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Évaluation d'un plan directeur urbain basé sur des indicateurs utilisant le processus de hiérarchisation analytique (PHA) :
le cas de Lahore (Pakistan)

Indicator based urban master plan evaluation using Analytic Hierarchy Process (AHP) for Pakistan: *The Case of Lahore*

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Résumé

Cette recherche vise à formuler un système d'évaluation post hoc basé sur des indicateurs pour les plans directeurs, le principal outil pour guider le développement des villes du Pakistan. Une tentative d'évaluation est également faite en ce qui concerne les propositions faites et la situation actuelle à la fin de la durée du plan de l'étude de cas Lahore, Pakistan et du plan directeur intégré de Lahore 2021. Le choix des plans directeurs et des indicateurs pour la réalisation de cette recherche est étayé par l'étude approfondie du système de planification au Pakistan, des villes du Pakistan, de la situation actuelle de la pratique d'évaluation des plans au niveau international et au Pakistan, et des pratiques contemporaines d'évaluation des plans.

Une analyse documentaire a ensuite été menée pour comprendre le concept d'indicateurs comme moyen d'évaluation des plans. Les caractéristiques des "bons" indicateurs/systèmes d'indicateurs ont été étudiées et celles qui sont utiles pour les villes du Pakistan ont été extraites. Ces systèmes d'évaluation urbaine (comprenant également des systèmes d'évaluation de la durabilité urbaine) sont ensuite explorés afin de développer des thèmes pour l'évaluation du plan directeur urbain pour l'étude de cas.

Simultanément, un système de pondération et d'agrégation des indicateurs a également été identifié en fonction de la nature de l'évaluation et de l'étude de cas. Cette méthode, l'Analytic Hierarchy Process, nécessite l'avis d'experts dans le domaine et, par conséquent, une comparaison des indicateurs par questionnaire a été réalisée. La sélection des personnes à interroger a également fait l'objet d'un raisonnement scientifique afin d'obtenir des résultats adéquats et fiables en incluant une variété d'experts de différents domaines de la gestion urbaine et en menant un nombre d'entretiens scientifiquement acceptable. Enfin, en utilisant les résultats et les conclusions des étapes mentionnées ci-dessus, un système complet basé sur des indicateurs pour l'évaluation du plan directeur urbain après sa mise en œuvre a été développé.

Le manuscrit est organisé en deux parties. La première est un résumé en français et la seconde est la thèse détaillée en anglais.

Summary

This research intends to formulate an indicator based post hoc plan evaluation system for the master plans, the main tool to guide the development of the cities, of Pakistan. An attempt at the conduction of an evaluation is also made with respect to the proposals made and the current situation at the end of the plan tenure of the case study Lahore, Pakistan and Integrated Master Plan of Lahore 2021. The choice of master plans and indicators for realisation of this research are supported through the in-depth study of the planning system in Pakistan, the cities of Pakistan, the current status of the plan evaluation practice internationally and in Pakistan, and the contemporary plan evaluation practices.

Literature review has then been conducted to understand the concept of indicators as a means to make plan evaluation. The characteristics for 'good' indicators/indicator systems have been studied and the ones useful for the cities of Pakistan have been extracted. These urban evaluation systems (also including urban sustainability evaluation systems) are then explored to develop themes for urban master plan evaluation for the case study.

Simultaneously, a system for indicator weightage and aggregation has also been identified based on the nature of the evaluation and the case study. This method, Analytic Hierarchy Process, requires opinions of experts in the field and therefore, a questionnaire-based indicator comparisons have been conducted. The selection of the persons to be interviewed has also been given scientific reasoning to get adequate and reliable results through the inclusion of a variety of experts from different realms of urban management and by conducting a scientifically acceptable number of interviews. Finally, and using the results and finding from the steps mentioned above, a comprehensive indicator-based system for urban master plan evaluation after its implementation has been developed.

The manuscript is organised in two parts. The first one is a resume in French and the second is the detailed dissertation in English.

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Résumé de la thèse en français

1. Introduction

L'évaluation, telle qu'elle est généralement définie dans la littérature d'aménagement, est l'appréciation systématique de la valeur ou du mérite d'un objet quelconque (Trochim, 1989). Dans le domaine de l'urbanisme, cet objet peut concerner les conséquences d'un plan de développement, ses résultats, le degré de réalisation des objectifs du plan de développement ou même le processus de planification par exemple le niveau et la qualité de la participation des parties prenantes. Il existe une littérature d'évaluation traditionnelle florissante, avec ses propres typologies et méthodes d'évaluation (par exemple, Patton, 2002 ; Wholey, 2004 ; Weiss, 1988). Il est intéressant de noter que bon nombre des préoccupations, techniques et typologiques de la recherche d'évaluation traditionnelle n'ont jamais fait surface dans les évaluations de plans pratiques. Par exemple, les débats sur la recherche en évaluation traditionnelle se concentrent sur les techniques quantitatives par rapport aux techniques qualitatives (Patton, 1986), le rôle de la théorie (Chen, 1990), la défense des intérêts et le biais de l'évaluateur (Chemlinsky & Shadish, 1997), et l'utilisation d'outils clés tels que la mesure du rendement (Perrin, 1998). Dans la pratique, l'évaluation des plans, en revanche, se concentre sur ce qu'il faut évaluer, comment l'évaluer, l'utilisation des résultats de l'évaluation et la non-pertinence potentielle de l'évaluation comme le montrent les évaluations les plans existants.

Les plans de développement urbain sont conçus pour aider à la gestion des secteurs complexes des environnements urbains (Oktay & Ercoşkun, 2021) sous la forme de documents politiques souvent accompagnés de directives, de règlements et de cartes. L'utilisation de ces documents de façon combinée façonne le développement et la croissance de la ville en question. Les réglementations peuvent prendre la forme de règles d'utilisation des sols et de critères de zonage. Les lignes directrices peuvent prendre la forme de codes de construction/urbanisme, de critères de niveau de service, etc. Les plans de développement urbain offrent des cadres complets basés sur les principes d'urbanisme et les orientations géographiques, un moyen de mettre en œuvre des projets urbains et d'améliorer le bien-être

des habitants. L'élaboration et la mise en œuvre de ces plans sont le plus souvent exigées par la loi ou les règlements locaux s'appliquant à la ville considérée.

En règle générale, les plans de développement urbain sont censés non seulement façonner l'environnement urbain, mais aussi inclure les éléments sociétaux pour assurer la diversité, la responsabilité et la croissance économique de la ville (Oktay & Ercoşkun, 2021). Le plan est chargé de combler les écarts entre les théories et la pratique de la planification, entre les différents secteurs du domaine urbain et entre les divers acteurs et parties prenantes. Pour cela, il est nécessaire de développer en permanence des outils et des techniques innovants, des critères de référence, des évaluations et un suivi. Les plans sont souvent aussi chargés de maintenir l'identité de la ville et de fournir des lignes directrices pour la préservation des éléments du patrimoine.

Le développement du raisonnement de cette recherche et la réalisation d'une analyse documentaire préliminaire ont également mis en évidence l'association entre les plans et la durabilité, car la durabilité est devenue le point central dans tous les domaines de la vie (Gürler, 2018). Il s'agit désormais d'un objectif à atteindre à tous les niveaux, des individus aux communautés en passant par les gouvernements et les organisations mondiales (Mega & Pedersen, 1998). En raison de la popularité du thème de la durabilité, la plupart des publications prises et analysées dans le cadre de cette recherche sont axées sur la réalisation et l'évaluation des plans ou des villes en matière de durabilité.

En accord avec les tendances profondes de la littérature et de la recherche, cette recherche étudie l'évaluation des plans urbains en conjonction avec les évaluations de la durabilité. La recherche ne se concentre pas sur la durabilité, mais reconnaît sa forte présence dans les pratiques de planification, les évaluations et la représentation dans les objectifs de développement et se développe selon les principes de chevauchement des plans urbains et de la durabilité.

Par conséquent, cette recherche se concentrera à la fois sur les aspects théoriques et pratiques des évaluations de plans et suivra une méthodologie stricte et structurée pour le développement d'un système d'évaluation post-hoc des plans directeurs urbains adapté à une application dans les villes du Pakistan.

1.1 Questions et objectifs de la recherche

L'objectif central de cette recherche est d'identifier les moyens potentiels d'évaluation des schémas directeurs principalement développés et mis en œuvre par les « autorités de développement » au Pakistan (les autorités de développement (DA) et leur rôle seront expliqués en détail plus loin). Ces résultats seront utilisés pour proposer un critère conçu pour le Pakistan afin d'évaluer la performance des plans directeurs en termes d'efficacité, d'efficience et d'autres paramètres grâce à l'utilisation d'indicateurs. Le cadre d'indicateurs développé est basé sur des thèmes qui ont été dérivés de la combinaison de la littérature sur les évaluations de plans, des systèmes d'indicateurs étudiés. Le plan directeur intégré de Lahore 2021 (IMPL 2021) constitue l'étude de cas de cette recherche. Les thèmes ont été ensuite pondérés par l'utilisation du processus de hiérarchie analytique et les opinions des experts du site choisi comme cas d'étude, qui est Lahore. L'étape finale de la recherche a été l'évaluation descriptive de l'IMPL 2021 avec les propositions faites et la situation réelle des éléments de la ville. D'autres conclusions et recommandations sont ensuite formulées sur la base des résultats.

La recherche préliminaire sur le sujet a également révélé que les plans de développement urbain sont censés répondre à un certain niveau de performance pour qu'ils soient considérés comme constituant des interventions acceptables (Cortinovis & Geneletti, 2020). La performance du plan d'urbanisme correspond à la capacité des propositions faites et mises en œuvre à contribuer aux objectifs définis dans le plan. L'évaluation peut alors être effectuée par rapport à ces objectifs qui peuvent être interprétés comme les exigences des propositions ou les effets requis des propositions (Cortinovis & Geneletti, 2020). Cortinovis et Geneletti (2020) affirment également Cortinovis et Geneletti (2020) affirment également que pour les interventions urbaines (guidées par les plans d'urbanisme) mises en œuvre, si elles contribuent aux objectifs du plan, l'impact peut être mesuré par l'utilisation du processus d'évaluation d'impact. Ces évaluations d'impact peuvent être à la fois qualitatives et quantitatives. Ils insistent également sur le fait que pour que l'évaluation soit pratique, il faut un outil qui permette d'évaluer les interventions urbaines (ou les plans dans ce cas).

Sur la base de ces analyses documentaires, les objectifs à atteindre dans le cadre de cette recherche sont assez simples à énoncer, il s'agit de réfléchir aux manières d'inculquer un

mode de développement et de mise en œuvre du plan directeur plus axé sur la performance et l'efficacité. Les objectifs de cette recherche sont donc les suivants :

1. Étudier le concept d'évaluation des plans, son développement et sa position dans la planification urbaine en général et au Pakistan.
2. Identifier et analyser de manière critique les pratiques contemporaines d'évaluation des plans d'urbanisme dans le trop large afin de classer et de filtrer les pratiques susceptibles d'être appliquées au Pakistan.
3. Développer un cadre d'évaluation pour l'évaluation a posteriori des plans directeurs au Pakistan à travers l'étude des systèmes d'évaluation des indicateurs existants.
4. Recueillir et synthétiser les opinions des urbanistes, des universitaires et des professionnels de l'urbanisme au Pakistan concernant les critères d'évaluation des plans afin de développer les pondérations des indicateurs dans le cadre d'évaluation.
5. Tirer des conclusions et des recommandations pour les recherches futures et pour la pratique de l'urbanisme au Pakistan.

Malgré la disponibilité de la littérature sur des recherches similaires au niveau international, nous notons d'emblée qu'il n'y a pas eu jusqu'à présent une seule tentative de ce type pour le Pakistan. Ainsi, cette recherche constituerait une étape pionnière dans l'évaluation des plans directeurs au Pakistan.

1.2 Importance de la recherche, lacunes de la littérature et justifications de la recherche

L'examen initial de la littérature suggère l'importance de l'évaluation des plans est encore soulignée dans les propos suivants :

« Si la planification entend avoir une quelconque crédibilité en tant que discipline ou profession, il devrait être possible, grâce à une évaluation systématique, d'avoir un véritable jugement sur l'efficacité de la planification » (Alexander & Faludi 1989 p127).

Pour le formuler autrement, une "bonne" planification ou de "bons" plans devraient pouvoir être distingués d'une "mauvaise" planification et de "mauvais" plans (Alexander 2002 ; Alexander & Faludi 1989 p127 ; Baer 1997).

Les recherches importantes menées au Pakistan dans le domaine de la planification et des plans directeurs font référence à un écart entre les résultats souhaités ou déclarés et les résultats réels observés (Hameed & Nadeem 2006). On peut affirmer que cette étape extrêmement importante de l'évaluation est absente du système de planification actuel au Pakistan. C'est la plus grande force motrice pour entreprendre cette recherche. Celle-ci tente d'identifier les leçons que l'évaluation des plans au Pakistan peut utiliser telles que présentées dans la littérature disponible sur ce sujet.

L'évaluation des résultats souhaités et réels d'un plan de développement relève de l'approche de la planification urbaine axée sur la performance. Cette approche se concentre principalement sur les résultats de la mise en œuvre du plan. La position du plan dans cette approche est celle d'un outil stratégique et d'orientation plutôt que de réglementation (Baker et al., 2006). Dans un système strictement basé sur la performance, le plan n'indique pas les moyens d'atteindre un objectif mais seulement les objectifs convenus à long ou à court terme, qui sont généralement basés sur les opinions de toutes les parties prenantes, y compris la communauté et les praticiens (Baker et al., 2006). Cependant, l'approche de la planification et de la gestion urbaines basée sur la performance pure présente des inconvénients : elle augmente le temps et le coût des négociations et des dialogues multiples tout en favorisant un niveau de flexibilité plus élevé (Cortinovis & Geneletti, 2020).

À l'autre extrême se trouve la planification prescriptive, dont le plan de zonage est l'outil de planification le plus courant. Si cette forme de planification urbaine offre la certitude, les étapes fixes pour la mise en œuvre de l'intervention et des coûts de mise en œuvre réduits, le principal inconvénient est le manque de flexibilité. Elle ne permet pas à cette forme de planification urbaine de s'adapter aux conditions socio-économiques et environnementales dynamiques de la région. C'est l'une des plus fortes limitations de la planification prescriptive et celle-ci a suscité une opposition au cours des dernières décennies (Cortinovis & Geneletti, 2020).

Malgré les avantages évidents de la planification urbaine axée sur la performance dans la situation dynamique actuelle des zones urbaines, le concept a connu une mise en œuvre limitée, plus dans certaines parties du monde que dans d'autres. Par exemple, en Europe, la tendance à la planification axée sur la performance est souvent observée dans les plans

stratégiques et à grande échelle (Faludi, 2000) et sa mise en œuvre est limitée dans les zones urbaines. En revanche, aux États-Unis, certains auteurs ont montré que l'application de la planification volontaire axée sur la performance se fait davantage au niveau des municipalités (dès les années 1970) que dans les plans à grande échelle (Cortinovis & Geneletti, 2020 et Baker et al., 2006).

Le plus haut niveau d'adoption de la planification urbaine axée sur les performances a été observé en Nouvelle-Zélande et dans le Queensland, en Australie, comme l'ont observé et étudié Baker et al. (2006). Cependant, malgré les dispositions et le soutien juridiques, les encouragements des fonctionnaires et des promoteurs privés, la réussite de l'urbanisme axé sur la performance n'a pas été aussi bonne. Cela a conduit à la réintroduction d'un certain niveau et d'une certaine forme de planification prescriptive après quelques années d'expérimentation, et au final on a un hybride d'éléments de planification urbaine prescriptive et basée sur la performance. Les principales raisons de cette situation ont été identifiées comme étant les suivantes : (i) la surcharge due aux négociations et à la gestion du système multipartite et (ii) le niveau plus élevé d'incertitude dans les résultats des interventions en raison de la difficulté à évaluer les interventions multidimensionnelles (Baker et al., 2006).

En ce début de décennie 2020, la situation est certainement différente, car les progrès des outils tels que les SIG et les grands ensembles de données permettent d'évaluer les interventions. Des modèles complexes peuvent être exécutés et des données en temps réel/précises peuvent être analysées. Aujourd'hui, alors que l'imbrication des aspects environnementaux et socio-économiques des zones urbaines est bien établie, l'évaluation holistique des interventions urbaines à l'aide d'outils avancés est une nécessité de la planification urbaine contemporaine, que ce soit dans des systèmes de planification prescriptifs, axés sur la performance ou hybrides (Cortinovis & Geneletti, 2020).

En plus des raisons susmentionnées pour mener cette recherche, une justification supplémentaire est fournie par le fait que l'un des principaux défis pour commencer à mettre en œuvre des mécanismes d'évaluation dans la pratique de la planification identifiée par la littérature approfondie est de rendre évident devant les décideurs politiques et les planificateurs les avantages de l'évaluation. Cela peut se faire par la promotion d'une culture

d'évaluation au sein des structures institutionnelles qui entreprennent des activités de planification (par exemple, les départements de planification ou des agences similaires). Si certaines structures peuvent avoir les caractéristiques requises pour entreprendre ce processus à court terme, d'autres peuvent ne pas l'avoir. C'est peut-être la question suivante, mais avant cela, le système de planification doit disposer d'une base pour développer l'évaluation des plans, ce qui peut être fait par l'examen de la littérature disponible, comme cela a été fait dans cette recherche.

La littérature et les recherches universitaires axées sur le Pakistan révèlent que les universitaires ont fortement critiqué la qualité des plans de gestion urbaine et leur mise en œuvre (Brail & Brail, 2008 ; Butt, 1991 ; et Buxton et al. 2011). Parmi les facteurs d'échec de ces plans figure "l'absence de mécanismes de suivi et d'évaluation" (ul Hussnain et al. 2020, p. 2). Les autres raisons invoquées sont l'insuffisance de l'inclusion et de l'appropriation des parties prenantes, les prévisions erronées, l'accent mis sur la collecte de données et le manque de fondement financier et juridique (Bartholomew, 2007 ; Butt, 1991 ; Chakraborty & Macmillan, 2015 et Charmeck et al. 2001). Cette recherche se base sur le manque de mécanisme de suivi et d'évaluation raisonnant pour l'échec des plans de développement urbain. En outre, des recherches récentes montrent que des changements sans précédent dans les indicateurs et les caractéristiques urbaines en temps réel ont rendu certains plans inutilisables, conduisant à leur abandon (ul Hussnain et al. 2020). En dépit de l'accent mis sur le suivi et l'évaluation comme l'un des éléments manquants nécessaires à la réussite des plans de gestion urbaine, les urbanistes en exercice n'ont pas réussi à le considérer comme un problème. La recherche menée par ul Hussnain (2020) et ses co-auteurs énumère les raisons de l'échec des plans d'urbanisme telles qu'elles sont perçues par plus de quarante urbanistes expérimentés travaillant dans tout le Pakistan. Malheureusement, l'évaluation des plans ne figure même pas dans cette liste. Cela met davantage l'accent sur l'importance de cette recherche car il semble y avoir un manque de perspective parmi les praticiens concernant l'importance de l'évaluation des plans de gestion urbaine.

La littérature initiale sur les plans directeurs urbains se concentre sur les raisons de l'échec (ul Hussanain et al. 2020) ou les défis de la mise en œuvre (Hameed & Nadeem, 2006). D'autres tentatives dans une direction similaire incluent le travail de Butt (1991) qui donne une évaluation de l'Outline Development Plan (pour la division de Gurjranwala) et plus

récemment par Galib (et al. 2017) qui analyse la durabilité de certaines des principales villes de la province du Punjab en utilisant des indicateurs. Cependant, ces études ne permettent pas de répondre spécifiquement au problème de recherche qui se pose, à savoir l'évaluation des plans directeurs urbains, car elles sont soit dépassées, soit non axées sur les plans directeurs eux-mêmes.

En outre, au niveau international, la situation est légèrement meilleure. Principalement en raison du fait qu'il existe de nombreux projets de développement dans les pays en développement qui sont financés par des organismes donateurs internationaux, un certain type de critères d'évaluation de la performance basés sur des indicateurs est disponible, mais ceux-ci sont basés sur des projets. Parmi les agences donatrices qui ont préparé de tels systèmes d'indicateurs, citons les Nations-Unies, la Banque mondiale, la Banque asiatique de développement (BAD), l'Agence américaine pour le développement international (USAID), etc.

D'autres raisons pour le développement de tels systèmes basés sur des indicateurs incluent le suivi et l'évaluation de projets bilatéraux/multilatéraux ou pour mesurer les performances d'un pays dans la réalisation d'objectifs internationaux (comme les objectifs de développement durable).

Parmi les exemples de ces critères d'évaluation de la performance, citons The Performance Monitoring Indicators Handbook (conçu pour différents secteurs du développement) de la Banque mondiale (Mosse & Sontheimer, 1996), Guidelines for the use of Indicators in Country Performance Assessment de la Commission européenne (Canton et al. 2010), DG Développement et Developing Key Performance Indicators : Toolkit for Health Sector Managers (Rozner, 2013) développé par l'USAID pour le Health Finance and Governance Project du gouvernement américain pour le monde en développement.

À cet égard, d'autres recherches ont également été menées, comme le rapport publié par l'Institut allemand de développement intitulé The Role of Indicators in Development Cooperation : An overview study with special focus on the use of key and standard indicators (Holzapfel, 2014), qui se rapproche du travail de cette recherche.

En résumé, l'étude de la littérature disponible a conduit aux déductions suivantes :

1. Aucune recherche basée sur des indicateurs pour l'évaluation de la performance des produits de planification (tels que les plans de développement) au Pakistan n'est disponible. Ainsi, cette recherche sera empirique et il est prévu qu'elle fournisse une base pour d'autres travaux dans ce domaine.

2. En outre, les exemples internationaux sont tout d'abord génériques pour tous les pays en développement et/ou basés sur des projets en raison de la demande des organismes de financement étrangers. Par conséquent, comme les plans de développement urbain ne font pas partie des projets financés par l'étranger (bien que certaines études puissent être Les études menées par des consultants étrangers, comme l'étude sur le développement urbain et la circulation de Lahore (LDA, 1980)), ils n'ont pas fait l'objet d'évaluations régulières.

Ces déductions montrent qu'il existe une lacune importante dans la littérature sur l'évaluation des performances par l'utilisation d'indicateurs pour le Pakistan. Il est reconnu que la littérature disponible sera très utile pour fournir la base du développement des indicateurs de performance et donc des indices, car ils ont été développés et appliqués de temps en temps dans différentes situations. En fait, les municipalités et les gouvernements locaux ont également développé de tels systèmes d'auto-évaluation dans les régions les plus développées comme le Royaume-Uni et les États-Unis d'Amérique. Cependant, le fossé demeure dans le cas du Pakistan, un pays en forte urbanisation.

Cette recherche voudrait réduire cet écart, et par là même encourager d'autres études pakistanaises sur les implications de l'évaluation des performances sur le renforcement de la confiance du public, la participation du public, l'augmentation de l'efficacité et de l'efficience, l'inclusion de concepts contemporains de planification urbaine, la coordination inter et intra organisationnelle pour l'efficacité et l'efficience, la gestion des performances et l'évaluation des performances basée sur des indicateurs.

1.3 Conceptualiser l'évaluation des plans au Pakistan

La planification consiste à faire des choix parmi les options qui semblent ouvertes pour l'avenir, puis à assurer leur mise en œuvre, qui dépend de l'allocation des ressources nécessaires (Roberts & Leghum, 1974). Au Pakistan, l'ensemble de cet exercice de planification prend la forme d'un plan qui porte différents noms tels que plan directeur, plan

intégré, plan de développement, plan stratégique, etc. Depuis son introduction au Royaume-Uni en vertu de la loi sur l'aménagement du territoire de 1947, le plan directeur (master *plan*) a été largement préparé pour de nombreuses villes des pays en développement (comme le Pakistan) et des pays développés. Il s'agit d'un plan à long terme, généralement préparé pour guider la croissance future d'une ville pour les 20 prochaines années, et qui consiste principalement en un rapport, des cartes d'occupation des sols et un programme d'action. D'un point de vue conceptuel, le plan directeur est basé sur l'étude de la situation existante des composantes d'une ville, y compris l'utilisation des sols, les enquêtes socio-économiques et les autres équipements, sur l'analyse de la situation existante, sur la prévision des tendances futures et enfin sur la formulation de propositions pour la croissance et la gestion de la ville.

Ce concept de planification a prévalu au Royaume-Uni jusqu'à la publication du rapport du Planning Advisory Group (PAG) en 1965 (Delafons, 1998), qui a suggéré un nouveau type de plan, appelé plan de développement dans le rapport, comprenant des plans structurels et locaux (Allmendinger et al, 2000). Bien que le Master planning soit un concept dépassé, remplacé par la planification structurelle (et plus récemment par la planification unitaire au Royaume-Uni), il est toujours pratiqué dans de nombreux pays en développement. Devas & Rakodi (1993) identifient plusieurs raisons pour lesquelles, malgré plusieurs faiblesses, l'approche de la planification directrice continue à dominer les systèmes de planification urbaine de nombreux pays en développement.

Il s'agit notamment de la formation professionnelle et de l'idéologie des urbanistes au sommet de leur profession, qui mettent l'accent sur des normes de planification difficiles à atteindre dans le monde réel ; des intérêts particuliers des organismes donateurs étrangers, des consultants, des professionnels, des administrateurs, des gestionnaires municipaux et des politiciens ; et d'une base législative inappropriée pour la planification en termes de préparation et de mise en œuvre des plans (Devas & Rakodi, 1993).

Un bref examen de certains de ces plans directeurs préparés pour différentes villes du Pakistan, suggère que ceux-ci ont adopté la notion la plus conventionnelle du processus de planification de Patrick Geddes (1915), à savoir :

1. Réaliser une ENQUETE,
2. Faire une ANALYSE et calculer des projections, puis
3. Faire un PLAN

Au Pakistan, la plupart de ces plans ont été préparés avec l'aide de l'étranger. Outre ces plans directeurs, un grand nombre de ce que l'on peut appeler des mini plans directeurs ont également été préparés sous le nom de Outline Development Plan (ODP) en utilisant les ressources techniques et financières locales.

L'urbanisation non planifiée est un défi pour les agences de planification locales au Pakistan. Des plans de développement ont été préparés pour les principales villes du Pakistan à partir du début des années 1960 ; cependant, ces plans n'ont donné aucun résultat (Hameed & Nadeem, 2006). Par conséquent, la croissance urbaine s'est faite par le biais d'un processus de conversion et d'utilisation spontanées des terres. L'échec continu des plans de développement a rendu impératif l'évaluation des causes réelles de ce problème. Le soutien juridique, les cadres institutionnels et les politiques efficaces des plans de développement sont les principaux facteurs contribuant au processus d'urbanisation planifiée (Banque asiatique de développement, 2017). Les politiques relatives au développement des villes et des agglomérations doivent être évaluées et révisées en permanence afin de relever les défis liés à l'augmentation de la population.

Au Pakistan, ni les cadres institutionnels ni les supports juridiques et réglementaires ne sont pris en compte dans la gestion des villes (Shah, Afridi, & Minallah, 2007). Une multitude d'institutions supervisent le développement au niveau local et ont des fonctions qui se chevauchent, tandis que les niveaux national et régional ne reçoivent qu'une attention limitée. Le 2e plan quinquennal (1960-1965) envisageait un processus de développement planifié aux niveaux national, régional et local qui établirait un système de développement hiérarchique dans le pays, mais seuls des plans au niveau local ont été préparés (Planning Commission, 1960). Ces plans n'ont pas réussi à établir un ordre dans les formes urbaines, et les raisons de cet échec sont complexes et n'ont pas été correctement évaluées jusqu'à présent. L'une des raisons de cet échec est que l'évaluation des plans est absente du processus de planification.

À la lumière des points susmentionnés et après un examen organisé de la littérature disponible sur la sphère de la planification, les institutions de planification et la situation de l'évaluation des plans au Pakistan, nous sommes arrivées aux conclusions suivantes.

Le Pakistan n'a pas d'obligation légale d'évaluation des plans directeurs dans le pays. La loi relative aux schémas directeurs (par exemple, les règles provinciales relatives aux schémas directeurs telles que les Punjab Master Plan Rules 2014) donne aux responsables des schémas directeurs le pouvoir de réviser les plans s'ils le jugent nécessaire. Par conséquent, l'autorité chargée de l'élaboration des plans peut ou non entreprendre un exercice d'évaluation des plans. Si l'on considère les capacités actuelles de la plupart des autorités chargées de l'élaboration des plans, on peut en déduire que les évaluations des plans ne sont souvent pas effectuées. Cette déduction est renforcée par le fait qu'aucune de ces évaluations n'était publiquement disponible lors de la recherche documentaire pour cette recherche.

Le développement de la pratique de la planification au Pakistan a été fortement lié à celui du Royaume-Uni, mais dans le domaine de l'évaluation des plans, le Pakistan n'a pas réussi à s'inspirer de manière significative du Royaume-Uni.

Il n'existe que quelques exercices purement académiques qui ont utilisé l'approche de l'étude de cas holistique pour déduire les raisons de l'échec des plans directeurs, sans impact significatif sur la pratique de la planification générale (Butt, 1991 ; Hameed & Nadeem, 2006 et Ahmed & Anjum, 2012) car les plans sont toujours considérés comme incapables d'atteindre les objectifs souhaités (Hussain & Nadeem, 2021).

Par conséquent, la littérature indique qu'il est nécessaire de mieux comprendre l'importance et la signification de l'évaluation des plans pour améliorer et faire progresser la pratique de la planification (Ahmed & Anjum, 2012).

Des recherches comme celle-ci doivent attirer l'attention sur les avantages de l'évaluation des plans et les planificateurs et les politiciens doivent savoir que l'évaluation des plans ajoute de la valeur au produit de la planification et augmente donc la crédibilité du plan.

La littérature a mis en évidence un certain nombre de façons de réaliser ces évaluations. Nous proposons ici la meilleure approche, la meilleure méthode et le meilleur outil qui peuvent être utilisés dans le cas de l'évaluation des plans au Pakistan.

L'approche appropriée pour l'évaluation du plan au Pakistan serait l'approche basée sur la conformité. Comme il a été clairement démontré, le plan de développement le plus utilisé au Pakistan est le plan directeur. La littérature a souligné que ces plans sont rigides et sont utilisés comme plan directeur pour gérer la croissance urbaine. L'approche basée sur la conformité utilise également le plan comme modèle et établit des comparaisons entre les résultats souhaités et attendus (Oliveira & Pinho, 2010).

L'approche basée sur la performance produit des résultats qui sont trop compliqués pour être utilisés dans l'amélioration du processus de planification. Compte tenu de la capacité des institutions de planification du Pakistan et une capacité encore plus faible des responsables gouvernementaux et des politiciens concernant les avancées de la planification, il est préférable d'utiliser les résultats plus simples des évaluations basées sur la conformité.

Comme l'approche basée sur la conformité produit l'étendue de la déviation du plan comme résultat, il est plus facile pour les planificateurs de passer à l'étape suivante de l'évaluation et d'identifier les raisons de ces cas de déviation. Cela peut finalement conduire à une amélioration des plans et du processus de planification.

La méthode la plus appropriée dans le cas du Pakistan, sur la base de la situation de la planification au Pakistan, devrait être la méthode *Plan Process Result (PPR)*.

Tout d'abord, cette méthode est principalement basée sur la conformité et s'aligne donc sur l'approche choisie pour le Pakistan.

Deuxièmement, la méthode produit des résultats faciles à interpréter à la fois pour les planificateurs et les politiciens sans l'utilisation de programmes informatiques avancés ou de compétences spécialisées. Par conséquent, cette méthode peut être utilisée pour les évaluations de plans directeurs sans entraîner de lourds coûts supplémentaires pour le système.

Troisièmement, la PPR a déjà été appliquée à deux villes portugaises (Oliveira & Pinho, 2010) et à des plans similaires aux schémas directeurs du Pakistan. Cela augmente les chances de succès de cette méthode au Pakistan.

L'outil préféré pour l'évaluation des plans, tel qu'il ressort de la littérature et de la situation de la planification au Pakistan, est celui des indicateurs. Les résultats et les processus numériques sont plus faciles à identifier et à justifier. Comme les évaluations devront faire face aux critiques des planificateurs traditionnels et des fonctionnaires du gouvernement, il est préférable de choisir l'outil le plus sûr. Cependant, les indicateurs peuvent être trop rigides et ne pas être en mesure d'identifier les effets intangibles, néanmoins, pour le début de l'application de l'évaluation de plan au Pakistan, ce serait une meilleure approche.

Les indicateurs sont également plus faciles à reproduire pour différentes régions et différents plans. Par conséquent, cela augmentera le niveau d'applicabilité globale dans le cas du Pakistan. Les indicateurs en tant qu'outil susciteront également l'intérêt d'autres professions telles que l'environnement, l'économie, etc. Cela pourrait faire de l'ensemble de l'exercice d'évaluation du plan un processus intégré et gagner en popularité.

La littérature souligne également que l'un des principaux problèmes de l'évaluation des plans est le fait qu'il n'existe pas d'approche, de méthode ou d'outil d'évaluation unique. Par conséquent, les planificateurs et les évaluateurs pakistanais doivent poursuivre la recherche et le développement dans ce domaine et utiliser les techniques susmentionnées comme point de départ.

L'évaluation des plans pakistanais n'en est qu'à ses débuts, il n'existe que quelques travaux de recherche et aucune évaluation documentée. Il est donc nécessaire d'élaborer un mécanisme d'évaluation des plans qui présente les caractéristiques de simplicité et d'applicabilité, L'étude peut être utilisée efficacement pour identifier non seulement les conflits mais aussi les raisons de ces conflits entre les résultats souhaités et les résultats réels.

1.4 Autres effets possibles de cette recherche

Au Pakistan, les autorités de développement (DA), qui sont des autorités régionales, sont chargées d'élaborer des politiques régionales qui affectent la sphère économique, spatiale et sociale, et leur interaction avec les autres régions du pays doit également être prise en

considération. Ainsi, d'une certaine manière, les AD jouent un rôle crucial dans le façonnement des villes pakistanaises et donc du Pakistan lui-même.

Alors que l'attention mondiale se tourne vers la participation du public et l'implication des parties prenantes dans presque tous les projets et plans d'urbanisme, le Pakistan est également confronté à ses effets avec les récents amendements aux lois sur l'urbanisme rendant la participation du public obligatoire. Dans une telle situation, disposer de critères pour évaluer les produits des AD s'avérera très utile et contribuera également à la diffusion de l'importance de ce domaine et de ses pratiques.

La recherche, telle que celle-ci, peut être responsable de l'incitation à une tendance accrue à la responsabilité et à l'évaluation de la part des institutions publiques et vient donc généralement du secteur universitaire.

Par conséquent, à travers cette recherche, une tentative est faite pour rationaliser le processus de développement au Pakistan, en particulier parce que, par rapport au monde développé, les pays en développement sont confrontés à un rythme d'urbanisation extrêmement rapide et il est crucial que ce développement physique rapide, avec ses conséquences, soit géré afin d'obtenir davantage d'impacts positifs.

Ainsi, cette initiative peut avoir des effets multiples sur les opérations des AD en ce qui concerne le développement des plans directeurs et encouragera les recherches futures à entreprendre des évaluations d'autres fonctions des AD pour une meilleure gestion urbaine.

2. Méthodologie

La méthodologie est conçue pour créer un cadre qui guide et permet de suivre une approche stratégique pour l'étude de la question de l'évaluation des plans directeurs urbains dans le contexte spécifique des pays en développement. Une partie importante de cette recherche est basée sur la littérature produite au niveau international pour examiner comment les évolutions dans le domaine de la théorie et de la pratique de l'évaluation des plans internationaux s'appliquent ou diffèrent du contexte pakistanais. Cette revue constitue la première partie de cette recherche. La deuxième partie de la recherche est le développement d'un cadre d'évaluation des plans basé sur des indicateurs pour une application au Pakistan en utilisant une étude de cas de la ville de Lahore. Pour ce faire, nous étudions de nombreux systèmes d'indicateurs populaires basés sur les critères suivants L'approche, la méthode et l'outil d'évaluation des plans pour le Pakistan et le plan directeur intégré pour Lahore (IMPL) 2021.

L'autre partie principale de cette recherche est de tester empiriquement la perception des urbanistes en ce qui concerne l'évaluation des schémas directeurs. Ceci a ensuite été utilisé pour attribuer des poids aux thèmes du cadre d'évaluation des plans directeurs et a permis une évaluation préliminaire de la performance de l'IMPL 2021 basée sur les interventions urbaines proposées (et leurs objectifs) avec la situation actuelle. L'analyse a été faite pour les aspects pour lesquels une certaine forme de données était disponible. Par conséquent, les remarques faites pour l'évaluation d'IMPL 2021 ont été étayées par des données dans tous les cas.

Si l'on décompose davantage la partie recherche empirique, elle repose sur deux méthodes complémentaires. La première est constituée d'entretiens avec des urbanistes et des professions liées à l'urbanisme et la seconde est l'évaluation du projet IMPL 2021 basée sur le cadre développé, les résultats des entretiens et du questionnaire avec les professionnels, les propositions du projet IMPL 2021 et les données disponibles.

Par conséquent, la méthodologie a été conçue afin de répondre à la nature exploratoire de cette recherche séminale, qui devrait fournir l'étape initiale pour d'autres recherches dans un avenir proche. Les pistes de recherches ultérieures ouvertes par cette recherche sont

également discutées dans le dernier chapitre de cette recherche. Les sections qui suivent expliquent la méthodologie d'une manière plus ordonnée.

2.1 Partie 1 - Revue systématique de la littérature I pour la théorie et la pratique de l'évaluation des plans et sa place dans le contexte du Pakistan

De nombreuses techniques d'évaluation des plans urbains peuvent être identifiées dans la littérature (Adinyira et al. 2007). Afin d'évaluer les plans directeurs urbains des pays en développement, une revue systématique de la littérature a été menée pour identifier, catégoriser et déduire l'approche, les méthodes et les outils d'évaluation des plans, puis les méthodes de pondération et d'agrégation adaptées au cas du Pakistan. Pour cette revue systématique de la littérature, un cadre a été établi pour la sélection des recherches et des articles. Une revue systématique consiste à étudier la littérature pour répondre à une question clairement formulée en utilisant une forme de système de recherche, de sélection et d'évaluation critique des recherches pour collecter (et/ou analyser) les données disponibles dans ces recherches (Nightingale, 2009).

Une quantité importante de littérature est disponible pour l'évaluation des plans, mais tout comme le domaine de la planification est vaste, la littérature sur l'évaluation des plans est également très vaste et peut être qualifiée d'éparpillée. Par conséquent, l'analyse systématique de la littérature visait à :

1. Identifier les méthodes d'évaluation des plans par l'étude de sources secondaires.
2. Catégoriser ces méthodes à l'aide d'une documentation complémentaire.
3. Organiser les résultats et faire des observations pour l'application de ces méthodes dans le cas des plans directeurs réalisés pour les zones métropolitaines du Pakistan.

Afin de structurer et d'ordonner cette recherche, la revue est effectuée de la manière suivante :

Un bref aperçu des recherches récentes dans le même domaine a été utilisé pour élaborer une liste de mots clés qui apparaissent dans toutes les études pertinentes réalisées. Des encyclopédies et des dictionnaires spécialisés ont ensuite été utilisés avec les définitions

données dans les recherches célèbres pour finaliser les définitions les plus pertinentes pour cette recherche. Les encyclopédies Pearson Education et Britannica ont été utilisées.

Les mots-clés et combinaisons de mots-clés suivants ont été utilisés pour générer la littérature utilisée pour cette revue :

Table 1: Mots-clés et combinaisons de mots-clés utilisés pour l'analyse documentaire

Mots-clés	**Combinaisons de mots-clés**
Plan	d'évaluation de plan
	Plan d'implémentation
	Évaluation des plans
Evaluation	Evolution de l'évaluation de plan
	Types de d'évaluation de plan
	Les approches pour le l'Evaluation de plan
	Les critères pour l'évaluation de plan
	Outils/méthodes d'évaluation de plan
	Évaluation de plan directeur
	Évaluation des plans Post-hoc
Pour le Pakistan	Le système de planification au Pakistan
	L'évaluation de plan au Pakistan
	Plan directeur au Pakistan
	Implémentation et évaluation des plans directeurs au Pakistan

Le catalogue de la bibliothèque de l'Université de Tours a été largement utilisé en utilisant les mots clés séparément et en combinaison pour rechercher des articles de recherche, des chapitres de livres et des revues de plans susceptibles d'être pertinents et de contribuer à cette recherche. D'autres sites web d'articles de recherche tels que Google Scholar et Science Direct ont également été explorés.

Toutes les sources de recherche disponibles ont été recherchées afin de trouver du matériel pour cette analyse documentaire. Il s'agit notamment d'articles publiés dans des revues réputées dans le domaine, telles *que Environment and Planning, Journal of American Planning Association, Planning Theory and Practice, Journal of Planning Literature*, etc. ainsi que d'autres revues encore.

Ensuite, la littérature grise telle que les publications gouvernementales, les politiques et les lois, les publications de la Commission européenne, les publications de la Banque mondiale, les publications de la Banque asiatique de développement, etc. ont également été incluses.

Après une étude attentive du titre, des mots-clés, du résumé et des conclusions, les articles recherchés ont été sélectionnés en fonction de leur pertinence pour cette recherche. De même, la littérature grise a également été sélectionnée en fonction de sa pertinence par rapport au sujet de la recherche et au Pakistan.

Les articles présélectionnés ont ensuite été soigneusement étudiés et des notes ont été prises pour organiser les résultats de ces articles. De nombreux nouveaux articles de recherche et sections de livres ont été trouvés dans les références de ces recherches. Un catalogue des recherches sur l'évaluation des plans a donc été élaboré. Ces articles ont été regroupés en fonction de leur contenu, par exemple, les recherches sur l'évolution de l'évaluation des plans, sur les types d'évaluation des plans et sur les approches de l'évaluation des plans, etc. ont été séparées.

Comme mentionné précédemment, l'analyse documentaire a été modifiée pour s'adapter au cas du Pakistan. Pour ce faire, une étude complète du système de planification du pays a également été réalisée. Bien que la recherche reconnaisse que le système de planification employé au Pakistan est vaste et diversifié, certains éléments sont communs au niveau national ou provincial. L'ensemble de la répartition concernant le Pakistan en général et

l'étude de cas en particulier est étudié et enregistré dans cette recherche. Ce développement de la compréhension des villes du Pakistan, de son système de planification, de la niche des évaluations de plans urbains et des institutions impliquées a conduit à la prise de décisions fondées sur la littérature en ce qui concerne la sélection de l'approche, des méthodes et des outils pour les évaluations de plans urbains au Pakistan.

L'étape finale a consisté à organiser les résultats de cet examen sous la forme d'un document cohérent comprenant les conclusions tirées de ce qui serait l'approche, la méthode et l'outil appropriés pour le développement de l'évaluation des plans urbains dans le cas du Pakistan.

