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Integrating Environment, Economy And Infrastructure In Planning For Sustainable 9+Urban Development: Key Approaches In The Neplese Context

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Abstract

In a time of rapid urbanizing process, planning and building an ecologically sustainable environment have become imperative in developing countries like Nepal in which urban settlements, as a densely populated built environment, are the center of attention. This paper aims to build a clear and concise synthesis of integration of environment, economy and infrastructure extension for sustainable urban development to serve as an essential reference for decision and policy makers, planners, implementing institutions, and other stakeholders at national and global level with a view to encourage more strategically organized and systematic and sustainability efforts. Using qualitative method for analyzing available information on urban development in Nepal and environmental consideration in urban planning at global level, the study clearly reveals that the urban condition of Nepal is spatially fragmented, less environmentally responsive and more socially divisive and need to adopt porous urban design, coupled with socio-economic and environmental mixed to solve social, economic and ecological issues. The paper further provides a framework for integrated urban development in Nepal with the recognition of environmental and economic parameters and the spatial and the social characteristics are to be inextricably linked in urban infrastructure extension in order to prove right path to the solution of location-specific issues of urban infrastructure extension and wellbeing of urban life along with territorial identity and ecological stability. Suggested integrated framework and techniques produce a holistic synthesis with around ten themes and three dimensions to facilitate sustainable urban development in which both environmental concerns and human wellbeing can be addressed properly.

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Introduction

Until the early 1990s, less subjects from sustainable development literature was concentrated on cities or urban development patterns. But in the following years, architects and urban planners began to notice that what use sustainability in a special feature could have in the urban development model. Some emphasized urban design and physical planning.

Others focused on environmental planning considerations and emphasized on factors such as the quality of climate, water and natural systems, and finally some emphasized the need for attention to social issues and injustices in human societies and believe that social and environmental issues are closely interlinked. The theory of sustainable urban development is the result of environmental advocacy discussions on environmental issues, especially urban environments, who sought sustainable development theory to support environmental resources. Urban sustainable development requires identification of environmental constraints for human activities in relation to urban centers and the implementation of design methods in these constraints [1].

Sustainable urban development seems to be nowadays the main challenge facing our urban centers (municipalities) in the 21st century. It is comprised of many different aspects regarding the social, economic and environmental stability of society [2]. Integrated urban development is the distinctive concept of the most sustainable urban form of the eco-city, which emphasizes urban greening, ecological and cultural diversity, sources of livelihoods and social change, and municipal service delivery, that mainly focuses on integration of ecology, economy and social services and environmental management and other key environmentally sound policies [2,3]. Generally, green infrastructure (GI) is one of the most important terms when we think about planning the contemporary city, that interlink the network of green space which conserves natural ecosystem values and functions and provides associated benefits to human populations [4,5].

Integration of environment is an integral component for sustainable urban development in the twenty first century however, the current trends in developing countries like Nepal are not only sustainable but also very damaging both cultural and natural environments. Our urban infrastructure extension initiatives are less planned and less balanced. Consequently, urban area produces more than half of all greenhouse gas emissions and taking up much more land than needed, with unaffordable housing. The consequences of these trends are dramatic in developing countries [6].

With the adoption of the New Urban Agenda at Habitat III, the debate over the positive and transformative outcomes of well-planned urbanization has led to challenge the paradigm as it reaps the benefits of good urbanization in seeking solutions to many of the problems that are facing today. If urban development in right direction, urban centers can be centers for creating jobs, promoting social inclusion and protecting local ecosystems. The planned and well managed urban centers are assumed as engines of national economic growth, social prosperity and environmental sustainability [7,8].

The concept of integrated urban development is rapidly becoming ensconced in land use planning and land use zoning. Environmental evidence to inform development plan production, as well as serving as a practical means of delivering sustainable development. Hence, GI planning represents a strategic approach to conservation that combines the efforts of previous conservation planning methodologies and practices into a systematic framework that can encompass larger landscapes and broader planning goals [5]. However, there is still considerable confusion and uncertainty about what GI is what value it adds and how it can be achieved and delivered on the ground [9].

