change also omits any reference to the issue of land in the urban built environment

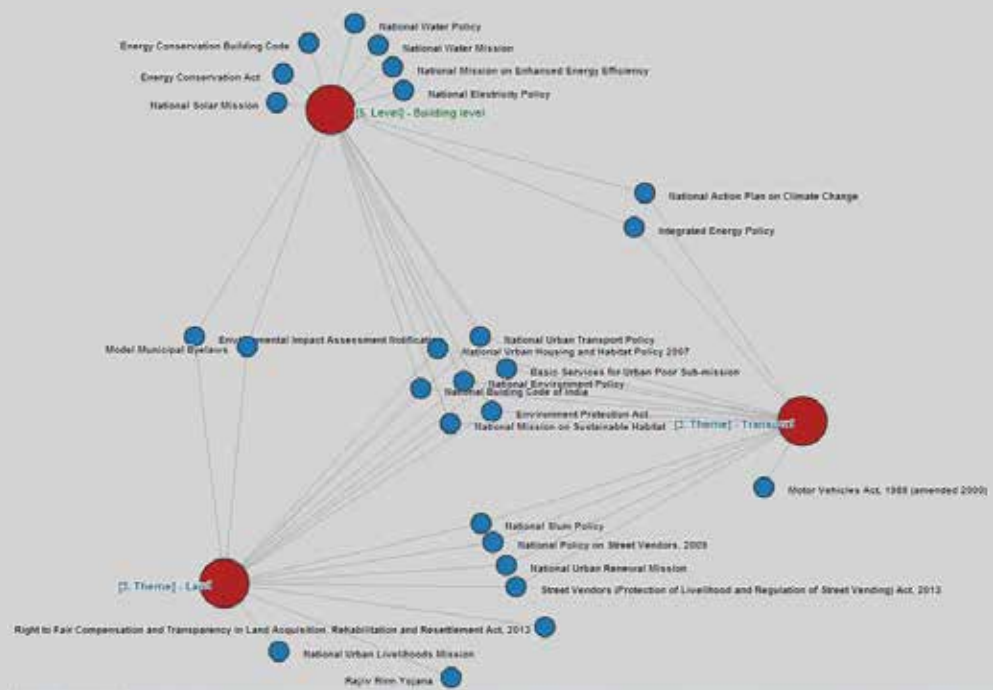


Figure 47: Image Showing Linkages between Land and Transport at the Building Level

- The National Urban Transport Policy does not consider the theme of energy

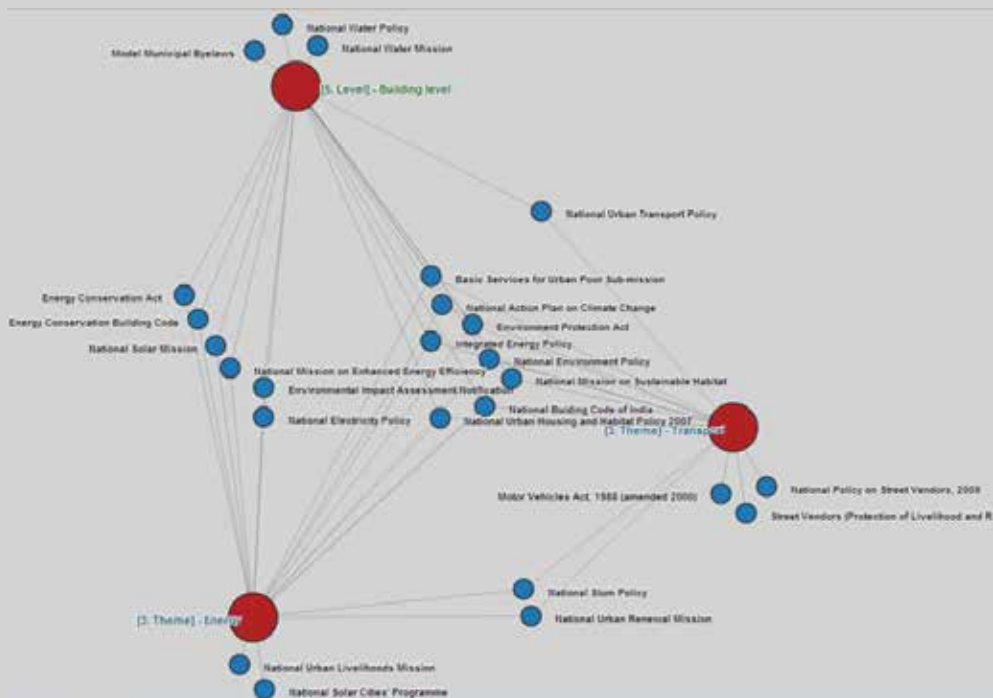


Figure 48: Image Showing Linkages between Energy and Transport at the Building Level