2.2 Partie 2 - Cadre des indicateurs (avec méthodes de pondération et d'agrégation) et élaboration du questionnaire

Sur la base des résultats et des conclusions de la section précédente, l'approche, la méthode et l'outil préférés pour le cas du Pakistan ont été identifiés. Cela a conduit à la deuxième revue de la littérature qui a exploré plus en détail les choix effectués. Par conséquent, une analyse documentaire a également été menée pour comprendre le concept d'indicateurs comme moyen d'évaluation des plans, car les indicateurs se sont avérés être l'outil le plus approprié pour l'évaluation des plans au Pakistan. Les caractéristiques des "bons" indicateurs/systèmes d'indicateurs ont été étudiées et celles qui sont utiles pour les villes du Pakistan ont été extraites. Le processus de sélection a été renforcé par le développement d'un cadre conceptuel pour la sélection des indicateurs basé sur la méthode *Plan Process Result* (Oliveira & Pinho, 2010) qui a déjà été identifiée comme la méthode appropriée pour l'évaluation du plan à Lahore dans la première partie de cette recherche.

En 2009, Oliveira et Pinho ont proposé la méthode *Plan Process and Result*. Ils ont présenté une méthode combinant les approches de performance et de conformité et ont établi un critère étendu basé sur dix dimensions différentes du plan. Ces dimensions comprennent l'efficacité, la pertinence, la participation, l'utilisation, la cohérence et l'allocation des ressources.

En outre, une liste des systèmes d'indicateurs actuellement utilisés a été élaborée et étudiée afin d'identifier les thèmes d'évaluation du plan et les indicateurs/systèmes d'indicateurs pouvant être utilisés pour les villes du Pakistan. Un soin particulier a été apporté à la variété

et à la fiabilité. Par conséquent, la priorité a été donnée aux systèmes d'indicateurs ayant une application significative et une pertinence pour le sujet de recherche actuel.

De plus, en gardant une connaissance actualisée du système de planification du Pakistan, de l'état de la pratique de l'évaluation des plans post hoc et du développement des plans de développement urbain (plans directeurs), une revue critique des systèmes d'indicateurs actuellement utilisés a été réalisée. Les principaux objectifs à atteindre à partir de l'étude de ces systèmes d'indicateurs étaient les suivants :

1. Extraction de thèmes pour le développement de systèmes d'indicateurs tels que la qualité de l'environnement, l'opportunité de développement économique, la cohésion sociale et le bien-être, etc.
2. Analyse de l'applicabilité ou de la faisabilité des indicateurs.
3. Le type, la qualité et la quantité de données requises pour le développement des indicateurs.
4. L'étendue de l'interprétation des indicateurs.

Il est important de préciser que la plupart des systèmes d'indicateurs les mieux développés sont conçus pour évaluer la durabilité des villes ou des communautés. Bien que cette recherche ne fasse pas de la durabilité son point central, elle comprend et reconnaît son importance et ses progrès en général et en particulier en termes de systèmes d'indicateurs. De plus, la durabilité est l'objectif ultime de toutes les formes de développement et de planification à l'ère contemporaine de l'urbanisme et cette recherche suit le mouvement. Par conséquent, certains des systèmes d'indicateurs sélectionnés pour être examinés dans cette recherche visaient à évaluer la durabilité à l'aide d'indicateurs.

De même, les méthodes de pondération et d'agrégation les plus couramment utilisées dans la littérature ont été sélectionnées et celles qui ont été appliquées à une dimension quelconque de l'urbanisme, comme l'évaluation de la durabilité, ont été privilégiées. Par conséquent, sur la base des caractéristiques de chaque méthode de pondération et d'agrégation et des attributs de l'étude de cas, la méthode appropriée d'attribution des poids (la méthode de la hiérarchie analytique ou AHP) et d'agrégation (moyenne géométrique) a été sélectionnée.

La dernière étape de cette partie a été l'élaboration d'un questionnaire et l'appropriation des données nécessaires à la réalisation de cette recherche. Le questionnaire comporte des tableaux soigneusement rédigés pour l'attribution de poids aux indicateurs dans le cadre d'évaluation en utilisant AHP. Le questionnaire permet aux experts de donner facilement leur avis en comparant par paires les indicateurs sélectionnés sous chaque thème en utilisant les tableaux développés.

Un total de quarante questionnaires a été distribué parmi les professionnels dans et autour de l'étude de cas pour la collecte de la perspective liée à l'évaluation du plan urbain et l'application de AHP pour assigner des poids aux indicateurs dans le cadre d'évaluation.

2.3 Partie 3 - Collecte des données

Pour faciliter la collecte des données, certaines sources ont été identifiées, d'où les données peuvent être extraites pour l'évaluation finale d'IMPL 2021. On estime que la collecte des données mentionnées sera suffisante pour réaliser l'évaluation du plan du projet IMPL 2021. Cela inclut les données à extraire de rapports tels que le rapport économique, le rapport environnemental ou le rapport sur le secteur des transports de Lahore. De même, les enquêtes sur les ménages représentatives au niveau national, qui recueillent généralement des informations sur l'assainissement de l'eau et les conditions de logement, notamment les enquêtes par grappes à indicateurs multiples (MICS) et les enquêtes sur les niveaux de vie et les mesures (LSMS), seront également utilisées (UN Habitat, 2004). En outre, de nombreux rapports provenant de revues d'actualités urbaines, de journaux et d'articles de recherche récents ont également été inclus.

Les données comprennent également l'évaluation des cartes disponibles qui font référence aux différentes limites administratives (municipalités et districts dans le cas de Lahore), la carte des divisions de recensement, les photographies aériennes et les images satellites et d'autres cartes techniques utilisées pour la ville (par exemple la carte des transports publics) (UN Habitat, 2009).

Dans le cas des entretiens structurés, une tentative d'avoir un large éventail de perspectives et d'expériences, les contacts ont été affectés à trois catégories, comme suit (Coleman, 2015) :

1. Universitaires : (les participants sont des professeurs ou des chercheurs).

2. Prestataires de services urbains : (les participants qui ont une formation liée aux services urbains et à l'environnement bâti (architectes, gestionnaires de déchets solides, professionnels de l'approvisionnement en eau et de l'assainissement, ingénieurs des transports, etc.)

3. Praticiens : (planificateurs et concepteurs urbains).

Comme AHP est l'une des méthodes les plus utilisées dans les systèmes d'évaluation multicritères, ce cadre d'évaluation utilise également cette méthode. Développée par Saaty en 1970 (1988), la méthode a été utilisée au cours des décennies avec succès pour résoudre les problèmes pratiques associés (Cabała, 2010). L'application méthodologique de l'AHP peut être résumée en deux étapes principales. La première aboutit à l'élaboration d'un système hiérarchique d'éléments où les éléments sont regroupés selon une hiérarchie. Le processus du développé est vu comme similaire au développement d'un arbre de but (Cabała, 2010). La deuxième et la phase statistique du processus d'application nécessite la comparaison par paire des éléments d'évaluation de la cohérence. Le résultat de cette étape se présente sous forme de matrices qui, après normalisation et examen de cohérence, ont constitué la base du système d'évaluation final.

La conduite minutieuse d'entretiens structurés avec des questions rédigées concernant le point de vue des experts pour l'évaluation du plan a été assurée. Les effets possibles d'une telle évaluation peuvent être obtenus pour aider à déduire des conclusions sur l'évaluation des plans directeurs, en particulier à la lumière de l'établissement de la confiance du public et de la réalisation des objectifs des plans directeurs. Cela fera également partie de la discussion lors de la présentation des conclusions et des recommandations basées sur l'analyse des données.

2.4 Partie 4 - Analyse des données et résultats

L'étape suivante est l'analyse des données collectées lors des entretiens et du questionnaire afin de développer l'échelle de poids pour les thèmes du cadre d'indicateurs et l'évaluation de l'IMPL 2021. Les résultats sont systématiquement présentés et tous les outils, méthodes ou calculs effectués sont expliqués en détail.

2.5 Partie 5 - Conclusions et recommandations

L'étape finale consiste à tirer des conclusions sur les performances de l'IMPL 2021 et à formuler des recommandations concernant l'amélioration des performances. Des explications par thème sont fournies et les recommandations sont également classées par catégorie à partir des résultats et des conclusions de l'analyse des données. Le chapitre traite également des buts et des objectifs de la recherche établie dans la phase précédente de la recherche et comment la recherche a été en mesure de les accomplir. En outre, et comme mentionné précédemment, les perspectives de recherches futures sont également discutées.

2.6 Limites de la recherche

Même si l'auteur a identifié et justifié l'utilisation de toutes les méthodes et de tous les outils, la recherche n'est pas exempte de sa part de limites. La première et la plus importante étant le manque de données et de ressources pour la réalisation de cette évaluation. Comme la recherche développe un cadre d'évaluation basé sur des indicateurs, la disponibilité de données pour certains indicateurs a été l'une des influences du processus de sélection. En outre, tous les aspects du domaine du développement urbain n'ont pas pu être évalués dans le cadre de cette recherche. Par exemple, lors de l'adaptation de la méthodologie de la méthode PPR, les aspects de rationalité et de perspectives politiques ont été abandonnés en raison de la portée limitée de cette recherche et des contraintes de temps et de ressources. De même, en ce qui concerne l'utilisation d'indicateurs comme outil d'évaluation, la question fait l'objet d'un débat continu et non clos jusqu'à présent (Coleman, 2015) et il est donc pertinent à ce stade de mentionner les prémisses et les hypothèses formulées pour cette recherche. Il s'agit de :

1. Prémisse : des indicateurs peuvent être établis et peuvent être utilisés pour mesurer la condition, la situation et le niveau de performance d'une ville,
2. Hypothèse : Les indicateurs sont un outil mesurable pour guider les villes dans la mise en œuvre, l'évaluation et l'amélioration des plans directeurs.

Des personnes différentes vivant dans des lieux différents ont des valeurs différentes. Les indicateurs doivent donc pouvoir prendre en compte différents lieux, personnes, cultures et institutions (UE, 2017) et donc :

1. Sans de bonnes données, basées sur le suivi, il n'est pas possible de développer des indicateurs.
2. Les mesures de performance impliquent que des objectifs doivent être fixés (c'est-à-dire par rapport auxquels les performances peuvent être comparées).
3. Les ensembles d'indicateurs évoluent dans le temps.
4. Les ensembles d'indicateurs ne sont presque jamais complets.
5. La mesure des indicateurs tend à réduire l'incertitude mais ne l'élimine pas.
6. Les indicateurs peuvent jouer un rôle important dans la manière dont les activités humaines influencent l'environnement.
7. Si l'on modifie les indicateurs, il est fort probable que l'on modifie également le système.

Cette recherche comprend et s'appuie pleinement sur les prémisses, hypothèses et limites mentionnées.

3. Étude de cas

Les villes pakistanaises connaissent une forte croissance démographique et également une croissance exponentielle sur le plan spatial. L'étalement urbain est considéré comme l'un des plus grands défis des villes pakistanaises modernes. Selon l'Atlas de l'expansion urbaine (UN et al., 2016), en l'espace de 22 ans, la zone bâtie de Karachi (la plus grande ville du Pakistan) a été multipliée par 2,5. De même, pendant la même période, la zone urbaine ou zone bâtie de Lahore (qui est notre étude de cas) a été multipliée par 3. Celle d'une autre ville de taille moyenne, Sialkot, a été multipliée par 4,7.

Cette urbanisation non gérée et non contrôlée est à l'origine des principaux problèmes auxquels sont confrontées les villes du Pakistan. La croissance de la population dans les villes du Pakistan a été si rapide que les villes ont été incapables de fournir les services économiques et publics requis. Selon Ellis et Roberts (2016), un habitant sur huit de ces villes vit sous le seuil de pauvreté. Ces auteurs affirment également que l'urbanisation au Pakistan est « déguisée » et n'est pas clairement mesurée, car elle est cachée par le mitage à faible densité, les villes se développant bien au-delà de leurs limites administratives. Ces zones sont désormais qualifiées de "périurbaines" dans la littérature de planification du Pakistan. Ces régions périurbaines représentent jusqu'à 60% des zones urbaines du Pakistan (Ellis & Roberts, 2016). Suivant le même schéma, les villes sont confrontées à des problèmes de pénurie de logements, de pénurie d'eau, de transport (Karachi est la seule mégapole du monde sans système de transport en commun), de santé et d'éducation, de pollution environnementale et, plus récemment, aux effets négatifs du changement climatique.

Lahore est devenue l'une des villes à la croissance la plus rapide en 1947, lorsque la partition de l'Inde britannique a entraîné la migration de près de la moitié de la population du Pendjab oriental vers Lahore (environ 400 000 personnes). Afin de contrer cet afflux de population et d'atténuer l'insécurité des résidents, Lahore étant devenue une ville frontalière avec l'Inde (entre autres raisons), le Pakistan a adhéré au plan Colombo en 1950 et a commencé à élaborer les premiers plans quinquennaux à l'échelle nationale. Le deuxième plan quinquennal (1960-1965) proposait la préparation de plans directeurs pour les onze grandes villes du Pakistan, ce qui a donné lieu au *Master Plan for Greater Lahore* (1965-1980). Ce plan n'a pas été complètement mis en œuvre et des projets tels que le chemin de fer circulaire et

la ceinture verte pour freiner l'urbanisation n'ont jamais été réalisés jusqu'à l'étude sur le trafic et le développement urbain de Lahore (LUDTS), également appelée le plan de structure de Lahore (1980-2000). Ce plan a été élaboré par des professionnels a été réalisé avec le financement de la Banque mondiale. Mais ce document n'avait aucune obligation légale de mise en œuvre et est donc resté un document consultatif pour le développement de la ville. Après un certain retard, le plan directeur intégré pour la région de Lahore (2001-2021) a été introduit en 2004 par l'autorité de développement de Lahore pour gérer le développement au cours des vingt prochaines années (LDA, 2004). Un amendement au plan a été publié en 2016, lorsque l'ADL a obtenu le statut d'autorité divisionnaire, passant d'une autorité de district à une autorité divisionnaire. Le plan suivant pour la ville de Lahore était le plan de développement stratégique intégré pour la région de Lahore 2035 (ISDP-35) (LDA, 2013). Cependant, le plan actuel, qui fait l'objet d'une audience publique et d'un examen minutieux, est le Master Plan of Lahore Division 2050 (LDA, 2020).

Le plan directeur de 1996 pour Lahore indique que la zone bâtie de la métropole était de 64,43 km². La ville a connu une augmentation spatiale de sa superficie de 31 % en 1988. Celle-ci s'est ensuite développée à un rythme très rapide avec une augmentation de 113 % entre 1988 et 2000. Depuis la mise en place de l'IMPL 2021 en 2004 jusqu'en 2017, la ville a connu une croissance d'environ 233 % et sa superficie s'élève désormais à 598,3 km2 (Hussain & Nadeem, 2021).

Lahore Development Authority (LDA) a été créée par l'Assemblée législative du Pendjab en adoptant le Lahore Development Authority Act 1975. Son institution mère est connue sous le nom de Lahore Improvement Trust. La juridiction de la LDA s'étend sur l'ensemble de la division de Lahore qui comprend les districts de Lahore, Nankana, Sheikhupura et Kasur. Elle comprend trois branches nommées :

1. L'aile du développement urbain (métropolitain) : dirigée par le planificateur métropolitain en chef, elle se concentre sur la planification du développement, le logement, la législation et les fonctions de renouvellement urbain de la LDA.
2. L'Agence de l'eau et de l'assainissement : dénommée WASA, elle a été créée immédiatement après l'établissement du LDA. Elle a été créée en tant qu'agence subsidiaire de l'autorité de développement de Lahore pour la planification, la

conception, le développement et l'entretien de l'approvisionnement en eau, des égouts et du système de drainage à Lahore.

3. Agence d'ingénierie et de planification du trafic : appelée TEPA, celle-ci a été créée en tant qu'agence subsidiaire pour la planification, la conception et le développement du trafic et du système de transport, des routes et des projets à Lahore.

L'un des plus grands avantages de l'approche de l'étude de cas pour toute recherche est le fait qu'elle permet la collecte de données dans la situation en temps réel dans laquelle l'activité a lieu (Bennett, 2004). Comme l'un des objectifs de cette recherche est d'élaborer des critères d'évaluation des performances basés sur des indicateurs et conçus pour être appliqués le mieux possible aux du Pakistan, la méthodologie de l'étude de cas est un choix approprié.

La littérature a souvent critiqué l'approche de l'étude de cas pour son manque de rigueur qui ne permet guère de généraliser (Bennett, 2004). Cependant, étant donné que le développement et la performance des indicateurs sont grandement influencés par la localité de leur application, cette recherche fournira la base d'autres études entreprises pour développer des critères similaires pour d'autres autorités de développement et d'autres institutions publiques.

Par conséquent, tant que la recherche basée sur l'étude de cas suit les conventions scientifiques, est capable de répondre à la question de recherche et suit les procédures de recherche avec une application appropriée, c'est une méthode viable pour obtenir des conclusions.

Cette recherche choisit le plan directeur de l'Autorité de développement de Lahore (Integrated Master Plan of Lahore 2021) comme étude de cas car :

1. La LDA est l'une des plus anciennes autorités de développement du Pakistan et s'est maintenant fermement établie en tant qu'organisation. Par conséquent, la LDA offre plus de possibilités d'acceptation de l'évaluation des performances et de l'auto-évaluation que les organisations plus récentes qui sont encore en phase de recherche d'assises solides.

2. Même avant l'adoption de la loi sur le développement des villes de 1976, le LDA avait son propre document juridique sous le nom de loi sur l'autorité de développement de Lahore de 1975. Il est un fait que de nombreuses fonctions des AD présentées dans la loi sur le développement des villes du Pendjab de 1976 ont été reprises de la loi sur le LDA.

3. Toutes les autres AD agissent en tant qu'agences exécutive du gouvernement du district urbain, mais grâce à un amendement récent de la loi LDA, l'Autorité a reçu le pouvoir d'entreprendre le développement en tant qu'entité distincte du gouvernement du district urbain pour l'ensemble de la division de Lahore qui comprend les districts de Lahore, Sheikhupura, Kasur et Nankana. Par conséquent, la juridiction de la LDA est plus grande que celle de toute autre DA du Pakistan, ce qui pour nous renforce la nécessité d'évaluer les performances de ses plans.

4. Le LDA est non seulement habilité à exercer plus de pouvoirs en termes de zone de compétence et de fonctions accrues, mais il reçoit également la plus grande part des ressources. Les données budgétaires de l'exercice 2016-2017, montrent que LDA a reçu le montant le plus élevé au titre du fonds du plan de développement annuel et d'autres sources. Le budget 2016-2017 de la Karachi Development Authority n'était que de 50,2 milliards de PKR (KDA, 2016), contre 93,48 milliards de PKR pour la LDA (LDA, 2016). D'autre part, l'autorité de développement de Faisalabad n'a obtenu que 2 milliards de PKR (FDA, 2016) alors qu'elle est la troisième plus grande ville du Pakistan. Karachi est la plus grande ville du Pakistan en termes de population et de superficie et pourtant elle reçoit moins de fonds que la LDA. Cela rend la responsabilité et la transparence de la part de la LDA encore plus nécessaires et un système d'évaluation des performances basé sur des indicateurs est une option plausible.

Outre les raisons susmentionnées de choisir le LDA comme étude de cas, nous pensons que c'est Lahore elle-même qui rend nécessaire la recherche dans le domaine de la planification urbaine, de la gouvernance urbaine et de la politique régionale. Lahore étant la deuxième plus grande ville du pays, elle est confrontée au taux d'urbanisation le plus élevé, qui est décrit comme l'augmentation de la proportion d'une population vivant dans des zones urbaines. Auparavant, Karachi occupait cette position, mais en raison de la détérioration de la situation

de l'ordre public dans la ville, le taux d'urbanisation a baissé et l'attention s'est portée sur Lahore.

Cette situation, ainsi que l'expansion urbaine démesurée, font de Lahore un cas d'étude approprié dans le domaine de la politique régionale et la LDA, qui est la principale institution exécutive, est l'organisation la plus appropriée pour cette recherche.

De plus, il existe un manque de confiance et des scandales de corruption associés à la LDA qui sont souvent mis en évidence dans les reportages locaux. La principale opposition rencontrée lorsque le gouvernement du Pendjab a renforcé les pouvoirs de la LDA pour qu'elle puisse élaborer des projets de développement pour l'ensemble de la division était que la LDA avait déjà échoué dans le district de Lahore et ne devrait pas être autorisée à étendre ses fonctions à d'autres districts (The Nation, Lahore, 2013).

Sur la base des points mentionnés ci-dessus, cette recherche choisit la LDA comme étude de cas pour développer le critère de mesure de la performance des AD au Pakistan.

3.2.1 Plan directeur intégré de Lahore 2021 (IMPL 2021)

Le besoin d'un nouvel instrument de développement et de gestion urbains s'est fait sentir lorsque l'instrument précédent, l'étude sur le développement urbain et les transports de Lahore, est arrivé à échéance. Conformément à la nouvelle ordonnance pakistanaise de 2001 sur le gouvernement local, Lahore a été divisée en neuf villes dans le cadre de la mise en place d'une nouvelle forme d'administration. Chaque ville devait avoir son autorité municipale ou Tehsil Municipal Authority (TMA). Contrairement au projet initial de fusion de l'autorité de développement de Lahore (LDA) avec le système de TMA, la LDA est restée une entité distincte sous le gouvernement du district de la ville en vertu de l'ordonnance LDA de 2002.

En 2004, le plan a finalement été approuvé pour être mis en œuvre, même si le processus de planification a commencé en 1997 avec une révision en 2002. En juillet 2016, la modification de l'IMPL 2021 a également été proposée et approuvée par la LDA elle-même et sa compétence a été étendue à l'ensemble des quatre districts de la division de Lahore.

L'IMPL 2021 était le plan le plus complet réalisé pour Lahore au moment de son élaboration. L'élément distinctif de ce plan est l'inclusion d'un chapitre sur les préoccupations

environnementales, une première dans l'histoire de la planification au Pakistan. En outre, le plan comprend également un résumé et des cartes et se compose de trois chapitres. Le plan vise à améliorer la qualité de la vie urbaine à Lahore et présente une analyse de la situation et des politiques conséquentes pour les différents secteurs du domaine urbain. Il s'agit notamment des potentiels et des défis du développement, de la gestion de la croissance urbaine, de l'environnement, des caractéristiques sociales et économiques de la ville, du logement, des transports, des infrastructures, du cadre institutionnel, des finances, des règles et règlements de zonage et du bien-être social. Les propositions formulées dans le plan sont classées en fonction du temps, en plans à court, moyen et long terme.

Des directives pour assurer la participation du public sont également données. La modification, d'autre part, est brève avec une carte mise à jour et une notification (LDA, 2016) qui est disponible pour le public et les chercheurs. On pense qu'il existe un rapport détaillé qui intègre les plans précédents des trois districts fusionnés, tels que les plans de développement généraux, afin d'avoir une vision holistique de la région. Le principal objectif de la LDA est de faire en sorte que l'ensemble de la division soit inclus dans le processus de planification, car la gestion urbaine de Lahore de manière isolée est impossible, compte tenu de la forte interdépendance entre Lahore et les autres districts de la division.

Le processus de planification de l'IMPL 2021 a suivi la voie conventionnelle de l'utilisation d'un niveau de collecte de données primaires pour l'analyse de la situation, avec l'aide de quelques sources secondaires. L'ensemble du processus a été marqué par l'absence de participation du public, bien que les propositions soulignent la nécessité de cette activité (Javed & Riaz, 2020). La LDA a toutefois organisé des séances de consultation afin de recueillir les avis de différentes organisations gouvernementales (par exemple, le département des transports, l'agence pour l'environnement, etc.).

L'un des points positifs du plan est l'ébauche d'une structure organisationnelle qui délègue les rôles et les responsabilités aux organisations et départements gouvernementaux pour assurer la mise en œuvre des propositions. Cependant, la LDA n'a pas réussi à exprimer clairement son propre rôle (Javed & Riaz, 2020). Ce cadre de mise en œuvre n'est pas complet et ne s'applique pas à tous les secteurs. Le cadre de mise en œuvre implique principalement l'utilisation des terres, la planification et le contrôle du développement. Pour d'autres secteurs, tels que la santé, l'éducation, le transport et l'environnement, le mécanisme de mise en œuvre fourni est faible, même si les propositions politiques sont détaillées.

Cela présente un énorme inconvénient car ni le LDA ni les TMA ne sont légalement tenues de faire appliquer ces propositions. Ce problème a été rapidement observé et un comité de mise en œuvre du plan a été créé et chargé d'assurer la mise en œuvre de l'IMPL 2021. L'une des tâches de ce comité était la coordination entre les différents départements du gouvernement du district urbain. Le comité a été autorisé à préparer un plan stratégique de mise en œuvre de l'IMPL 2021 pour les cinq prochaines années. Ce plan n'a pas été révélé.

Même s'il n'est pas exempt de problèmes, les réalisations de l'IMPL 2021 en termes de planification peuvent être les dispositions relatives à l'amélioration des conditions de circulation, l'examen et la révision des lois sur la construction, ou encore l'amélioration des règles relatives aux programmes de logements privés et à la conversion de l'utilisation des terres (Javed & Riaz, 2020).

4. L'évaluation des plans et sa position dans le système de planification du Pakistan

L'examen approfondi et systématique des études menées dans le domaine de l'évaluation des plans a permis de dégager les observations et les conclusions suivantes :

L'évolution de l'évaluation des plans est directement liée à l'évolution du domaine de la planification. Alors que le paradigme de la planification est passé d'une planification rigide basée sur des plans à une planification orientée vers le processus, puis à une planification communicative, l'évaluation des plans a également montré des changements dans les aspects des plans évalués. Ainsi, l'évaluation s'est déplacée des résultats physiques des plans (tels que l'utilisation des sols) vers le processus de prise de décision, puis vers l'inclusion et la participation du public concerné.

Les deux principales approches de l'évaluation des plans sont la conformité et la performance (Oliveira & Pinho, 2009). Elles sont considérées comme les deux extrêmes du spectre de l'évaluation des plans, chacune ayant ses propres points positifs et négatifs. Cependant, la littérature sur l'évaluation des plans ne se limite pas à ces deux approches, car des méthodes qui utilisent les deux ont également été développées (comme la méthode PPR d'Oliveira et Pinho, 2009).

Il existe une grande variété de types, de méthodes et d'outils d'évaluation de plans, et de nombreux chercheurs ont tenté de les classer en fonction de différents aspects tels que la nature du plan, le moment de l'évaluation et/ou l'objectif de l'évaluation, etc.

Divers exemples d'application des méthodes et des outils d'évaluation des plans ont donné des résultats tels que la non-conformité et la performance inefficace. Bien que la littérature s'accorde à dire que la relation action-réaction des plans et des résultats est trop simplifiée, la recherche n'a pas été en mesure d'identifier les causes alternatives de ces résultats (Oliveira & Pinho, 2010).

La littérature sur l'incorporation de l'évaluation des plans dans la pratique de la planification générale et ses conséquences est également très limitée.

Une autre observation faite à partir de l'étude de la littérature est que la préparation des critères de développement revêt une immense importance. Pour que l'évaluation du plan soit crédible et qu'elle soit utilisée pour améliorer les plans futurs, elle doit être objective, de préférence quantifiée et facile à interpréter. Par conséquent, le modèle PPIP (Policy-Plan/Programme-Implementation-Process) politique-Plan/Programme-Processus de mise en œuvre, n'a jamais été appliqué car il est trop compliqué et les résultats des études de cas holistiques sont considérés comme trop subjectifs (Waldner, 2004).

Les évaluations de plans contribuent à la banque de connaissances du domaine de la planification et ces connaissances peuvent être utilisées pour améliorer la qualité des plans et le processus d'élaboration des plans. Un aspect important mis en évidence par cette étude est qu'il existe un certain nombre d'évaluations menées en interne dans les institutions de planification qui n'apparaissent jamais dans la littérature documentée. Des recherches supplémentaires sont nécessaires dans ce domaine pour prouver son importance dans le domaine de la planification (Waldner, 2004).

La recherche initiale et l'examen de la littérature ont permis de faire de nombreuses nouvelles observations. Les principales conclusions sont les lignes directrices pour le développement d'un système d'indicateurs pour l'évaluation des plans dans un pays en développement comme le Pakistan. Elles sont résumées ci-dessous.

La première et principale étape consiste à définir précisément les différents termes utilisés pour l'évaluation des plans. Cela signifie qu'il faut établir des indicateurs clairs qui ont la caractéristique de pouvoir mesurer un certain paramètre dans le temps pour évaluer le changement et fournir des informations sur les causes et les effets de ce changement. Les indicateurs sont donc différents des repères (University of Missouri Extension, 2000), car les repères ne sont que des points de référence et n'ont pas la capacité de mesurer les progrès.

Dans le prolongement de la conclusion précédente, il a été constaté qu'il est également important de corriger certaines limites lors du développement de systèmes d'indicateurs. La plus importante de ces limitations est la juridiction administrative, c'est-à-dire que le système d'indicateurs est basé uniquement sur les villes ou les centres urbains.

Il existe de nombreuses directives concernant les caractéristiques des indicateurs ou des systèmes d'indicateurs et deux approches largement utilisées ont fait surface. Il s'agit de l'approche SMART (Specific, Measurable, Achievable, Relevant and Time-bound) et de l'approche SPICED (Subjective, Participatory, Interpreted and communicable, Cross-checked and compared, Empowering and Diverse and disaggregated). En comparant le système de planification du Pakistan et les avantages et inconvénients de ces deux approches, on peut conclure que l'approche la plus pertinente pour le Pakistan est l'approche SMART.

La justification de ce choix réside dans le fait que, même si l'approche SPICED est plus ciblée et descriptive, avec une plus grande participation des parties prenantes, elle prend également beaucoup de temps, utilise plus de ressources en termes de main-d'œuvre et de moyens financiers et est également très localisée avec une application limitée dans tout le pays. Ces facteurs la rendent impropre à une utilisation dans le système de planification actuel du Pakistan.

En revanche, l'approche SMART est pas très facilement modifiable et ne peut mesurer que des paramètres superficiels, elle est facile à utiliser, ne fournit que des informations pertinentes, est efficace en termes de temps, d'argent et de main-d'œuvre et peut être appliquée dans tout le pays.

Les autres caractéristiques importantes d'un indicateur ou d'un système d'indicateurs qui sont importantes pour le développement d'un système d'évaluation post hoc du plan directeur urbain basé sur des indicateurs pour les villes du Pakistan sont les suivantes :

Les indicateurs doivent être à jour par rapport aux tendances et pratiques contemporaines au niveau international, mais ne doivent jamais être utilisés sans que leur intégration dans le système de planification pakistanais ait été envisagée au préalable et doivent donc être modifiés en conséquence.

Les indicateurs devraient avoir une applicabilité plus large dans les villes du Pakistan, des changements mineurs étant possibles lorsqu'ils sont appliqués aux différentes villes. À cet égard, l'étude suggère que le système d'indicateurs intègre tous les scénarios possibles, mais que, selon les circonstances, certains indicateurs aient plus de poids que d'autres pour mieux refléter la situation de la ville.

Les indicateurs devraient être rendus plus efficaces en se basant sur les données déjà collectées par les autorités de développement au Pakistan. Cette simple étape peut s'avérer très utile pour faciliter l'intégration de cette pratique d'évaluation des plans basée sur des indicateurs dans le système de planification actuel du Pakistan, et ce à plusieurs niveaux. Le premier facteur important est que le système basé sur des indicateurs deviendra plus économique en termes de collecte de données. Deuxièmement, l'application de ce système nécessitera moins de renforcement des capacités, avec une augmentation réduite de la main-d'œuvre.

En outre, le système d'indicateurs doit être aussi simple que possible, mais il doit également mesurer de manière adéquate le paramètre requis et son évolution. Cela permettra non seulement de faciliter la collecte, l'application et l'interprétation des données, mais aussi d'améliorer la communication entre les multiples départements et secteurs qui jouent un rôle dans le façonnement de la ville, comme le transport et l'environnement.

Même si de nombreuses techniques d'évaluation sont présentées dans la littérature, telles que les études quasi-randomisées, les benchmarks, les questionnaires et enquêtes et les études de cas, ce sont les indicateurs qui ont été acceptés comme la technique la plus couramment utilisée (Bell & Morse, 2012).

Mais à mesure que l'acceptation et l'application de la nécessité de l'évaluation augmentent, le nombre de systèmes basés sur des indicateurs augmente également. Avec l'autonomie accordée aux instituts locaux, des systèmes d'indicateurs distincts se sont développés aux niveaux local, régional, provincial, national et international. Le nombre de ces systèmes est encore plus important pour les organisations privées et à but non lucratif. Si la tendance à mettre de plus en plus l'accent sur l'évaluation est une bonne chose, le nombre croissant d'indicateurs et de systèmes d'indicateurs est devenu un défi. Dans une situation où un nombre incalculable de systèmes d'indicateurs présente son propre ensemble de définitions et d'interprétations pour les différents buts et objectifs, le "plan efficace" et la durabilité (etc.), la compréhension et le développement d'une tendance plus large des indicateurs est une tâche difficile.

C'est un fait bien établi qu'il existe peu de preuves d'une évaluation officielle des plans dans les pays en développement comme le Pakistan. La principale raison en est le manque de ressources, qui ne permet guère de répondre aux besoins de la planification elle-même, sans parler de l'évaluation des plans. Les pays qui tentent de mettre en place un système de planification bien organisé mettent davantage l'accent sur l'élaboration des plans que sur la résolution des problèmes et les stratégies de mise en œuvre (UNHSP, 2009).

Pour introduire un système de suivi et d'évaluation des plans urbains dans une ville, il est conseillé de développer un ensemble restreint et gérable d'indicateurs orientés vers la planification urbaine (UNHSP, 2009). Il est conseillé dans la littérature qu'un début idéal pour l'établissement d'un système d'évaluation de plan basé sur des indicateurs est d'avoir des indicateurs qui sont très en vue et reflètent les questions de planification déjà établies dans la ville. En suivant ce conseil, cette sélection a soigneusement choisi des indicateurs liés à l'utilisation des sols, à la gestion des catastrophes, au transport et au logement (etc.), car il s'agit des problèmes de planification acceptés et rencontrés par les habitants et les gestionnaires urbains.

À l'appui de la sélection effectuée dans les chapitres suivants, il est affirmé que la qualité et la signification des indicateurs pour la ville concernée sont plus importantes que leur nombre et leur quantité (UNHSP, 2009). Ainsi, les indicateurs utilisés dans cette recherche cherchent à être clairs et à avoir une signification pour les acteurs de l'urbanisme.

Un autre facteur pour le processus de sélection est que les indicateurs doivent utiliser au maximum les informations et les données déjà existantes. Cependant, il ne faut pas oublier que la facilité d'accès aux données peut ne pas répondre aux besoins d'information de l'évaluateur. En gardant cela à l'esprit, cette recherche n'est en aucun cas définitive car les indicateurs évoluent avec le temps et doivent être testés pour vérifier leur utilité.

Une liste exhaustive a également été élaborée pour l'examen et l'analyse des différents systèmes d'indicateurs. On a pris soin de garantir la variété et la fiabilité. Par conséquent, la priorité a été donnée aux systèmes d'indicateurs ayant une application et une pertinence significatives pour le sujet de recherche actuel. Cela inclut, sans s'y limiter, les systèmes d'indicateurs suivants :

Table 2: Systèmes d'indicateurs examinés pour cette recherche

Système d'indicateurs	Organisation en développement	Année de publication	Source
Urban Indicators Guidelines	UN Human Settlements Programme	2009	UN Habitat (2004)
Eurostat Sustainable Development Indicators	Eurostat	2020	European Commission (2020)
Green Cities Programme	OECD	2010	OECD (2010)
China Urban Sustainability Index	Urban China Initiative	2014	Li et. al. (2014)
EEA Urban Metabolism Framework	European Environment Agency	2011	Minx et. al. 2011
Urban Indicators for Mega Cities	University of Bonn	2009	Kötter & Friesecke (2009)
Reference Framework for Sustainable Cities (RFSC)	RFSC	2012	Van Dijken et. al. (2012)
Urban Audit Cities Statistics	Eurostat	2017	European Union (2017)
Urban Sustainability Indicators	European Foundation for the Improvement of Living and Working Conditions	1998	Mega & Pedersen (1998)

Les indicateurs présélectionnés sont présentés par rapport aux différents aspects du domaine urbain, appelés thèmes. Cette liste est basée sur les critères de sélection mentionnés précédemment. En outre, cette liste n'est pas exhaustive et peut être étendue, mais les limites sont présentées par le délai et l'étendue de la portée de cette recherche. En outre, il est également important de préciser ici que les indicateurs sont principalement adoptés à partir des différents cadres étudiés, mais qu'ils ont été modifiés et rationalisés en fonction de leur application dans l'étude de cas.

Les thèmes de l'évaluation du plan directeur urbain dans le cas de la ville de Lahore sont énumérés ci-dessous. Cette liste est un amalgame des secteurs abordés dans le plan directeur intégré de Lahore 2021 et des thèmes présentés dans la revue de la littérature afin de développer un système d'indicateurs complet.

1. Droit et administration
2. Atténuation et prévention des catastrophes
3. Utilisation des sols
4. Services urbains
5. Transport
6. Logement
7. La protection sociale
8. Environnement urbain
9. Économie urbaine

Ces thèmes et leur signification dans l'évaluation du plan directeur urbain dans le cas de Lahore au Pakistan sont discutés ci-dessous. La liste des indicateurs sélectionnés, les sous-indicateurs et l'unité de mesure sont tous présentés sous forme tubulaire à la fin.

Table 3: Indicateurs pour l'évaluation de l'IMPL 2021

Indicateurs pour l'évaluation de l'IMPL 2021

Aspects	Thèmes	Indicateur	Sous-indicateur	Unité de mesure
Sociale	Droit et administration	Participation du public/Niveau de transparence	Force légale du Plan directeur	Niveau d'incidence de déviation par rapport au plan directeur
			Revue et Evaluations	Nombre de révisions et modifications du plan en conséquence
			L'ampleur de l'accès public à l'information	Pourcentage de plans, règlements et procédures accessibles au public
			Langage de Communication	Pourcentage des publications de la ville réalisées dans la langue locale
	Atténuation et prévention des catastrophes	Gestion des inondations	Analyse des risques des inondations	Le niveau d'exactitude des prédictions faites
			Plan de gestion des inondations	Variation en pourcentage des dommages causés par les inondations
			Aménagements physiques pour atténuer les impacts des inondations	Nombre de constructions réalisées
	Utilisation des sols	Compatibilité de l'utilisation des sols	Niveau de contrôle du zonage	Pourcentage de développements avec des objections d'utilisation des sols
		Equilibre géographique	Croissance de la population urbaine	nombre en milliers et augmentation en pourcentage
			Croissance des zones urbaines	Superficie en mètres carrés et pourcentage d'augmentation
			Nouveaux développements planifiés	Superficie en mètres carrés
		Traitement des friches	Réutilisation des terrains abandonnés	Superficie en mètres carrés
		Conversion de l'utilisation des sols	Conversion de l'utilisation des terres de l'agriculture à toute autre utilisation	Superficie en mètres carrés
			Conversion de l'utilisation des terres d'un usage résidentiel à un usage commercial ou industriel	Superficie en mètres carrés
			Espace vert urbain	Superficie par habitant
		Densité urbaine		Nombre d'habitats par kilomètres carrés
	Services urbains	Approvisionnement en eau	Couverture de l'approvisionnement public en eau	Pourcentage de la population ayant accès à l'eau
		Déchets solides	Traitement des déchets solides	Taux de traitement des déchets domestiques
		Assainissement et drainage	Traitement des eaux usées	Taux de traitement des eaux usées
		Technologie	Accès à Internet	Pourcentage de la population ayant accès à l'Internet
	Transport	Modes	Répartition modale des transports	Pourcentage de la population utilisant différents modes de transport
		Temps de trajet	véhicules immatriculés	Taux de motorisation
		Projets de transport public	Longueur du réseau de transport public	Kilomètres
			Longueur du réseau de transport	Kilomètres

			État des routes	Pourcentage de routes répondant aux critères standard de la route
	Logement	Durabilité des logements	État des unités de logement	Pourcentage de logements considérés comme sûrs pour y vivre
		L'écart entre l'offre et la demande		Nombre supplémentaire d'unités de logement nécessaires
		Coût du logement par rapport à la vie		Taux du coût du logement par rapport au salaire minimum
		Logements abordables	Programmes gouvernementaux de logement	Pourcentage de la demande de logement satisfaite par des logements subventionnés
		Répartition par statut de propriété	Répartition de la propriété par propriété/location	Pourcentages de la population
	La protection sociale	Santé	Espérance de vie/taux de mortalité	Nombre de décès pour 1000 personnes
			Médecin comme ressource	Nombre de médecins par habitant (pour 1000 personnes)
		Education	Taux d'alphabétisation	Nombre de personnes alphabétisées pour 1000 personnes
		Crime	Taux de criminalité	Nombre de cas annuels
		Patrimoine	Patrimoines nécessitant l'attention	Nombre des sites négligés
Environnement	Environnement urbain	Protection environnementale	Niveau d'application des politiques environnementales	Pourcentage de projets urbains validés par le département de la protection de l'environnement
				Fréquence du suivi de l'évaluation environnementale
		Pollution urbaine	Qualité de l'air	Niveau de dioxyde de carbone, d'oxyde d'azote, dioxide e soufre et de particules (en milligrammes par mètre cube)
				Nombre de jours qualifiés de dangereux au regard de la qualité de l'air
			Qualité de l'eau	pH de l'eau, salinité, niveaux d'oxygène dissous et turbidité
			Niveau de nuisance	Pourcentage de la population affectée par des niveaux de bruit élevés
				Pourcentage de la population affectée par les nuisances olfactives ou visuelles
Économie	Économie	Efficacité des ressources	Consommation d'énergie	Consommation d'énergie par unité de PIB et par habitant
			Consommation d'eau	Litres d'eau utilisés par habitant
		Recherche et développement	Budget pour la recherche-développement	PKR
		Développement	Centre de finances et de commerce	Pourcentage de la population
			Développent industriel	Niveau de performance du site industriel
			Produit Intérieur Brut	PKR/USD

Les principales étapes du cadre d'évaluation sont la sélection de la méthode d'évaluation appropriée (dans notre cas, les thèmes), la pondération des thèmes, puis la réalisation du cadre d'évaluation final (agrégation) (Juwana et al., 2012).

La littérature souligne la difficulté du processus d'évaluation à partir de la sélection des méthodes d'indicateurs, souvent réalisée par l'utilisation des lignes directrices (Wu et Wu, 2012) données par les cadres d'indicateurs (dont le plus commun est le cadre de réponse de l'état de pression (OCDE, 1993)) ou les principes de Bellagio (Hardi et Zdan, 1997). Le principe de Bellagio tire son nom du centre d'études et de conférences de la Fondation Rockefeller à Bellagio, en Italie, où des praticiens et des chercheurs se sont réunis en 1996 pour mesurer les progrès du développement durable. Il en est résulté un ensemble de principes qui ont été approuvés à l'unanimité (Hardi et Zdan, 1997).