New urban development agendas require to adopt integrated urban development plan (IUDP) with the active participation of urban population to materialize the basic approaches and principles of environmental and social safeguard in the course of urban infrastructure development and urban area expansion. Thus, integrated urban development planning (IUDP) starts with a strategy on fostering innovations in urban governance, the impact of world urban development policies and the implementation of new planning instrument. Driven by demand for more effective and flexible planning, urban governance influenced the use of different instruments in practice. IUDP Strategy is a collaborative development processes in which adapting and adjusting to market-oriented model. As such it holds spatial and endogenous characters and meaning within the local planning practice. The key challenges of the IUDP implementation are identified as understanding of the expected outcomes of its application and the existence of potential for change. With regards to the indicators of institutionalization of this new instrument, local planners have pointed out at the importance of providing further technical support, steps towards the implementation of the strategic plan for capacity development and, introduction of better communication as well as the establishment of relations. As a new instrument for urban development planning and supporting urban governance, the strategy IUDP plan is considered as the subject of analysis in the field of administration, professional and the academic community [10].

As part of the smart growth and conservation approach to more sustainable living and climate change adaptation, in

addition to environmental/social safeguard, it is increasingly recognized not just a nice to have, but also as a must have, since it has a number of multi-functional benefit to the urban population. This issue must be reflected in various aspects of local, regional and national planning policy in developing countries [11].

The reality of the urban condition of Nepal reveals that in many parts of the country urbanization has become more spatially fragmented, less environmentally responsive and more socially divisive. Adaptable and porous urban design, coupled with social mix and density cannot solve social inequality on its own, but these measures will go a long way in mitigating the negative impacts of exclusionary design and planning. By developing a more open form of urbanism, this paper attempts to provide a framework for integrated urban development in Nepal with the recognition of environmental and economic parameters and how the spatial and the social characteristics are to be inextricably linked in urban infrastructure investment scheme with due consideration of environmental/social safeguard could be proved right path to the solution of location-specific issues of urban infrastructure extension and wellbeing of urban life along with territorial identity and ecological stability. Methodologically, this paper is based on review of existing literature on integrated urban development with reference to frame out the integrated model for Nepalese urbanism using content analysis method and more qualitative in nature. Model and system analysis techniques are also applied to suggest the IUDP model in Nepalese context which direct sustainable urban development modality for the integration of environment, economy and social parameters appropriately into the urban infrastructure development national, province and local governments.

National urban development policy and global practices

By policy provision of urban development in Nepal, the integrated urban development planning has been prioritized through an approach based on the spatial dimension, linking resources with collaboration of various stakeholders, and is realized through integrated urban development strategies [12]. In the Nepalese context, spatial dimension can provide basis for identification of problems and potentials of the area, as well as communication and cooperation between the actors involved. Spatial approach also helps to overcome the interest-oriented and limited sectoral policies with the application of integrated approach for participation of all relevant stakeholders and organization of the process, which focuses on the complexity of the problems and potentials of the area. Additionally, themes that are recognized significant are: coordination and cooperation between different levels of government, facilitating the conduct of communication with citizens, creating networks of administration and entities from surrounding, as well as enhancing local economy, involvement of representatives of public institutions and other relevant stakeholders in the planning and implementation of projects and activities. Thus, the main focus of the integrated urban development strategy is to contribute to the social, economic, environmental and spatial aspects of development. As such, the strategy is seen as a response to modern requirements due to linking environment, economic, social, control and political components of planning with spatial and physical ones. It also emphasizes participation in all phases of planning, introduces collaboration and, links the plan with financial and time frames and actors / institutions as holders of the activities who implement it. Therefore, the plan document of integrated urban development strategy should represent suitable instrument for the promotion of efficient urban areas, authentic socio-spatial pattern of social and spatial integration. Because in spatial perspective integration represents the basic procedural theme, means that all policies, projects and proposals need to be observed in conjunction with each other. The synergy between the elements should be regulated with regards to the desirable overall impact that should be stronger as a whole than realized through individual elements being implemented in integrated set that priorities for sustainable urban development with the core purpose of collaborative decision-making and agreeing on priorities. This urban development strategy (IUDP) should also contribute to maximizing the value of financing the priority measures/projects and developing links within and outside environments. The formulation of strategy plan which is a development process needs to derive with new knowledge about the area and ideas on how to improve the area, a vision of what the area might become, strategic goals and development activities, areas of intervention / activities, stakeholders, policy / measures for implementation, the time frame of activities and potential sources of funding.