- The Model Building Bye-laws do not address the efficiency of energy and water

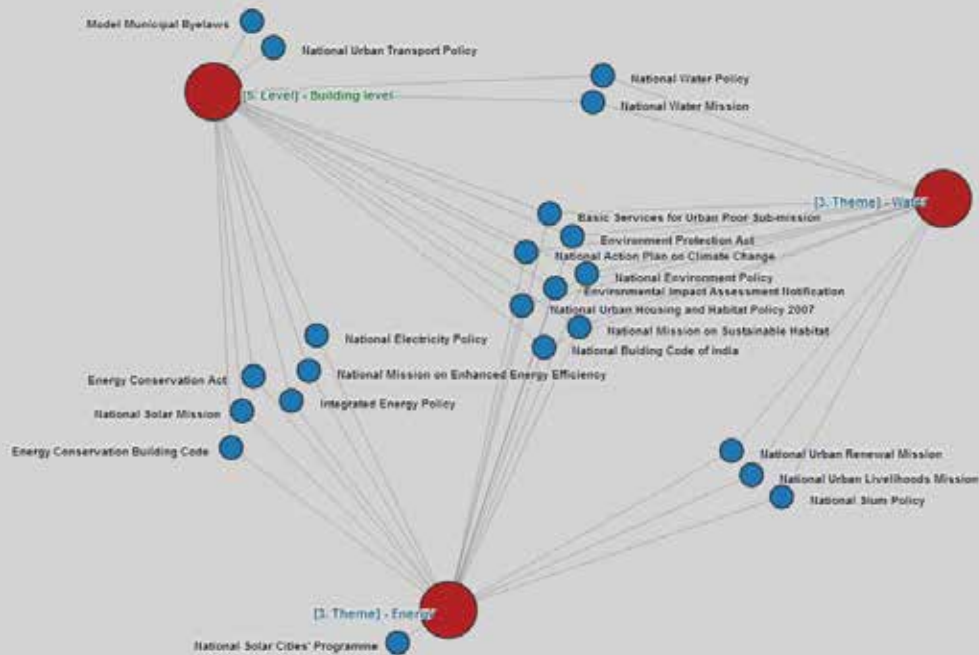


Figure 49: Image Showing Linkages between Energy and Water at the Building Level

- The Environment Impact Assessment Notification does not consider the theme of transport

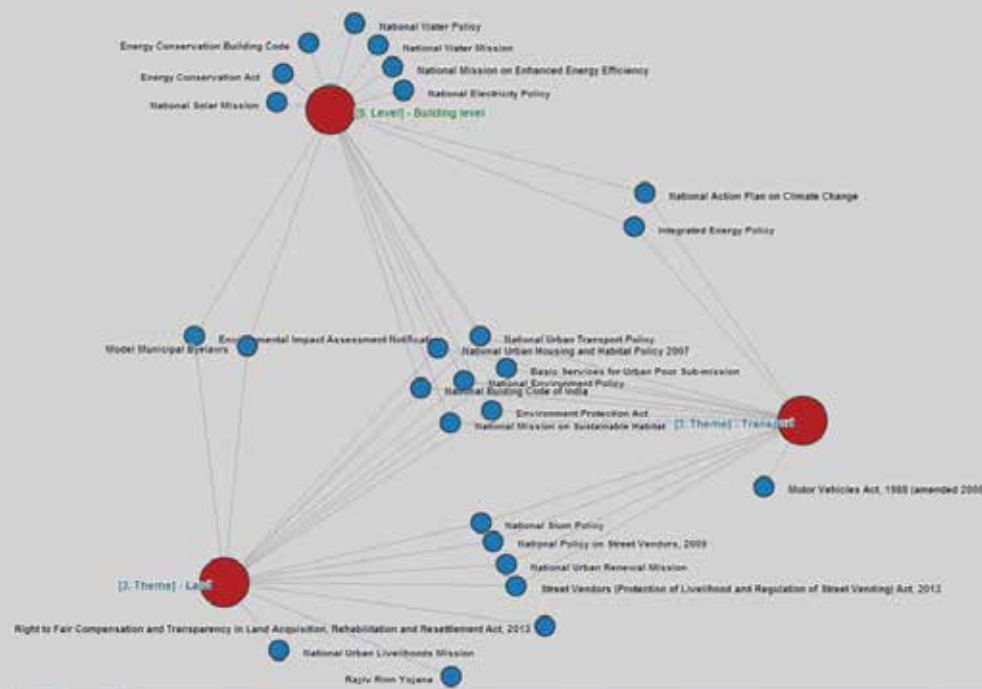


Figure 50: Image Showing Linkages between Land and Transport at the Building Level