Cette recherche diffère également de l'utilisation conventionnelle des indices de durabilité car elle ne fusionne pas les thèmes en un seul indice de durabilité (Böhringer et Jochem, 2007) mais conserve les scores individuels des thèmes et effectue des interprétations sur cette base. Ainsi, les problèmes liés à la détermination de la contribution de chaque thème et à la recherche de valeurs de compromis peuvent être évités.

L'analyse de la prise de décision multicritères (MCDM) attribue une importance relative ou des pondérations aux critères qui sont représentés par leur poids dans le système. Dans cette recherche, nous allons calculer le poids des thèmes développés et voir la performance de l'IMPL 2021 par rapport à chaque thème. L'attribution de poids donnera une image plus claire, car nous pourrons voir si un thème relativement important a de mauvaises performances (dans ce cas, les performances de l'IMPL 2021 diminueront de manière significative) ou de bonnes performances (dans ce cas, les performances augmenteront même si les autres thèmes ont obtenu de mauvais résultats).

L'évolution mondiale vers une prise de décision plus démocratique et inclusive souligne l'importance des décisions prises par de multiples acteurs et non par des organes uniques ou des décideurs individuels. Une approche similaire est également appliquée par les organisations, qui estiment qu'une décision issue d'une connaissance et d'une expertise collectives est supposée être plus objective et informée que celle des individus en raison des

restrictions cognitives négatives (Ossadnik et al. 2016). Par conséquent, les décideurs multiples présentent de nombreux avantages, notamment la réduction des restrictions cognitives négatives, des approches diversifiées, moins d'erreurs, une expérience et des informations plus riches et même une plus grande acceptation des résultats proposés (Sims 2002 ; Kreitner et Cassidy, 2011).

Cependant, comme tous les concepts, la prise de décision en groupe n'est pas exempte d'inconvénients. Il existe des risques de domination et/ou de stéréotype de la majorité (Kreitner et Cassidy, 2011). Pour éviter que cela ne se produise, des aides systématiques à la décision de groupe sont apparues pour aider à atteindre des solutions idéales.

Sous cette prétention, cette recherche a choisi l'utilisation du Processus de Hiérarchie Analytique (AHP) pour l'attribution de poids aux thèmes développés pour l'évaluation d'un plan directeur.

Le Processus de Hiérarchie Analytique (AHP) (Saaty 1980 ; Saaty et Vargas 2001) a gagné en intérêt dans la littérature scientifique à travers les domaines principalement en raison de sa capacité à donner une dimension quantitative aux données qualitatives. Le processus est bien adapté pour traiter simultanément des données qualitatives et quantitatives. Le processus a été si largement utilisé pour l'attribution de poids/significativité aux critères qu'il existe un support logiciel suffisant pour exécuter les calculs fatigants associés à l'analyse (Ossadnik et al. 2016). Le processus a également une approche compensatoire qui le rend adapté à des études comme celle-ci, car les sujets sont divers et leurs valeurs peuvent l'être aussi. Ce facteur est pris en charge par AHP. De plus, les résultats dérivés de l'AHP sont plus proches de la réalité car les données proviennent d'experts du monde réel et de multiples acteurs sont impliqués (Ossadnik et. al. 2016 ; Alphonce, 1997 et Okada et. al. 2008). Cela rend également les résultats plus acceptables par l'ensemble du groupe. En outre, le processus donne également une idée sur le degré de différence attribué aux thèmes ou aux critères. Cela peut également contribuer à la formulation de jugements judicieux.

Toutefois, le processus n'est pas exempt de problèmes. Les problèmes surviennent lorsque la question à traiter est d'une grande complexité. Plus le nombre de variables à comparer est élevé, plus la tâche de mener l'AHP devient longue et fatigante. Un autre problème est lié à

cela : lorsque le problème devient complexe, le groupe d'experts associé devient également complexe. Cela signifie que la cohérence des données collectées est difficile à atteindre (Alphonce, 1997). On peut en dire autant de l'effort nécessaire pour établir une liste de critères ou de thèmes à présenter aux experts. La méthode de collecte des données peut également entraîner des incohérences dans l'analyse, car elle a un format unique et le répondant a besoin de conseils clairs pour donner des pondérations aussi précises que possible (Okada et. al. 2008). En raison de la nature subjective du processus, la littérature fait état d'un manque de systématisation et d'évaluation du processus (Ossadnik et. al. 2016).

Par conséquent, on peut conclure que l'AHP est une méthode statistique simple à utiliser et flexible qui peut convertir efficacement des données qualitatives en données quantitatives pour la prise de décisions ou une étude plus approfondie (Saaty, 1977). Un problème complexe est rendu hiérarchique dans l'application de l'AHP, ce qui le rend beaucoup plus systématique et plus facile à résoudre. Il a été recommandé de l'appliquer à l'évaluation des performances car il fournit une analyse plus approfondie du système (Elshaikh et al. 2018).

Une légère adaptation apportée à l'AHP conventionnel est qu'il n'y aura pas de sélection d'une alternative faite à la fin. Les pondérations seront attribuées à chaque thème et à partir de là, l'étude adopte une approche différente et mesure la performance de l'IMPL en fonction des données collectées par rapport au cadre d'indicateurs.

5. Résultats

Au total, 25 experts ont été consultés pour cette recherche. Nous avons recherché un mélange de professionnels avec différentes expertises et environnements de travail. La plupart d'entre eux étaient des urbanistes travaillant dans différents domaines tels que les universités (5), les organisations gouvernementales (LDA) (5) ou autres tels que la gestion des déchets solides, le transport, l'environnement et le logement. Ces experts occupent différentes fonctions et travaillent dans diverses organisations telles que des sociétés de développement foncier ou des cabinets de conseil en urbanisme. Un architecte et un ingénieur civil ont également été inclus dans la liste des répondants. Malgré leurs différences, tous les experts inclus dans cette recherche ont une expérience de la zone d'étude de cas par leur profession et leurs observations personnelles. Les réponses aux 25 questionnaires ci-dessus, autres que les comparaisons par paires, ont été incluses afin de déduire des informations significatives sur l'importance et l'acceptation des évaluations de plans dans le domaine de la planification à Lahore.

Après avoir éliminé les réponses inacceptables, la matrice de décision finale (ou matrice de jugement) est réalisée en prenant la moyenne géométrique des priorités des matrices cohérentes.

A partir de là, la matrice normalisée finale a été calculée comme décrit dans le chapitre précédent. Le tableau ci-dessous est le résultat de ce calcul. Le tableau montre également les pondérations finales des thèmes comme résultat de l'analyse AHP des opinions des experts.

Comme prévu, l'incohérence de cette matrice est extrêmement faible car les valeurs sont issues de matrices cohérentes. Elle est de 0,0077. Les propositions faites dans l'IMPL 2021 concernant chaque thème sont discutées à la lumière des pondérations qui ont été attribuées. Certaines comparaisons ont également été faites, lorsque cela était possible et lorsque les données étaient disponibles, afin d'évaluer le degré de réussite de l'IMPL 2021 dans ce thème. Par conséquent, les thèmes sont examinés dans l'ordre des pondérations qui ont été attribuées, en commençant par les pondérations les plus élevées.

Table 3: Matrice normalisée finale et poids des thèmes attribués

Matrice normalisée (N)	Droit et administration	Atténuation et prévention des catastrophes	Utilisation des sols	Densité urbaine	Services urbains	Transport	Logement	Protection sociale	Environnement urbain	Economie urbaine	Poids (moyen) (P)	Poids% (Terminé)
Droit et administration	0.09	0.09	0.10	0.08	0.09	0.09	0.08	0.09	0.07	0.09	**0.09**	**9**
Atténuation et prévention des catastrophes	0.08	0.08	0.11	0.09	0.08	0.07	0.11	0.09	0.07	0.06	**0.08**	**8**
Utilisation des sols	0.10	0.08	0.11	0.12	0.09	0.10	0.12	0.12	0.11	0.14	**0.11**	**11**
Densité urbaine	0.08	0.07	0.07	0.08	0.06	0.07	0.09	0.08	0.08	0.10	**0.08**	**8**
Services urbains	0.09	0.09	0.11	0.12	0.09	0.07	0.07	0.07	0.07	0.11	**0.09**	**9**
Transport	0.08	0.11	0.09	0.09	0.10	0.09	0.07	0.09	0.08	0.09	**0.09**	**9**
Logement	0.15	0.10	0.13	0.13	0.18	0.19	0.14	0.15	0.16	0.12	**0.14**	**14**
Protection sociale	0.09	0.08	0.08	0.09	0.10	0.08	0.08	0.08	0.07	0.09	**0.08**	**8**
Environnement urbain	0.13	0.13	0.11	0.10	0.13	0.11	0.10	0.12	0.11	0.08	**0.11**	**11**
Economie urbaine	0.12	0.16	0.10	0.10	0.09	0.12	0.14	0.11	0.16	0.12	**0.12**	**12**

6. Conclusion et recommandations

L'une des tendances observées par l'analyse AHP est que l'éventail des pondérations attribuées n'est pas large. La pondération la plus élevée est celle de 14% alors que la plus faible est de 8%, soit une différence de seulement 6%, ce qui est assez faible avec trois thèmes à 9% et trois thèmes à 8% sur un total de dix thèmes. On peut déduire de ce résultat que les experts accordent un certain niveau d'importance à chaque thème et les considèrent tous comme significatifs pour une performance efficace de l'évaluation d'un schéma directeur. Il montre également que même si certains thèmes sont considérés comme plus importants que d'autres, la différence attribuée ne dépasse pas plus de 6%.

En outre, les pondérations attribuées par les experts ne sont pas toujours cohérentes avec l'importance attribuée à ces mêmes thèmes dans l'IMPL 2021. Par exemple, le thème du transport a reçu un poids de 9% (l'avant-dernier) dans l'analyse AHP, mais le budget le plus élevé a été alloué aux projets liés au transport dans les propositions à court terme de l'IMPL 2021. Il en va de même pour le thème de l'utilisation des terres et l'inverse a été observé pour le thème de l'environnement où l'importance donnée dans l'IMPL 2021 a été observée comme étant plus faible que celle attribuée par l'analyse AHP (11% et deuxième plus élevé). D'autre part, les thèmes qui ont montré une cohérence sont ceux du logement et de l'économie urbaine qui ont reçu un poids élevé dans l'analyse AHP et une grande importance dans l'IMPL 2021.

Les autres conclusions concernent la performance de l'IMPL 2021 à la lumière des propositions faites.

Tout d'abord, il a été observé que, comparé aux données disponibles et aux repères occasionnels dans l'IMPL 2021, le plan a été performant dans certains thèmes dans une certaine mesure, mais n'a pas été en mesure de l’être dans d'autres. Dans le domaine de la loi et de l'administration, la transformation de la LDA en une autorité divisionnaire peut être considérée comme l'un des points positifs par rapport aux propositions faites pour gérer Lahore par rapport aux zones, villes et villages voisins. De même, en ce qui concerne les services urbains, le plan a réussi à atteindre l'objectif de couvrir un pourcentage plus élevé de résidents pour l'approvisionnement en eau, les

égouts et la collecte des déchets solides (Urban Unit, 2010). La performance du thème du transport a également quelques points de succès avec l'augmentation des initiatives de transport public et la mise en œuvre de nouvelles stratégies pour améliorer l'accessibilité de ces derniers (JICA, 2012).

Néanmoins, la performance globale est loin d'être satisfaisante, comme le montrent les discussions du chapitre précédent. Bien qu'il y ait quelques progrès, les efforts tendent à être à court terme ou à manquer de qualité. Les autres thèmes tels que le logement, l'environnement, l'aménagement du territoire et la densité urbaine ne présentent que de très faibles résultats.

Dans le même ordre d'idées, des retards importants ont été observés dans l'élaboration ou la mise en œuvre de certaines propositions importantes. Par exemple, la construction d'un centre financier et commercial et la construction de plusieurs réseaux de bus à haut débit et de métro léger ont été proposés depuis les années 1980, approuvés par l'IMPL 2021, mais sont toujours loin d'être achevés (JICA, 2012). On peut également dire la même chose de la relocalisation des industries (Husnain, 2021) proposée dans le thème de l'utilisation des sols et de la construction de décharges sanitaires (Randhawa, 2020) dans le thème des services urbains. En général, tous les thèmes présentaient cet élément de retard dans l'application/mise en œuvre des propositions faites dans l'IMPL 2021.

L'une des raisons de ces retards peut être le point suivant observé, à savoir des prévisions erronées et l'incapacité du plan à s'adapter à des conditions urbaines en évolution rapide. Presque toutes les prévisions faites dans l'IMPL 2021 étaient fausses en réalité. Cela est vrai à commencer par les estimations de la population urbaine de Lahore qui ont pu conduire à la distorsion de toutes les autres prévisions dérivées telles que celles de la demande de logement, de transport, de services urbains, etc. (Pasha, 2021). Dans le même ordre d'idées, certaines propositions sont faites sans que leur faisabilité ait été correctement étudiée. C'est le cas des propositions de développement du site industriel de Chunian qui sont maintenant abandonnées car le sol s’est révélé impropre à la construction d'un tel site (Husnain, 2021).

De même, une déconnexion (ou un manque de connexion) a parfois été observée dans les propositions de plan et les projets réels qui ont été initiés. Les exemples incluent le début du développement du projet de développement urbain de la rive de la rivière Ravi, la question des villages piégés (les villages qui sont entourés par des développements urbains), la question de l'augmentation des zones urbaines à faible densité et la réduction du pourcentage de zones agricoles et vertes (Hussain, 2022 ; Ghaffar, 2015 ; Ghaffar et. al. 2015 et Hussain & Nadeem 2021).

Dans une autre observation, le plan a mis l'accent sur la quantité plutôt que sur la qualité dans certains des thèmes. Cette constatation est étayée par les exemples de l'augmentation de la couverture des services d'approvisionnement en eau, de collecte des déchets solides et d'assainissement (Urban Unit, 2010). Cependant, la qualité du service doit encore être améliorée car la qualité de l'eau est inférieure aux normes approuvées par l'OMS, les déchets solides collectés ne sont pas éliminés correctement, ce qui entraîne une pollution de l'air et de l'eau, et les eaux usées ne sont pas traitées et se déversent dans la rivière Ravi, ce qui cause des problèmes plus importants que ceux qu'elles résolvent (Randhawa, 2020). Il en va de même pour les propositions faites pour les thèmes de l'aide sociale où l'accent est davantage mis sur le nombre d'écoles et d'hôpitaux fournis (Siddiqui & Mehfooz, 2017 ; Bureau of Statistics Punjab, 2018) plutôt que sur leur assurance qualité ou la lutte contre la cause profonde des faibles taux d'alphabétisation et de la mauvaise santé des résidents.

Un manque de rigueur dans la mise en œuvre des propositions faites par l'IMPL 2021 a également été observé car il existe des cas où le plan a été négligé au profit des marchés fonciers ou des agendas politiques. Ceci est particulièrement évident dans le domaine du logement, de l'utilisation des sols et de la densité urbaine. L'approbation et le développement de programmes de logement loin du centre-ville et maintenant au-delà de la rivière, principalement aux dépens des terres agricoles qui étaient censées être conservées, est l'exemple le plus approprié du plan cédant aux forces du marché foncier (Hussain, 2022). De même, le démarrage et l'arrêt du système de transport en commun dans la ville en fonction du changement de gouvernement au pouvoir est également un exemple clair (JICA, 2012).

On a également constaté que l'IMPL 2021 et sa mise en œuvre ont adopté une approche réactive plutôt que proactive au cours de son mandat. De nombreux exemples viennent étayer cette affirmation, notamment le développement du projet d'aménagement urbain du front de mer de la rivière Ravi, la conversion de la zone industrielle de Chunian en Aqua Business Park et la mise en place de l'équipe anti-smog pour réduire les niveaux de pollution atmosphérique. Il en va de même pour le thème du transport où l'élargissement des routes a été adopté pour lutter contre les problèmes de congestion, ce qui est considéré comme une solution à court terme (JICA, 2012). La conclusion faite à propos de l'accent mis sur la quantité plutôt que sur la qualité est également en accord avec cet accent mis sur les solutions à court terme et observé dans le thème du bien-être social (Urban Unit, 2010). Plutôt qu'une approche à long terme visant à changer la dynamique socio-économique et culturelle pour accroître l'alphabétisation dans la ville, le plan se concentre sur le nombre d'écoles, de collèges et d'universités disponibles. L'incidence de la résolution de la situation sanitaire des résidents en ajoutant seulement le nombre d'institutions de santé plutôt qu'en améliorant la qualité de l'eau, la qualité de l'air et la qualité générale de l'environnement tombe dans la même catégorie.

Le point suivant dans cette discussion est le manque de participation du public dans le développement des propositions. Cela a été observé dans un certain nombre de thèmes, mais plus particulièrement dans le thème du logement. Certains auteurs observent que peu de choses sont faites pour loger les pauvres, les personnes qui ont réellement besoin d'un logement, et que la situation du marché rend de plus en plus difficile l'accès ou l'achat d'un logement dans la ville pour les autres (Hasan & Arif, 2018). La question associée des villages piégés est également un autre exemple où les résidents actuels du quartier ne sont pas pris en compte lors de la planification du développement de la zone (Cermeño, 2021). La différence entre les poids attribués par les experts aux différents thèmes et l'importance accordée par l'IMPL 2021 va également dans le même sens en plus des résultats des questions générales analysées dans le chapitre précédent.

La dernière conclusion, et la plus pertinente pour cette recherche, est celle de l'inefficacité du suivi et de la révision du plan, s'il y en a eu une, car elle a été clairement mentionnée dans l'IMPL

2021 et des modifications ont été apportées au plan, mais aucun document justificatif n'est disponible pour l'étayer. Les trois amendements apportés à l'IMPL 2021 semblent découler soit des forces du marché, soit d'agendas politiques, mais pas nécessairement de l'examen et de l'évaluation des performances de l'IMPL 2021 (Alam, 2020). En effet, aucun des amendements n'adopte les changements observés ou le développement dans les domaines où le plan échouait, comme l'environnement ou l'augmentation du rythme de développement des projets.

6.1 Contribution de la recherche et de ses résultats

La recherche a été fondée sur le fait qu'il existe un manque important de connaissances dans la littérature sur les évaluations de plans spécifiques à l'étude de cas. Les premiers chapitres de la recherche développent l'idée que le concept d'évaluation des plans est très sensible à la région et au système de planification. Cela a conduit à la constatation que l'une des raisons de la sous-performance des plans de gestion urbaine était l'absence d'une étape d'évaluation et de suivi. Ce qui a conduit à la répétition des erreurs du processus de planification et les résultats du plan ont presque toujours été insatisfaisants. Après une étude plus approfondie du problème de recherche, il a été découvert qu'il y a un manque de recherche et de données disponibles pour les éléments de base de l'évaluation Cortinovis et Geneletti (2020) affirment également que pour les interventions urbaines (guidées par les plans d'urbanisme) mises en œuvre, si elles contribuent aux objectifs du plan, l'impact peut être mesuré par l'utilisation du processus d'évaluation d'impact.

Par conséquent, nous avons élaboré un certain nombre d'objectifs qui devaient être remplis par cette recherche. Les objectifs de cette recherche (mentionnés dans le premier chapitre) et leur réalisation sont décrits ci-dessous.

Objectif 1 : étudier le concept d'évaluation des plans, son développement et sa place dans la planification urbaine en général et au Pakistan.

Une revue complète de la littérature concernant le concept et l'évolution de l'évaluation des plans a été menée. Une étude approfondie de la littérature de base, a été menée y compris, mais sans s'y limiter, en mobilisant des références phares telle que celles produites par Oliveira &

Pinho, (2010), Alexander (2006), Alexander & Faludi (1989), Baer (1997), Brody & Highfield (2005) et Talen (1997). Les résultats ont été intégrés à cette thèse de manière ordonnée.

La recherche, basée sur une revue de la littérature extensive, systématique et sensible au cas par cas, est également arrivée à la conclusion qu'il y avait une absence significative d'évaluation de plan au Pakistan (Hameed & Nadeem, 2006). La recherche a également permis de découvrir sa présence inexistante dans le cadre juridique et la pratique (Shah, Afridi, & Minallah, 2007). Ces résultats, parmi d'autres, ont contribué à la réalisation de cet objectif de la recherche.

Objectif 2 : Identifier et analyser de manière critique les pratiques contemporaines d'évaluation des plans d'urbanisme dans le monde, afin de classer et de filtrer les pratiques susceptibles d'être appliquées au Pakistan.

Pour atteindre cet objectif, les sources secondaires ont été explorées plus en détail. La recherche a développé un système de catégorisation des approches, des méthodes et des outils d'évaluation des plans urbains à partir des systèmes d'évaluation contemporains et appliqués disponibles. La discussion relative à l'approche de conformité et de performance de l'évaluation du plan a été faite sur la base des travaux importants de Oliveira et Pinho (2009 ; 2010), Laurian et. al. (2004) et Berke et. al. (2006), ce qui a permis de prendre une décision sur l'approche appropriée pour le Pakistan. De même, les méthodes de PPIP (Alexander & Faludi, 1989), PIE (Laurian et. al., 2004 et Berke et. al., 2006) et PPR (Oliveira & Pinho, 2009) ont été discutées en détail pour choisir la bonne méthode pour le cas du Pakistan. La recherche s'est ensuite penchée sur l'outil des indicateurs, qui a été jugé le plus approprié pour l'étude de cas. Une analyse approfondie de son utilisation, de ses avantages et inconvénients, de ses présomptions et hypothèses, de son cadre de sélection, etc., a été réalisée afin de permettre le développement du cadre d'indicateurs pour l'évaluation du plan IMPL 2021.

Objectif 3 : Développer un cadre d'évaluation pour l'évaluation post-hoc des plans directeurs au Pakistan à travers l'étude des systèmes d'évaluation des indicateurs existants.

Cet objectif a été atteint en développant d'abord les thèmes du cadre d'évaluation et ensuite le cadre d'évaluation des indicateurs. Les systèmes d'indicateurs des lignes directrices sur les

indicateurs urbains (UN Habitat, 2004), les indicateurs de développement durable d'Eurostat (Union européenne, 2020), le programme des villes vertes (OCDE, 2010), l'indice de durabilité urbaine de la Chine (Li et al., 2014), les indicateurs urbains pour les mégapoles (Kotter & Friesecke, 2009), le cadre de référence pour les villes durables (van Dijken et al., 2012), les statistiques des villes d'audit urbain (Union européenne, 2017) et les indicateurs de durabilité urbaine (Mega & Pedersen, 1998) ont été étudiés pour cette recherche. Ils ont été utilisés pour développer les thèmes de cette recherche en gardant à l'esprit les chapitres d'IMPL 2021. Une étude plus approfondie de ces derniers a conduit à la sélection d'indicateurs à utiliser dans l'évaluation d'IMPL 2021.

Objectif 4 : Recueillir et synthétiser les opinions des urbanistes, des universitaires et des professionnels de l'urbanisme au Pakistan concernant les critères d'évaluation du plan afin de développer les pondérations des indicateurs dans le cadre d'évaluation.

La littérature a également aidé à la sélection des techniques de pondération et d'agrégation pour attribuer les poids des thèmes développés. Un certain nombre de techniques de pondération ont été étudiées, allant de celles basées sur les statistiques, l'analyse factorielle et le bénéfice du doute, à celles plus orientées vers l'opinion, comme l'opinion publique et l'analyse conjointe. Cependant, comme elles ont toutes leurs avantages et leurs inconvénients, le processus de hiérarchisation analytique (Saaty, 1990, 2008) s'est avéré être le plus approprié pour cette recherche basée sur une étude de cas, grâce à un processus de sélection structuré (Gan et al., 2017). Cependant, parmi les méthodes d'agrégation étudiées, toutes ont été jugées adaptées aux caractéristiques de la recherche. Cela a mis en lumière d'autres facteurs de la recherche, en utilisant la discussion d'Elshaikh et de ses co-auteurs (2018), une décision d'agrégation compensatoire a été prise.

Le chapitre sur l'analyse des données de la recherche décrit le processus et le calcul des pondérations des thèmes en fonction des entretiens d'experts soigneusement sélectionnés.

Objectif 5 : Tirer des conclusions et des recommandations pour les recherches futures et pour la planification urbaine pratique au Pakistan.

Dans les pages suivantes, les conclusions et les recommandations pour la planification urbaine pratique au Pakistan sont présentées en s'appuyant sur les résultats de cette recherche. Les limites de la recherche, sa contribution au manque de littérature et les pistes de recherche futures sont également présentées.

En résumé, nous espérons que cette thèse fournit une étude solide du concept d'évaluation des plans, de son développement et de sa place dans le système de planification urbaine en général dans le monde et aussi spécifiquement pour le Pakistan. La recherche a permis d'identifier et d'analyser les pratiques contemporaines d'évaluation des plans d'urbanisme dans le monde, afin de classer et de filtrer les pratiques susceptibles d'être appliquées au Pakistan. Les résultats de cette étude ont conduit la recherche à aller plus loin et à développer un cadre d'évaluation pour l'évaluation a posteriori des schémas directeurs au Pakistan à travers l'étude des systèmes d'évaluation des indicateurs existants.

A partir de là, la recherche contribue à rassembler et à synthétiser les opinions des urbanistes, des universitaires et des professionnels de l'urbanisme à Lahore, au Pakistan, concernant les critères d'évaluation des plans afin de développer les pondérations des thèmes dans le cadre d'évaluation. Enfin, la recherche formule des conclusions et des recommandations discutées dans ce chapitre.

6.2 Limites et recherches futures

Un certain nombre de limites rencontrées au cours de la recherche ont, d'une part, affecté les résultats de l'étude et, d'autre part, identifié des lacunes et des pistes pour des recherches ultérieures. Elles sont abordées dans cette section.

La disponibilité des données a été l'un des obstacles les plus importants rencontrés dans le développement et la conduite de cette recherche (ONU, 2007 et Bell & Morse, 2012). Le chercheur et certains des experts consultés pour cette étude sont d'avis que le LDA réalise des évaluations et des rapports de suivi, bien qu'ils n'aient jamais été rendus publics et que, par conséquent, leur analyse et leur contribution à l'élaboration du plan et à sa performance sont impossibles à déterminer.

En outre, il y a très peu de cas où les dernières données ou les données supplémentaires étaient disponibles pour comprendre et évaluer la performance de l'IMPL 2021 par rapport aux propositions faites. La recherche a dû passer par un certain nombre de ressources documentaires telles que des rapports et des articles de presse, des déclarations gouvernementales et des rapports associés d'autres secteurs tels que le Bureau des statistiques pour l'extraction de données pertinentes. Pallier l'absence d'indicateurs et de rapports urbains consolidés a été considérée comme une tâche difficile et chronophage dans cette recherche. Idéalement, l'inclusion de l'examen et de l'évaluation en tant qu'étape permanente du processus de planification urbaine, dans le but de les rendre légalement contraignants et de rendre publics les rapports qui en résultent, constituerait un grand pas en avant vers l'amélioration du système de planification, des plans urbains et de l'évaluation des plans au Pakistan.

Cependant, ce manque d'information et de recherche est à l'origine de cette recherche et une identification plus poussée des lacunes dans les connaissances permettra d'envisager de futures options de recherche telles que la réalisation et la publication de rapports d'évaluation de plans basés sur le cadre proposé ou toute autre forme de techniques d'évaluation. L'étude et la préparation d'une base de données d'indicateurs urbains périodiquement mise à jour seront également utiles pour les recherches futures de ce type et pour les processus de planification.

Une autre limite de cette recherche était son incapacité à avoir une approche holistique et intégrée pour développer les raisons concernant les aspects sociaux, politiques et culturels de la performance d'IMPL 2021. La recherche a été confrontée à des limitations de temps et de ressources financières pour entreprendre cette entreprise, ce qui pourrait être traité dans le cadre de recherches ultérieures sur ce sujet. Par conséquent, un examen plus approfondi du rôle joué par les aspects socio-économiques et politiques du domaine de la planification sur la performance des plans directeurs pourrait être mené.

De plus, cette recherche a développé les pondérations pour les thèmes dans le cadre des indicateurs et la recherche peut être poursuivie en assignant des pondérations aux indicateurs dans chaque thème pour comprendre la performance et son évaluation d'une manière plus solide. Par conséquent, la conduite d'une autre étude pour attribuer des poids à tous les

indicateurs qui peuvent être énumérés non seulement sur la base de la littérature mais aussi en combinaison avec l'inclusion des parties prenantes et de leurs opinions.

6.3 Recommandations

Comme étape finale de cette recherche, quelques recommandations sont faites principalement pour l'inclusion de l'évaluation du plan directeur dans le système de planification et ses avantages connexes dans le processus de planification et la performance du plan.

Le concept d'évaluation devrait être incorporé non seulement dans le plan mais aussi dans le processus de planification (Alexander & Faludi, 1989 ; Laurian et. al., 2004 et Oliveira & Pinho, 2009). L'IMPL 2021 prévoit la réalisation d'une révision du plan et la modification des propositions à la lumière de ses résultats (LDA, 2004). Cependant, il n'y a d'abord aucune obligation légale pour le LDA d'effectuer cette révision et cette évaluation (LDA Master Plan Rules, 2014) et ensuite, les modifications ultérieures apportées à l'IMPL 2021 sont perçues comme ayant été faites sous l'influence du marché ou de la politique (Alam, 2020). Par conséquent, cette recherche encourage le développement d'un comité d'examen avec de multiples experts et le résultat de l'examen devrait être rendu public (Chelimsky, 1997). La conduite de ce processus devrait également être rendue légalement contraignante pour les autorités de planification et de mise en œuvre.

Les plans élaborés à l'avenir devraient avoir des objectifs et des propositions clairs, assortis de repères mesurables, afin d'évaluer périodiquement les performances et d'apporter les changements nécessaires si besoin est. Actuellement, la recherche a été limitée par le manque de repères mesurables (LDA, 2004) qui pourraient être utilisés pour évaluer combien et dans quelle mesure le plan a atteint tous ses objectifs.

La recherche a également identifié que le niveau de participation du public est très limité dans le processus d'évaluation du plan (sur la base des résultats de l'enquête). L'inclusion du public et d'autres parties prenantes et experts enrichirait le processus de planification et ses résultats et contribuerait donc à une meilleure performance du plan.

Un problème identifié avec l'IMPL 2021 était celui de ses prévisions erronées telles que celles de la population (Pasha, 2021). Ce problème peut être résolu en améliorant les techniques de prévision d'une part, mais aussi en rendant le plan flexible pour permettre des changements adaptatifs à la lumière de l'évolution rapide des caractéristiques socio-économiques de la ville (ONU, 2007 ; Bell & Morse, 2018 et Ossadnik et. al., 2016).

Le renforcement et la réforme du support légal pour les processus de planification, la mise en œuvre et la révision encourageront également les autorités de planification à être responsables et à avoir plus de contrôle sur le développement sans céder aux influences du marché et de la politique (Nadeem & Hameed, 2006 ; Brody & Highfield, 2005 ; et Talen, 1997).

Enfin, le développement d'une approche holistique de la planification pourrait être incorporé dans le système de planification où les différents thèmes sont étudiés en relation les uns avec les autres et des propositions plus durables et à long terme sont faites pour atteindre les objectifs du plan (Alexander 2006 ; Alexander & Faludi, 1989 ; et Baer, 1997).

Par conséquent, cette recherche se conclut par les recommandations susmentionnées pour les prochains plans de développement urbain des villes du Pakistan.

Chapter 1: General Introduction

Evaluation, as typically defined in planning literature, is the systematic assessment of the worth or merit of some object (Trochim, 1989). This object in the urban planning field can be anything ranging from the consequences of a development plan, its outcomes, the extent of achievement of the objectives of the development plan or even the planning process or the level and quality of stakeholder participation. A thriving mainstream evaluation literature exists, with its own evaluation typologies and methods (e.g., Patton, 2002; Wholey, 2004; Weiss, 1988). Interestingly, many of the concerns, techniques, and typologies of mainstream evaluation research never surfaced in practical plan evaluations. For example, mainstream evaluation research debates focus on quantitative versus qualitative techniques (Patton, 1986), the role of theory (Chen, 1990), advocacy and evaluator bias (Chemlinsky & Shadish, 1997), and the use of key tools such as performance measurement (Perrin, 1998). In practice plan evaluation, in contrast, focuses on what to evaluate, how to evaluate, the use of the evaluation results and the potential irrelevance of evaluation as shown by the available plan evaluations.

Urban development plans are made to help in the management of the complex sectors of the urban settings (Oktay & Ercoşkun, 2021) in the form of policy documents often aided with guidelines, regulations and maps. The use of these documents in combination shapes the development and growth of the city at hand. The regulations can be in the form of land use rules and zoning criteria. The guidelines can occur in the form of building codes, level of service benchmarks, etc. The urban development plans offer comprehensive frameworks based on the urban planning principles and geographical orientations, a means for the implementation of urban projects and increase in the wellbeing of the residents. The development and implementation of such plans are most often required by the law or local regulations of the city.

Typically, urban development plans are supposed to not only shape the urban environment but also to include the societal elements to catering to the diversity, responsibility and economic growth of the city (Oktay & Ercoşkun, 2021). The plan is responsible for bridging the gaps

between planning theories (which due to the academic and research work are at an advanced level) and practice, between the different sectors of the urban realm and between the various actors and stakeholders. For this, there is a constant need for the development of innovative tools and techniques, benchmarks, evaluations and monitoring. The plans are often also responsible to maintain the character of the city and provide guidelines for the preservation of heritage elements.

The development of the rationale of this research and the conduction of preliminary literature review also pointed to the association between the plans and sustainability as sustainability has become the central point in all walks of life (Gürler, 2018). It is now a goal to be achieved at every level starting from individuals to communities to governments and the global organisations (Mega & Pedersen, 1998). Being the popular topic that sustainability is, most of the literature taken and analysed for this research is focused on the achievement and assessment of plans or cities with respect to sustainability.

In line with the mainstream literature and research trends, this research studies the evaluation of urban plans in conjunction with sustainability assessments. The research does not focus its growth with sustainability at the centre, but acknowledges its strong presence in the planning practices, evaluations and representation in development goals and develops along the overlapping principles of urban plans and sustainability.

Therefore, this research will focus on both the theoretical and the practical aspects of plan evaluations and follow a strict and structured methodology for the development of a post-hoc urban master plan evaluation system tailored for application in the cities of Pakistan.

1.1 Research Questions and Aims

The preliminary research on the topic also revealed that all urban developments are expected to meet certain level of performance for it to be considered an acceptable intervention (Cortinovis & Geneletti, 2020). Urban plan performance corresponds to the capacity of the proposals made and implemented to contribute to the objectives made in the plan and the assessment can then be carried out with respect to these targets which can be interpreted as the requirements of the

proposals or the required effects of the proposals (Cortinovis & Geneletti, 2020). Cortinovis and Geneletti (2020) also state that for the urban interventions (guided by the urban plans) approved if they contribute to the objectives of the plan and the approvals can be made through the use of the process of impact assessments. These impact assessments can be both qualitative and quantitative. They also stress the fact that for the assessment to be practical, a tool is required that allows for the assessment of the urban interventions (or plans in this case).

Building upon these literature reviews, the aims to be achieved from this research are quite simple but have the capacity to inculcate a more performance led and efficiency-oriented mode of master plan development and implementation. These are:

1. To study the concept of plan evaluations, its development its niche in the urban planning in general and in Pakistan.
2. To identify and critically analyse the main contemporary practices for urban plan evaluations in different parts of the world in order to categorise and filter the practices that have the potential for application in Pakistan.
3. Develop an evaluation framework for the post-hoc evaluation of master plans in Pakistan through the study of existing indicator evaluation systems.
4. Gather and synthesise the opinions of urban planners, academics, and urban planning professionals in Pakistan regarding the plan evaluation criteria to develop weights of the indicators in the evaluation framework.
5. Draw conclusions and recommendations for future research and for the practical urban planning in Pakistan.

Despite the availability of literature on similar research internationally, there is not a single such attempt made for Pakistan as per the extensive literature review and research. Thus, this research will be a pioneer step in master plan evaluations in Pakistan.

1.2 Research Significance, Literature Gap and Research Justifications

Initial literature review suggests the importance of learning from previous planning experiences through the use of plan evaluation and review in the following words of Oliveira and Pinho (2008

p31): “the evaluation of planning practice is a complex but most necessary exercise” (Alexander 2006; Alexander & Faludi, 1989; Baer, 1997; Brody & Highfield, 2005; Talen, 1997).

Further stress on the importance of plan evaluation is given in the following words of Alexander and Faludi (1989 p 127):

If planning intends to have any credibility as a discipline or as a profession, it should be possible, through a systematic assessment, to have a real judgment of planning effectiveness.

“Good planning (or good plans) should be distinguishable from bad (planning and bad plans) (Alexander 2002; Alexander & Faludi 1989 p127; Baer 1997).

The prominent research in Pakistan in the area of planning and master plans refer to a gap between the desired or stated outcomes and the actual results observed (Hameed & Nadeem 2006). It is safe to say that this extremely important step of evaluation is missing from the current planning system in Pakistan. This is the greatest driving force to undertake this research that attempts to identify the lessons that plan evaluation in Pakistan can use as presented in the literature available on this subject.

The assessment of the desired and actual outcomes of a development plan falls under the performance led approach to urban planning and urban plans. The main focus of this approach is the outcomes and implementation results of the plan. The position of the plan in this approach is that of a strategic and guiding tool rather than regulatory (Baker et al., 2006). In a strict performance based system, the plan does not indicate the means to achieve a goal but just the agreed long or short term goals that are usually based on the opinions of all the stakeholders including the community and the practitioners (Baker et al., 2006). However, the pure performance based approach to urban planning and management does have its drawbacks that increase the time and cost of negotiations and multiple dialogues while it promotes a higher level of flexibility (Cortinovis & Geneletti, 2020).

On the other extreme is the prescriptive planning that has the zoning plan as the most usual planning tool. While this form of urban planning provides with the certainty, the fixed steps for

intervention implementation and reduced implementation costs, the main drawback is the lack of flexibility. This does not allow for this form of urban planning to adapt to the dynamic socio-economic and environmental conditions of the area. This is one of the strongest limitation of prescriptive planning and has caused opposition in the past decades (Cortinovis & Geneletti, 2020).

Despite the obvious advantages of performance led urban planning in the current dynamic situation of the urban areas, the concept has seen limited implementation, more in certain parts than the others. For example, in Europe, the inclination of performance led planning is often seen in the large scale and strategic plans (Faludi, 2000) and the implementation is limited in the urban areas. However, on the other hand, the USA has shown the application of voluntary performance led planning more on the municipality level (as early as the 1970s) than the larger scale plans (Cortinovis & Geneletti, 2020 and Baker et. al., 2006).

The highest level of the adoption of performance led urban planning was observed in New Zealand and Queensland, Australia as observed and studied by Baker et. al. (2006). However, despite the legal provisions and support, the encouragement from both the public officials and private developers, the success of performance led urban planning had its issues. This resulted in the reintroduction of some level and form of prescriptive planning after a few experimental years and is now a workable hybrid of elements of prescriptive and performance based urban planning. The core reasons for these have been identified to be the administrative overload due to negotiations and managing the multistakeholder system and the higher level of uncertainty in the outcomes of the interventions due to the difficulty in the assessment of multidimensional interventions (Baker et. al., 2006).

The situation is different now as the advancement in the urban planning tools such as GIS and large sets of data allow for the assessment of the interventions as complex models can be run on real time/accurate data can be analysed. Today as the intertwining of environmental and socio-economic aspects of the urban areas is well established, the holistic assessment of the urban interventions using advanced tools is the necessity of the contemporary urban planning in either prescriptive, performance led or hybrid systems of planning (Cortinovis & Geneletti, 2020).

In addition to the above-mentioned reasons to carry this research, further justification is provided by the fact that one of the main challenges to start implementing evaluation mechanisms in planning practice identified by mainstream literature is to make evident before politicians and planners the advantages of evaluation. This can be done through the promotion of an evaluation culture within the institutional structures that undertake planning activities (e.g., planning departments or similar agencies). While some structures might have the required characteristics to undertake this process in the short term, others may not. Now this may be the next question but before that the planning system needs to have a foundation to develop plan evaluation which can be done through the review of available literature as done in this research.

Literature and academic research focused on Pakistan reveals that the academics have put the quality of urban management plans and their implementation under immense critique (Brail & Brail, 2008; Butt, 1991; and Buxton et al. 2011). Included in the factor that result in the failure of these plans is the 'absence of a monitoring and evaluation mechanisms' (ul Hussnain et al. 2020, p. 2). The other reasons stated include the insufficient stakeholder inclusion and ownership, misguiding forecasts, higher focus on data collection and lack of financial and legal foundation (Bartholomew, 2007; Butt, 1991; Chakraborty & Macmillan, 2015 and Charmeck et al. 2001). This research is based on the lack of monitoring and evaluation mechanism reasoning for the failure of urban development plans. Furthermore, recent research shows that unprecedented changes in the real time urban indicators and characteristics have rendered some plans unusable leading to their abandonment (ul Hussnain et al. 2020). Despite the stress put to the monitoring and evaluation as one of the missing elements needed for successful urban management plans, the practicing urban planners have failed to see this as even an issue. The research conducted by ul Hussnain (2020) and co-authors lists the reason of urban plan failure as seen by over forty experienced urban planners working all over Pakistan. Unfortunately, plan evaluation did not even make it to this list. This puts greater stress on the importance of this research as there seems to be a lack of perspective among the practitioners regarding the significance of urban management plan evaluation.

Initial literature on the urban master plans focuses on the reasons of failure (ul Hussanain et al. 2020) or the challenges of implementation (Hameed & Nadeem, 2006). Some other attempts in a similar direction include the work of Butt (1991) which gives an evaluation of Outline Development Plan (for Gurjranwala Division) and more recently by Galib (et al. 2017) which analyses the sustainability of some of the major cities of the Punjab province using indicators. However, these do not specifically offer insight into addressing the research problem at hand of evaluation of urban master plans as either being outdated or not focusing on the master plans itself.

Additionally, at the international level, the situation is slightly better. Mainly due to the fact that there are numerous development projects in the developing countries which are funded by international donor agencies, some type of indicator-based performance evaluation criteria is available but these are project based. Examples of the donor agencies that have prepared such indicator systems include the United Nations, The World Bank, The Asian Development Bank, and United States Agency for International Development (USAID) etc.

Other reasons for the development of such indicator-based systems include the monitoring and evaluation of bilateral/multilateral projects or for measuring the country-wise performances in achieving international goals (as the Sustainable Development Goals).