Since the urban environment comprises a wide range of elements and its form of planning is varied, the sustainable urban life is a main concern in Nepalese context and environmental impacts has to be considered during the design phase of urban planning and encourages residents to actively reduce their energy and water consumption and to limit their emissions of greenhouse gases (GHGs) and other pollutants. Melbourne expert panel discussion pointed out principles for

sustainable urban growth to create environmentally healthy, vibrant and sustainable urban centers where people respect one another and nature, to the benefit of all. Rather than a fixed framework, the principles are designed to be flexible enough to be adopted by any urban centers and they provide a starting point for decision-makers on the journey towards sustainability, assisting government officials in understanding the implications of decisions taken at a broad strategic level [13].

One of the most considerable features of modern urban centers in developing countries like Nepal is high density where vehicles in these confined spaces are not controlled in numbers, or have poorly-maintained fossil fuel engines, serious air pollution is surely followed. Therefore, urban centers have to rigorously monitor and manage such emission sources. In this case, transit-oriented development (TOD) could be the potential to address this issue. TOD represents a neighborhood incorporating a mélange of land uses centered around a transit station. Within a short walking distance from the core, usually in ten minutes, residents can easily access all kinds of daily services, such as retail stores, offices, and residential quarters. The function and importance of TOD can provide a model of efficient land utilization, to better serve the needs of diverse households, and to create more identifiable, livable communities. As identified by Belzer and Autler, measures of livability which relate to TOD include reduction of gasoline consumption, increased walkability and access to public transportation, decreased traffic congestion, positive health outcomes, and more convenient access to services, activities, and public spaces [14]. The built environment of urban centers is too often the most prominent and the truth is sustainability cannot be accurately portrayed and therefore identify its solutions. Because, the sustainability from the global scale to the local scale (which is the municipality on this scale) is correlated, and on the other hand, there are still contradictory theories over the consequences and processes of many development actions. Nonetheless, need is to identify the most important solutions agreed by the majority of experts in urban planning and management. Reduced dependency on the vehicle, increased physical compression in urban development, conservation and restoration of natural systems in the urban and surrounding area, reducing resource consumption and pollution production in the urban center and its related area, improving viability of urban communities, sustain and strengthen the urban economy and reforming the municipal administrative and governance system.

Why integration of environment, economy and spatial characteristics into urban infrastructure extension?

As urban settlements represent a built environment with various man-made architectural structures, the concept of greenness is also important in contemporary building standards. Both homes and commercial buildings use large amounts of energy for heating, cooling, cooking, and management of waste. Attempts to rein in such energy use and its subsequent GHGs emissions led to an increase of green building standards that promote better occupant comfort and lower environmental impacts at the same time. Green building aims to be responsible to the environment during its entire life cycle and to increase its energy efficiency at different stages, including siting, design, construction, operation, maintenance, renovation, and demolition in close coordination of design teams, architects, engineers, and clients in order to expand concerns of economy, utility, durability, and comfort [15]. Therefore, the strategic plan of IUDP should attempt to meet green-building standards as a part of healthy urban life in Nepalese cases.

Since urban centers are for people, so that sustainable urban centers should be places where people want to live and work, now and in the future. Thus, the urban centers (Municipalities) meet the diverse needs of existing and future residents, are sensitive to their environment, and contribute to a high quality of life [16]. They (Municipalities) are safe and inclusive, well planned, built and run, and offer equality of opportunity and good services for all. It is prescient that human health, wellbeing, safety, security and opportunity have to be influenced by the strategies of urban infrastructure services are planned, designed, developed and managed for environmental stability, social development and economic productivity.