The Housing and Habitat Policy does not address the area development plan level

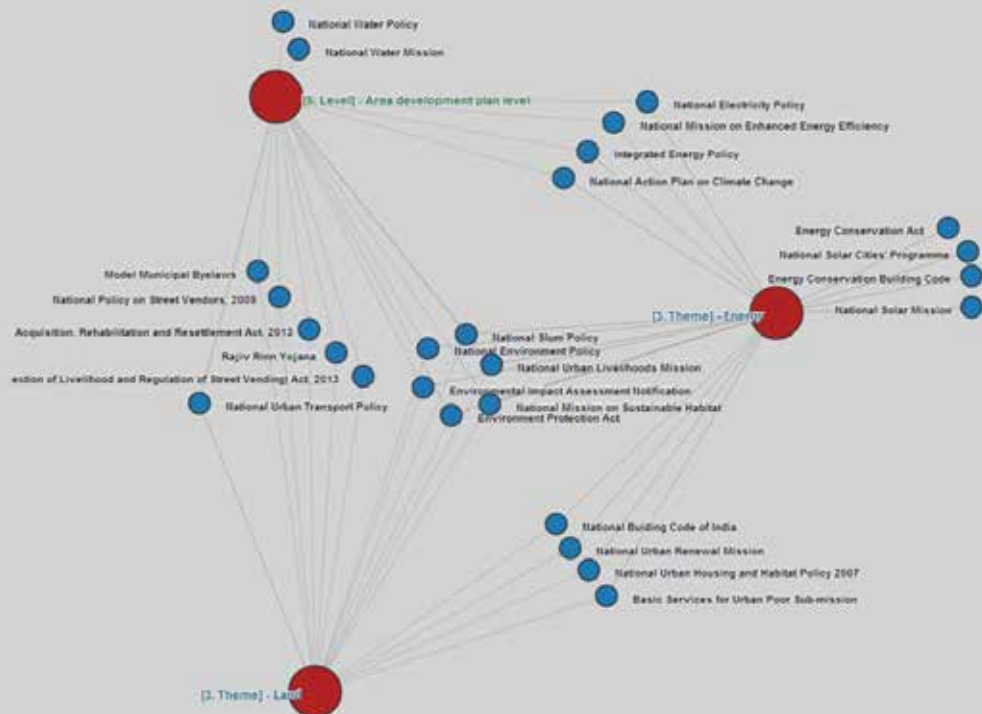


Figure 51: Image Showing Linkages between Land and Energy at Area Development Plan Level



## Target Group of Ministries

- The Ministry of Urban Development, Ministry of Housing and Urban Poverty Alleviation, Ministry of Environment, Forests and Climate Change are the most involved. However, the Ministry of Road Transport and Highways also has a key role to play, along with the Ministry of Rural Development.

## Target Group of Core Policies

- The National Environment Policy is the most comprehensive policy across levels and themes, followed by the National Mission for Sustainable Habitats. Energy and water are the most addressed themes. The policies are weaker in terms of articulating goals, and contain more information on strategies and actions. The policies not backed by legislative mechanisms, such as an act or a set of rules are the least effective.

## Roles and Institutional Set Ups

- More detailed prescriptive formats for different levels of government with clear institutional roles are required
- Priority setting by different levels of government: there are some cons of consolidating ministries as well. For example, if all the energy ministries have now been merged, and the priorities are set for energy sector as a whole, there is a possibility of the topics of efficiency and renewable energy to get less focus if the number one priority is listed as energy supply for all.

## Legislation and Policies

- Clarity is required on the role, hierarchy, etc of the different policy instruments: a high level framework for these would be useful
- Enabling legislation exists, and the focus now needs to be on operationalization through schemes, programmes, etc and to monitor the depth of these programmes

## Data and Knowledge Management

- The lack of data at the micro level is a big gap
- There is a lack of institutional memory in government machinery: a mechanism to avoid duplication and reinvention of work is required



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