Examples of these performance evaluation criteria include The Performance Monitoring Indicators Handbook (made for different sectors of development) by the World Bank (Mosse & Sontheimer, 1996), Guidelines for the use of Indicators in Country Performance Assessment made by The European Commission (Canton et al. 2010), DG Development and Developing Key Performance Indicators: Toolkit for Health Sector Managers (Rozner, 2013) developed by the USAID for Health Finance and Governance Project of US government for developing world.

In this regard there have been subsequent research as well such as the report published by the German Development Institute by the name of The Role of Indicators in Development Cooperation: An overview study with special focus on the use of key and standard indicators (Holzapfel, 2014) comes close to the work in this research.

Summarising, the study of the available literature has led to the following deductions:

1. Any indicator-based research for performance evaluation of planning products (such as development plans) in Pakistan is not available. Thus, this research will be empirical and it is intended that it will provide basis for further works in this area.

2. In addition to this the international examples are firstly generic for all developing world and/or project based due to the demand of the foreign funding organisations. Therefore, as urban development plans do not fall under the foreign funded projects (though some studies may be conducted through the foreign consultancy such as the Lahore Urban Development and Traffic Study (LDA, 1980)) they have not been subject to regular assessments and evaluations.

These deductions point towards a major gap in the literature in the area of performance evaluation through the use of indicators for Pakistan. It is acknowledged that the available literature will be very useful in providing the basis for the development of the performance indicators and hence indices as they have been developed and applied from time to time in different situations. As a matter of fact, municipalities and local governments have also developed such systems for self-evaluation in the more developed regions as the United Kingdom and the United States of America. However, the gap remains where Pakistan and especially the urban planning authorities called the Development Authorities (DAs) in Pakistan are under question.

Therefore, the research will prove to be seminal. It will encourage further Pakistan based studies in the implications of such performance evaluation on public trust building, public participation, and increase in efficiency and effectiveness, inclusion of contemporary urban panning concepts, inter and intra organizational coordination for effectiveness and efficiency, performance management and indicator-based performance evaluation.

1.3 Conceptualising Plan Evaluation for Pakistan

Planning consists of making choices among the options that appear open for the future, and then securing their implementation, which depends upon allocation of necessary resources (Roberts

& Leghum, 1974). In Pakistan all this planning exercise takes the form of a document called a plan (appears under different names such as master plan, integrated plan, outline development plan, strategic plan etc.) which is one of the important tools to guide and manage future growth of the cities in a planned manner. Since its introduction in United Kingdom under the Town and Country Planning Act 1947, master plan has been widely prepared for many cities of both the developing (such as Pakistan) and developed countries. It is a long-term plan and usually prepared to guide the future growth of a city for the next 20 years mainly consisting of a report, land use maps, and programme of action. Conceptually, master plan is based on study of existing situation of components of a city comprising land use, socio-economic and other facilities' surveys, based on analysis of existing situation, forecasting of future trends, and finally making proposals for the growth and management of the city.

This concept of planning prevailed in United Kingdom until the publication of Planning Advisory Group (PAG) Report in 1965 (Delafons, 1998), which suggested a new type of plan referred to in the report as development plan comprising of structure and local plans (Allmendinger et al, 2000). Although Master planning is an out-dated concept replaced by structure planning (and more recently by unitary planning in UK), yet it is still being practiced in many developing countries. Devas & Rakodi (1993) identify various reasons why despite several weaknesses master planning approach continue to dominate the urban planning systems of many developing countries. These include professional training and ideology of planners at the top of their profession emphasizing planning standards difficult to attain in real world situation; vested interests of foreign donor agencies, consultants, professionals, administrators, city managers, and politicians; and inappropriate legislative basis for planning in terms of plan preparation and implementation (Devas & Rakodi, 1993).

A brief review of some of these master plans prepared for different cities of Pakistan, suggests that these have adopted the most conventional notion of planning process by Patrick Geddes (1915), that is:

1. Conduct a SURVEY,
2. Do an ANALYSIS and calculate projections and then

3. Make a PLAN

In Pakistan most of these plans were prepared with foreign assistance. Besides these master plans, a large number of what may be termed as mini master plans have also been prepared under the name of Outline Development Plan (ODP) using local technical and financial resources.

Unplanned urbanization is a challenge for local planning agencies in Pakistan. Development plans were prepared for Pakistan's major cities starting in the early 1960s; however, these plans failed to produce any results (Hameed & Nadeem, 2006). Therefore, urban growth has occurred through a process of spontaneous land conversion and use. The continuous failure of development plans has made it imperative to assess the actual causes of such problem. Legal support, institutional frameworks and effective development plan policies are the major contributors to the planned urbanization process (Asian Development Bank, 2017). Policies pertaining to urban and city development must be continuously assessed and reviewed to meet the challenges associated with increasing populations.

In Pakistan neither institutional frameworks nor legal and regulatory supports are considered in the management of cities (Shah, Afridi, & Minallah, 2007). A multiplicity of institutions oversees development at the local level and has overlapping functions, whereas the national and regional levels get limited attention. The 2nd 5-year plan (1960–1965) envisaged a process of planned development at the national, regional and local levels that would establish a system of hierarchical development in the country, but only local level plans were prepared (Planning Commission, 1960). These plans failed to establish order to urban forms, and the reasons for this failure are complex and have not been properly assessed until now. One of the reasons for this is that plan evaluation is missing from the planning process.

In the light of the above-mentioned points and after an organized review of available literature on the planning sphere, planning institutions, and the situation of plan evaluation in Pakistan has led to the following findings.

Pakistan does not have any legal obligation of evaluation of master plans in the country. The law pertaining to master plans (e.g., provincial master plan rules such as the Punjab Master Plan Rules

2014) gives the master plan makers authority to review plans if it sees it as fit. Therefore, the plan making authority may or may not undertake plan evaluation exercise. This fact when viewed under the light of the current capacities of most plan making authorities leads to the deduction that plan evaluations are often not done. The deduction is strengthened by the fact that none of these reviews were publicly available when searching literature for this research.

The development of the planning practice in Pakistan has been strongly linked with the development in the United Kingdom, however, in the area of plan evaluation, Pakistan has failed to adopt significantly from the UK.

Only a couple of pure academic exercises exist that have used the holistic case study approach to derive reasons for the failure of master plans with no significant impact on the mainstream planning practice (Butt, 1991; Hameed & Nadeem, 2006 and Ahmed & Anjum, 2012) as the plans are still deemed as unable to achieve the desired goals (Hussain & Nadeem, 2021).

Therefore, the literature points at a need to develop understanding of the importance and significance of plan evaluation for the improvement and advancement of the planning practice (Ahmed & Anjum, 2012).

Research like this need to bring attention to advantages of plan evaluation and both the planners and the politicians need to know that plan evaluation adds value to the planning product and hence increases credibility of the plan.

The literature has pointed out a number of ways to carry out these evaluations. Here the author proposes the best approach, method and tool that can be used for the case of plan evaluation in Pakistan.

The appropriate approach for plan evaluation in Pakistan would be the conformance-based approach. As clearly shown the most widely used development plan in Pakistan is the master plan. Literature has pointed out that these plans are rigid and are used as the blueprint to manage urban growth. Conformance-based approach also uses the plan as the blueprint and makes comparisons between desired and expected outcomes (Oliveira & Pinho, 2010).

The performance-based approach produces results that are too complicated to be used in the improvement of the planning process. Given the capacity of the planning institutions of Pakistan and an even lesser capability of government officials and politicians regarding the planning advancements, it is best to use the simpler results of conformance-based evaluations.

As the conformance-based approach produces the extent of deviation of the plan as the output, it is easier for the planners to take the evaluation to the next step and identify reasons for these instances of deviations. This can ultimately lead to improved plans and planning process.

The most appropriate method in the case of Pakistan, based on the planning situation in Pakistan, should be the Plan Process Result method.

Firstly, the method is mainly conformance based and hence will be aligned with the chosen approach for Pakistan.

Secondly, the method produces easy to interpret results both for the planners and the politicians without the use of advanced computer programs or specialised skills. Therefore, such method can be used for master plan evaluations without incurring heavy additional costs to the system.

Thirdly, PPR has already been applied to two Portuguese cities (Oliveira & Pinho, 2010) and on plans similar to the master plans in Pakistan. This increases the chances of success of this method in Pakistan.

The preferred tool for plan evaluation as seen from the literature and the situation of planning in Pakistan is the indicators. Numerical results and processes are easier to identify and justify. As the evaluations will have to face critics from both traditional planners and the government officials, it is best to choose the safest tool. However, the indicators may be too rigid and may not be able to identify intangible effects, nonetheless, for the start of application of plan evaluation in Pakistan this would be a better approach.

Indicators are also easier to replicate for different regions and different plans. Therefore, this will increase the level of overall applicability in the case of Pakistan. Indicators as a tool will also attract interest of other professions such as the environment, economics etc. This has the

potential to make the whole plan evaluation exercise an integrated process and may gain popularity.

The literature also highlights one of the main problems of plan evaluation to be the fact that there is not one fits all evaluation approach, method and tool. Therefore, planners and evaluators in Pakistan need to continue research and development in this field and use the above-mentioned techniques as only the starting point.

Pakistan's plan evaluation is in its very initial stages of development where there exists only a few research works with no documented evaluation available. Therefore, there is a need to develop plan evaluation mechanism that has the attributes of simplicity, applicability, affordability, exportability and can be effectively used to identify not only the conflicts but also the reasons for these conflicts between the desired and the actual outcomes.

1.4 Further Possible Effects of this Research

In Pakistan the Development Authorities (DAs) being regional authorities are entrusted with the making of regional policies that affect the economic, spatial as well as the social sphere and its interaction with the other regions of the country is also to be taken into consideration. Thus, in a way, the DAs are playing a crucial role in how Pakistani cities and hence Pakistan itself is shaped.

As the global focus turns to public participation and stakeholder involvement in almost all the urban planning projects and plans, Pakistan is also facing its effects with recent amendments in urban planning laws making public participation an obligatory exercise. In such a situation having criteria to evaluate the products of DAs will prove to be very useful and will also help in the dissemination of the significance of this field and its practices.

Research, such as this one, can be responsible to incite increased trend of accountability and assessment on the part of the public institutions and thus usually comes from the academic sector.

Therefore, through this research an attempt is being made to streamline the development process in Pakistan especially because, as compared to the developed world, the developing

countries are facing an extremely rapid pace of urbanization and it is crucial that this fast-paced physical development, along with its consequences is managed in order to achieve more of the positive impacts.

Thus, this initiative can have multifarious effects on the operations of the DAs regarding development of master plans and will encourage future research to take up evaluations of other functions of the DAs for enhanced urban management.

Chapter 2: Systematic methodological framework of research

The methodology is designed to make a framework that guides and allows to follow a strategic approach for the study of issue of urban master plans' evaluation with specific context of developing countries. An important part of this research is based on the literature produced at the international level to examine how the evolutions in the field of international plan evaluation theory and practice apply to or differ from the Pakistani context. This review constitutes the first part of this research. The second part of the research is the development of an indicator-based plan evaluation framework for application in Pakistan using a case study of the city of Lahore. This is done through the study of numerous and popular indicator systems based on the desired approach, method and tool of plan evaluation for Pakistan and the Integrated Master Plan for Lahore (IMPL) 2021.

The other main part of this research is to empirically test the perception of urban planners with regard to the evaluation of master plans. This was then used to assign weights to the themes of master plan evaluation framework and allowed for a preliminary assessment of the performance of IMPL 2021 based on the proposed urban interventions (and their goals) with the current situation. The analysis was made for aspects of which some form of data was available. Hence the remarks made for the assessment of IMPL 2021 have been backed with supporting data in all cases.

Breaking down the empirical research portion further, it is based on two complementary methods. The first is the interviews with planners and professions connected with urban planning and the second is the assessment of IMPL 2021 based on the developed framework, the results of the interviews and questionnaire with the professionals, the proposals of IMPL 2021 and the data available.

Therefore, the methodology was designed in order to respond to the exploratory nature of this seminal research, which is expected to provide the initial step for further research in the near future. The avenues of further research opened by this research are also discussed in the last chapter of this research. The sections that follow explain the methodology in a further orderly manner.

2.1 Part 1 - Systematic literature review I for plan evaluation theory and practice and how it fits in the context of Pakistan

To carry out a comprehensive review of identified approaches, methods and tools, a review framework that allows for the inclusion of most relevant methodologies to urban master plan evaluation was drafted and employed. For each approach, method and tool, issues such as the origin and status, from well-established to experimental, were looked into. As part of the review, various assessment methods developed on the basis of the identified approach, method and tool were appraised. The data requirements of these methods and their application to urban developmental activities such as planning and development of master plans were looked into. This allowed for the strengths, weaknesses, potential applications, data inputs, outputs and applicability at various spatial scales for the various methods to be identified.

Many urban plan evaluation techniques can be identified from literature (Adinyira et al. 2007). To evaluate the urban master plans of developing countries a systematic literature review was conducted to identify, categorise and deduce plan evaluation approach, methods and tools, and then the weighting and aggregation methods suitable for the case of Pakistan. For this systematic literature review a framework for the selection of research and papers was made. A systematic review is when literature is studied to answer a clearly formulated question using a form of system to search, select and critically appraise the research to collect (and/or analyse) data available in these research (Nightingale, 2009).

Significant amount of literature is available for plan evaluation but just as the field of planning is vast, the plan evaluation literature is also very broad and may be termed as scattered. Therefore, the systematic literature review was to:

- Identify plan evaluation methods through study of secondary sources
- Categorize these methods with the help of further literature
- Organize the results and make observations for the application of these methods in the case of master plans made for the metropolitan areas of Pakistan.

To provide structure and order to this research the review is done in the following manner:

A brief overview of recent research in the same field was used to develop a list of key words that appear in all the relevant studies conducted. Encyclopaedias and specialized dictionaries were then used along with definitions given in celebrated research to finalize definitions most pertinent to this research. Pearson Education and Britannica Encyclopaedia have been used.

The following keywords and keyword combinations were used to generate the literature used for this review:

Table 4: Keywords and Keyword Combinations used for Literature Review

Keyword	**Keyword Combination**
Plan	Plan Evaluation
	Plan Implementation
	Plan Assessment
Evaluation	Evolution of Plan Evaluation
	Types of Plan Evaluation
	Approaches to Plan Evaluation
	Criteria for Plan Evaluation
	Tools/Methods of Plan Evaluation
	Master Plan Evaluations
	Post-hoc Plan Evaluations
For Pakistan	Planning System of Pakistan
	Plan Evaluation in Pakistan
	Master Plan in Pakistan
	Implementation and Evaluation of Master Plans in Pakistan

The library catalogue of University of Tours was widely used by using the key words separately and in combinations to hunt down research articles, chapters in books and plan reviews with the

potential of relevancy and contribution to this research. Other research article websites such as Google Scholar and Science Direct were also explored.

All the available sources of research were searched to find material for this literature review. These include articles in prominent journals in the field such as *Environment and Planning*, *Journal of American Planning Association*, *Sage Publications*, *Planning Theory and Practice*, *Journal of Planning Literature etc*. along with other journals, however, these are the most used.

Secondly, grey literature such as government publications, policies and laws, European Commission publications, World Bank publications, Asian Development Bank publications etc. have been also included.

After careful study of the title, keywords, abstract and conclusions, the searched articles were shortlisted based on their relevancy to this research. Similarly, the grey literature has also been selected based on the relevancy to the research topic and Pakistan.

The shortlisted articles were then carefully studied, and notes were made to organize the findings from these articles. Many new research articles and book sections were found in the references of these research. Therefore, a catalogue on plan evaluation research was developed. These articles were grouped based on their content, e.g., the research on evolution of plan evaluation, on types of plan evaluations and on approaches to plan evaluations etc. were separated.

As mentioned previously the literature review was modified to fit with the scenario of Pakistan. To make this possible, a comprehensive study of the planning system of the country was also done. Though the research acknowledges that the planning system employed in Pakistan is vast in nature, but certain elements are common at a national or provincial level. The whole breakdown with respect to Pakistan in general and the case study in particular is studied and recorded in this research. This development of the understanding about the cities of Pakistan, its planning system, the niche of urban plan evaluations and the institutions involved has led to the making of literature supported decisions with respect to the selection of approach, methods and tools for urban plan evaluations in Pakistan.

The following basic criterion for inclusion in this research was used:

Table 5: Literature Selection Criteria for this Systematic Literature Review

Characteristic of Research Article	Description
Quality	Peer reviewed and publications by prominent publication houses in the planning field were included in this research.
Time of Research	As this research also deals with the evolution of the key concepts, both recent and older research were made part of this thesis, however in case of similar topics, the recent research was given priority since it fulfilled the above criterion.
Language	Only research in English were included
Geography	For making the research credible, research articles from different regions have been included; however, it is important to mention that similar research were limited in Asian and African regions and the ones present did not satisfy the research quality parameters set for this research. Therefore, this is seen as a limitation to this research.

The final step was to organise the findings from this review in the form of a coherent document which included the conclusions made for what would be the appropriate approach, method and tool for the development of urban plan evaluation for the case of Pakistan.

2.2 Part 2 - Indicator framework (with weightage and aggregation methods) and questionnaire development

Based on the results and conclusions of the previous section, the preferred approach, method and tool for the case of Pakistan were identified. This led to the second literature review that explored the choices made in greater detail. Therefore, literature review has also been conducted to understand the concept of indicators as a means to make plan evaluation as indicators came

out to be the most appropriate tool for plan evaluation in Pakistan. The characteristics for 'good' indicators/indicator systems had been studied and the ones useful for the cities of Pakistan were extracted. The selection process was further strengthened by development of a conceptual framework for indicator selection based on the Plan Process Result method (Oliveira & Pinho, 2010) which has already been identified as the suitable method for plan evaluation in Lahore in part 1 of this research.

In 2009 Oliveira and Pinho came up with the Plan Process and Result method. They presented a method that combined both the performance and conformance approaches and made an extensive criterion based on ten different dimensions of the plan. These dimensions include effectiveness, relevance, participation, utilisation, coherence and allocation of resources.

Moreover, a list for the currently utilised indicator systems had been developed and studied to identify plan evaluation themes and indicators/indicator systems that can be used for the cities of Pakistan. Care has been taken to ensure variety and reliability. Therefore, the indicator systems with significant application and relevance to the current research topic have been given priority.

Furthermore, keeping an up-to-date knowledge of the planning system of Pakistan, the state of post hoc plan evaluation practice and the development of urban development plans (master plans), critical review of the currently used indicator systems was conducted. The main aims to be fulfilled from the study of these indicator systems were:

1. Extraction of themes for the development of indicators systems such as the quality of environment, the economic development opportunity, social cohesion and well-being etc.
2. Analysis for the applicability or achievability of the indicators
3. The type, quality and quantity of data required for the development of the indicators
4. The extent of interpretation of the indicators.

Here it is important to declare that most of the better developed indicator systems are made for the assessment of sustainability of cities or communities. While this research does not make sustainability as the focal point, it does understand and acknowledge its importance and

advancement generally and specifically in terms of indicator systems. Moreover, sustainability is the ultimate goal for all forms of development and planning in the contemporary age of urban planning and this research follows suite. Therefore, some of the indicator systems selected for review in this research were aimed at the assessment of sustainability with the help of indicators.

On similar lines, the most commonly used methods for weighting and aggregation reported in the literature were shortlisted and those that have been applied to any dimension of urban planning, such as sustainability assessment, were given priority. Therefore, based on the characteristics of each method of weighting and aggregation and the attributes of the case study, the appropriate method of assigning weights (the analytic hierarchy method or AHP) and aggregation (geometric mean) has been selected.

The final step in this part was the development of a questionnaire and an appropriation of the data needed for completion of this research. The questionnaire has carefully drafted tables for assigning weights to the indicators in the evaluation framework using AHP. The questionnaire enables the experts to easily give opinion with pairwise comparison of the selected indicators under each theme using the developed tables.

A total of forty questionnaires have been circulated among the professionals in and around the case study for collection of perspective related to urban plan evaluation and the application of AHP for assigning weights to indicators in the evaluation framework.

2.3 Part 3- Data collection

For the ease of data collection, certain sources were identified from where data can be extracted for the final assessment of Integrated Master Plan of Lahore (IMPL) 2021. It is believed that the collection of the mentioned data will be enough to carry out the plan evaluation of IMPL 2021. This includes data to be extracted from reports such as the economic report, environment report or the transport sector report of Lahore. Similarly, nationally representative household surveys, which typically collect information about water sanitation and housing conditions include Multiple Indicator Cluster Surveys (MICS) and Living Standards and Measurement Surveys (LSMS)

will also be used (UN Habitat, 2004). In addition to this multiple reports from the urban news journals, newspapers and recent research articles have also been included.

The data also includes assessment of available maps that refers to different administrative boundaries (town municipalities and districts for the case of Lahore), map of census divisions, aerial photographs and satellite images and other technical maps in use for the city (for example the public transport map) (UN Habitat, 2009).

In the case of structured interviews, an attempt to have a broad range of perspectives and experiences, contacts have been assigned to three categories, as follows (Coleman, 2015):

1. Academics: (participants are professors or researchers)
2. Urban Service Providers: participants that have urban services and built environment related backgrounds (architects, solid waste managers, water supply and sanitation professionals, transport engineers etc.)
3. Practitioners: (planners, and urban designers)

As AHP is one of the most widely used method when multi-criteria evaluation systems are used, this evaluation framework also employs the same. Developed by Saaty in 1970 (1988), the method has been used over the decades with success for solving associated practical problems (Cabała, 2010). The methodological application of AHP can be summarised in two main steps. The first one results in the development of a hierarchical system of elements where the elements are grouped according to a hierarchy. The process of the developed is seen similar to the development of a goal tree (Cabała, 2010). The second and the statistical phase of the application process requires the pair-wise comparison of the elements of consistency evaluation. The result of this step is in the form of matrices which after normalisation and consistency examination have formed the basis of the final evaluation system.

Thorough conduction of structured interviews with questions drafted regarding the perspective of experts for plan evaluation was ensured. The possible effects of such an evaluation can be obtained to help deduce conclusions about the evaluation of master plans especially in the light of public trust building and achievement of the goals of the master plans. This will also become

part of the discussion when presenting the conclusions and recommendations based on the analysis of the data.

2.4 Part 4 - Data Analysis and results

The next step is the analysis of the collected data from both the interviews and questionnaire to develop the weight scale for the themes of the indicator framework and the assessment of the IMPL 2021. The results are systematically presented and all the tools, methods or calculations made are elaborately explained.

2.5 Part 5 - Conclusions and recommendations

The final step is the drawing of conclusions about the performance of IMPL 2021 and recommendations regarding the improvement of the performance. Theme-wise explanations are provided and the recommendations are also categorised taking from the results and findings of the data analysis. The chapter also talks about the aims and objectives of the research established in the earlier phase of the research and how the research has been able to accomplish those. Furthermore, and as mentioned earlier, the prospects of further research are also discussed.

2.6 Limitations to the research

Even though the author has identified and justified the use of all the methods and tools, the research is not free from its fair share of limitations. The first and foremost being the lack of data and resources for the conduction of this evaluation. As the research develops an indicator-based evaluation framework, the availability of data against certain indicators was one of the influence in the selection process. Additionally, not all the aspects of the urban development realm could be evaluated in this research. For example, when adapting from the methodology for the PPR method aspects of rationality and political perspectives have been dropped due to limited scope of this research and time and resource constraints. Similarly for the use of indicators as evaluation tool, the matter is an ongoing debate and inconclusive till date (Coleman, 2015) and therefore it is pertinent at this moment that premise and assumption made for this research at this stage are also mentioned. These are:

- Premise: indicators can be established and can be used to measure condition, situation and level of a city's performance,
- Assumption: Indicators are a measurable tool to guide cities to implement, assess, and improve the master plans.

Different people living in different places have different values. Indicators must therefore be able to consider different locations, people, cultures and institutions (EU, 2017) and therefore:

1. Without good data, based on monitoring, it is not possible to develop indicators.
2. Performance measures imply that targets need to be set (i.e., against which performance can be compared).
3. Sets of indicators evolve over time.
4. Sets of indicators are hardly ever complete.
5. Measurement of indicators tends to reduce uncertainty but does not eliminate it.
6. Indicators can play an important role in how human activities influence the environment
7. Changing the indicators will most likely also change the system

This research fully understands and relies on the mentioned premise, assumptions and limitations.

Chapter 3: The City of Gardens, Schools and now Literature: Lahore, Pakistan

3.1 Overview of Pakistan

Pakistan is a Muslim majority country situated in the south of Asia. It was created in 1947 along with India, as both countries sought independence from the colonial power of the British Empire. The word Pakistan is the amalgamation of two Urdu words, *Pak* (meaning pure) and *stan* (meaning land or country).

The predominant population at the time of its creation was Indo-Iranian, but it also has strong cultural association with Afghanistan. Since 1947, the greatest difference between Pakistan and its eastern neighbour, India, has been the majority of Muslims as opposed to Indian majority of Hindus.

Pakistan's survival has been a difficult struggle since its creation as the country fought with both internal and external forces to sustain political stability and obtain positive social development.

Two of the most important cities of the ancient civilisation of Indus Valley (c. 2500-1700 BC) (Burki & Ziring, 2017) were situated in the present day Pakistan. The land has been approached by many invaders like the Aryans, Persians, Greeks, Turks, and Arabs to name the significant ones. These have invaded and ruled the land for several thousand years, with the introduction of Islam in 711 by an army general named Muhammad bin Qasim. The Mughals came to the region in 1526 and ruled until the mid of 18th century.

The next big event was the coming of the British through the establishment of East India Company in early 18th century. After the mutiny/war of independence of 1857, British became the most dominant power of the Indian subcontinent.

The seeds of a different land for the Muslims of the subcontinent can be traced back to the creation of the *All India Muslim League* that was made to voice the rights of the Muslims in the prevailing situation of Hindu dominance both politically and economically. The leader of the Pakistan movement was Muhammad Ali Jinnah (1876-1949) who is called the *Father of the Nation*.



Figure 4: A group of people raising the flag of Pakistan a day after its creation (Chaudhry, 2017)

After years of struggle, the British finally agreed to the partition of India in August 1947. Muhammad Ali Jinnah became the first Governor General of Pakistan and the partition led to a mass migration of about 17 million people across the two countries. This migration is known to be the largest in the human history. Unfortunately, the migration was not a peaceful process as sectarian violence killed hundreds of thousands on both sides of the new border (Pearson Education, 2017).

Pakistan's location in south-Asia makes it neighbours with China in the north, Afghanistan in north-west, Iran in south-west and India in the east. Tajikistan separated with just a small strip of land called "Wakhan" is also at Pakistan's north. The south is bordered by the Arabian Sea. In terms of area, Pakistan is the 37th largest country in the world, however, the population ranking makes Pakistan the 6th largest country of the world (World Atlas, 2017).

Pakistan is situated at the western end of the great Indo-Gangetic Plain. Of the total area of the country, about three-fifths consist of rough mountainous terrain and plateaus, and the remaining two-fifths constitute a wide expanse of level plain.

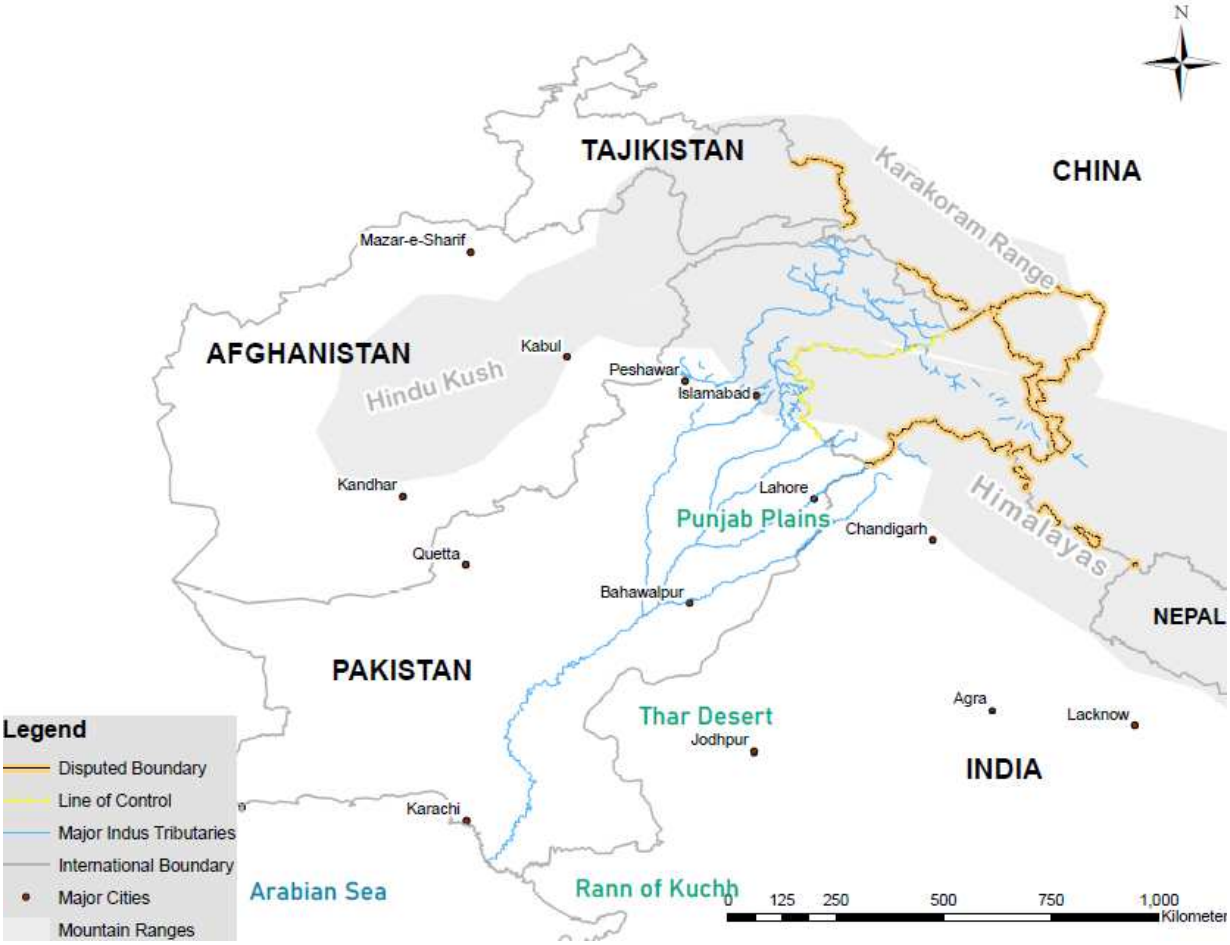


Figure 5: Pakistan, Neighbouring Countries and Major Cities (Source: Author)

3.1.1 Cities of Pakistan

As mentioned in the earlier section, Pakistan is the 6th most populated country in the world. In the top ten most populated districts of Pakistan, eight are present in the fertile province of Punjab with the highest population. The following map shows the population distribution of Pakistan along with the prominent cities:

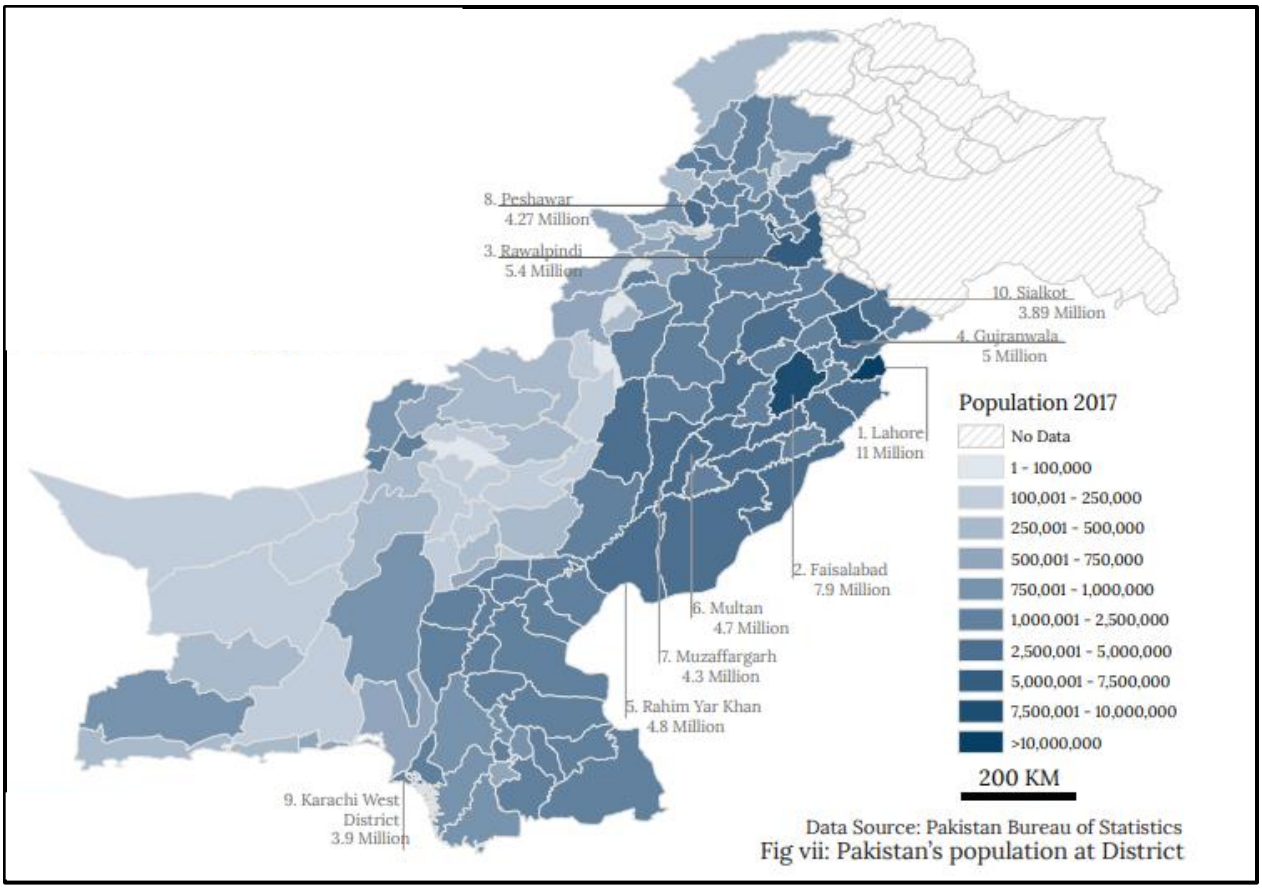


Figure 6: District Wise Population of Pakistan (Adopted from The Urban Unit, 2017)

The largest city of Pakistan is Karachi. With 14 million residents, Karachi holds 31% of the whole province of Sindh of which it is the capital. Lahore falls next in line as the second largest city and has a population of 11 million which is approximately equal to about 10 percent of the provincial population. Combined, the population of Lahore and Karachi makes up 34.4% of the total urban population of the country (Pakistan Bureau of Statistics, 2017).

The recent Census of 2017 revealed that Pakistan's 36% population is urban. Once again Punjab becomes the most urbanized province having 63% of the inhabitants living in cities. Shown below is the province wise urban-rural population breakup of Pakistan.

Not only in terms of population, but the cities of Pakistan are also showing exponential growth spatially. Urban sprawl is seen one of the biggest challenges of modern day Pakistani cities.

According to the Atlas of Urban Expansion (UN et. al., 2016), in a span of 22 years, the built-up area of Karachi grew by a factor of 2.5. Similarly for the same period of time the urban area or built-up area of Lahore grew by 3 times and that of Sialkot grew by a factor of 4.7.

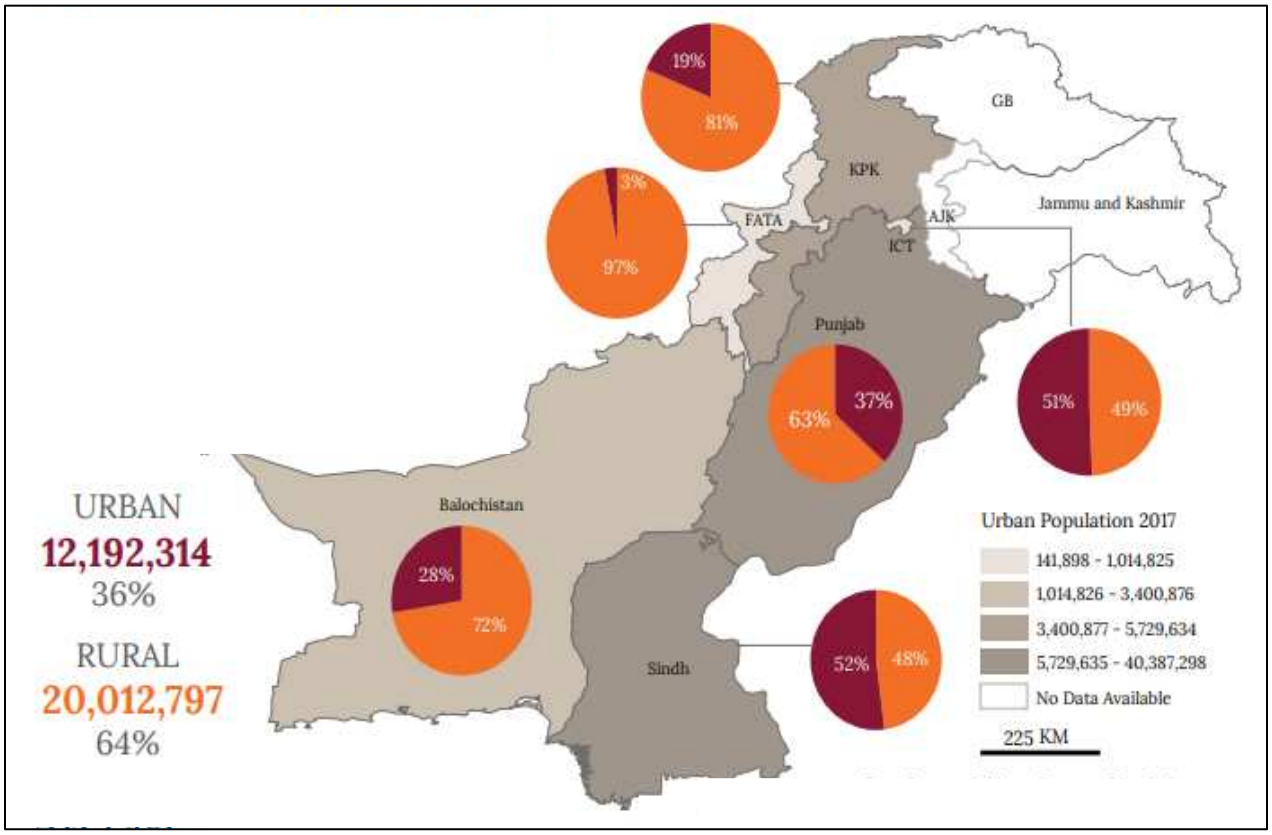


Figure 7: Urban-Rural Population Divide in Pakistan (Adopted from The Urban Unit, 2017)

Therefore, for a little over two decades, both Karachi and Lahore added approximately 50 hectares of area as their urban built-up extent. This area is roughly five times larger than the area of Sialkot city in 1991.