Sustainable urban development is indeed a multilayered concept. It synthesizes land development and nature preservation and refer to the capacity of nature to support its activities, the vitality of an urban center as a complex system, and the quality of life of its inhabitants. Thus, IUDP strategic plan for sustainable urban development should cover many fields of activity such as environmental protection, human development, and inhabitant wellbeing to maintain environmental quality and carrying capacity, to support socio-economic development and management, and to provide sufficient services and livelihoods to all current and future inhabitants. That is, the practicable and full realization of sustainability can only take place in the overlap, or the dynamic, among

the three sustainability can only take place in the three fundamental capacities (Figure-1)

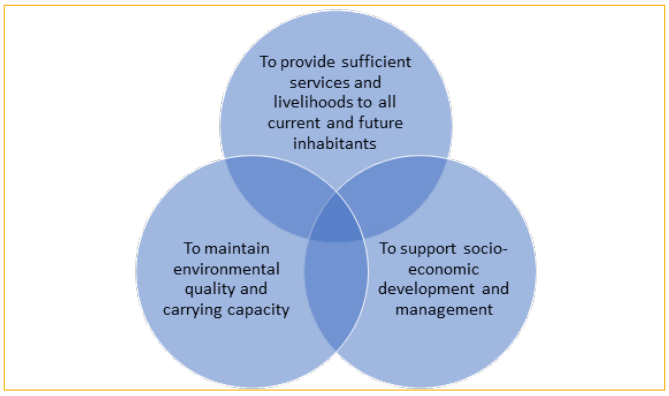

Figure 1: Integrated urban development strategic plan framework Way towards integration .

Integration of environment, economy, social and cultural characteristics of location-specific space is or achieving sustainability with the prosperity of urban life, developing urban policies is the prime task to establish mechanisms of coordination between central and local governments, preventing the duplication of services and costs and amalgamate the dispersed energy and potential of urban centers within a national system or hierarchy of cities and towns. The policy provision needs to coordinate the work of different sectors and tiers of government, Further, national policy must establish incentives for more sustainable practices and provide a basis for the allocation of resources. Next to ensuring proper urban legislation for fostering institutional and social relationships that underpin the process of urbanization. Another task is to generate prosperity is closely linked to the physical design that need good planning which can change a city's internal structure, form and functionality, contributing to a more compact, integrated and connected layout and leading to sustainable solutions. Densification, social diversity, climate change mitigation and adaptation, the sustainable use of natural resources, and adequate public spaces, including vibrant streets are all resulted from good urban planning and design. The next point is finance for social and economic phenomena in which public investment generates private value. To create employment, urban areas and regions require strong economic growth strategies that take into account regeneration, cluster development and industrial zones.

Strengthening municipal finance comprises realigning fiscal authority, responsibility and revenue sharing i.e. achieving the right balance between different levels of government, designing new financial mechanisms and exploring new sources of capital, improving systems of revenue collection and improving budget management and transparency. Finally, expanding urban area implementing maintain planned urban extensions and planned city infills. This results in lowered costs of basic urban services, urban energy use and greenhouse gas emissions [17].

Environment is an integral component of sustainable urban services primarily because it can help communities protect the environment and human health while providing other social and economic benefits. It is always true that green spaces, quiet streets and recreational parks are important for relaxation, health and sport, nature watching and social activities. Similarly, open areas and green parks are important building blocks for promoting quality of life in urban environments. To become more environmentally and economically sustainable, many communities use smart growth approaches a range of strategies that cities, suburbs, towns, and rural areas can use to protect the environment and public health, support economic development, create strong neighborhoods with diverse housing and transportation options, and improve residents' quality of life [18].

Integration Plan Process

Urban strategic plan preparation processes currently use composed of indicators that address different concerns and all of the indicators are selected to provide information about the functioning of a specific system, for a specific purpose to support decision-making and management. The common ground to be found among all the standards as to promote sustainable urban development by aggregating diverse information into focused and applicable knowledge. However, issues covered in strategic urban development can be innumerable such as urban planning, transport systems, water, sanitation, waste management, disaster risk reduction, access to information, education and capacity-building. The most important requirements are: a flourishing local economy to provide jobs and wealth, strong leadership to respond positively to change, effective participation by local people, groups and businesses, especially in the planning, design and long-term stewardship of their community, and an active voluntary and community sector, a safe and healthy local environment with well-designed public and green space, sufficient size, scale and density, and the right layout to support basic amenities in the neighborhood and minimize use of resources (including land), good public transport and other transport infrastructure both within the community and linking it to urban, rural and regional centers, buildings both individually and collectively that can meet different needs over time, and that minimize the use of resources, a well-in-

tegrated mix of decent homes of different types and tenures to support a range of household sizes, ages and incomes, good quality local public services, including education and training opportunities, health care and community facilities, especially for leisure, a diverse, vibrant and creative local culture, encouraging pride in the community and cohesion within it, a sense of place, and the right links with the wider regional, national and international community.