The following images show the spatial growth of Karachi over the years:

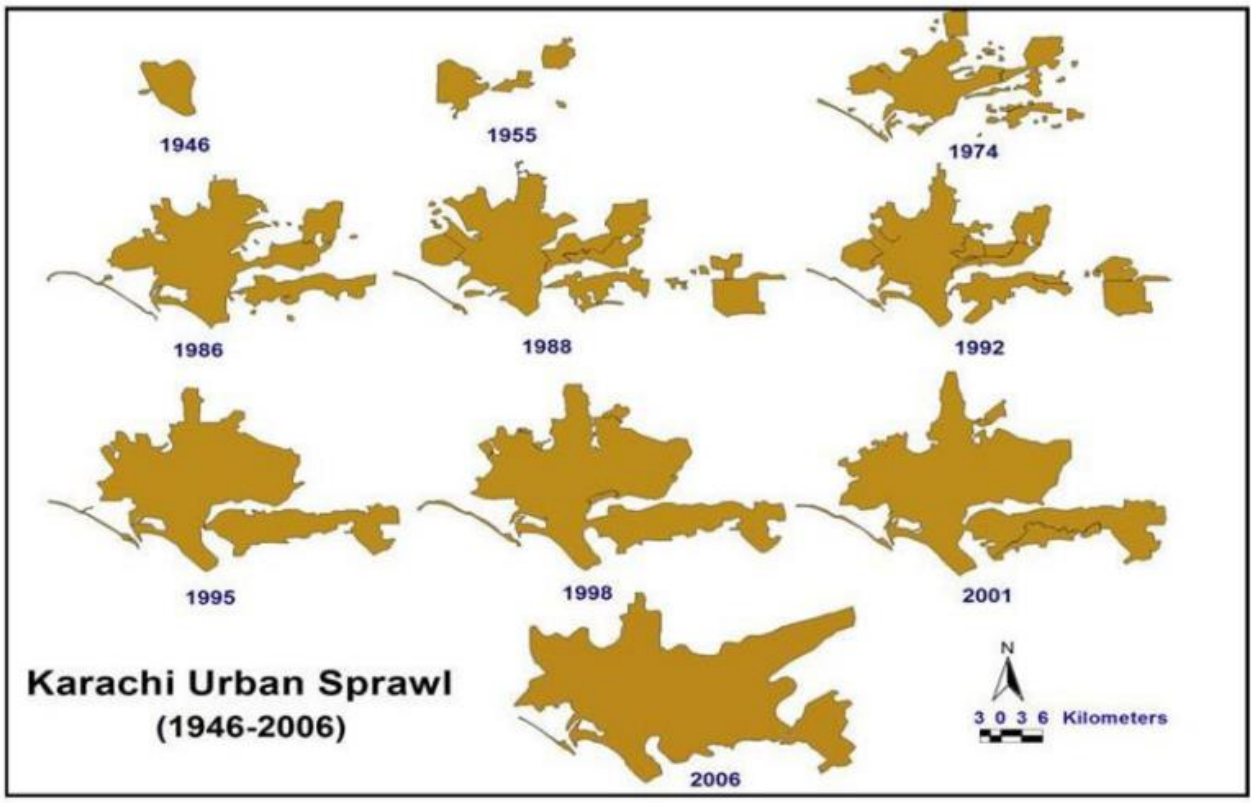


Figure 8: Spatial Growth of Karachi from 1946 to 2006 (Adopted from Kazmi et, al. 2008)

Similarly, the spatial growth of Lahore is shown in the map images below:

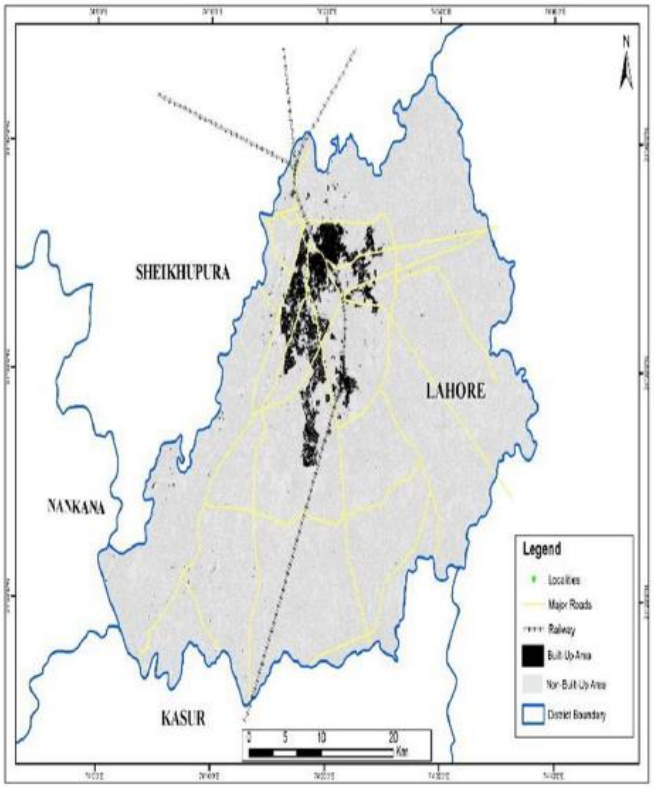


Figure 6: Urban Growth of Lahore in 1988 (Hussain & Nadeem, 2021)

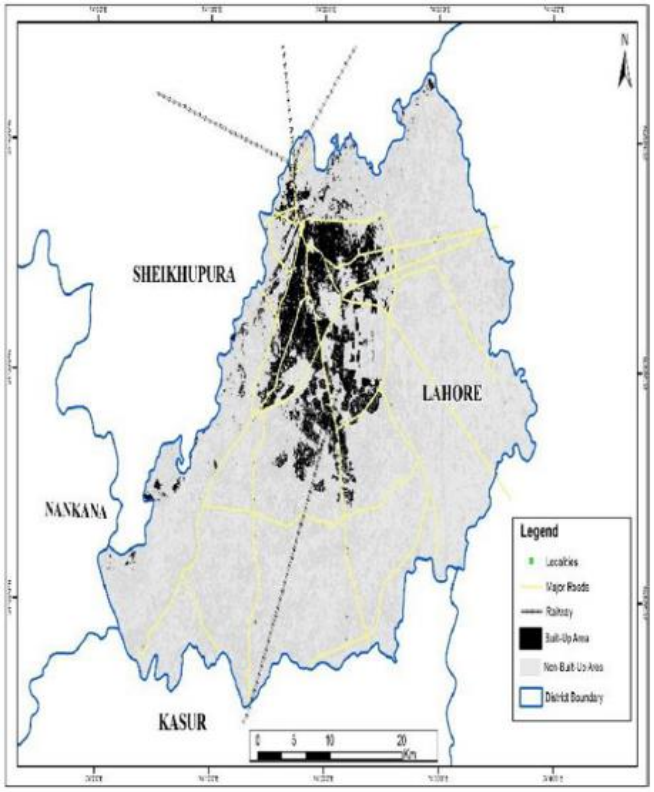


Figure 9: Urban Growth of Lahore in 2000 (Hussain & Nadeem, 2021)

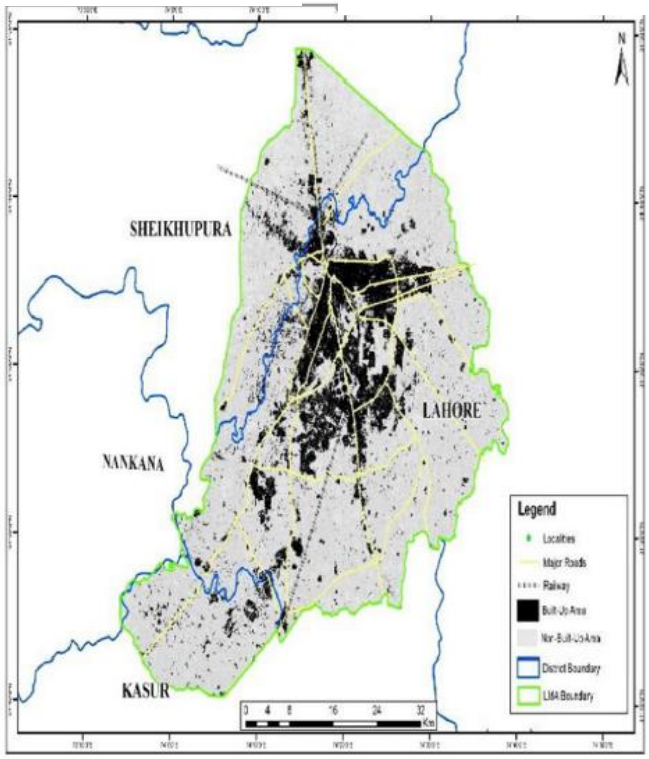


Figure 8: Urban Growth of Lahore in 2010 (Hussain & Nadeem, 2021)

Therefore, this unmanaged and uncontrolled urbanization gives rise to the main problems faced by the cities of Pakistan. The population growth in the cities of Pakistan has been so fast that the cities have been unable to deliver the required economic and public services. According to Ellis and Roberts (2016), one in eight of the urban residents of these cities is living below the line of poverty. They also state that urbanization in Pakistan is disguised and not clearly measured as it is hidden by the low density sprawl as cities grow beyond their administrative boundaries. These areas have now been termed as "*Peri-Urban"* in the planning literature of Pakistan. These peri-urban regions make up-to 60% of the urban of Pakistan (Ellis & Roberts, 2016). Following the same pattern, the cities face issues of housing shortage, water scarcity, transportation (Karachi is the only mega city of the world without a mass-transit system), health and education, environmental pollution and more recently the negative effects of climate change.

Further issues related to urban planning and planning legislation are discussed in detail later in the chapter.

3.1.2 Urban Master Planning in Pakistan

The Indian subcontinent is home to one of the oldest and finest civilizations, the Indus Valley Civilization, which had one of the most advanced planned cities of that time. The cities of the Indus Valley included: Mehrgarh, Harrappa, Mohenjodaro and Lothal. Among these Mohenjodaro was, in fact an epitome of the urban planning in the classical era and was located in present day Pakistan.

Before the British colonial period, town planning in Pakistan was very limited and traditional because the Pakistan of that time was predominately rural and divided into states and therefore each state had to maintain its own urban and rural areas mainly through the ancient Old Caste System introduced in the Vedic period in the subcontinent.

The British came as colonists and changed the physical, social, economic and cultural systems of the villages and towns. They build cantonments for their military and civil lines for administration in every state of the subcontinent.

Therefore, before the creation of Pakistan in 1947 urban planning was essentially local, physical and restricted, rooted in the engineering and architectural traditions of the British. It was also reactive and practiced at irregular intervals.

City and Regional Planning After Independence in 1947

After its creation city and regional planning in Pakistan borrowed heavily from the British planning system despite the marked differences in physical, social and economic spheres. To address the mounting problems of the cities of the new country the tool used for managed development was “Master Plan” (Hameed & Nadeem, 2006). It was termed Outline Development Plan for smaller settlements and was less detailed. According to Hameed and Nadeem (2006), this use of rigid Master Plans survived longer in Pakistan than in the UK.

The present system of planning in Pakistan begins with the Ministry of Economic Affairs which has the subsidiary called the Planning Commission of Pakistan and formulates the Five Year Development Plans at the National Level. These plans have sectoral policies and guidelines and are then handed down to the respective provincial departments such as the Physical Planning and Housing Department or the Local Government and Rural Development Department etc. These provincial departments than send it down to the local authorities (for example the Development Authorities or municipal corporations) for the making of annual development plans and other necessary plans. After making these local plans, the plans are sent to the Ministry of Economic Affairs for approval and funds and then back to the local institutes for execution.

Planning Legislation in Pakistan

There has been no Town and Country Planning law at national level in Pakistan. In the beginning, the only legislation with provision for the preparation of master plans by local councils was the Municipal Administration Ordinance (MAO) 1960. However, this Ordinance did not say anything about plan sanctioning and implementing authorities. Nor did it contain any provisions requiring the revision of the plans as and when needed. The MAO 1960 was replaced by Provincial Local Government Ordinance (PLGO) 1979. It simply carried forward the provisions of MAO 1960 about master planning in almost the same words. Therefore, legislation about plan review and

evaluation is absent since the beginning of the planning practice after the independence of Pakistan.

Like the MAO 1960, only the urban local councils were required to prepare master plans for their jurisdiction under the PLGO 1979 and it was also not mandatory to do so. Thus, rural areas of the country received no planning attention even under this Ordinance. However, it was in 1997 only when the rural local councils were also given a non-mandatory task to prepare and implement master plans for areas under their jurisdiction. Unfortunately, none of the rural local councils could prepare any master plan due mainly to lack of interest of decision makers, and weak institutional capacity.

Legislative backup is the main strength of any type of development planning done in Pakistan. Listed below are the legislative tools used by the urban planning institutions:

1. Urban Planning Legislation (Law/Act/Rules) (e.g., the Master Plan Rules 2014)
2. Development Plans (e.g., the Integrated Master Plan of Lahore 2021)
3. Development Standards (e.g., Punjab Private Housing Scheme Rules)
4. Development Regulations (e.g., LDA Building Regulations)

There are a number of legislations that shape the urban planning framework in Pakistan. They occur at all the levels of the government.

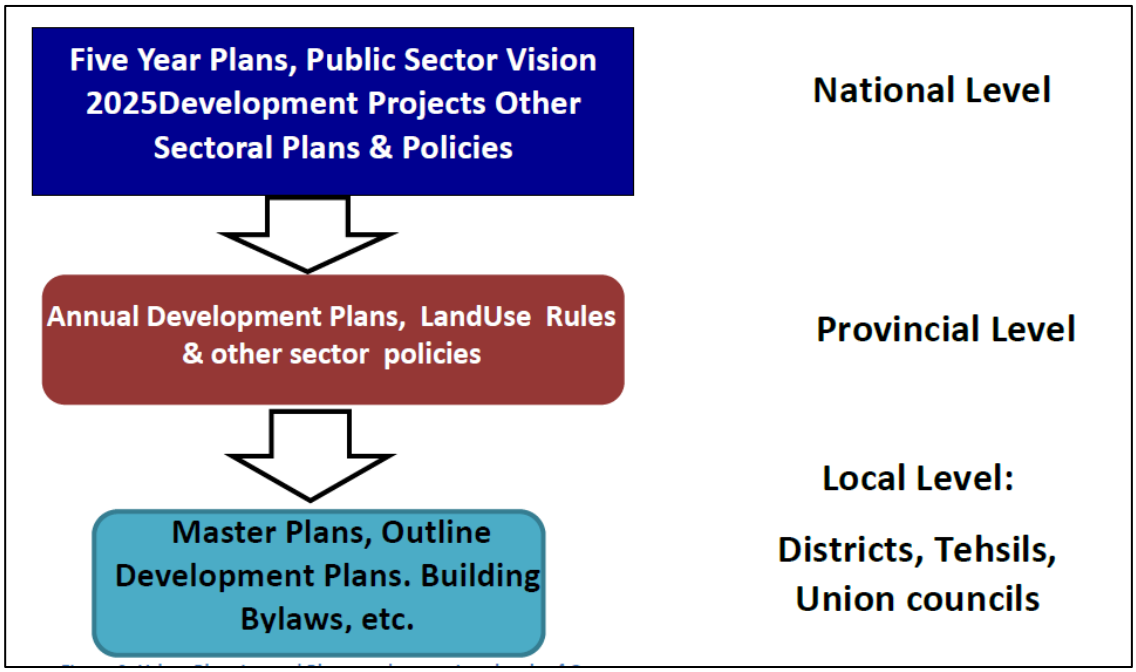


Figure 10: Types of Plans at different Administrative Levels (Source: Author)

The Local Government Ordinance 2001 has replaced the PLGO 1979 as part of the devolution plan of the current military regime. Under the 2001 Ordinance, a new system of Local Government has been established, creating three tiers of local government administration. Each province has been divided into Districts by eliminating the previous rural-urban divide. Each district comprises a few Tehsils/Towns which are again divided into areas of Union Councils. Staff at each administrative level has been appointed by abolition and merger of different existing institutions functioning at provincial and local levels, for better governance at the local level.

Thus, the Tehsil Municipal Administrations (TMA) has replaced the urban (e.g., Municipal/Town Committees) and rural (e.g. Zila Councils) local councils. All the TMAs in a district are administratively linked with District Government. However, in case of provincial capitals, a City District Government (CDG) has been established by dividing the city into different Town Municipal Administrations. Under the 2001 Ordinance, all the TMAs are required to prepare a master plan for their respective areas and get it approved from their respective district level

institutions (District Government or City District Government). However, this Ordinance does not provide for spatial planning at the district level.

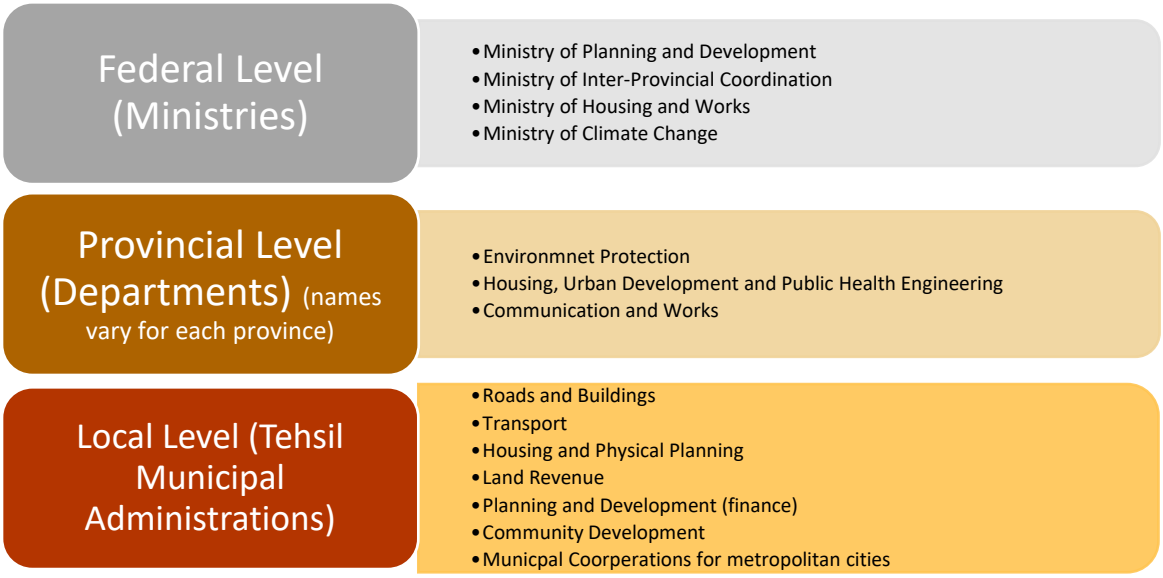


Figure 11: Planning and affiliated institutions at different levels of the government in Pakistan (Source: Author)

Provisions for master planning can also be found as one of the function of various development authorities or planning agencies in their respective Acts / Ordinances under which these authorities or agencies were created primarily in large cities. For example, these include Karachi Development (KDA) Authority Order 1957, Lahore Development Authority (LDA) Act 1975, and Quetta Development Authority Ordinance 1978. Until recently these development authorities have been working in parallel with local government institutions often with overlapping jurisdictions and duplication of planning powers. Since the reorganization of local government in 2001, these development authorities have been made part of the District Government but as a separate entity.

Since the promulgation of devolution plan in Pakistan, a new form of local government system has been introduced through LGO 2001. Section 40 of LGO 2001 elucidates that the CDGs, in addition to providing overall vision, policy and guidelines for the district, shall perform the following functions (Government of NWFP, 2005):

1. ‘‘Approve Master Plans, Zoning plans, Land Use plan including classification and reclassification of land . . .’’
2. ‘‘Review implementation of rules and bylaws governing land use. . .’’

Section 54-A describes the following job description for the DAs:

1. ‘‘Prepare Spatial plans for the towns in collaboration with the district and union councils including land use plans and zoning . . .’’
2. ‘‘Exercise control over land use, land subdivision, land development and zoning by the public and private sectors for any purpose . . .’’

Under PLGO 2001, there is no distinction between rural and urban areas, and this creates confusion. The entirety of a district is considered to be a City District Government; however, things have not changed in practice. Functions of TMAs, such as the regulation of buildings and the extension of urban services, are still not available in rural part of the districts. In rural parts, landowners are occupying and using the land however they choose.

Uncertainty prevailed as the powers awarded to local government institutions had already been vested in the DAs by the Development of Cities Act (1976) in Punjab and urban planning legislation in the rest of the provinces too. Section 4 of the Act allows the Government to establish Development Authorities for cities to which the Act applied. Regarding the powers and functions of the Authority, the Act explains in Section 7 clause 2 subsections (i), (ii) and (v) that subject to the provisions of the Act and any rules framed there under, the Authority may do the following (Government of Punjab, 1976):

i. ‘‘Initiate and maintain a continuous process of comprehensive development planning for the area with the objective of preparing a development plan.’’
ii. ‘‘Periodically update such a development plan and coordinate its implementation by the Authority or Government agencies within the area...’’
iii. ‘‘Establish, maintain and periodically revise as necessary, planning controls and building regulations for the area to:

(a) provide appropriate urban design and protect public safety; and

(b) ensure compliance with the development plan after its preparation.''

Therefore, Pakistan has responded to momentous urban challenges by establishing town planning, transport planning and engineering, environment and housing departments at federal, provincial and local levels. Physical planning and housing constitute a distinct 'social' sector in the national level Five Year Plans. The Environment and Urban Affairs Division of the Federal Ministry of Housing and Works coordinates urban development and housing policies at the national level.

All four provinces have established town planning and housing as ministerial functions, though under different names, in their governmental structures. The difference in names and also the details of responsibilities is a consequence of provincial autonomy and socioeconomic difference of the four provinces. Major cities such as Karachi, Lahore, Faisalabad, Islamabad, Rawalpindi etc. have autonomous development authorities, primarily concerned with planning and development activities in their respective jurisdictions.

Many local level administrations have appointed town planners and are beginning to exercise development control authority after the devolution of 2001. The extensive network of planning agencies and activities has evolved to deal with urban problems in the country. This organizational network and its functional activities jointly frame the urban planning practice/system of Pakistan.

Development Authorities in Pakistan: An overview

In the later years of 1970s the government of Pakistan realized that the problems related with urban areas were becoming increasingly difficult to address. At the top of the list of these problems were issues of unmanaged urbanisation as urban sprawl, stress on infrastructure and housing shortage etc. Therefore, despite the presence of local government, which in the case of urban areas were called City District Government (CDG), the Development Authorities were created. These DAs were established as a wing of the CDG that dealt with urban issues of the

areas under its jurisdiction. In this way a parallel system of DAs and Local Government emerged in major cities of Pakistan.

The DAs are established at the district level. The administrative hierarchy in Pakistan follows the following order from the largest to the smallest:

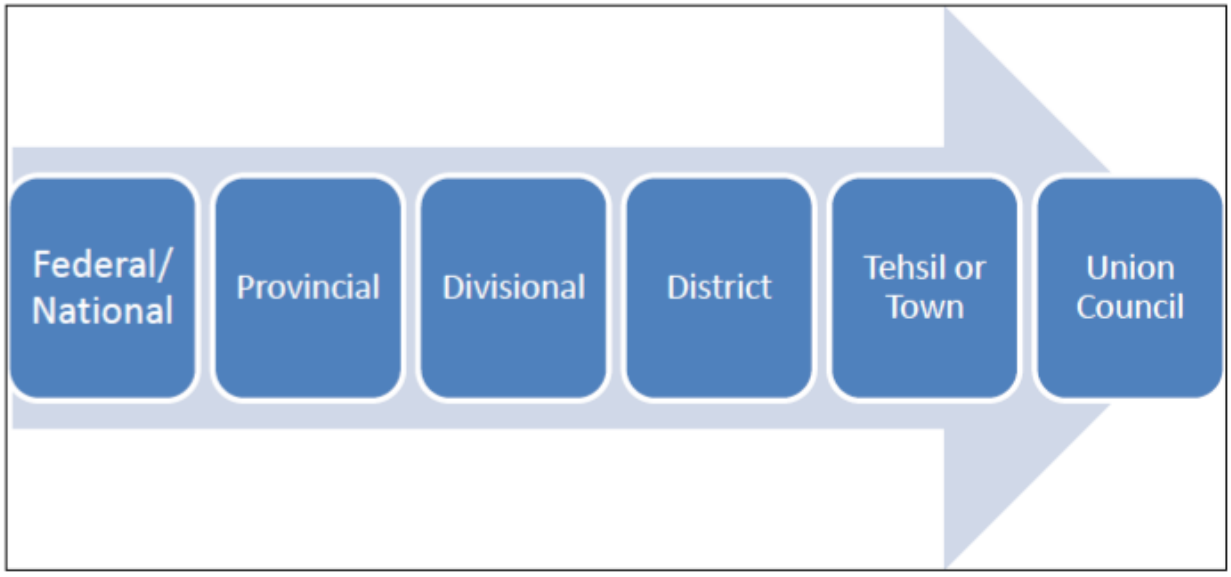


Figure 12: Administrative Hierarchy in Pakistan (Source: Author)

The greatest number of Development Authorities exists in the province of Punjab, which happens to be the most populated province and has a significant number of bigger cities of Pakistan. The law providing for the Authorities in Punjab is given by the Punjab Development of Cities Act 1976. For the DAs of the other provinces specific Acts/Ordinances are passed with respect to the specific Development Authority, for example Karachi Development Authority is backed by the Karachi Development Authority Revival and Amending Act, 2016.

This Punjab Development of Cities Act, 1976 defines the functions of these development authorities by stating that the Development Authority established under this Act will:

1. initiate and maintain a continuous process of comprehensive development planning for the area with the objective of preparing a development plan.

2. periodically update such a development plan and coordinate its implementation by the Authority or Government agencies within the area.
3. develop, operate and maintain water supply, sewerage and drainage system within the area.
4. prepare Annual Development Program for the area, ensure compliance of the Annual Development Program with priorities established in the development plan after its preparation and evaluate performance under the Annual Development Program at the end of each year.
5. establish, maintain and periodically revise as necessary, planning controls and building regulations for the area to: -

    (a) provide appropriate urban design and protect public safety; and

    (b) ensure compliance with the development plan after its preparation.
6. prepare, implement and enforce schemes for environmental improvements, housing, urban renewal including slums improvement and re-development, solid waste disposal, transportation and traffic, health and education facilities and preservation of objects or places of historical, archaeological, scientific, cultural and recreational importance.

In addition to this and in order to perform the above mentioned functions, the DA may:

7. take any steps or adopt any measures for the face lifting and beautification of the area.
8. acquire property, both movable and immovable.
9. sell, lease, exchange or otherwise dispose of any property vested in it.
10. undertake any works and incur any expenditure.
11. procure machinery instruments or any other material required by it.
12. enter into contracts.
13. cause studies, surveys, experiments, technical research or contribute towards the cost of any such studies, surveys, experiments or technical research made by any other Agency;
14. issue interim development order for the area for which a scheme is under preparation and restrict or regulate by general or special order, any change in the use of land and alteration in building structure and installation.

15. seek and obtain advice and assistance for the preparation of any scheme, or for the execution of any scheme from any Government agency or person and such agency or person shall give the advice and assistance sought by the Authority to the best of its ability, knowledge and judgment and the additional expenditure, if any, involved in giving such advice or assistance shall be borne by the Authority; and
16. establish an agency/agencies and entrust to it such powers and functions as it may deem fit with the approval of the Government.

Using the power given in the clause 16 above, the DAs usually perform their functions using three wings named as:

1. The Development Planning Wing
2. Water and Sanitation Agency
3. Transport Engineering and Planning Agency

From the functions enumerated in the Act it is clear that all the municipal services are to be provided by the development authorities. Moreover, the functions related to the preparation and execution of development plans make these development authorities play a major role in the regional development policy. This makes the performance evaluation of these authorities even more crucial.

3.2 The City of Lahore

Lahore became one of the fastest growing cities in 1947 when the partition of British ruled India led to the migration of almost a half of the eastern Punjab's population into Lahore (around 400,000). To counter this influx of population and to ease the insecurity of the residents as Lahore became a border city with India (among other reasons), Pakistan joined the Colombo Plan in 1950 and started the process of making first nationwide Five Year Plans. In the second Five Year Plan (1960-1965) suggested the preparation of Master Plans for the eleven big cities of Pakistan and this resulted in the Master Plan for Greater Lahore (1965-1980). This plan was not implemented completely and projects such as the circular rail and green belt to curb urbanisation were never realised until the Lahore Urban Development and Traffic Study (LUDTS), also called the Lahore

Structure Plan (1980-2000) by the professionals was made with the funding of World Bank. This document did not have any legal obligation for implementation and hence stayed as an advisory document for the development of the city. After some delay, the Integrated Master Plan for Lahore Region (2001-2021) was introduced for managing the development for the next twenty years by the Lahore Development Authority in 2004 (LDA, 2004). An amendment to the plan was published in 2016, as LDA gained the status of a divisional authority, moving up from a district authority. The next plan for the city of Lahore was Integrated Strategic Development Plan for Lahore Region 2035 (ISDP-35) (LDA, 2013). However, the current plan developed and under the public hearing and scrutiny is the Master Plan of Lahore Division 2050 (LDA, 2020).

The map of the metropolitan area of Lahore is shown below with the town boundaries. Lahore, being managed by multiple institutions (The Lahore Development Authority, Cantonment Board and the Tehsil Municipal Authority), there are different jurisdiction divisions of Lahore. However, as our study is focused on the master plan made by Lahore Development Authority, we will be focusing on the ten towns of Lahore.

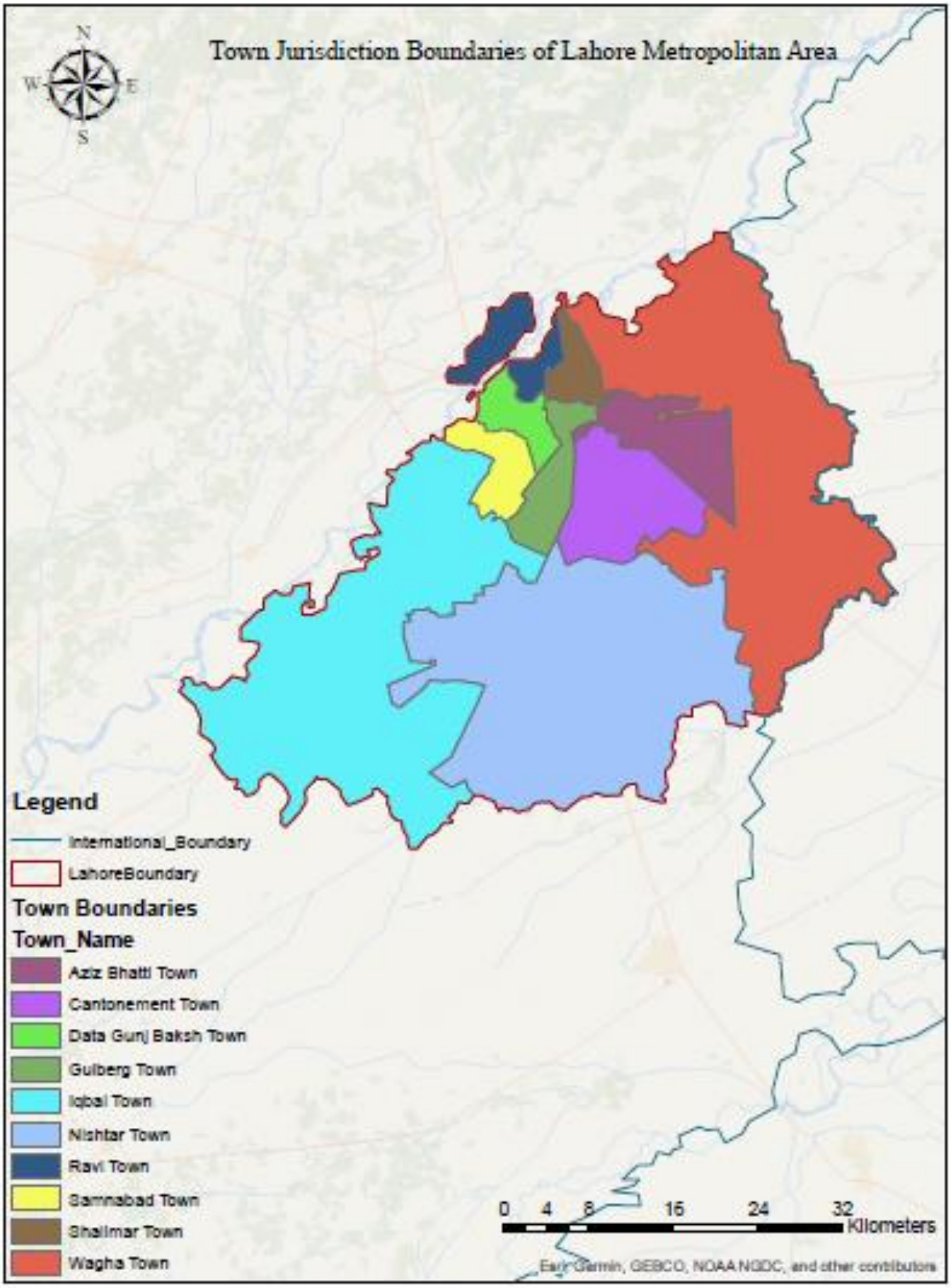


Figure 13: Jurisdiction Boundaries of Towns of Lahore (Source: Author)

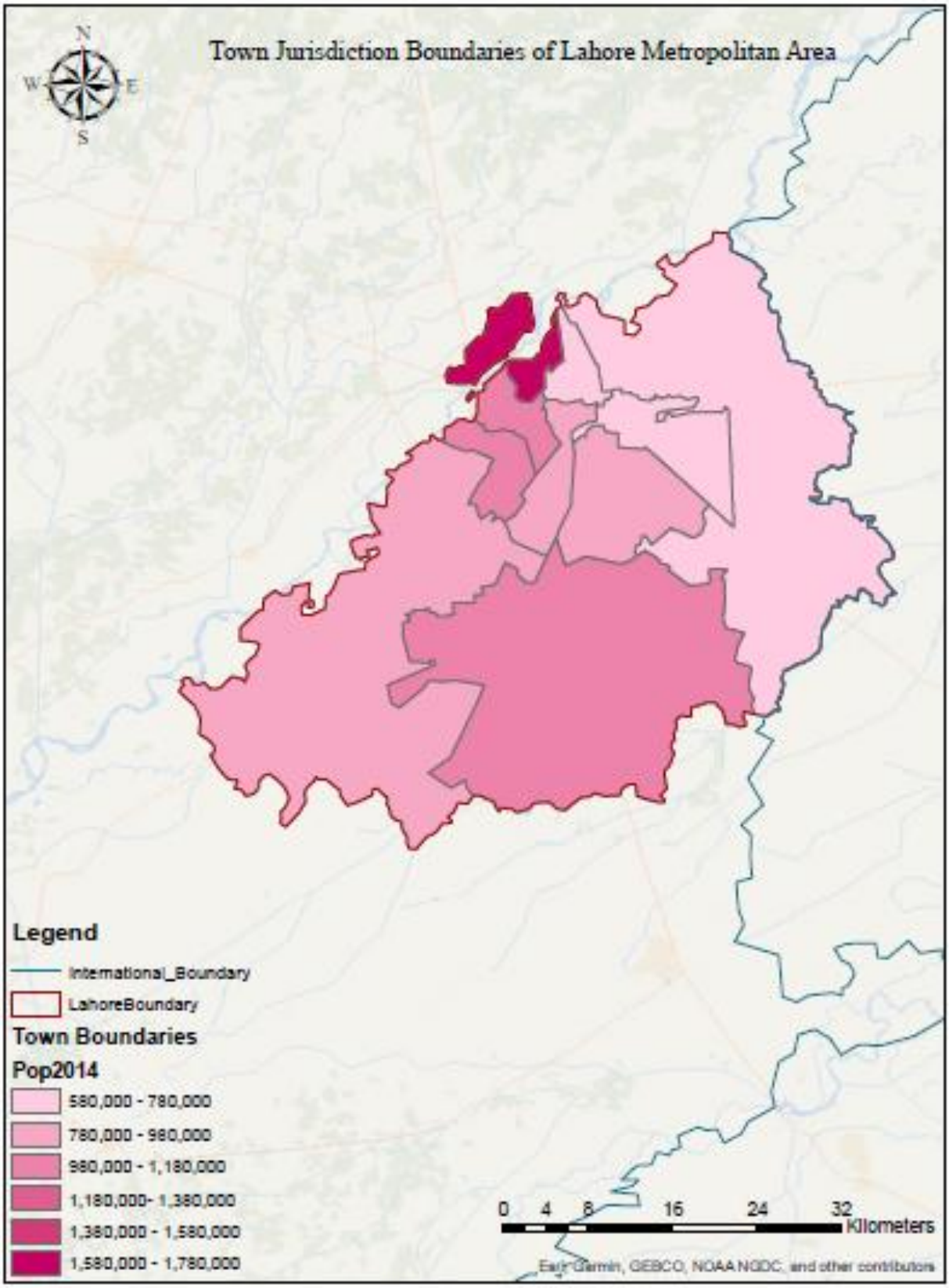


Figure 14: Population of Towns of Lahore in 2014 (Source: Author and Pakistan Bureau of Statistics, 2016)

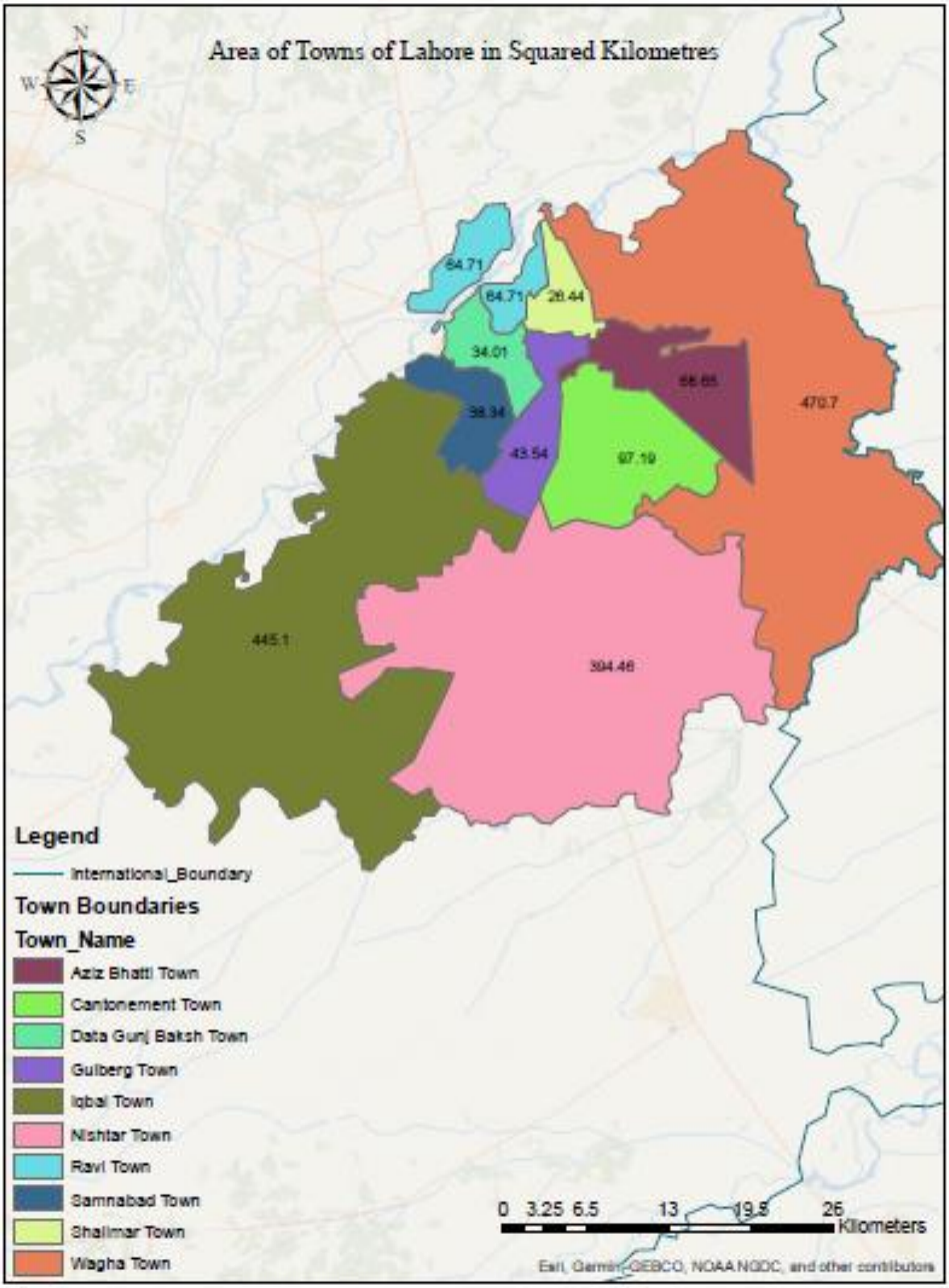


Figure 15: Area of Towns of Lahore (Source: Author)

The 1996 Master Plan for Lahore states that the built-up area of the metropolitan was 64.43 sq.km. The city saw a spatial increase in the area of 31 percent by 1988. This then grew at a very fast pace with a 113% increase from 1988 to 2000. Since the IMPL 2021 in 2004 till 2017, the city has shown a growth of about 233 percent and now the area stands at 598.3 sq.km (Hussain & Nadeem, 2021).

Lahore Development Authority and Justifications for case study selection

Yin gives one of the widely accepted definitions of case study research that it "(is) an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used" (Yin, 1984).

Using case studies, data within a specific context or situation (which could be a small geographical area, a few individuals or as it is in the case of this research an organization) is closely examined. As case study research allows for in depth examination of a single case it offers a unique way of to study phenomenon within the selected data sets. Similarly, using Lahore Development Authority (LDA) as the case study, this research will keenly observe the extent of the potential that DAs in Pakistan hold for indicator based performance evaluation and will also attempt to figure out its implications.

Lahore Development Authority (LDA) was established by the Punjab Legislative Assembly by passing the Lahore Development Authority Act 1975. Its parent institute is known by the name of Lahore Improvement Trust. The jurisdiction of LDA extends over the whole of Lahore Division that comprises of the Lahore, Nankana, Sheikhupura and Kasur Districts. It comprises of three wings named:

1. The Urban Development (Metropolitan) Wing: headed by the chief metropolitan planner it focuses on the development planning, housing, legislation and urban renewal functions of LDA.

2. Water and Sanitation Agency: WASA was made immediately after the establishment of LDA. It was created as subsidiary Agency of Lahore Development Authority for the planning, designing, development and maintenance, water supply, sewerage and drainage system in Lahore.

3. Traffic Engineering and Planning Agency: TEPA was created as subsidiary agency for the Planning, Designing and Development of Traffic and Transport System Roads & Projects in Lahore.

One of the greatest advantages of case study approach to any research is the fact that it allows for data collection to be in the real-time situation in which the activity takes place (Bennett, 2004). As one of the aims of this research is to make indicator-based performance evaluation criteria that is tailored for best possible applicability for DAs in Pakistan, the case study methodology for research is a suitable choice.

Literature has often criticized the case study approach for its lack of rigor which provides for little basis for generalization (Bennett, 2004). However, as indicator development and performance are greatly influenced by locality of its application, this research will provide basis for further studies undertaken to develop similar criteria for other DAs and other public institutions.

Therefore, as long as the case study-based research follows the scientific conventions, is able to answer the research question and follows the research procedures with proper application, it is a viable method to elicit conclusions.

This research chooses Lahore Development Authority as its case study because:

1. LDA is one of the oldest DA in Pakistan and by now has established itself firmly as an organization. Therefore, LDA provides more scope for acceptance to performance evaluation and self-assessment rather than newer such organizations that are still in the phase of finding firm footings.

2. Even before the passing of the Development of Cities Act 1976, LDA had its own legal document by the name of Lahore Development Authority Act 1975 and it is a fact that many of the functions

of DAs presented in the Punjab Development of Cities Act 1976 have been lifted from the LDA Act.

3. All other DAs act as an executive wing of the City District Government, but through a recent amendment in the LDA Act, the Authority has been given the power to undertake development as a separate entity from the City District Government for the whole of the Lahore division that includes the districts of Lahore, Sheikhupura, Kasur and Nankana. Therefore, LDA‟s jurisdiction is greater than any other DA of Pakistan and thus the need for evaluation of performance.

4. LDA is not only entitled to exercise more powers in terms of increased jurisdiction area and functions, but it also receives the greatest share of resources. Budget data of the fiscal year 2016-2017, shows that LDA received the highest amount under the Annual Development Plan fund and other sources. The budget for 2016-2017 for Karachi Development Authority was only PKR 50.2 billion (KDA, 2016) as opposed to LDA‟s PKR 93.48 billion (LDA, 2016). On the other hand, Faisalabad Development Authority got a mere PKR 2 billion (FDA, 2016) despite being the third largest city of Pakistan. It is also stated that Karachi is the largest city of Pakistan in terms of population and area and yet it receives lesser funds than LDA. This makes accountability and transparency on the part of LDA even more necessary and an indicator-based performance evaluation system is a plausible option.

In addition to the above-mentioned reasons for choosing LDA as the case study, it is Lahore itself that makes research in the field of urban planning, urban governance and regional policy necessary. Lahore being the second largest city of the country is facing the highest rate of urbanisation. Previously Karachi had held this position, but due to the deteriorating situation of law and order in the city, the rate of urbanisation has gone down and the focus has shifted to Lahore.

This along with the monstrous urban sprawl makes Lahore an apt case study in the field of regional policy and LDA being the major executive institution presents the most suitable organisation for this research.

Moreover, there is a lack of trust and corruption scandals associated with LDA that are often highlighted in local news reports. The major opposition faced when the Government of Punjab enhanced the powers of LDA to make development projects for the whole of the division was that LDA has already failed in Lahore district and should not be allowed to expand its functions to other districts (The Nation, Lahore, 2013).

Based on the above-mentioned points, this research chooses LDA as the case study to develop performance measurement criterion for DAs in Pakistan.

3.2.1 Integrated Master Plan of Lahore 2021 (IMPL 2021)

A need for a new instrument of urban development and management was felt when the time for the previous instrument, Lahore Urban Development and Transport Study was up. According to the then new Pakistan Local Government Ordinance of 2001, Lahore was divided into nine towns as part of setting up new form of administration. Each town was to have its Town Municipal Authority or TMA. Contrary to the original plan of merging the Lahore Development Authority (LDA) with the TMA system, LDA remained a separate entity under the City District Government using the LDA Ordinance of 2002.

Thus, in 2004 the plan was finally approved for implementation even though the planning process started in 1997 with a revision in 2002. In July 2016, the IMPL 2021 amendment was also proposed and approved by LDA itself and its jurisdiction was increased to the whole four districts of the Lahore division.

The IMPL 2021 was the most comprehensive plan made for Lahore at the time of its development. The distinguishing component of this plan is the inclusion of a chapter on environmental concerns, a first in the planning history of Pakistan. In addition to this the plan also includes a summary and maps and is comprised of three chapters. The plan aims at a better quality of urban life in Lahore and presents situational analysis and consequent policies for the different sectors of the urban realm. These include the development potentials and challenges, management of urban growth, environment, the urban social and economic features, housing, transportation, infrastructure, institutional framework, finances, zoning rules and regulations

and social welfare. The proposals given by the plan are categorised according to time into short, medium- and long-term plans.

Guidelines to ensure public participation are also given. The amendment, on the other hand, is brief with an updated map and a notification (LDA, 2016) which is available for public and researchers. It is believed that a detailed report exists that integrates the previous plans of the three merged districts, such as Outline Development Plans, to have a holistic view of the region. The main agenda for LDA to enforce this inclusion of the whole division for the planning process is that the urban management of Lahore in isolation is impossible especially given the heavy interdependence of Lahore and the other districts in the division.

The planning process for the IMPL 2021 followed the conventional path of the use of minimum level of primary data collection for situational analysis aided by some secondary sources. The whole process witnessed an absence of public participation though the proposals stress on the need of this activity (Javed & Riaz, 2020). LDA, however, did have some consultation sessions to get the input from different government organisations (for example the transport department, environment agency etc.) technocrats, professionals, administrators and builders.

One plus point of the plan is the outline of organisational setup that delegates roles and responsiblities to government organisation and departments to ensure the implementation of the propsals. Still, however, LDA failed to express its own role clearly (Javed & Riaz, 2020). This implementation framework is not complete and is not comprehensive for all sectors. The implementation framework implies mainly to landuse, planning and development control. For other sectors, such as health, education, transportation and environment, the implementation mechanism provided is weak even though the plolicy proposals are detailed.

This brings a huge drawback as neither the LDA and nor the TMAs are legally bound to enforce these proposals. This problem was soon observed and a Plan Implementation Committee was made and given the responsibility of ensuring the implementation of the IMPL 2021. One of the tasks of this committee was coordination beteen the different departments of City District Government. The committee was entitled to prepare a strategic implementation plan for the IMPL 2021 for the next five years. This plan was not revealed.

Not free from its fair share of problems, the achievements of IMPL 2021 in terms of planning can be the provisions related to better the traffic conditions, review and revisions of building laws and better rules related to private housing schemes and the conversion of land use (Javed & Riaz, 2020).

Chapter 4. Plan Evaluation

This chapter defines plan evaluation as used in this research and provides an overview of some key aspects of plan evaluation.

Before proceeding further, it is important to clearly define what is meant by evaluation in this research, since planners use that term to mean anything from evaluating plan alternatives to evaluating plan outcomes. In this situation of literary confusion, William Baer (1997) identifies five meanings of the term "plan evaluation," based on who undertakes the evaluation, at what point in the planning process, and with what methods. Evaluations include:

1. plan assessment (ensuring that the plan embodies its outlined planning process' aims)
2. plan testing and evaluation (evaluating alternative ways to achieve the goals of a plan)
3. plan critique (a subjective review of a plan by other planners, similar to a book review)
4. comparative research and professional evaluation (comparing various plans, with or without considering outcomes) and
5. post hoc evaluation of plan outcomes.

This research concerns itself mainly with the latter definition of evaluation, post hoc evaluation of plan outcomes. This choice can be justified by a brief assessment of both the planning system of the country in question, Pakistan, and the nature of the plan evaluation. Pakistan's planning system is still primitive in terms of plan evaluation and the capacity of the planning system can adopt a simpler version of plan evaluation presented by post-hoc plan evaluation. Secondly, the plans under discussion in this research are the most common planning tool used in Pakistan's metropolitan areas, the Master Plans, and post-hoc plan evaluation has more compatibility with this type of planning tool as explained by literature review.

Post-hoc plan evaluation refers to what happened to the plan? Was it useful? Did it achieve its intended effects? Post-hoc evaluation is also sometimes referred to as *monitoring* (especially in British town planning literature) or *retrospective evaluation*. It is pertinent to explain here that

the process of post-hoc plan evaluation may not necessary occur only once after the plan is made and/or implemented and it may begin in the earliest stages of the planning process in order to yield more focused results when the evaluation is actually undertaken.

Among other aspects, evaluation is foundational to identification, implementation and dissemination of effective and cost-efficient interventions in any process (Denford et.al. 2017). Therefore, plan evaluation refers to the processes needed to measure the achievement of the objectives and established goals and to suggest proper policy and design changes for plans made to guide development. To carry out an evaluation, it is important to identify tools to measure the performance of the actions and policies, and to solve problems related to implementation and effectiveness of policies (Hogwood & Gunn, 1984).

Plan evaluations are also needed to promote a smart approach, defined as a means for researchers, stakeholders, and the local community to acquire better knowledge of the territory to better manage its development (Girardot, 2010). Evaluation can be carried out at any time of the planning process and it can be performed by external agents that are not part of the team in charge of the plan. Usually, the evaluation of objectives is performed with the aid of indicators, which are considered a fundamental element for the evaluation of spatial policies since the 1970s, for example, as presented in the U.S. National Environmental Policy Act (Wong, 2006).

Segura and Pedregal (2017) summarize the various aspects of plan evaluation based on the purpose, time of evaluation, the evaluator, the process, the aim and the involvement of public in plan evaluation. The following table summarizes these various aspects of plan evaluation:

Table 6: Different Aspects of Plan Evaluation (Segura & Pedregal, 2017)

Aspect of Evaluation	**Explanation**
Purpose	Accountability, information, improvement of implementation design of the plan
When is the evaluation performed?	Before, during or after plan preparation and/or implementation
Who is the Evaluator?	External or internal
Aim of the evaluation	Assessment of relevance, usefulness, effectiveness and/or efficiency
Extent of public involvement	Allows questioning and critique by the public

As is the case of Pakistan, a common criticism of planning is that governments spend a great deal of energy making plans, only to have them 'sit on the shelf' for years without being used, and without accountability for results (Norton, 2005; Berke et al., 2006). Calkins (1979) criticizes the lack of post-adoption plan evaluation, and the prevalence of 'new plan syndrome' where, after 'it becomes obvious that the development patterns of the urban region are substantially different from those called for in the plan, the municipality simply repeats the planning process to create a new plan that better reflects reality, without working to find out why the old plan failed (Calkins, 1979, pp. 745–746).

Although a number of physical planning acts, ordinances, rules and regulations have been introduced in Pakistan, no uniform and consistent planning and development frameworks have been developed at the national, regional or local levels. Parallel institutions perform similar activities within cities. Examples include the Cantonments Boards, Development Authorities (for major metropolis)/City District Governments (for the rest of the cities) and Town Municipal Authorities, which are found in all the major cities of Pakistan. Each of these organizations has similar functions, including the production, implementation, monitoring and reviewing of development plans though at different levels or for different spatial zones of the cities. As a result, a number of plans are made (e.g., master plans) to manage and develop the cities. However, the absence of plan evaluation (along with no laws or regulations to direct coordination or enhancing of professional capacities) causes these institutions to operate at the different levels in their respective domains without addressing the root causes of problems.

For these reasons and as believed by mainstream plan evaluation scholars, planners should be interested in evaluating what happens to plans after they are adopted, and in trying to identify factors that seem to lead to higher levels of implementation and effectiveness (Alexander & Faludi, 1989; Talen, 1996; Baer, 1997; Laurian et al., 2004; Brody & Highfield, 2005).

This also hampers the holistic and integrated planning efforts required to address the challenges associated with increasing populations which is the main issue of the cities of the developing world including Pakistan.

The extensive and systematic review of studies conducted in the field of plan evaluation has yielded the following observations and findings:

1. The evolution of plan evaluation is directly linked to the evolution of the planning field. As the planning paradigm showed shift from rigid blueprint planning to process oriented planning and later to communicative planning, the plan evaluation also showed shifts in the aspects of plans being evaluated. This showed a shift of evaluation from physical plan outcomes (such as land use) to the decision making process and later to the inclusion and participation of the subject public.

2. The two main approaches to plan evaluation are Conformance and Performance (Oliveira & Pinho, 2009). These are seen as the two extremes of the plan evaluation spectrum with each having positive and negative points of their own. However, the plan evaluation literature is not restricted to these two approaches as methods that use both of these have also been developed (such as the PPR method by Oliveira & Pinho, 2009)
3. A vast variety of plan evaluation types, methods and tools are available and many researchers have attempted to categorise these based on different aspects such as the nature of the plan, the time of evaluation and/or the objective of the evaluation etc. same can be applied to the plan evaluation to yield uniqueness for each evaluation (e.g., Baer 1997).
4. Various examples of application of plan evaluation methods and tools have presented with results such as non-conformance and inefficient performance. While the literature agrees on the action-reaction relationship of plans and outcomes to be too simplified, the research was unable to identify alternative causes of these results (Oliveira & Pinho, 2010).
5. Literature of the incorporation of the plan evaluation into mainstream planning practice and its consequences is also very limited.
6. Another observation made from the literature study is that the preparation of development criteria holds immense importance. For the plan evaluation to have credibility and for its utilisation in the improvement of future plans it should be objective, preferable quantified and easy to interpret. Therefore, the PPIP model has never been applied for being too complicated and the results of holistic case studies are considered too subjective (Waldner, 2004).
7. Plan evaluations contribute to the knowledge bank of the field of planning and this knowledge can be used for the improvement of the quality of plans and the process of plan making. An important aspect highlighted from this review is that there are a number of internally conducted evaluations in the planning institutions that never surface in the documented literature. Further research is needed in this area to prove its importance in the field of planning (Waldner, 2004).

4.1 Contemporary Approaches, Methods and Tools for Plan Evaluations

Creating a hierarchy of order, this research puts forward the categorisation of plan evaluations based on approach, method and tool being used. The approach comes at the top or is the first broader category followed by the method and then the tool (explained below). A specific method may yield different results based on the approach being used. Therefore, a method can be applied using any of the approaches mentioned. The third classification is the tools. These are the recent application instruments used for the application of the methods. Similar to the methods, a tool may be using one or the other method and therefore may have different objectives and hence results.

It has already been stated that this paper places post-hoc plan evaluation at its core. Therefore, the categorisation is also for the post-hoc plan evaluation.

The approach refers to the basic concept behind the evaluation. There are presented two approaches the Conformance and the Performance approach Based on the approach one or more methods of plan evaluation can be used.

Post-hoc plan evaluations are focused on the plan implementation, plan output and plan impact. It may also address the plan process but would be discussing these with respect to its effect and impact on the plan's final impact.

Oliveira and Pinho signify the importance of post-hoc evaluation by stating two major advantages for the planning field of studies. First the evaluation's assessment of the plans' effectiveness adds value to the plans and the planning exercise. Secondly, the evaluation identifies factors associated with plans success that are used to improve the plan along with the planning process (Oliveira & Pinho, 2009). They also suggest that the two important approaches to post hoc evaluation are conformance and performance.

Laurian and colleagues (Laurian et al., 2004) claim that many recent studies prefer conformance as opposed to the performance approach. The conformance-based approach focuses on the

relation of the plan and its output through the process of implementation. Performance on the other hand has its fundamentals in the planning process and the societal role of the plan.

Literature points out research where a middle ground between the two approaches have been sought (Berke et al., 2006). They argue that it is true that direct relation between plan and outcomes can be unrealistic, it is also necessary to hold the planners accountable by assessing the outcomes of their planning products (Talen, 1996b; Brody & Highfield, 2005).

Therefore, to conclude the above debate it is stated that plan evaluation has conformance and performance as the two extreme ends. There is presence of middle approach and the biasness should be based on the setting of the plan and purpose of the evaluation (Talen, 1996a; Laurian et al., 2004; Norton, 2005; Berke et al., 2006).



Figure 18: Approaches to Plan Evaluation (Author's interpretations)

Presented below are methods of plan evaluation developed in the recent years (Oliveira and Pinho, 2010) that have also been applied in metropolitan regions and hence made part of this research. These are:

- the Policy-Plan/Programme-Implementation-Process PPIP (Alexander and Faludi, 1989),
- the Plan Implementation Evaluation PIE (Laurian et al, 2004; Berke et al, 2006), or Metropolitan Plan Evaluation
- Matrix and Multicriteria Evaluation or more commonly called the Plan Process Result Method (Oliveira & Pinho, 2010).

These methods are seen as complements or advancements of the traditional methods of Cost Benefit Analysis, Balance Sheet and Goals Matrix (Oliveira & Pinho, 2010).

4.1.1 Policy-Plan/Programme-Implementation-Process PPIP

Th PPIP method has been developed by Alexander and Faludi in 1989 (Alexander and Faludi, 1989). This method proposes five criteria that may be used to evaluate the plan post implementation. These criteria are:

- Conformity
- Rationality
- optimality ex ante
- optimality ex post
- and utilisation

As indicated by the list above, PPIP integrates a list of elements of plan implementation and its consequences that are normally overlooked by other evaluation methods. These include the plan making process, the implementation and the deeper impacts of the plan. This makes the basic approach of this method to be performance however the most widely used criterion is that of conformity (Berke et al., 2006; Brody & Highfield, 2005). This has been discussed in detail in the previous section. A classic example is the performance-based approach to the evaluation of the European spatial development perspective (ESDP).

4.1.2 Plan Implementation Evaluation (PIE)

Laurian and collegues' work, (2004) The Plan Implementation Evaluation was a response to Talen (1997) which demanded the development of a criterion to evaluate plans. These authors bring forward the PIE method that is conformance based and therefore more useful to the planners in everyday planning duties than the PPIP's performance approach.

The PIE reflects the principles and objectives of the traditional planner; hence it is more popular among the planners because the practically performance does deviate despite the efficient implementation of the plan.

Unlike PPIP the PIE does not intend to stamp the plan as a success or failure, rather it just measures the level of implementation. Therefore, being simplistic in the results, this method is more appreciated by the planners in the practical field.

When applied to metropolitan areas, this method gauges the level of incorporation of the dynamics of the metropolis in the plan. An application of PIE is in the study by Feria (2010) for Granada, an intermediate city in Spain. It has thirty-two municipalities and an approximation of 600,000 population size. The PIE method is simple as it is based on the type and quality of data available. The method does not require the use of advanced computer programs and software and is applicable to different spatial regions as the method is easily customised based on the situation (Laurian et al. (2004).

4.1.3 Plan Process Result Method (PPR)

In 2009 Oliveira and Pinho came up with the Plan Process and Result method. They presented a method that combined both the performance and conformance approaches and made an extensive criterion based on ten different dimensions of the plan. These dimensions include effectiveness, relevance, participation, utilisation, coherence and allocation of resources.

While the method includes both of the approaches' (conformance and performance) components, the criticism faced is that the results are too complicated and difficult to interpret (Oliveira and Pinho, 2010).

PPR has the plan, its making process and its contribution in the city's development, as its core interest. The method shares the beliefs of the PPIP method explained before. However, the literature presents three distinguished characteristics of PPR (Oliveira and Pinho, 2009) stated below:

- PPR puts greater stress on urban form.
- PPR has seen practical application to two urban plans in Portugal, while PPIP has no published applications and
- the evaluation criteria developed by PPR provides with the greatest number of aspects of the plan and its implementation being evaluated.

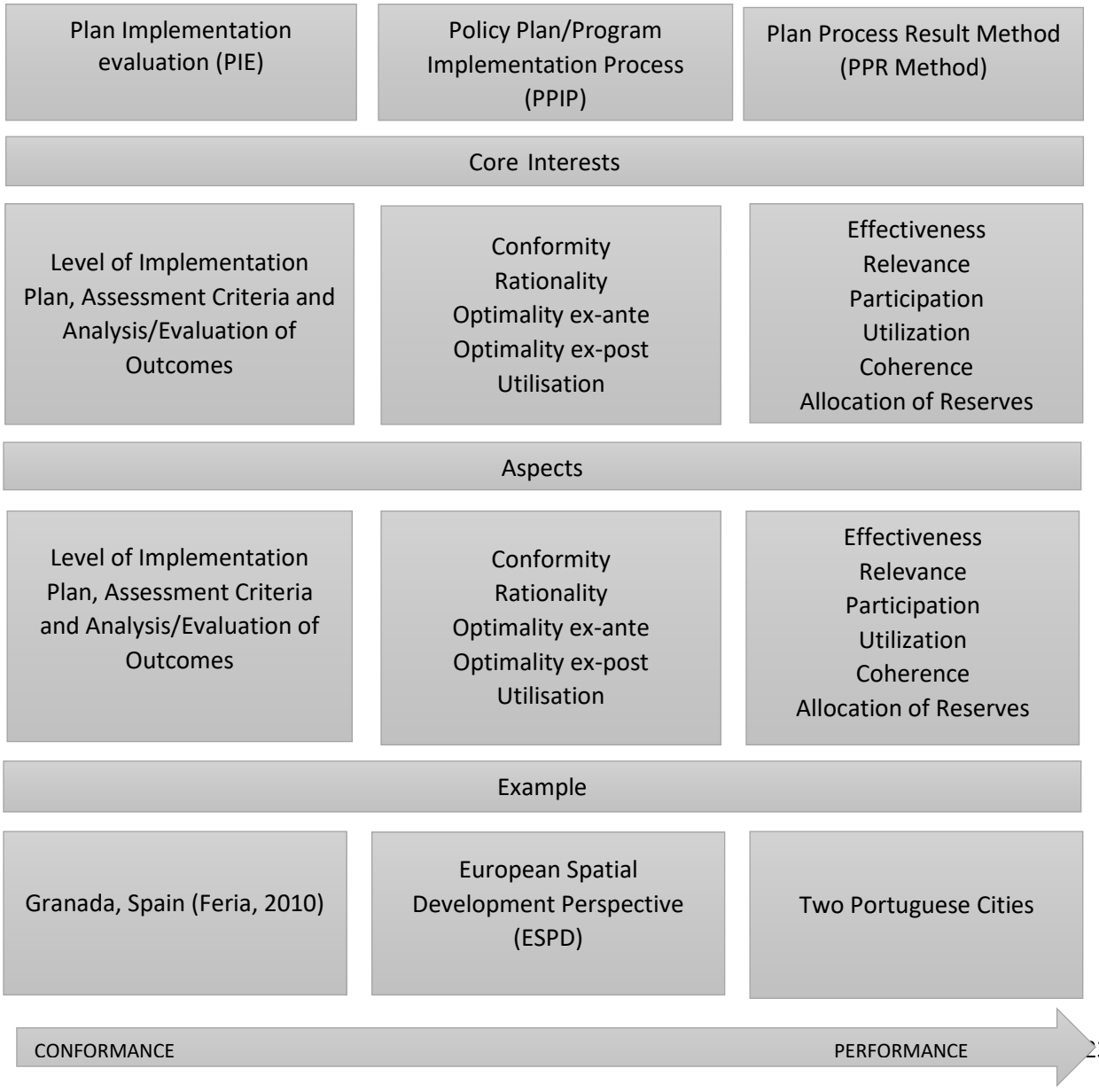


Figure 19: Contemporary Methods of Plan Evaluation

Plan evaluation tools are the lowest level instruments for plan evaluations. These tools can be used under the different approaches and methods mentioned above and in a certain evaluation one or more of these tools may be applied simultaneously. The most widely used plan evaluation tools are presented below:

Table 7: Tools for Post-hoc Plan Evaluations

Tools for Post-hoc Plan Evaluations
Indicator
Indicators generate quantitative information to aid communication, negotiation and informed decision making (European Commission, 1999). A vast literature is available on indicators with research developing in the early mid-20th century and advancing in the late 1900s. (Seasons, 2003).
Value Driven Tool
The value driven tool assigns value to one of the aspects of the plan and makes assessment for that aspect in isolation. This dis-aggregated approach is used for thematic plans e.g. plans made for the increment of green areas in a city, or are used to assess only one aspect of the plan, e.g. only the objectives and proposals related to green spaces are analysed.
Holistic Case Studies
Holistic case studies are anecdotal in nature as they make assessment of the various plans made for a certain region over a stated period. This tool of plan evaluation makes the use of impact analysis to determine the success and failure of the plans implemented over time. Many of the documented evaluations have used this tool to give historical accounts some time followed by sections on lessons learnt.
Invisible/Incremental
Lindblom (1959) believes that all plan evaluation exercises are not published and that internal plan evaluations are often carried out by the planning institutions for making comparisons between successive plans or to avoid major faults in previous plans. Examples of use of this plan evaluation tool are in the form of technical reviews, capital programs, financial audits and consistency reviews.

4.2 Indicators and their use in Plan Evaluations

4.2.1 Indicator and Indicator Based Evaluation

Through the initial research and review of literature many new observations have been made. The main findings are the guidelines for the development of indicator system for plan assessments in a developing country such as Pakistan. These are summarised below.

The first and foremost step is the precise definition of the various terms in use for the plan assessment. This means that clear indicators should be made that have the characteristic of being able to measure a certain parameter over time to gauge change and provide information for the causes and effects of this change. This makes indicators different from benchmarks (University of Missouri Extension, 2000) as benchmarks are just the reference points and do not have the ability to measure progress.

Furthering the previous conclusion, it has been found out that it is also important to fix certain limitations when developing indicator systems. The most important of this is the fixing of administrative jurisdiction which is that the indicator system is based solely on the cities or urban centres.

Many notable guidelines are available regarding the characteristics of the indicators or indicator systems and two widely used approaches have surfaced. These are the SMART and the SPICED approach. Making comparisons with planning system of Pakistan and the pros and cons of these two approaches, it can be concluded that the approach more relevant to Pakistan is the SMART approach.

The justification for this choice lies in the fact that even though the SPICED approach is more focused and descriptive with greater stakeholder participation, it is also time consuming, uses more resources in terms of manpower and money and is also much localised with limited application across the country. These factors make it unfit for use in the current planning system of Pakistan.

On the other hand, SMART approach is rigid and may only measure superficial parameters, it is easy to use, provides with relevant information only, is time, money and manpower efficient and allows for applicability across the country.

Other important characteristics of indicator or indicator system that are important for development of an indicator-based post hoc urban master plan evaluation system for the cities of Pakistan include the following:

The indicators should be up to date to the contemporary trends and practices internationally but should never be used without prior consideration of its incorporation in the planning system of Pakistan and hence should be modified accordingly.

The indicators should have a wider applicability in the cites of Pakistan with minor changes being possible when applied to the different cities. In this regard, the research suggests that indicator system should incorporate all the possible scenarios but according to different circumstances, certain indicators can be given a higher weightage over the others to better display the situation in the city.

The indicators should be made more efficient by being based on the data already being collected by the development authorities in Pakistan. This simple step can prove to be very useful for the easy settlement of this indicator-based plan evaluation practice in the current planning system of Pakistan on multiple levels. The first important factor would be that the indicator-based system will become more economical in terms of data collection. Secondly fewer additional capacity building will be needed for the application of this system with reduced increase in the manpower.

Moreover, the indicator system should be as simple as possible but also should adequately measure the required parameter and its change. This will not only result in easier data collection, application and interpretation, but will also enhance communication across the multiple departments and sectors that play a role in the shaping of the city as transport and environment.

Lastly two major debates have been generated by the research for the quality of the indicators. The first is the decision about 'What is the appropriate number of indicators?' The literature suggests that an effective indicator system will have as few as possible indicators. Simultaneously, it also points to the importance of the indicator system to be comprehensive to adequately measure the change and hence the impact of the parameter. Therefore, researchers suggest a break-even point between the simplicity and available data with the comprehensiveness and detail (UN 2007, Bell & Morse 2012).

The second debate presented is between the centralisation and localisation of the indicator system. Where the research focuses time and again on the fact that for the most effective output, the indicators should be tailored to the local environment, it also puts stress on the economic sustainability of the indicator system and agrees that a sea of indicators resulting from this de-centralised approach presents a major challenge for the quality of assessment criteria.

Even though a lot of techniques for making assessments are presented in the literature such as quasi-randomised studies, benchmarks, questionnaires and surveys and case studies, it is the indicators that have been accepted as the most commonly used technique (Bell & Morse, 2012).

But as the acceptance and application of the need for assessment grows, the number of indicator-based systems also increases. With the autonomy to the local institutes, separate indicator systems have evolved at the local, regional, provincial national and international levels. The number is further increased by the private and non-profit organisations. Where the trend for increasing stress on evaluation is a positive thing, the blooming number of indicators and indicator systems has become a challenge. In the situation where countless number of indicator systems presents their own set of definitions and interpretations for the various goals and objectives and 'effective plan' and sustainability (etc.), understanding ad developing a broader indicator trend is a difficult task.

This presents a challenge for the institutes involved in assessment and evaluation and therefore in developing policies. For these bodies, to understand urban development and its evaluation, it is important that they have a standardised set of definitions for the urban development goals and objectives. If such a system is unavailable, the institutes will find the relevant knowledge from city based local experiences which might not be comparable enough. In this case a standard and fact-based indicator system may provide the answers for objectives that are pertinent for effective planning and urban development.

This is a problem for the local agencies and municipalities as they might not have the needed financial resources, staff or knowledge needed for the development of effective indicator system for the assessment of urban development planning. Also, what is to be noted is that these medium sized cities are the one with the highest rate of urbanization in Pakistan. These with their smaller, low capacity urban management agencies have the largest peri-urban areas and need the greatest attention towards managed urban development.

4.2.2 Indicator Selection Framework

Conceptual framework for indicator selection has been developed based on the Plan Process Result method (Oliveira & Pinho, 2010) which has already been identified as the suitable method for plan evaluation in Lahore.

In 2009 Oliveira and Pinho came up with the Plan Process and Result method. They presented a method that combined both the performance and conformance approaches and made an extensive criterion based on ten different dimensions of the plan. These dimensions include effectiveness, relevance, participation, utilisation, coherence and allocation of resources.

While the method includes both of the approaches' (conformance and performance) components, the criticism faced is that the results are too complicated and difficult to interpret (Oliveira and Pinho 2010). PPR has the plan, its making process and its contribution in the city's development, as its core interest. Therefore, adapting from the methodology for

the PPR method the following diagram presents the conceptual framework for selection of indicators in this research. The aspects of rationality and political will have been dropped from this research to limit the scope of this research and due to time and resource constraints.

It is a well-established fact that there is limited evidence of official plan evaluation in developing countries like Pakistan. The main reason for this seen to be the lack of resources which is hardly catering to the needs of planning itself let alone plan evaluation. Countries that attempt for a well organised planning system put greater stress on plan making rather than putting emphasis on problem solving and implementation strategies (UNHSP, 2009).

For introducing urban plan monitoring and evaluation system for any city, it is advised that a small and manageable set of urban planning-oriented indicator system be developed (UNHSP, 2009). It is advised in the literature that an ideal start for the establishment of an indicator-based plan evaluation system is to have indicators that are high-profile and reflect already established planning issues in the city. Following this advice this selection has carefully chosen land use, disaster management, transport and housing (etc.) related indicators as these are the planning problems accepted and faced by the inhabitants and the urban managers alike.

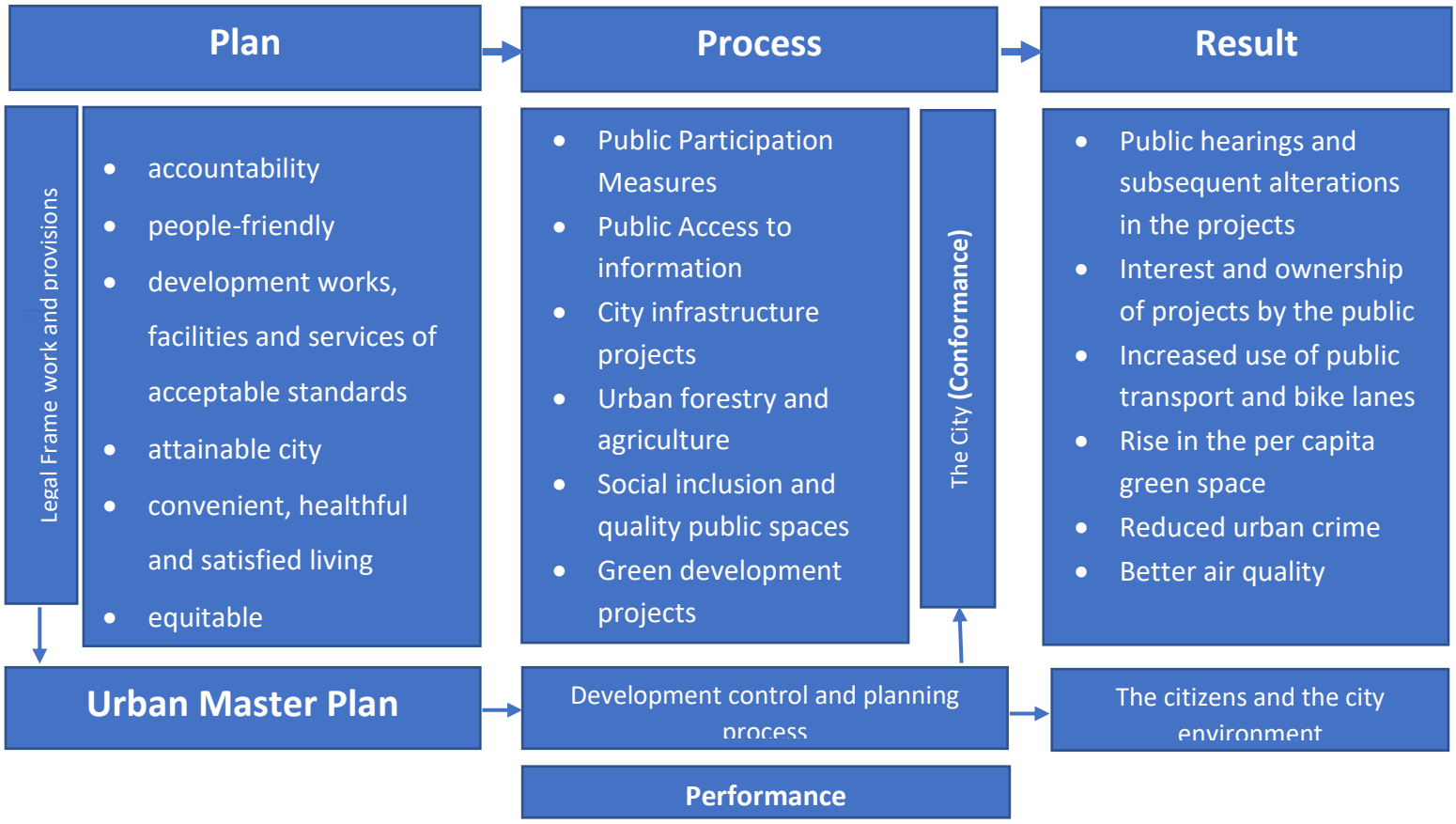


Figure 21: The Conceptual Framework for Indicator Selection

In support of the selection made in the next chapters it is claimed that the quality and significance of the indicators for the subject city is more meaningful than the number quantity of the indicators (UNHSP, 2009). Thus, the indicators that made to this research are made to be clear and have meaning for the urban planning stakeholders.

Another factor for the selection process is that the indicators be making maximum use of the already existing information and data. However, it is not forgotten that the ease of access of data may not cater to the evaluator's need of information. Keeping this in mind, this research is not final in any manner as indicators evolve over time and need testing to check their usefulness.

4.2.3 Developing Effective Urban Master Plan Evaluation Indicator System

The European Commission's European Sustainable Cities Report (Fudge et. al., 1996) recognises the need for indicators as tools for quantifying urban plan performance. The World Bank defines indicators as performance measures that aggregate information into a usable form. However, the unresolved issues of fluctuation, intertemporal variations and uncertainty still cause difficulties to fully achieve what is intended from these indicators. All organisations involved in indicator construction seem to agree that indicators provide a useful tool for plan making and evaluation but their limitations are also always stressed (Fudge et. al., 1996).

Indicators are meaningless without specified objectives without which they cannot contribute to the improvement of the urban quality, if there is no policy framework, based on situational analysis, giving directions for the aspects of urban realm that require change for betterment. The exceptional significance of indicators is well known, but the impact of their real use in measuring urban performance is still at an initial stage. Descriptive indicators are easier to establish and interpret as they are measured against pre-established benchmarks, illustrating the status of the environment and based on physical measures, against performance indicators which are based on more abstract policies and goals.

Indicators are used to describe in what aspects the city's performance is better than in others. A single index should tell us whether or not the city is in the direction of betterment. Effort must be made to avoid overlapping of indicators in different thematic groups.

The literature provides with a variety of instruments and practice guides for urban interventions for promoting evaluation and monitoring and benefiting from this process for the enhancement of the planning process and planning products. Professional planners, decision makers, plan makers, researchers and the citizens can all take advantage from these. Thematic indicators and their index need to be developed according to the priorities of each city. The performance of a city can therefore be evaluated based on its objectives and the progress achieved in achieving them. Therefore, the list presented in the previous chapter

will help guide the development of the indicator system that can help evaluate the urban master plan of Lahore, Pakistan.

4.3 Weights for Evaluation of Urban Master Plan

The definition of indicators is constantly evolving and can change depending upon the objective of the indicator development and/or the spatial unit and its characteristics for which the indicator is developed. Therefore, it is beyond the traditional collecting of data or statistics. Further uniqueness is introduced when thematic indices are associated with these indicators. This increases the complexity of the indicator system and means that the indicator system can significantly change with the change in the weightage assigned to each theme. Thus, the system needs to be updated regularly or whenever the need arises.

The method suggested by the European Union Sustainable Development Goals Indicator set 2020: Result of the review in preparation of the 2020 edition of the EU SDG monitoring report is that of defining a unique thematic index based on a questionnaire-based survey measuring the degree of interest shown by the citizens of a given city (Eurostat, 2020). The degree of interest here refers to the true probability of accepting and making ranking of alternatives.

In case of measuring urban performance, the quality of life of its citizens and their level of satisfaction takes the centre stage. For certain interventions, the willingness to pay by the population for public goods for environmental benefit can be a major deciding factor.

Certain themes on which the degree of interest can be measured are (Eurostat, 2020):

1. Air quality
2. Clean transportation
3. Solid waste and waste-water disposal
4. Energy Management
5. Water management

6. Local nuisances or peace
7. Social justice
8. Housing
9. Urban safety
10. Local heritage, green and public spaces, or
11. Creation of a unique project.

The analysis of the survey results would conclude what significance is given to each urban theme. This weight is what experts perceive as contribution of each theme in the quality of urban living and the city. The thematic indicators, weighted by their contribution to the city's performance will form the evaluation of the city.

Certain important and logically irreplaceable themes and indicators will have to be dropped out of the indicator set due to the availability of too little information linked to these themes (Eurostat, 2020).

A list for the currently utilised indicator systems had been developed and were under study to identify plan evaluation themes and indicators/indicator systems that can be used for the cities of Pakistan. Therefore, this report presents the findings of this step of the research.

The research presented in the so far clearly outlined the characteristics of a good indicator system mainly using the SMART approach introduced by the European Union and Statistical Institute for Asia and Pacific (2007). In addition to this, guidelines that make the indicator system pertinent to Pakistan have also been highlighted. Furthermore, keeping an up to date knowledge of the planning system of Pakistan, the state of post hoc plan evaluation practice and the development of urban development plans (master plans), critical review of the currently used indicator systems is now presented in the following pages.

An extensive list had also been developed for review and analysis of different indicator systems. Care has been taken to ensure variety and reliability. Therefore, the indicator systems with significant application and relevance to the current research topic have been given priority. It includes but is not limited to the following indicator systems:

Table 8: Indicator Systems Reviewed for this Research

Indicator System	Developing Organisation	Year of Publication	Source
Urban Indicators Guidelines	UN Human Settlements Programme	2009	UN Habitat (2004)
Eurostat Sustainable Development Indicators	Eurostat	2020	European Commission (2020)
Green Cities Programme	OECD	2010	OECD (2010)
China Urban Sustainability Index	Urban China Initiative	2014	Li et. al. (2014)
EEA Urban Metabolism Framework	European Environment Agency	2011	Minx et. al. 2011
Urban Indicators for Mega Cities	University of Bonn	2009	Kötter & Friesecke (2009)
Reference Framework for Sustainable Cities (RFSC)	RFSC	2012	Van Dijken et. al. (2012)
Urban Audit Cities Statistics	Eurostat	2017	European Union (2017)
Urban Sustainability Indicators	European Foundation for the Improvement of Living and Working Conditions	1998	Mega & Pedersen (1998)

Chapter 5: Indicator System for Urban Master Plan Evaluation: IMPL 2021

In this chapter the shortlisted indicators are presented with respect to the various aspects of the urban realm, called themes. This list is based on the selection criteria previously mentioned. Furthermore, this list is not extensive and can be expanded but the limitations are presented by the time limit and extent of scope of this research. In addition to this, it is also important to state here that the indicators are mainly adopted from the different frameworks studied but has been modified and streamlined in accordance with the application in the case study.

The three basic aspects of any city are social, economic and environmental. The themes that are presented below stem from these aspects. The quantity and quality of indicators that are selected under each theme (or aspect) is also influenced heavily by the availability of data and therefore is not the representation of the significance of the theme.

The themes for urban master plan evaluation in the case of the city of Lahore are listed below. The list is an amalgamation of the sectors discussed in the Integrated Master Plan of Lahore 2021 and the themes presented in the literature review to develop a comprehensive indicator system.

1. Law and Administration
2. Disaster Mitigation and Prevention
3. Land Use
4. Urban Services
5. Transportation
6. Housing
7. Social Welfare
8. Urban Environment
9. Urban Economy

These themes and their significance in the evaluation of Urban Master Plan in the case of Lahore Pakistan is discussed below. The list of selected indicators, sub-indicators and the unit of measure are all presented in a tubular form at the end of this chapter.

5.1 Law and Administration

Evaluating the legal provisions and the administrative setup for urban master plans has high significance as it is at the beginning of any plan development process. The legal provisions also ensure the occurrence of the proper steps and efforts needed for urban management and growth which would otherwise be ignored by professionals. These rules are also playing an important part in maintaining social balance and safeguarding the environment as these aspects of urban areas can easily fall prey to the much stronger aspect of economy.

Simultaneously the quality of the legal and administrative framework also helps ensure transparency and public inclusion. As the inhabitants of a city are at the heart of measuring the city's performance, the legal provisions ensure their active participation and wellbeing.

A number of indicators are available and can be selected to gauge the level of law and administration with respect to the development and application of the urban master plans. However, as mentioned earlier, the constraints faced by this research do not allow for inclusion and measurement of all these indicators. Therefore, keeping in mind the urban planning situation in Lahore, the availability of data and time constraints only a limited number of indicators and sub- indicators have been selected.

5.2 Disaster Mitigation and Prevention

Closely related to the above theme, the disaster mitigation and prevention theme focuses on the provisions and implementation of the provisions put in force to ensure the safety of the citizens from natural and man-made disasters. As cities have high density of humans, the vulnerability is high due to the increased level of risk.

An efficient master plan will not only be made with the knowledge of disaster prevention but would also show its depiction in all the sectors of the plan. Moreover, development of urban resilience is also to be ensured through the master plan.

Once again due to the limitations of this research, only a handful of indicators will be used to assess the level of the urban master plan in this regard.

5.3 Land Use

The third theme for the evaluation of integrated master plan of Lahore is land use. Since the beginning of the urban planning in Pakistan, land use has been the most influential part of the master plan. So much so that the TMAs have been known to consult only the land use maps to guide development in their respective towns.

Land use zoning and control is the first step taken by city planners and managers towards planned urban development. By the delineation of spatial locations of different land uses, the city managers ensure the grouping of compatible land uses and segregation of volatile land uses while ensuring a stable land market, travel patterns and efficient use of the limited land resource.

Thus, it is safe to say that land use plan determines not only the shape of the city but also has its implications on the economic, social and economic output of the city. Therefore, this selection of indicators puts great significance on this theme and it will also be a potential theme with high weightage for the evaluation phase of this research.

5.4 Urban Services

One of the distinguishing factors between urban and rural areas is the level of service provision. The quality of life in any urban centre is a direct reflection of the level of service provided to the citizens. This includes all kinds of municipal services but this research focuses on the basic services of housing, solid waste management, water and sanitation and transportation. The transportation and housing service has been chosen as separate themes and will be discussed later.

Therefore, the performance of urban master plan can also be assessed by evaluation of the quality and coverage of urban services, and this research aims to do so.

5.5 Transportation

A multidimensional theme, transportation has its implication on all the other themes under assessment. It has direct link with the quality of life of the citizens, urban environment and also economy. The social aspect of transport services makes it one of the basic rights of the citizens, and the master plan is burdened with the responsibility of making the transportation efficient, cleaner, affordable and accessible to all citizens.

Consequently, the IMPL 2021 has a detailed section dedicated to transportation plans and proposals. It includes projects and policy guidelines for modal shift, mass transit, public transport enhancement etc. This research will study this theme to evaluate the IMPL 2021.

5.6 Housing

The highest percentage of land use in Lahore goes to residential land use. The gigantic population of more than 11 million (11,126,285) (Pasha, 2021) needs to be housed in the city and its suburbs. With a high rate of population growth this demand of housing is ever increasing and the urban master plan needs to meet between the limited resources, social constraints and the need of housing.

Once again being the basic right of the citizens, liveable and affordable housing has been a challenge since the creation of the country. Lahore faces an increased burden as its status of a mega city causes high influx of people from all over the country each year. Therefore, the plan includes demarcation of new residential areas and schemes to house the people despite environmental criticism.

In this evaluation, attempt has been made to cover both these aspects under the themes of housing and land use. The choice of indicators and the relevant unit of measure are mentioned later in the chapter.

5.7 Social Welfare

Forwarding the role of urban managers of reducing social differences and ensuring healthy social inclusion, this theme measures the level of social welfare extended by the master plan. Different proposals and relating to health, education and heritage were found in the IMPL 2021 the evaluation of which will be done under social welfare promotion.

This is an overlapping theme and will find its presence in the other themes such as transportation and housing as well. To remove repetition the indicators selected in these overlapping themes are different. Therefore, care has been taken to make the list of selected indicators as comprehensive as possible without overlapping and repetition. In addition to this, for the ease of understanding and dissemination of the results of this research, the indicators are grouped to ensure continuation in the analysis and hence the results.

5.8 Urban Environment

One of the leading aspects of the urban realm, urban environment is gaining immense attention at all local and international forums. With calculations of direct links with the condition of the environment and social costs, even the governments are facing pressures to maintain a health urban environment to gain popularity and betterment of international image.

Keeping in mind the scope of this research, only the basic indicators for the measurement of urban environment quality have been shortlisted. A variety of indicators and well-established indicators systems are available and a whole field of research and study has been dedicated solely to assessment of urban quality using indicators and also other means. However, to undertake a full environmental assessment will not be possible for the scope of this research. This results in the selection of only a handful of indicators to give an overview of the quality of the urban environment.