As the pace of urbanization continues to accelerate, an urgent need for a transition towards a future that maximizes live ability and sustainability. The notion of urban sustainability becomes increasingly intertwined with livability, which represents the sum of the factors that add up to a community's quality of life including the built and natural environments, economic prosperity, social stability and equity, educational opportunity, and cultural, entertainment and recreation possibilities. In short, a sustainable and livable urban center should be an environment that is both inviting and enjoyable, where inhabitants would want to live and work now and, in the future [19].

From the aforesaid discussion, it can be noted that different types of issues embody different concerns. In many cases, the concerns are unbalanced and fails to concurrently address the environmental, socio-economic, and inhabitant wellbeing aspects. Therefore, the major theme that need to be incorporated in urban strategic plan are environmental quality monitoring, natural resource consumption, lowering environmental impact and maintaining carrying capacity, a sound socio-economic environment, adequate infrastructure, development strategy considering both human and natural environment, sports, leisure and recreation, consumer goods and services, cultural diversity and tolerance, and sense of wellbeing and work-life balance. All of these themes of strategic plan for urban development further can be grouped into three broad classification as first three are under environmental, the second three under socio-economic, and the last four under inhabitant wellbeing-oriented adopting integrative method for urban development planning (Figure 2).

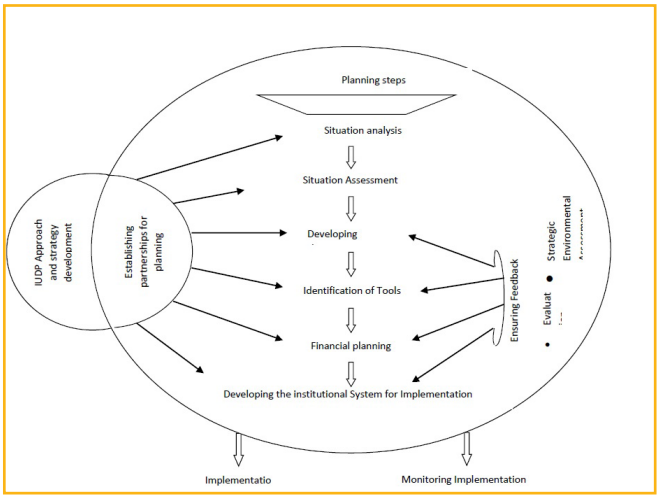

Figure 2: Integration plan process.

As presented in figure 2 urban development P planner has to be pointed out the major themes for integrated urban development based on global standards first and further integrate the themes into environmental quality and carrying capacity, environmental resource management and development strategy and of integrated urban development and lifestyles of sustainability. The three dimensions correspond directly to the concept of integrated urban development with a synthesis framework as composed of economic, social, and environmental goals. A successful, sustainable and well-balanced urban development planning, has an interwoven approach that addresses natural environment and resources, infrastructure and socio-economic development, and inhabitants' wellbeing are ensured. Therefore, these three aspects must receive equal attention and importance.

Model for Integration

As the modern as well as innovative concept of urbanism in the developing countries like Nepal, it has been undertaken as a reaction against the perceived environmental, economic and social problems of earlier generations of urban planning. New urbanism should basically advocate restructuring of public policy and development practices to support the neighborhoods that must be diverse in use and population; communities should be designed for the pedestrian and transit as well as the car; urban centers and towns should be shaped by physically defined and universally accessible public spaces and community institutions; urban places should be framed by architecture and landscape design that celebrate local history, climate, ecology, and building practice (Figure 3).