5.9 Urban Economy

The final theme in this evaluation is that of urban economy. The cities are termed as engines of growth and change and are known to derive the economy of the nation. This means that the

estimation of how well a city is performing is depicted in how well the economy of the city is performing. Using a limited number of indicators an estimate of the condition of the economy will be made which is not claimed to be complete and/or comprehensive.

Similar to the situation with the urban environment, urban economy also forms a research field of its own. In this research only a small attempt will be feasible to estimate how the economy of the city was affected by the proposals in the IMPL 2021.

5.10 Urban Density

There is no benchmark as to what constitutes as the optimal density for any city to categorise it as a well performing city. However, the indicator is important to understand and estimate other indicators that are used as plan performance indicators. Therefor this indicator is included without any theme attached to it and is also not big enough to be assigned the status of a separate theme.

At this point it is important to mention that this indicator focuses on the most fundamental indicators needed to evaluate the performance of urban master plan for Lahore. The results of these indicators can and will be used for the development of composite indicators for further interpretation of the data and for making inferences such as making correlations and finding trends. An example is given below to explain this point.

Another indicator called The City Product can be calculated to measure the economic performance of the city. I can be calculated using two methods using the indicators mentioned in list below. Method A consists in taking the national product in each industry sector and then multiplying it by differential wage rates at the city level, for each industry sector. This method is used when employment by industry sector is known. Method B consists in using the city household income figures and by multiplying by the ratio of GNP to total house-holds income at the national level. This method assumes that the ratio of the GNP to the household income is the same at the city and the national level. So far, this method has been used in most of the cases.

Therefore, when and if a need arises, the indicators can be used to develop inferential indicators that will assist in the evaluation of IMPL 2021.

5.11 Indicator Framework for Post-hoc Plan evaluation

According to the European Union Sustainable Development Goals indicator framework (Eurostat, 2020), a limited number of indicators in the indicator system, around 100 different indicators, is widely recognised as an upper limit for effective and harmonised assessment by the experts form the National Statistical Offices of OECD countries and also Eurostat among others.

Table 9: Indicator Framework for Evaluation of IMPL 2021

INDICATORS FOR EVALUATION OF IMPL 2021

Aspects	Themes	Indicator	Sub-Indicator	Unit of Measure
Social	Law and Administration	Public Participation/Level of Transparency	Strength of Legal framework of Master Plan	Level of incidences of deviation from master plan
			Review and Evaluations	Number of reviews and change of plan accordingly
			Extent of Public Access to Information	Percentage of Plan/Policy/Procedure Documents with Public Access
			Language of Communication	Percentage of City Publications made in Local Language
	Disaster Mitigation and Prevention	Flood Management	Flood Risk Analysis	Level of accuracy of predictions made
			Flood Management Plan	Percentage changes in flood damages
			Physical construction to mitigate flood impacts	Number of constructions made
	Land Use	Land Use Compatibility	Level of Zoning Control	Percentage of Developments with Land Use Objections
		Geographical Balance	Urban Population Growth	Number in 1000s and Percentage Increase
			Urban Area Growth	Area in square meters and Percentage Increase
			New Planned Developments	Area in Square meters
		Brownfield Development	Reuse of Abandoned Land	Area in square meters
		Land Use Conversion	Land use Conversion from Agriculture to any other Use	Area in square meters
			Land use Conversion from Residential to Commercial or Industrial	Area in square meters
			Urban Green Space	Area per Capita
		Urban Density		Persons per Square Meter
	Urban Services	Water Supply	Public Water Supply Coverage	Percentage of Population with access to water
		Solid Waste	Solid Waste Treatment	Domestic Waste Treatment Rate
		Sewerage and Drainage	Waste-Water Treatment	Waste-Water Treatment Rate
		Technology	Internet Access	Percentage of Population with access to internet
	Transportation	Modes	Transportation Modal Split	% Of Population using different modes
		Travel Times	Registered cars	Rate of Car Ownership

		Public Transportation Projects	Public Transport Network Length	Kilometres
			Road Network Length	Kilometres
			Road Condition	Percentage of Roads Meeting Standard Road Criteria
	Housing	Durability of Housing	Condition of Housing Units	Percentage of Housing Considered Safe for Living
		Supply and Demand Gap		Number of Housing Units
		Cost of Housing to Living		Rate of Housing Cost with respect to Minimum Wage
		Affordable Housing	Government Housing Schemes	Percentage of Housing Demand met by Subsidised Housing
		Breakdown by Ownership Status	Ownership Split by Owned/Rented and Leased	Percentages of Population
	Social Welfare	Health	Life Expectancy/Mortality Rate	Number of Deaths per 1000 persons
			Doctor Resource	Number of Doctors per capita (per 1000 persons)
		Education	Literacy Rate	Number of Literate Persons per 1000 Persons
		Crime	Crime Rate	Number of annual cases
			Traffic Accidents	Number of Annual Fatal Accidents
		Heritage	Heritage in need of Attention	Number of Neglected Site

Aspects	Themes	Indicator	Sub-Indicator	Unit of Measure
Environment	Urban Environment	Environment Protection	Level of application of Environmental Policies	Percentage of Urban Projects cleared by Environmental Protection Department
				Frequency of Environmental Assessment Follow-up
		Urban Pollution	Air Quality	Level of Carbon dioxide, Nitrogen Oxides, Sulphur Oxides and Particulate Matter (Milligrams per cubic meter)
				Number of days Qualified as Hazardous with respect to Air Quality
			Water Quality	Water pH, Salinity, Dissolved Oxygen Levels and turbidity
			Level of Nuisance	Percentage of Population Affected by higher noise Levels
				Percentage of Population Affected by Odour or Visual nuisance
Economy	Urban Economy	Resource Efficiency	Energy Consumption	Energy Consumption per Unit GDP and per Capita
			Water Consumption	Litres per Capita/GDP
		Research and Development	Budget for Research and Development	PKR
		Development	Finance and Trade Centre	Percentage of Population
			Industrial Development	Level of performance of Industrial Site
			GDP of the City	PKR/USD

Chapter 6: Aggregation and Weightage Methods for Indicator Analysis

For any system based on indicators, the weightage and aggregation associated to the indicators/indices influence the quality of the system and its validity. Here the different methods are discussed and the method of selection devised by Gan et. al. (2017) is explored for making a reasonable choice of weightage and aggregation for the indicators in the evaluation matrix. Other research in the literature present methods based on the data and the analyst including the work of Singh et. al. (2009) and Böhringer and Jochem (2007) among others. It must be noted that Gan et. al. (2017) use sustainability as the foundation of their research, but its application is possible in other realms of urban planning as well. Also, as master plans aim to promote sustainability in the city, the method is applicable in this research. Their research was well done with inclusion of a number of articles and research papers to list down the frequently used methods and their pros and cons.

6.1 Selection of Appropriate Weighting and Integration Method

The classification methods of these weighting and aggregation techniques are based on the one proposed by Nardo et al. (2005) and OECD (2008) as interpreted by Gan et. al. (2017). The nine weighing methods and the three aggregation methods commonly used for the indices are as follows:

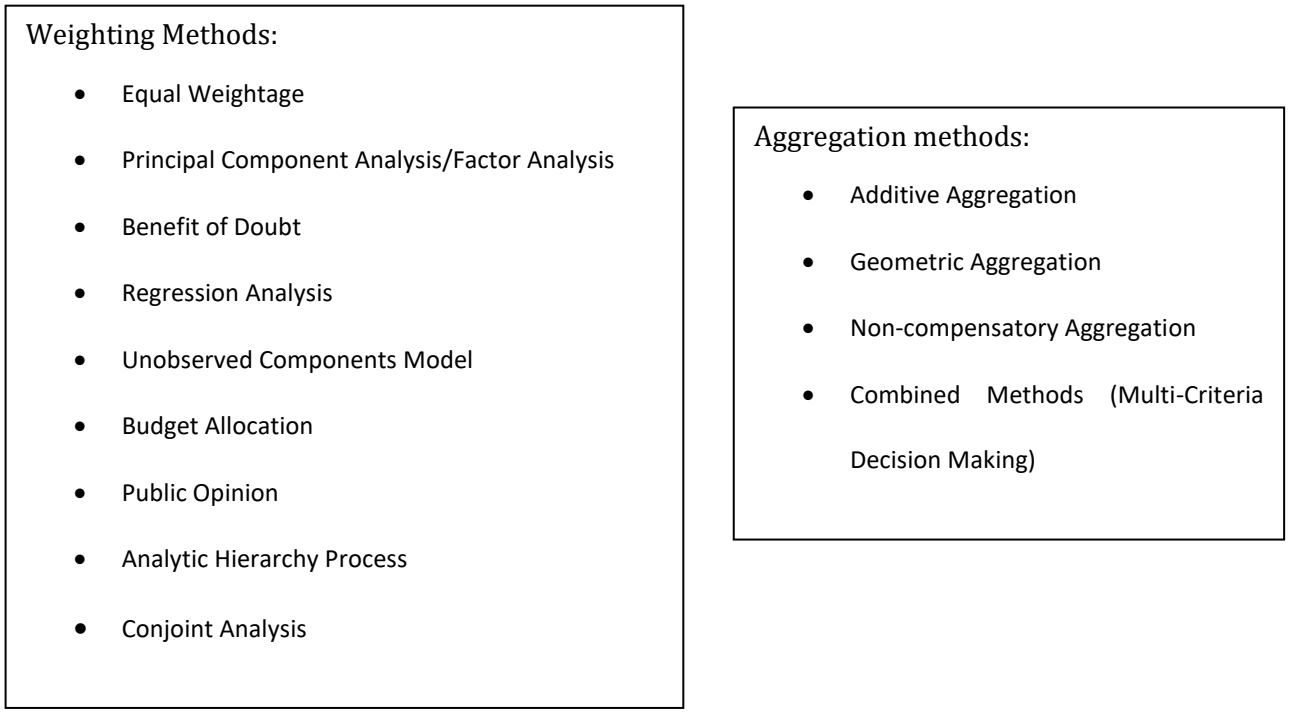


Figure 22: Weighting and Aggregation Methods (Gan et. al., 2017)

The Unobserved components method has been dropped from this discussion as it is a very complicated method and tries to identify and link unobserved components to deduce weights for the indicators. This method is hard to justify in the identification process and in the assignment of weights process and will complicate the process of this research as the data collection and interpretation will be way out of the scope.

The systematic method for making the choice of the weightage and aggregation methods as proposed by Gan et. al. (2017) is based on the purpose of the study/analysis, the time span of study, the scale of the study area and the perspective of sustainability. The last point of perspective of sustainability consists of the result of the choice made to study weak or strong sustainability. As our research does not focus on sustainability in that spirit, this step will be dropped from our selection process.

The main steps of the evaluation framework are selection of the appropriate method for evaluation (in our case themes), weighting of the themes and then making the final evaluation framework (aggregation) (Juwana et al., 2012).

The literature points to the difficulty in the evaluation process starting from the selection of the indicator methods often done by the use of the guidelines (Wu and Wu, 2012) given by indicator frameworks (most common of which is the pressure state response framework (OECD, 1993)) or the Bellagio Principles (Hardi and Zdan, 1997). The Bellegio Principal gets its name from Rockefeller Foundation's Study and Conference Center in Bellagio, Italy, where practitioners and researchers came together in 1996 to measure the progress of sustainable development. The result was a set of principles that were unanimously endorsed (Hardi and Zdan, 1997).

While the selection can be justified by the application of these methods, the weightage and aggregation methods are more subjective (Morse et al., 2001) and hence often difficult to justify to the audience. Therefore, the selection of the appropriate weightage and aggregation methods can propose a challenge (Wilson and Wu, 2017).

This research also differs from the conventional use of indices for sustainability as it does not merge the themes into a single sustainability index (Böhringer and Jochem, 2007) but will keep the individual scores for the themes and make interpretations based on these. Hence the problems of figuring out the contribution of each theme and finding trade-off values can be omitted.

6.2 Weighting and Aggregation methods

6.2.1 Weighting Methods

The main categories in which the weighting methods can be put are the from the simplest, equal weightage for all themes, to those based on the statistical characteristics of the values of the indicators and the ones based on the perspectives of the public and the professionals of the respective field.

Although simple, the equal weightage method can be the best option under certain circumstances such as when other methods are not applicable, or when the method needs to be reciprocated over a wider number of cases. However, the problems of validity and transparency are found when this method is used (Mikulić et al., 2015) as the method disregards the differences in the characteristics of the scenario where it is being applied, the stakeholder concerns etc. as all themes are given equal representation.

The statistics-based methods as the principal components analysis, benefit of doubt, regression and budget allocation, use the statistical characteristics of the indicator values for the weights. These include corelation and variance of the themes such as in the principal component analysis. The factors with high variance are retained while the ones with less information are dropped (Smith, 2002). Thus, one indicator represents each theme. While this method preserves most of the information (DeCoster, 1998) and is best used when dealing with a large set of indicators by removing over-weightage that might be caused in case equal weightage method is used (Yeheyis et al., 2013), the method lacks in representing indicators that lack statistical corelation (OECD, 2008). Hence the method is most suitable when a significant number of corelated indicators are present (Hermans et al., 2008).

The benefit of doubt method assigns weights to the themes according to their contribution in achieving the goal (Shwartz et al., 2009) which in our case is the performance of the urban master plan. The weights made using this method are ratio based derived from their relative position with respect to the benchmarks already established (Cherchye et al., 2007). This method provides for the chance of unfair assignment of weightage (Cherchye et al., 2007) but at the same time it can potentially derive multiple results and has incomparability and low transparency (Nardo et al., 2005; Shwartz et al., 2009).

The regression analysis works on the regression value of the variables of the indicators and looks for the degree of dependence (or independence) of one variable with respect to the other (Kleinbaum et al., 2013). The method can cater to a large set of indicators that have a tendency of being independent and the method is also used to update or verify already assigned weights in indicator systems (Nardo et al., 2005). The greatest drawback of this method is that it is based

on the lack of multiple collinearity of indicators. This is not the case when referring to themes of sustainability, hence the urban setting, as each has and is influenced by the other themes (Gan et.al., 2017). The greatest challenge if a system were to use this method would be the choice of the independent and the dependent variable. Hence, it is more suitable for the validation of a weighting method, rather than a weighting method itself (Gan et.al., 2017).

The next category is that based on the opinions, either of the experts or the public or both.

The budget allocation method (Saisana and Tarantola, 2002) asks the experts to allocate a budget or n value to the indicators in the system (Nardo et al., 2005; OECD, 2008). These values reflect the perceived importance of these indicators in achieving the goal. While this system is highly localised and can achieve results in a shorter period of time, the subjectivity of the values assigned cannot be ignored (Nardo et al., 2005). Therefore, the results of this method are highly subjective and may express the immediate need, political agendas or the cognitive stress of the professionals (Saisana and Tarantola, 2002) even if a large number of experts from various sectors are included (Gan et. al., 2017).

Similarly, the public opinion method asks the public to assign values according to their 'concerns' in achieving a certain goal (Van Haaster et al., 2017). The method is highly participative and methodologically transparent (Munda, 2004). Nonetheless, it lacks transferability as it is highly localised and gives significance to the concern of the public in a given time/place rather than the importance of the indicator (Nardo et al., 2005).

The analytic hierarchy process method is an amalgamation between the statistics-based methods and the public/expert opinion methods. This method suits best the current study in that it starts off with the setting of a goal or an objective (Gan et. al., 2017) (which in our case will be the implementation of IMPL 2021). The next step is the identification of the different factors that help/hinder the achievement of this goal and indicators are used to measure these factors (Gan et. al., 2017) (called themes in this research). All the selected indicators are assigned values from 1-9 (9-1) in each theme with 9 being the most important by the experts (Saaty, 1990, 2008) (or various sectors). Hence the experts dictate what is more important and by what degree. The next

step involves the statistical method of pairwise comparison using matrices and eigenvalue method. The method also solves the problems of inconsistencies caused by skewed judgements of experts (Krajnc and Glavič, 2005) by using the consistency ratio (Nardo et al., 2005). This system is simple and flexible, gives consistent feedback for monitoring and hence decision making (Ho et al., 2010), can be used for both qualitative and quantitative data and as it follows the structure of a framework it is comprehendible by various stakeholders (Hermans et al., 2008). Further points that justify the use of this method for this research are enumerated later in the document.

Lastly, conjoint analysis is discussed. It is also a method that combines the statistical methods with the other data analysis methods. The technique further uses the decomposition technique by first asking the respondents for a greater or overall scenario and asks them to make a choice for the better case (Wind and Green, 2013). The indicators are then introduced based on their preferences and the opinions collected. This method requires a large number of preference response from a sample with a high degree of variance and the weight estimation method is rather complicated (Gan et. al., 2017).

6.2.2 Aggregation Methods

The next step is the calculation of global weight of each theme based on their locally assigned weights. The different weights of each respondent are aggregated to give global weight to the theme. Once again different methods exist and are classified. These are based on the semantics (Beliakov et al., 2007) and the degree of compensation (OECD, 2008). Gan et. al. (2017), explore the degree of compensation classification as it poses greater challenges in integration (Wilson and Wu, 2017) and is also more widely used. Therefore, we have additive aggregation, multiplicative aggregation and non-compensatory aggregation methods.

Additive aggregation is the most common method employed for indicator system aggregation. Of this the weighted arithmetic mean is put to the most use. This method falls short on the assumption that indicators are independent and no relationship, positive or negative exists between the indicators (Nardo et al., 2005). Secondly, the arithmetic nature implies that the

values are based on compensatory logic rather than importance. Hence the use of arithmetic aggregation is limited if there exists relationship between indicators (Gan et. al., 2017).

As the name suggests, instead of additive formulas, the geometric aggregation uses multiplicative functions and hence the most used is the weighted geometric mean (Gan et. al., 2017). This method is limited in compensability as indicators with lower scores will have lower representation in the index and vice versa (Beliakov et al., 2007). The method is only partially non-compensatory as this is also based on the independence of indicators (OECD, 2008).

The non-compensatory methods do not allow for substitution between the indicators. This method produces ranks based on the preference of the decision maker (Munda and Nardo, 2005). There are two ways to achieve this. The first is the comparison of the indicators in pairs or the ranks are made using a ranking matrix established beforehand (Munda and Nardo, 2005).

The output is not a single value rather a ranking that reflects the value of each theme and there is no limitation to the type of data can be used hence it reflects both qualitative and quantitative data (Gan et. al., 2017).

6.3 Selection of Weighting and Aggregation Methods for Urban Master Plan Evaluation

The process oriented approach for the selection of the weighting and aggregation method for the evaluation matrix for urban master plans as given by Gan et. al. (2017) focuses on the purpose, scale and the sustainability perspective. As mentioned earlier, this research does not focus on sustianability and therefore will not be taking into account the weak and strong sustainability aspects of method selection. The other aspect of purpose and scale will help in the selection process only. The adapted process oriented approach is explained in the figure later in the document.

With respect to the purpose of the research, Gan et. al. (2017) suggest two types, the assessment of a state (or prediction) and comparison. This research will choose comparison as the purpose

is to how well the IMPL 2021 performed by assessing the parameters of the themes with the use of the developed indicator framework.

Another important factor worth mentioning here is that Gan et. al. (2017) do not elaborate on the extent of spatial and temporal scales that are used when selecting the methods. Only terms and 'coarse' and 'fine' are used for spatial scale and 'short timescales' and 'long timescales' are used for temporal scales. Hence, as this study is based on one master plan of one city, the spatial scale is said to be fine, and as the master plan spans over a period of 20 years, the temporal scale is said to be long. The selection will be based on these parameters of the study.

After finalising the above mentioned aspects of the study that will influence the selection process of weighting and aggregation methods, the choice is made on elimination process. Gan et. al. (2017) categorises the methods as; recommended, okay to use or not to use, given the situation of the factors. Hence this study will prioritise the recommended methods followed by the okay to use methods. In the final step, based on the other characteristics of the research in terms of data availability, data collection method and the purpose of the research, only one method will be selected.

Table 10: Process Oriented Weighting Method Selection Matrix (Adopted from Gan et. al., 2017)

Weighting Method	Aim of Evaluation		Spatial Scale		Temporal Scale	
	State Assessment/ Prediction	Comparison	Coarse	Fine	Short	Long
Equal Weights	Recommended	Okay	Recommended	Recommended	Recommended	Recommended
Principal Component Analysis	Recommended	Okay	Recommended	Okay	Okay	Recommended
Benefit of Doubt	Recommended	Not-Recommended	Recommended	Okay	Okay	Recommended
Regression Analysis	Recommended	Okay	Recommended	Okay	Okay	Recommended
Budget Allocation	Recommended	Okay	Not-Recommended	Recommended	Recommended	Recommended
Public Opinion	Recommended	Okay	Not-Recommended	Recommended	Recommended	Recommended
Analytic Heirarchy Process	Recommended	Okay	Not-Recommended	Recommended	Recommended	Recommended
Conjoint Analysis	Recommended	Okay	Not-Recommended	Recommended	Recommended	Recommended

The result from the above table and based on elimination method, the first weighting method to be dropped is the Benefit of Doubt method as it is not recommended when the research is based on comparison and is only okay to use for a fine sptial scale. The second and third methods to be dropped are the principal component analysis and the regressin analysis as these are only okay to use and not recommended for our current study that is a comparison and is fine in spatial scale.

Therefore, the only choices left are the Equal Weights, Budget Allocation, Public Opinion, Analytic Heirarchy Process and the Conjoint Analysis methods.

The pros and cons of these methods were studied once again in the light of the characteristics and purpose of this research. It was deduced that the equal weights method fulfilled all the criteria used for the method selection. The budget allocation and analytic heirarchy process both follow the same pattern of using the knowledge of the experts in assigning a budget and a 1-9 value. However, the analytic heirarchy process method gives a more detailed approach as to how to use these values for calculation of wieghts. In addtion to this, the analytic heirarchy process method also statistically removes the over judgement of the experts using the inconsistency index. Therefore, the budget allocation method is dropped in favor of the the analyrtic heirarchy process method.

Studying the aspects of the public opinion method brought forward certain drawbacks such as the method focuses on the concerns of the population rather than the importance of the indicators. As mentioned earlier, this method is highly participative, and hence subjective. One of the reasons of the choice of indicators for this evaluation is their ease of raplication. The use of this method reduces its application in other cases. This fact has reduced the usage of this method for our evaluation and hence this method will be dropped from this sudy.

Conjoint analysis has been dropped because of its need of a large number of and highly variant respondents. The method is difficult to execute due to the scenario identification process, the preference collection process and the weightage estimation process. Given the current nature of

the research, a large number of respondents will not be possible due the time and monetary limitations.

Concluding the discussion, the analytic hierarchy method is the most appropriate for this research based on the purpose oriented method proposed by Gan et. al. (2017) and in the light of the purpose and characteristics of this evaluation.

The aggregation method selection is done on the same criteria. The Gan et. al. (2017) process oriented method is explained below.

Table 11: Process Oriented Aggregation Method Selection Matrix (Adopted from Gan et. al., 2017)

Aggregation Method	**Aim of Evaluation**		**Spatial Scale**		**Temporal Scale**	
	State Assessment/ Prediction	**Comparison**	**Coarse**	**Fine**	**Short**	**Long**
Additive Aggregation	Recommended	Okay	Recommended	Recommended	Recommended	Recommended
Multiplicative Aggregation	Recommended	Okay	Recommended	Recommended	Recommended	Recommended
Non-compensatory Aggregation	Recommended	Okay	Recommended	Recommended	Recommended	Recommended

The result from the above table shows that all the methods are equally qualified to be applied in our scenario. Therefore, the other aspects of the research are brought to light and the methods are re-evaluated. This process discovers that as we are following the compensatory approach where we assume that the performance of the master plan will be judged according to its performance in respective themes. If a higher weightage theme has better scores, the overall performance of the master plan will improve significantly. This means that the over-achievement in one theme can be used as a compensation for under-achievement in another less important theme. Hence, this it is concluded that compensatory aggregation method is the best choice for our research.

6.4 Assigning Weights to the Themes of the Indicator System: The application of AHP

The multi -criteria decision making (MCDM) analysis assigns relative importance or weights to the criteria which is represented as their weight in the system. In this research we will calculate the weight of the developed themes and see the performance of the IMPL 2021 with respect to each theme. The assignment of weights will give a clearer picture as we can see if a relatively important theme is performing poor (in which case the performance of IMPL 2021 will go down significantly) or well (in which case the performance will increase even if the other themes have faced poor scores).

The global shift towards more democratic and inclusive decision making is highlighting the importance of decisions to be made by multiple actors and not single bodies or individual decision makers. Similar approach is also applied by organisations, which believe that a decision derived from collective knowledge and expertise is assumed to be more objective and informed compared to individuals due to the negative cognitive restrictions (Ossadnik et. al. 2016). Therefore, there are many advantages to multiple decision makers include the reduction of negative cognitive restrictions, diversified approaches, lesser mistakes, richer experience and information and even a greater acceptance of the proposed results (Sims 2002; Kreitner and Cassidy 2011).

However, like all concepts, group decision making is not free from its drawbacks. There are present chances of domination and/or a stereotype of the majority (Kreitner and Cassidy 2011). To avoid this from occurring a systematic group decision supports have emerged to help in reaching ideal solutions.

Under this pretence, this research has chosen the use of Analytic Hierarchy Process (AHP) for the assignment of weights to the developed themes for the assessment of a master plan.

The Analytic Hierarchy Process (AHP) (Saaty 1980; Saaty and Vargas 2001) has gained interest in the scientific literature across fields mainly due to its ability to give quantitative dimension to qualitative data. The process is well suited to handle both qualitative and quantitative data simultaneously. The process has been so widely used for allocation of weights/significance to criteria that there is sufficient software support available to execute the tiring calculations associated with the analysis (Ossadnik et. al. 2016). The process also has a compensatory approach which makes it suitable for studies such as this one as subjects are diverse and so can their values be. This factor is taken care of by AHP. Moreover, the results derived from AHP are closer to the reality as the input is from real world experts and multiple actors are involved (Ossadnik et. al. 2016; Alphonce, 1997 and Okada et. al. 2008). This also makes the results more acceptable by the group at large. Furthermore, the process also gives an idea about the degree of difference assigned to the themes or criteria. This can also help in making sound judgements.

However, the process is not free from its fair share of issues. The problems arise when the issue at hand has high complexity. Higher the number of variables to be compared, the task of conducting AHP becomes time consuming and tiring. Another issue is related to this that as the problem becomes complex, the associated group of experts also becomes complex. This means that the consistency in the data collected is hard to achieve (Alphonce, 1997). The same can be said about the effort needed to put together a wholesome list of criteria or themes for presentation to the experts. The method of data collected can also lead to inconsistencies in the analysis as it has a unique format and the respondent needs clear guidance to give weights as accurately as possible (Okada et. al. 2008). Due to the subjective nature of the process, the literature points to a lack of systemisation and assessment of the process (Ossadnik et. al. 2016).

Therefore, it can be concluded that AHP is a simple to use and flexible statistical method that can efficiently convert qualitative data into quantitative data for making decisions or further study (Saaty, 1977). A complex problem is made hierarchical in the application of AHP making it much more systematic and easier to solve. It has been recommended to be applied for performance assessment as it provides with a deeper analysis of the system (Elshaikh et. al. 2018).

6.4.1 Technical aspects of AHP method

As has been explained before, AHP works by first arranging the problem into a hierarchy, conducting pair-wise comparison of each aspect (theme) on a judgement scale, converting the subjective judgements to quantitative data as a priority matrix, and using Eigenvector method to calculate the respective weights of the themes (Saaty, 1980). The method also applies a consistency check for each response for validating the results and finally the consistent responses are aggregated to measure the global weights of the criteria (themes) for further study (Triantaphyllou and Mann, 1995). The detailed step by step process with equations used is described below with help of an example taken from one of the responses collected for this research.

6.4.1.1 Structuring the Target Problem in a Hierarchy

The problem at hand is broadened into sub-issues or criteria. A typical AHP process will have a hierarchy of issues or solutions. At the lowest level of the hierarchy chart in a typical AHP are the alternatives. In this research we have already identified the problem of the lack of evaluation of urban master plans in developing countries such as Pakistan. The evaluation has then been divided into the respective analysis of the performance of the master plan with respect to the themes as identified by the combined study of the literature, the case study IMPL 2021 and the planning system of the case study. These themes are the sub-criteria or issue with respect to this research.

A slight adaptation made to the conventional AHP is that there will be no selection of one alternative made at the end. The weights will be assigned to each theme and from there the

study takes on a different approach and measures the performance of the IMPL in line with the data collected against the indicator framework.

6.4.1.2 Developing the Judgement Matrix

In the next step a judgement matrix is developed. Using Saaty's table of judgement a pair-wise comparison is done between each of the themes. This step allows for the experts to focus on one theme at a time with respect to the other themes. The table of judgement used is as shown below (Saaty, 1980; Saaty, 1990 and Adamovic et. al. 2008):

Importance Scale	Definition of Importance Scale
1	Equally Important Preferred
2	Equally to Moderately Important Preferred
3	Moderately Important Preferred
4	Moderately to Strongly Important Preferred
5	Strongly Important Preferred
6	Strongly to Very Strongly Important Preferred
7	Very Strongly Important Preferred
8	Very Strongly to Extremely Important Preferred
9	Extremely Important Preferred

Using this table, the judgement matrix was developed for comparing all the. A total of 9 similar matrix were made. As an example, the first matrix is shown below:

Table 12: Example of Judgement Matrix (Source: Author)

	Extremely Important	Very Strongly to Extremely Important	**Very Strongly Important**	Strongly to Very Strongly Important	**Strongly Important**	Moderately to Strongly Important	**Moderately Important**	Equally to Moderately Important	**Equally Important**	Equally to Moderately Important	**Moderately Important**	Moderately to Strongly Important	**Strongly Important**	Strongly to Very Strongly Important	**Very Strongly Important**	Very Strongly to Extremely Important	**Extremely Important**	
Law and Administration	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Disaster Mitigation and Prevention
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Land Use
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Density
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Services
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Transportation
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Housing
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Social Welfare
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Environment
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Economy

This was then circulated among carefully selected group of experts for collecting their opinions regarding the themes in the context of master plan evaluations. The responses collected are what is the empirical data for this research.

6.4.1.3 Developing the Pair-wise Comparison Matrix or Priority Matrix

Once the response is received from an expert, data is converted into a comparison or priority matrix. From here on, all the steps will have to be performed for each response individually and the results will only be combined at the end of the AHP analysis.

An example of the comparison matrix (A) developed using one of the response collected (R2) is shown below:

Table 13: Example of Comparison Matrix (A) (Author)

Comparison Matrix (A)	Law and Administration	Mitigation and Prevention	Land Use	Urban Density	Urban Services	Transportation	Housing	Social Welfare	Urban Environment	Urban Economy
Law and Administration	1	2	2	2	1	2	1/4	1/3	1/2	1/2
Disaster Mitigation and Prevention	1/2	1	1	1	1/5	1/2	1/3	1/3	1/6	1/8
Land Use	1/2	1	1	1/2	1/5	1/2	1/5	1/5	1/5	1/4
Urban Density	1/2	1	2	1	1/4	1	1/5	1/6	1/3	1/3
Urban Services	1	5	5	4	1	1	1/5	1/5	1/6	1/5
Transportation	1/2	2	2	1	1	1	1/6	1/6	1/7	1/7
Housing	4	3	5	5	5	6	1	1/3	1/4	1/3
Social Welfare	3	3	5	6	5	6	3	1	1/3	1/2
Urban Environment	2	6	5	3	6	7	4	3	1	1/2
Urban Economy	2	8	4	3	5	7	3	2	2	1
Sum	15	32	32	26 1/2	24 2/3	32	12 1/3	7 3/4	5	3 7/8

The table can be explained as having a diagonal of the number 1 which shows that when compared to the same theme, none is more important than the other. This is a rational decision and is explained in the table with the help of numbers. Focusing on the numbers above the diagonal of 1s, it is seen that some of the numbers are whole while others are fractions. This is because of the importance given to one theme over the other. For example, the 2 comparing Law and Administration and Mitigation and Prevention of Disasters indicates that the Mitigation and Prevention of Disasters theme is more important than Law and Administration theme and the extent is *Equally to Moderately Important* as shown by the table of Saaty (1980). Similarly, an inverse, such as the one at Landuse and Housing show that the Housing theme is important *Strongly Important* to the Landuse theme. The values below the diagonal of 1s are just the reciprocals of the values above the diagonal. This process results in the development of the Comparison Matrix (A).

6.4.1.4 Computing Local Weights

Through the use of a series of equations, the above table is used to calculate the local weights of the themes for each response. These are explained in the following diagram:

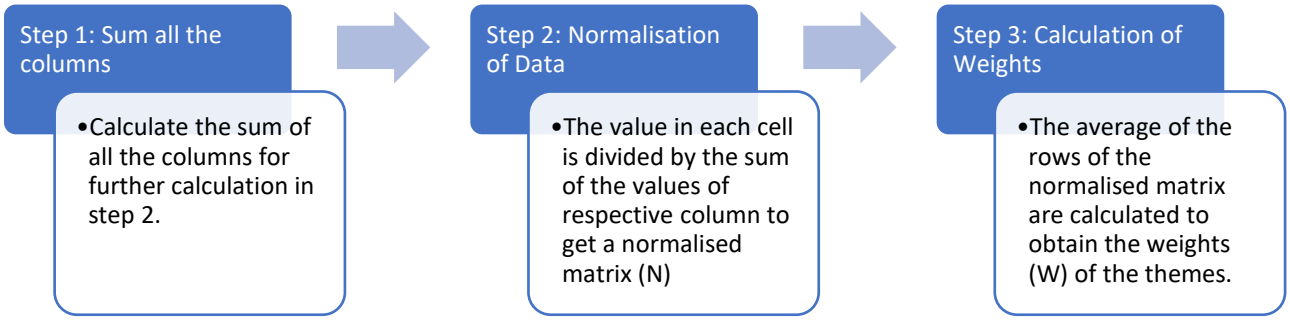


Figure 23: The stepwise process of calculation of Weights (W) (Author)

The example (taken from R3) of these steps are shown in the table below:

Normalised Matrix (N)	Law and Administration	Disaster Mitigation and Prevention	Land Use	Urban Density	Urban Services	Transportation	Housing	Social Welfare	Urban Environment	Urban Economy	Weight (Average) (W)
Law and Administration	0.07	0.06	0.06	0.08	0.04	0.06	0.02	0.04	0.10	0.13	0.07
Disaster Mitigation and Prevention	0.03	0.03	0.03	0.04	0.01	0.02	0.03	0.04	0.03	0.03	0.03
Land Use	0.03	0.03	0.03	0.02	0.01	0.02	0.02	0.03	0.04	0.06	0.03
Urban Density	0.03	0.03	0.06	0.04	0.01	0.03	0.02	0.02	0.06	0.09	0.04
Urban Services	0.07	0.16	0.16	0.15	0.04	0.03	0.02	0.03	0.03	0.05	0.07
Transportation	0.03	0.06	0.06	0.04	0.04	0.03	0.01	0.02	0.03	0.04	0.04
Housing	0.27	0.09	0.16	0.19	0.20	0.19	0.08	0.04	0.05	0.09	0.14
Social Welfare	0.20	0.09	0.16	0.23	0.20	0.19	0.24	0.13	0.06	0.13	0.16
Urban Environment	0.13	0.19	0.16	0.11	0.24	0.22	0.32	0.39	0.20	0.13	0.21
Urban Economy	0.13	0.25	0.13	0.11	0.20	0.22	0.24	0.26	0.39	0.26	0.22

Weights Calculated by taking the average of the rows for each theme

Normalised Matrix Obtained by dividing each value with the sum of the column of the respective value.

Figure 24: Example of calculation of Weights (W) (Author)

6.4.1.5 Running Consistency Check

A consistency check is to be applied at this moment to verify that the judgements of the experts were consistent or not. This is based on the fact that the comparison matrix has the rank of 1. This mean that its rows are multiples of the preceding row and its columns are multiples of the preceding column. Another way to check for consistency is that the sum of the weights calculated should be equal to 1. The final and statistical way of making consistency check is that provided by Saaty (1977) and using the following equation for the consistency Index (CI or μ):

$$\mu = \frac{\lambda_{max} - N}{N - 1}$$

Here λ_{max} is calculated by first calculating an AW matrix. As the name suggests, it is obtained by multiplying the Comparison Matrix (A) with the Weights (W). When this matrix (AW) is divided by W, we get the values for λ. λ_{max} is the average of these values as shown in the table below:

Now going back to the equation, the CI or μ is calculated by using this value of λ_{max} and N. N is the number of variables or themes in this case. N is equal to 10. The value is 0.83945814.

Table 14: Example of calculation of □max (Author)

AW Matrix	**λ**
0.708479602	52.34833459
0.323428409	2.242889535
0.299694492	9.693735361
0.409712056	14.74635156
0.760450299	16.72713796
0.408006193	6.883660263
1.589937595	4.687100871
1.997547864	13.93423575
2.612141381	23.02837603
2.589153626	31.25941068
Average of λ (λ_{max})	17.55512326

In general, the comparison matrix, A, will not be consistent. Despite the researcher's best effort to explain the matrix and its working and the expert's best effort to give consistent comparisons, the rows and columns do not differ from each other by multiplication function. This may also be due to the importance scale of 9-1 for each preference and the expert's relative importance of one theme over the other. To cater to this lapse of judgement, Saaty (1988) developed the table of Random Index. This table gives a value that corresponds to the number of variables being used. The table is shown below:

Table 15: Saaty's Table of Random Index (Saaty, 1988)

n	1	2	3	4	5	6	7	8	9	10	11	12	13
Random Index	0	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.58	1.56

The Consistency Ratio (CR) is calculated by CI/RI for the respective value of N. For the example stated above, this value is 0.83945814/1.49 = 0.563394725.

Ideally, the value of CR should be equal or less than 0.1 for a matrix to be consistent. However, as mentioned before, such consistency is hard to achieve with the given number of themes and the different opinions of the experts. Therefore, this problem is tackled in the next section.

6.4.1.6 Iterations for Inconsistent Data for Ensuring Consistency

Small changes in the matrix values can produce small differences in the eigenvalue of the matrix (Klein, 2019). Ishizaka and Lusti (2006) talk about a method of the mean of normalised values which provides a derivation of a consistent matrix. The discussion goes as if A was consistent, then all the columns will be eigenvectors. Therefore, each column is treated individually for the eigenvector of matrix W. It is assumed that the errors have a mean value of 0 and the average of the rows is calculated to reduce the error of approximation. These values are then used to

compute AW and λ_{max} and μ (CI). The process is repeated until the acceptable value of CR (that is equal to or less than 0.1) is obtained.

Thankfully, there are many AHP calculator software and online spreadsheets available that compute the iterations using these formulas, so the researcher does not have to manually perform them (Klein, 2019). This is how the research will continue. Though there was no fixed number of ideal iterations found in the literature, this research has taken it to be 7. The responses that do not become consistent even after 7 iterations will be deemed unfit and discarded from this research.

6.4.1.7 Calculating Global Weights

After all the responses are made consistent, the final comparison matrix is made using the geometric mean of the individual A matrices. The same calculations are made on this final matrix to calculate the global weights of the themes using AHP.

Chapter 7: Data Analysis and Analytic Hierarchy Process Outcome

As the name suggests, this chapter talks about the data analysis of the responses to the questionnaire collected. The chapter is divided into two different type of data analysis discussed in respective sections. The chapter also included the software used for the conduction of this analysis with justification of their use over other available options.

A total of 25 experts were consulted for this research. There were a mix of professionals with different expertise and working environments. Most of them were urban planners working in different fields such as academics (5), government organisations (LDA) (5) or other such as solid waste management, transport, environment and housing. These experts work in various positions and in various organisations such as land development companies or planning consultancies. An architect and a civil engineer were also included in the list of respondents. Despite their differences, all the experts included for this research have an experience of the case study area through profession and personal observations. The chart below displays the variety of the respondents for this research:

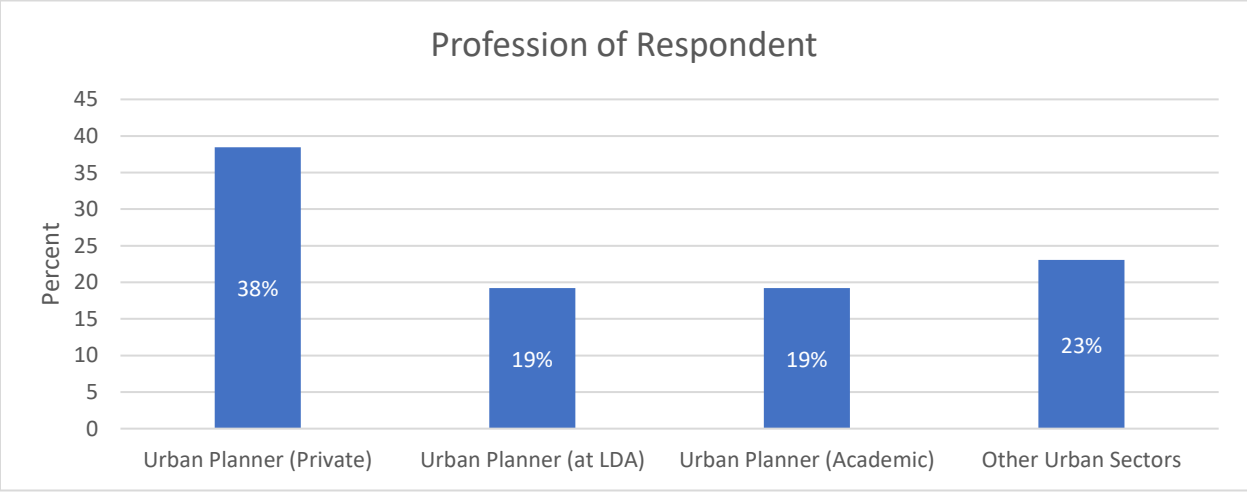


Figure 25: The number of respondents from different professions. (Source: Author)

The responses in all the above 25 questionnaires other than the pair-wise comparisons have been included to deduce meaningful insights into the niche, importance and acceptance of plan evaluations

across the planning realm of the case study. This chapter displays and discusses this data analysis first before the results of AHP analysis.

As explained in the previous chapter, the AHP analysis requires the conversion of subjective judgements into numerical output and for this an acceptable level of consistency is required for the results to be valid. Moreover, the results of AHP are as good as the clarity in the completion of the survey form. Despite the best efforts of the researcher and the respondent, 2 of the responses were incorrectly filled and had to be removed from the analysis.

The next rejection of responses was due to the high percentage of inconsistency in the pair-wise comparison. A total of 8 responses were dropped due to this issue and the bar for selection was set at less than 40% of inconsistency. This was set because it was observed that if the inconsistency was higher than 40%, the iterations of the responses was high (more than 4) and required change of the judgement matrix by a great degree. This means that the resulting judgement matrix was very different from the one first submitted. As this may come across as incorrect assumption and distortion of data, these 8 responses have been removed from further analysis. This still leaves us with 15 satisfactory responses, which is believed to be a good enough sample for the conduction of AHP analysis.