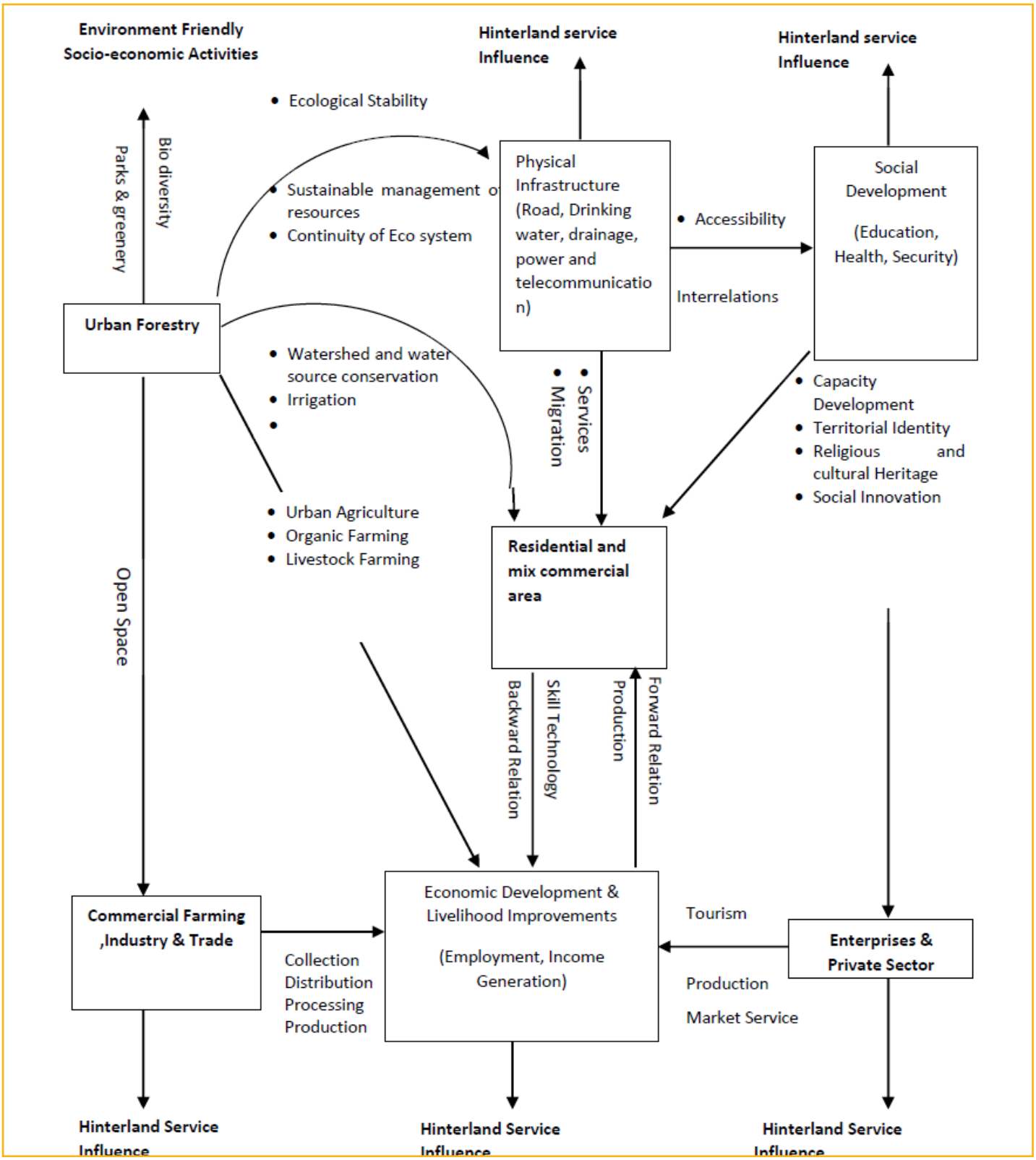

Figure 3: IUDP strategic plan model.

From a thoroughgoing critique of the impacts of urbanization, many have also made the case for walkable, human-scaled neighborhoods as the building blocks of sustainable communities and regions. These conceptions are materialized into six fundamental features, including a clear neighborhood center that satisfies all residents' daily needs, the five-minute walk, a street network in the form of a continuous web, narrow and versatile streets, mixed land use, and special sites for special buildings. These new urbanist features have in reality been translated into indicators, such as shift of transport mode in the low carbon cities framework (LCCF), local transport green transport promotion in green city index (GCI), density in sustainable cities Index, complete neighborhood/compact city in indicators for sustainability, and street life in quality of life. Each of these indicators serves as a parameter which points to, provides information about, and/or describes the state of a phenomenon/environment/ area. Indicators have the role of measuring performance. They must be clear, simple, scientifically sound, verifiable, and reproducible. According to the European Evaluation Network for Rural Development, an indicator must be SMART: Specific, Measurable, Achievable, Relevant, and Time-related to make tangible all indicators rather than abstract concept of urban sustainability [20].

Planning cycle for integration

Integrated urban development approaches simultaneously advance multiple benefits across the three dimensions of sustainable urban development (social, environmental and economic). They ensure wellbeing of urban life, environmental sustainability and social participation which go hand in hand and require effective governance, policy coordination and coherence across government departments and between stakeholders to fully understand and manage the many interactions between economic growth, livelihood improvement and the environment, and to ensure that policies and plans are designed and implemented in ways that do not bring progress in one dimension at the expense of another. In practice, integrated urban development approaches need to be mainstreamed into each stage of the national planning cycle as compromising of all the activities and decisions undertaken at the federal, province and local levels by diverse stakeholders to both develop and implement policies, strategies, plans and projects. It should include the following generic components over a revolving planning cycle such as stakeholder engagement and coordination to set visions and goals, integrated assessments to understand the environmental, social and economic impacts (positive and negative) of different policy options across different sectors and segments of the population and the linkages (synergies and trade-offs) of policy options, strategies and plan formulation based on integrated assessments and stakeholder consultations, implementation of plans and strategies (e.g., through investments, the supports, regulations and social interventions ,and, monitoring and evaluation to measure the effect of the inventions against targets and recommend corrective actions [21]. A generic representation of the planning cycle of urban development plan is presented in figure-4 and is used as the framework for discussing possible entry points for integrated approaches at the distinct stages in the cycle. This planning cycle mirrors the policy cycle as it is commonly portrayed. Feedback loops and iterations are also common to the planning and policy cycle as depicted to address the challenges and bottlenecks facing the adoption of integrated approaches across the planning cycle.

Figure 4: Urban Development Planning cycle.

The complexity of integrated planning, with its many drivers and actors, makes evidence-based policymaking increasingly desirable. However, the assessment of integrated policy options is a challenge in Nepal due to a lack of data availability and sharing arrangements, low institutional capacities across the policy cycle, and insufficient communication between analysts, policymakers and stakeholders. While better evidence is necessary to support and inform a consultative policymaking process, for such a process to be realized, mechanisms also need to be in place that ensure all parties have a voice in the process, especially the vulnerable sections of society. Thus, integrated planning should address the fundamental enabling factors as strengthening institutions and governance system, strengthening evidence-based empirically backed policy options, development of budgeting and financial systems, support for monitoring and evaluation, and capacity development with applicable policy measures and plan framework.

Conclusion

Since we are moving into a fast-growing and transforming stage, we need to be aware and consensus on urbanizing trends which continue to bring about compelling national and local changes. To adapt and respond to changes, we need to a newly devised synthesis framework of integrated urban development with basic themes and three (environment, social and wellbeing) dimensions which enabled the idea of sustainable urban development exploring through a review of current notions in literature; approached the multifaceted concept of integrated urban development from the perspectives of policy-making, decision-making, and problem-solving processes to establish the essentiality of developing a synthesis framework, re-organized and integrated major factors into newly and clearly defined dimensions and themes under a concise framework to help identify a more holistic approach to realizing the goal of livable, ecological, and sustainable urban life; and devised a synthesis framework that is globally encompassing and adaptive for any urban centers to use in their policy-and-decision-making processes towards a sustainable future. To achieve the 2030 urban development agenda reflected by the SDGs, federal government has both challenge and opportunity of developing and implementing strategies, plans and policies that aim sustainable urban development through integrated development approaches that simultaneously achieve economic growth, social development , infrastructure extension, and environmental sustainability, and consider synergies and trade-offs between sectors and development objectives as key to achieving this. Integrated planning approach is the defining feature of the way forward, and all stakeholders at all levels (local, province and federal) have a part to play in its realization. While support for financial and technical capacity-building is needed in the process of developing integrated planning approaches, political economy issues, is seen to underline all the challenges identified during the planning. Therefore, the more pressing and urgent transformations are needed in areas linked to the political economy, vested interests, and more equitable access to and participation in the benefits of local, province, national and global growth and wealth creation. Focusing on environment, economy and inhabitants' comfort or wellbeing this approach can ensure a successful and sustainable urban environmental planning, an interwoven strategy that addresses concerns in natural environment and resources, infrastructure and socio-economic development, and inhabitants' wellbeing.

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