7.1 Analysis of Descriptive Responses and Interpretations

7.1.1 Statistical Package for Social Sciences (SPSS) Tool for Descriptive Data Analysis

A number of statistical tools and software have been developed to help in carrying out statistical calculations for different purposes. Some of the examples include:

1. Minitab
2. STATA
3. Statistical Package for Social Sciences (SPSS)
4. SAS
5. SEM-Smart PLS
6. SEM-AMOS and
7. R-Programming to name a few.

In this research the SPSS has been used for the analysis of the data collected.

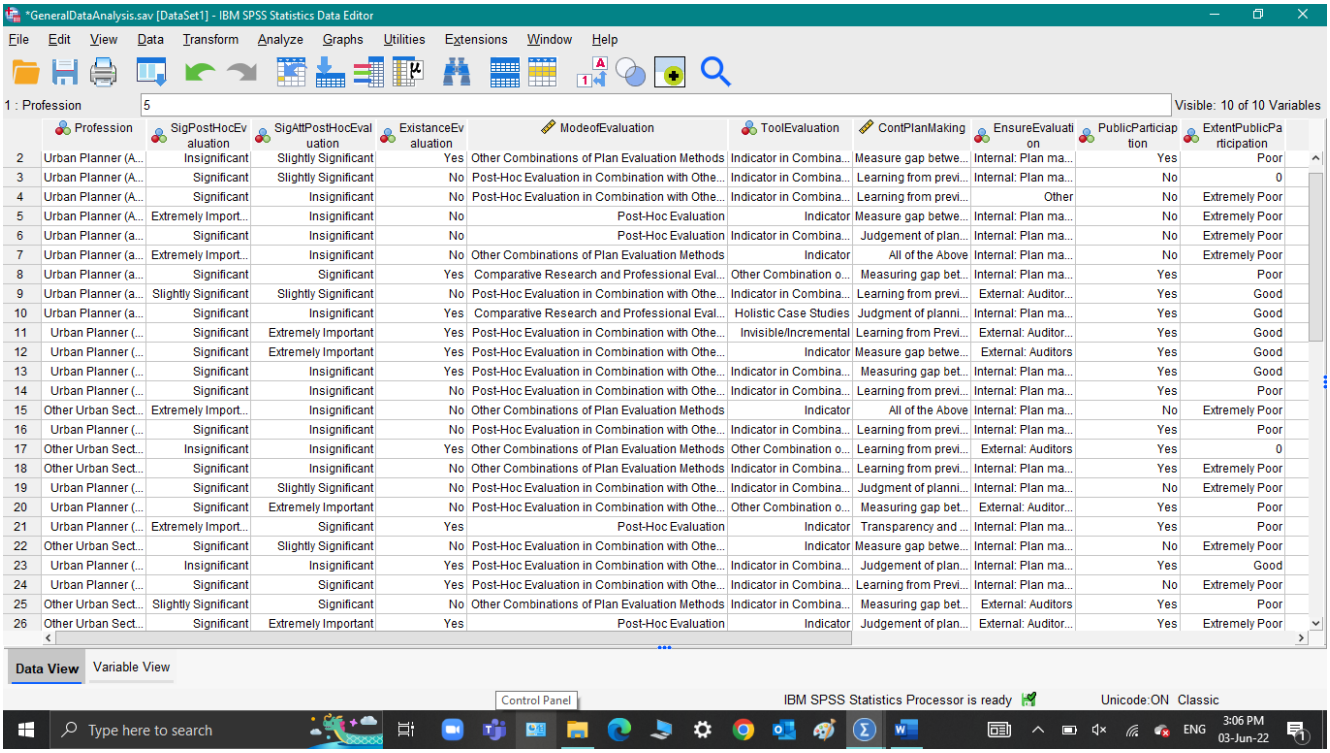
SPSS is one of the most widely used tool by social researchers and academics worldwide (Greasley, 2007; Nie et. al. 1975 and Ong & Puteh, 2017). It has been observed to be very user friendly and a number of statistical test can be easily carried out using this tool including comparisons and correlation statistical tests using univariate or multivariate analysis.

In their research that guides researchers to choose between the available tools for statistical analysis, Ong and Puteh (2017) have developed a summary of the common scenarios (types of statistical approach) used in social research and the respective tool that supports it best. 11 out of the 13 scenarios mentioned have SPSS as the most optimum choice. As we will be using descriptive statistics and cross tables for data visualisation, SPSS is the most appropriate choice and hence used.

7.1.1.1 Working in SPSS

SPSS window, when opened, shows two '*views*', the data view and the variable view. The data view shows the data in a spreadsheet format with rows and columns. The values shown here under the columns are the responses of the parameters used. Each row constitutes a single case or responses to the questions in one questionnaire.

The image below shows the responses added for the first 10 questions for the 26 questionnaires conducted.



	Profession	SigPostHocEvaluation	SigAttPostHocEvaluation	ExistanceEvaluation	ModeofEvaluation	ToolEvaluation	ContPlanMaking	EnsureEvaluation	PublicParticipation	ExtentPublicParticipation
2	Urban Planner (A...	Insignificant	Slightly Significant	Yes	Other Combinations of Plan Evaluation Methods	Indicator in Combina...	Measure gap betwe...	Internal: Plan ma...	Yes	Poor
3	Urban Planner (A...	Significant	Slightly Significant	No	Post-Hoc Evaluation in Combination with Othe...	Indicator in Combina...	Learning from previ...	Internal: Plan ma...	No	0
4	Urban Planner (A...	Significant	Insignificant	No	Post-Hoc Evaluation in Combination with Othe...	Indicator in Combina...	Learning from previ...	Other	No	Extremely Poor
5	Urban Planner (A...	Extremely Import...	Insignificant	No	Post-Hoc Evaluation	Indicator	Measure gap betwe...	Internal: Plan ma...	No	Extremely Poor
6	Urban Planner (a...	Significant	Insignificant	No	Post-Hoc Evaluation	Indicator in Combina...	Judgement of plan...	Internal: Plan ma...	No	Extremely Poor
7	Urban Planner (a...	Extremely Import...	Insignificant	No	Other Combinations of Plan Evaluation Methods	Indicator	All of the Above	Internal: Plan ma...	No	Extremely Poor
8	Urban Planner (a...	Significant	Significant	Yes	Comparative Research and Professional Eval...	Other Combination o...	Measuring gap bet...	Internal: Plan ma...	Yes	Poor
9	Urban Planner (a...	Slightly Significant	Slightly Significant	No	Post-Hoc Evaluation in Combination with Othe...	Indicator in Combina...	Learning from previ...	External: Auditor...	Yes	Good
10	Urban Planner (a...	Significant	Insignificant	Yes	Comparative Research and Professional Eval...	Holistic Case Studies	Judgment of planni...	Internal: Plan ma...	Yes	Good
11	Urban Planner (...	Significant	Extremely Important	Yes	Post-Hoc Evaluation in Combination with Othe...	Invisible/Incremental	Learning from Previ...	External: Auditor...	Yes	Good
12	Urban Planner (...	Significant	Extremely Important	Yes	Post-Hoc Evaluation in Combination with Othe...	Indicator	Measure gap betwe...	External: Auditors	Yes	Good
13	Urban Planner (...	Significant	Insignificant	Yes	Post-Hoc Evaluation in Combination with Othe...	Indicator in Combina...	Measuring gap bet...	Internal: Plan ma...	Yes	Good
14	Urban Planner (...	Significant	Insignificant	No	Post-Hoc Evaluation in Combination with Othe...	Indicator in Combina...	Learning from previ...	Internal: Plan ma...	Yes	Poor
15	Other Urban Sect...	Extremely Import...	Insignificant	No	Other Combinations of Plan Evaluation Methods	Indicator	All of the Above	Internal: Plan ma...	No	Extremely Poor
16	Urban Planner (...	Significant	Insignificant	No	Post-Hoc Evaluation in Combination with Othe...	Indicator in Combina...	Learning from previ...	Internal: Plan ma...	Yes	Poor
17	Other Urban Sect...	Insignificant	Insignificant	Yes	Other Combinations of Plan Evaluation Methods	Other Combination o...	Learning from previ...	External: Auditors	Yes	0
18	Other Urban Sect...	Significant	Insignificant	No	Other Combinations of Plan Evaluation Methods	Indicator in Combina...	Learning from previ...	Internal: Plan ma...	Yes	Extremely Poor
19	Urban Planner (...	Significant	Slightly Significant	No	Post-Hoc Evaluation in Combination with Othe...	Indicator in Combina...	Judgment of planni...	Internal: Plan ma...	No	Extremely Poor
20	Urban Planner (...	Significant	Extremely Important	No	Post-Hoc Evaluation in Combination with Othe...	Other Combination o...	Measuring gap bet...	External: Auditor...	Yes	Poor
21	Urban Planner (...	Extremely Import...	Significant	Yes	Post-Hoc Evaluation	Indicator	Transparency and ...	Internal: Plan ma...	Yes	Poor
22	Other Urban Sect...	Significant	Slightly Significant	No	Post-Hoc Evaluation in Combination with Othe...	Indicator	Measure gap betwe...	Internal: Plan ma...	No	Extremely Poor
23	Urban Planner (...	Insignificant	Insignificant	Yes	Post-Hoc Evaluation in Combination with Othe...	Indicator in Combina...	Judgement of plan...	Internal: Plan ma...	Yes	Good
24	Urban Planner (...	Significant	Significant	Yes	Post-Hoc Evaluation in Combination with Othe...	Indicator in Combina...	Learning from Previ...	Internal: Plan ma...	No	Extremely Poor
25	Other Urban Sect...	Slightly Significant	Significant	No	Other Combinations of Plan Evaluation Methods	Indicator in Combina...	Measuring gap bet...	External: Auditors	Yes	Poor
26	Other Urban Sect...	Significant	Extremely Important	Yes	Post-Hoc Evaluation	Indicator	Judgement of plan...	External: Auditor...	Yes	Extremely Poor

Figure 26: Screenshot of data entered in SPSS. (Source: Author)

The Variable view is the tab where the actual work of data entry is done in SPSS. Here all the parameters (questions) are described as variables. For example, as we have 'The Profession of the Respondent' as the first question, it will be described as variable 1. All the attributes of this variable need to be put in in this tab. These include the variable type (string, numeric etc), the decimal places, the length, the label (how it should appear in tables and graphs), values, missing values, measure and role.

The development of the list of values is important. These require the allotment of a number to the descriptive answers given by the respondents, or the options available for multiple choice questions. The presence of data before the development of the list of values is suggested as an overview of the data is available and the list can be prepared accordingly to represent all the responses.

As an example, the image below shows the values assigned for question number 6 of the questionnaire:

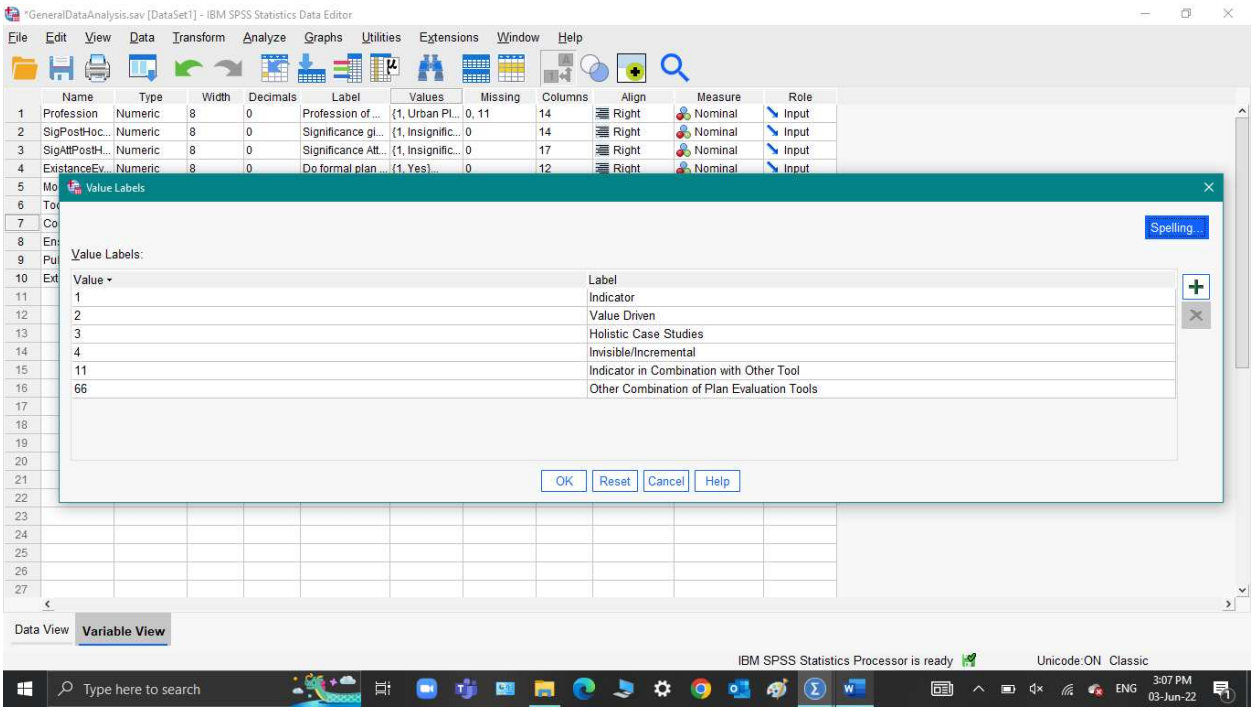


Figure 27: Values assigned for question number 6 of the questionnaire. (Source: Author)

Following this pattern for all the 10 questions, the variable values are developed. The data is then entered in the data view tab of the SPSS and the further statistical computations are made.

7.1.2 Findings from the Data Analysis

7.1.2.1 Descriptive Analysis of Frequencies

This part of the data analysis does not involve any type of statistical formulas and calculations and just displays the parameters of the questions asked in the questionnaire in terms of their frequencies. These are discussed in the order of their occurrence in the questionnaire.

Significance given by respondent to Post-Hoc Plan Evaluation

The second question asked from the respondents after their profession was how much significance they attribute to post-hoc plan evaluation. As the table shows, over 60% of the respondents have given it significant importance and around 15% think that it is extremely important for the planning system.

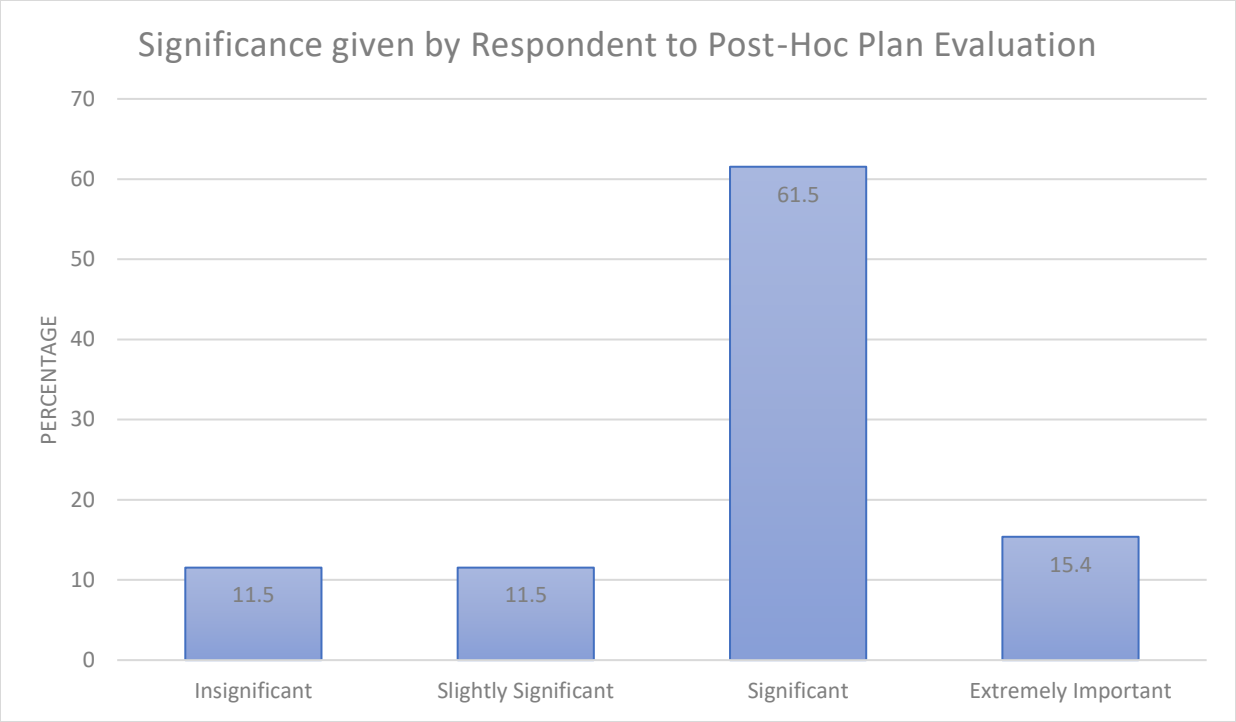


Figure 28: Significance given by Respondent to Post-Hoc Plan Evaluation. (Source: Author)

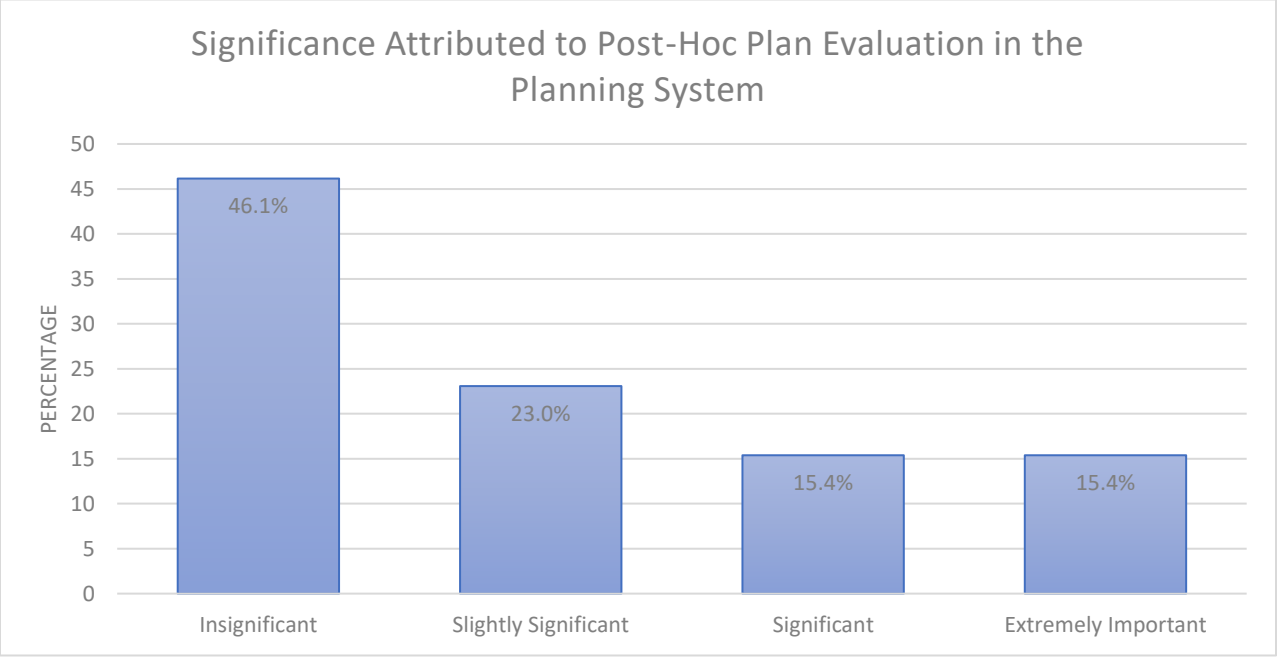


Figure 29: Significance Attributed to Post-Hoc Plan Evaluation in the Planning System. (Source: Author)

The third question then proceeds to access the significance given to the post-hoc plan evaluation in the current planning system of the case study, Lahore Pakistan, according to the respondent. A majority of

the respondents, 46.1%, have observed that the system considers post-hoc plan evaluation as insignificant in the current planning system of Lahore. Meanwhile, 23% have responded that it is given slight significance in the current planning system. The remaining 30% of the respondents believe that it is considered significant to extremely significant.

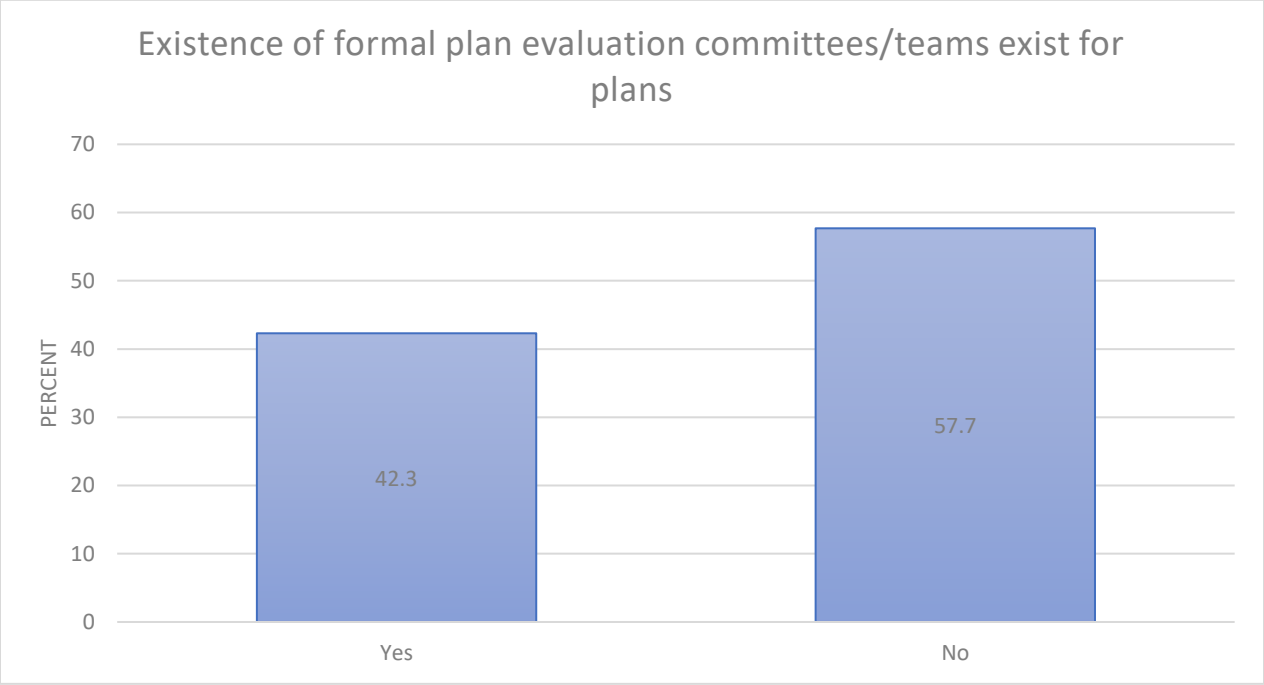


Figure 30: Existence of formal plan evaluation committees/teams exist for plans. (Source: Author)

As shown in the graph above, in response to the question regarding the existence of the formal plan evaluation committees or teams, it was observed that 57.7% believe that there is no such team. However, almost the other half believe that some sort of formal plan evaluation does exist. However, as seen and deduced from the extensive literature review, there is no documented record of the existence of these teams. Nonetheless, there are some legal provisions, not strictly binding, that require the review of these plans every five years.

The next question refers to what, according to the respondent's expertise and experience, is the preferred form of urban plan evaluation. There were options given as deduced by the literature as to the mostly used form of plan evaluation. Multiple options could be checked for this question and the respondents could also give an answer other than the options. The options were:

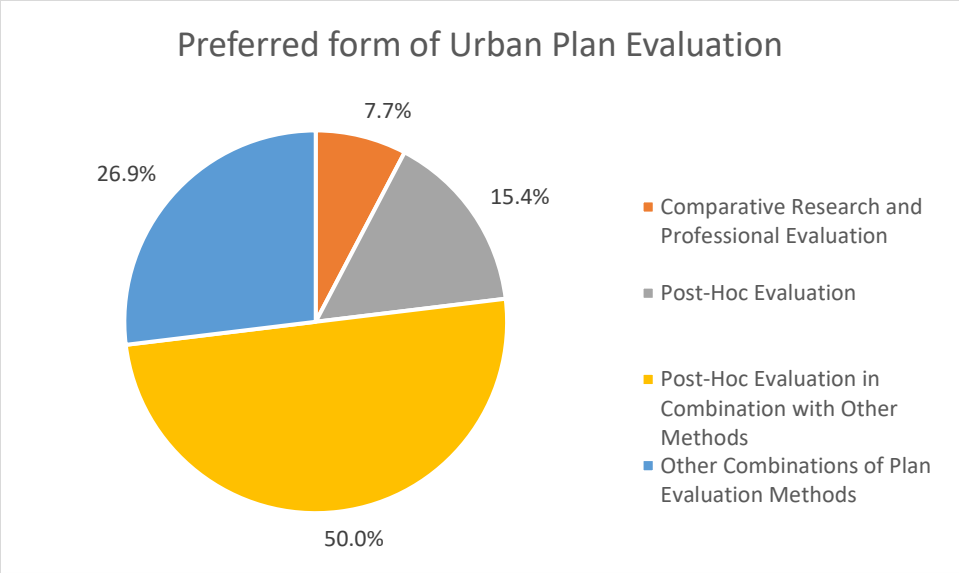


Figure 31: Preferred form of Urban Plan Evaluation. (Source: Author)

1. plan assessment (ensuring that the plan embodies its outlined planning process' aims)
2. plan testing and evaluation (evaluating alternative ways to achieve the goals of a plan)
3. plan critique (a subjective review of a plan by other planners, similar to a book review)
4. comparative research and professional evaluation (comparing various plans, with or without considering outcomes)
5. post hoc evaluation of plan outcomes

As this research is focused on post-hoc plan evaluation the responses were grouped according to this option. While 15.4% of the respondents think that post-hoc plan evaluation is the preferred form of evaluation for the case study, 50% think that post-hoc plan evaluation should be used in combination with other forms of plan evaluation. On the other hand, the second most popular form of evaluation is comparative research and professional evaluation at around 8%. Lastly, a significant 26.9% have suggested another combination of plan evaluation.

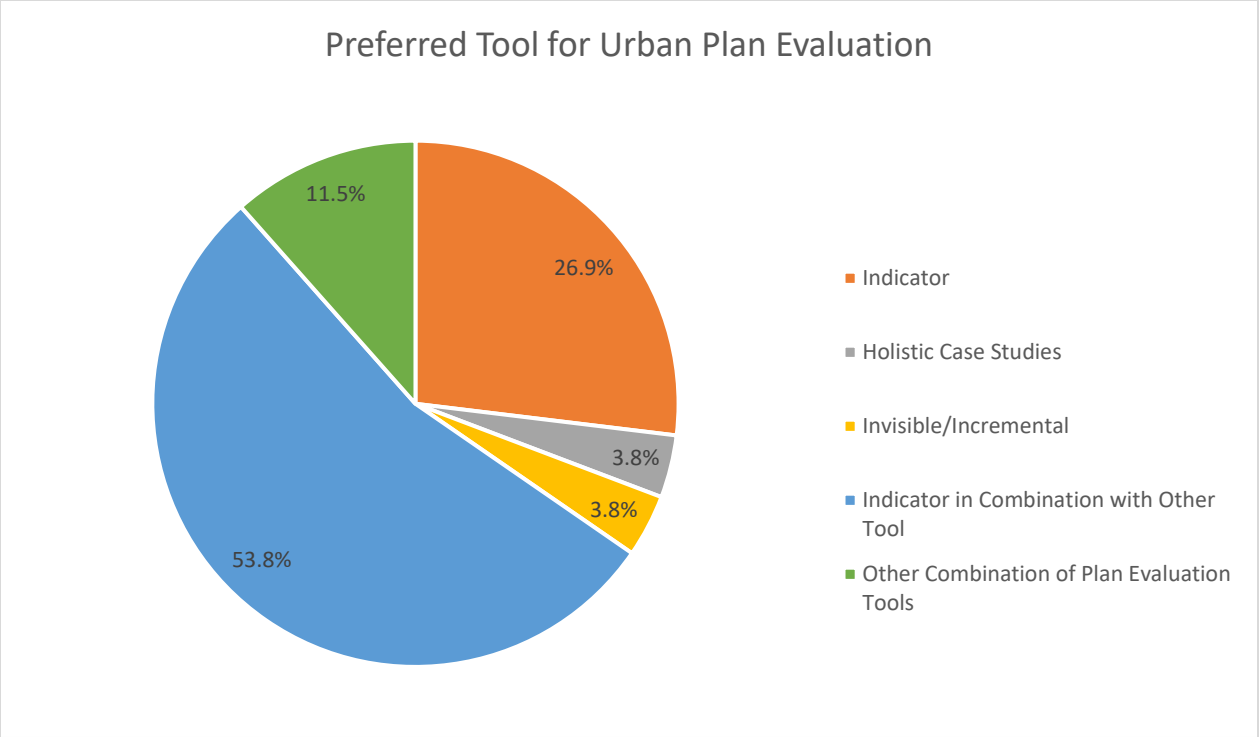


Figure 32: Preferred Tool for Urban Plan Evaluation. (Source: Author)

The next question was with respect to the ideal tool for plan evaluation for IMPL 2021. The following options were given and the respondent could choose multiple options:

1. Indicator: Performance measured against benchmarks or goals, may be qualitative or quantitative.
2. Value Driven: assigns value to one of the aspects of the plan and makes assessment for that aspect in isolation.
3. Holistic Case Studies: anecdotal in nature as they make assessment of the various plans made for a certain region over a stated period.
4. Invisible/Incremental: often carried out by the planning institutions in the form of technical reviews, capital programs, financial audits and consistency reviews.

The results are in line with what has been suggested by this research. Around 27% of the responses are in favour of the use of indicators and another significant (approximately) 54% responses are for indicators in combination with one or more tools. Other popular choices have been holistic case studies and incremental plan evaluation tools at around 4%. Lastly, 11.5% have chosen a different combination of plan evaluation tools.

The next question was on how the respondent thought that these evaluations could contribute to the plan making process. The following options were given and multiple choices were possible:

1. learning from previous planning experiences
2. to have a real judgment of planning effectiveness
3. to measure gap between the desired goals and actual outcomes
4. promotes transparency and public participation.

The table shows the different combinations made by the respondents and their respective percentages.

Table 16: Contribution of Evaluation to Plan Making Process. (Source: Author)

Contribution of Evaluation to Plan Making Process		
	Frequency	Percent
Judgment of planning effectiveness	1	4
Measure gap between the desired goals and actual outcomes	4	15
Transparency and public participation	1	4
Learning from previous experience & Measuring gap between desired and actual outcomes	2	8
Learning from Previous Experience & Transparency and public participation	2	8
Judgement of planning effectiveness & Measuring gap between desired and actual outcomes	3	12
Measuring gap between desired and actual outcomes & transparency and public participation	4	15
Learning from previous planning experiences, Judgment of planning effectiveness & Measure gap between the desired goals and actual outcomes	1	4
Learning from previous planning experiences, Judgment of planning effectiveness & Transparency and public participation	1	4
Learning from previous planning experiences, Measure gap between the desired goals and actual outcomes & Transparency and Public Participation	4	15
Judgment of planning effectiveness, Measure gap between the desired goals and actual outcomes & Transparency and Public Participation	1	4
All of the Above	2	8
Total	26	100

In the next question, the respondents were asked about who should carry out or ensure that plan evaluations are integrated in the planning system. Once again multiple answers were possible and their respective percentages are shown in the table below:

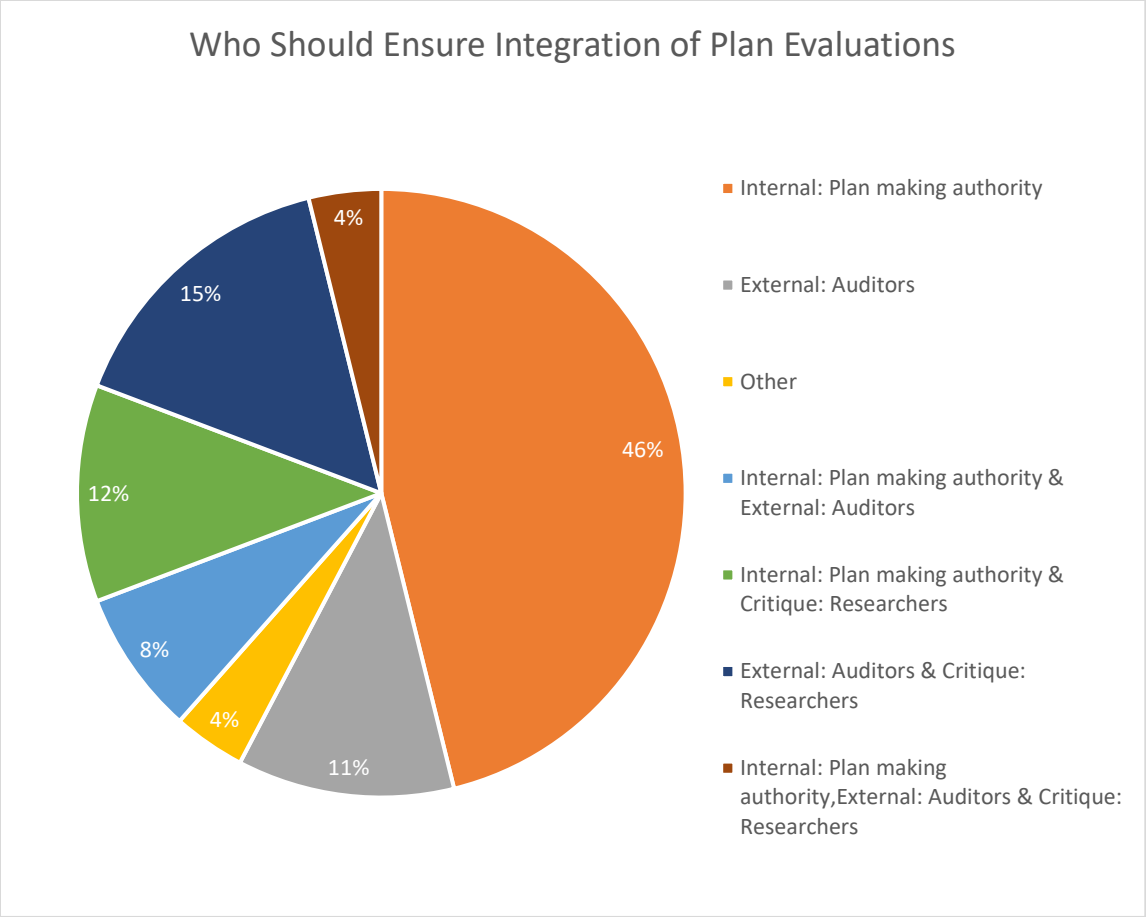


Figure 33: Who Should Ensure Integration of Plan Evaluations. (Source: Author)

Regarding the question about if, according to the respondent, there existence of public participation in the plan evaluations is. The majority of the respondents have claimed that there is some level of participation of public in any type of plan evaluation at 65%. The remaining 35% have negated the presence of any public participation in plan evaluations.

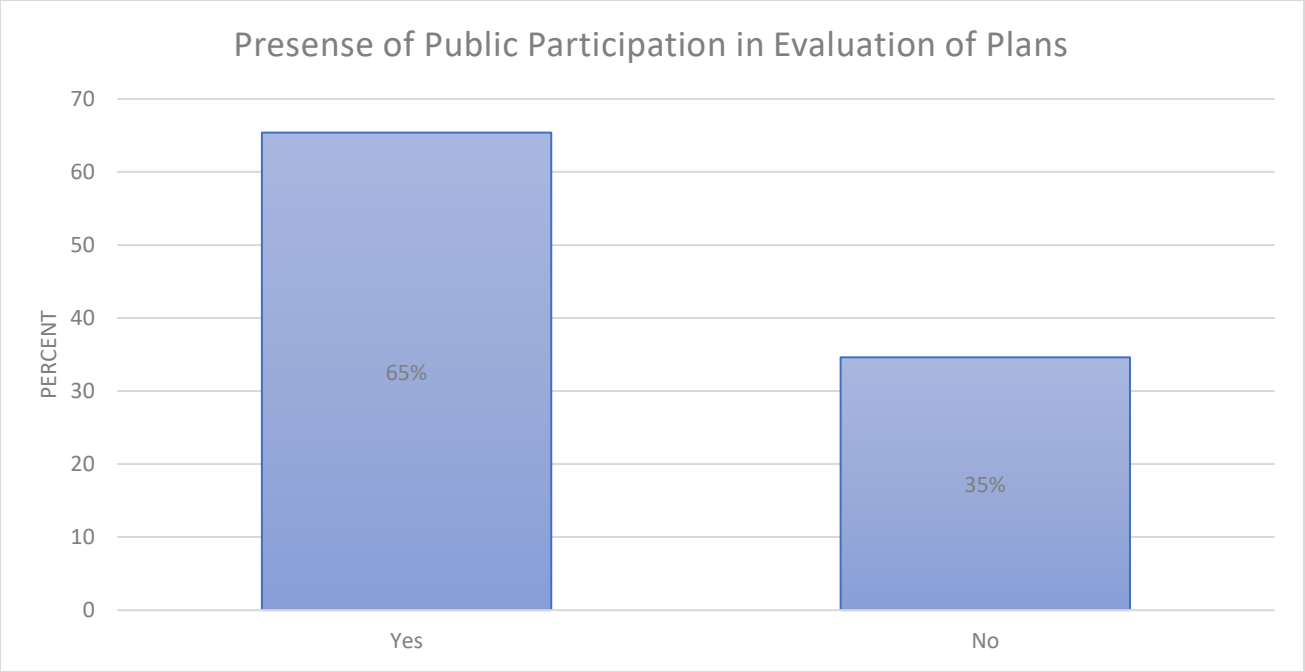


Figure 34: Public Participation in Evaluation of Plans. (Source: Author)

The proceeding question was a continuation of the previous question. The respondent was asked that if they believe that some sort of public participation is present for plan evaluations, what is the extent of this participation. The figure below explains the results.

7.2 Analytic Hierarchy Process Results and Discussion

7.2.1 Tool used for the conduction of AHP

This research uses the free and web-based online AHP system, the AHP-OS (AHO-Online System) (Goepel, 2017). The system can perform detailed analysis of decision matrix along with means to allow for improvement in inconsistent judgements. The software also allows for other advance features such as alternative evaluations, group data input and consensus and calculation of weights on random and small variations in judgements. However, these are not needed for this research.

Another advantage of using this online software is that it was made specifically for academic and research purposes where all algorithms and functions are documented and the results can be exported in open format for data visualisation as has been done in this research. The outputs of the software were exported to excel for further processing and final weights calculation.

This research does not compare Microsoft Excel with the other software present for AHP as simple calculations are correctly computed in Excel but for complex decision making analysis, tools are needed (Goepel, 2013).

The chosen software was not the only one available and have also been compared in literature as done by Ossadnik & Kaspar (2013), Ishizaka & Labib (2009) and Siraj et al. (2015). However, as shown by the literature, these are targeted for business organisations and not academics (Goepel, 2017). This also makes the other options costly and demanding certain requirements from the computer system for efficient use. The one used for this research is free of cost and works with any search engine.

Other options available in the market include the following:

- 123AHP, http://123ahp.com/
- AHP-OS, https://bpmsg.com/academic/ahp.php
- MakeItRational, http://makeitrational.com
- ChoiceResults, https://www.filebuzz.com/fileinfo/91865/ChoiceResults.html
- Decisor, https://github.com/czekster/Decisor/
- HIPRE 3+, http://sal.aalto.fi/en/resources/downloadables/hipre3
- SuperDecisions, https://superdecisions.com/
- Expert Choice, https://expertchoice.com/
- Decision Lens, https://decisionlens.com CDP,
- Criterium® DecisionPlus®, http://www.infoharvest.com/ihroot/index.asp
- RightChoiceDSS, https://www.updatestar.com/publisher/tgkconsulting-2369 PriEsT,
- AHP Priority Estimation Tool, https://sourceforge.net/projects/priority/

Other justifications for using AHP-OS include the feature of highlighting the top three most inconsistent judgements for each pair-wise comparison where the inconsistency exceeds the acceptable value of 10%. The software allows for:

1. Flexible definition of decision parameters,
2. Automatic development of the decision matrix for Pairwise comparison input
3. Weight calculation using the AHP eigenvector method,
4. Consistency check and highlighting of the top-3 most inconsistent judgments among others.

Figure shows an example of the display of pairwise comparisons to the user for this research where theme 1 is being compared to the other 9 themes and priority are assigned from the scale of 1-9.

	A - wrt AHP priorities - or B?		Equal	How much more?
1	○ Law and Administration	◉ Disaster Mitigation and Prevention	○1	○2 ○3 ○4 ◉5 ○6 ○7 ○8 ○9
2	◉ Law and Administration	○ Land Use	○1	○2 ○3 ◉4 ○5 ○6 ○7 ○8 ○9
3	◉ Law and Administration	○ Urban Density	○1	○2 ○3 ○4 ○5 ◉6 ○7 ○8 ○9
4	◉ Law and Administration	○ Urban Services	○1	○2 ○3 ○4 ○5 ◉6 ○7 ○8 ○9
5	○ Law and Administration	◉ Transportation	○1	○2 ○3 ◉4 ○5 ○6 ○7 ○8 ○9
6	◉ Law and Administration	○ Housing	◉1	○2 ○3 ○4 ○5 ○6 ○7 ○8 ○9
7	◉ Law and Administration	○ Social Welfare	○1	○2 ○3 ◉4 ○5 ○6 ○7 ○8 ○9
8	○ Law and Administration	◉ Urban Environment	○1	○2 ○3 ○4 ○5 ○6 ◉7 ○8 ○9
9	○ Law and Administration	◉ Urban Economy	○1	○2 ○3 ○4 ◉5 ○6 ○7 ○8 ○9

Figure 35: Example of the display of pairwise comparisons. (Source: Author)

As mentioned before, the software highlights the three most inconsistent judgements in the matrix. These can then me altered by a value of two or three scales (either up or down the importance scale).

It has been explained in the beginning of the chapter that the responses with inconsistency of 40% or above have been removed from the final weight calculation as making these consistent would require a greater degree of manipulation of the judgement matrix and could be argued to cause greater data manipulation. Therefore, these have been removed from this research.

The others, with slight changes made to the judgement matrix, have been included in the final calculations of the weights.

7.2.2 Weights Assignments and Discussion on the results of AHP

After removing the unacceptable responses, the final decision matrix (or judgement matrix) is made by taking the geometric mean of the priorities of the consistent matrices. This leaves us with the decision matrix shown below:

Table 17: Final Decision Matrix. (Source: Author)

Comparison Matrix (A)	Law and Administration	Disaster Mitigation and Prevention	Land Use	Urban Density	Urban Services	Transportation	Housing	Social Welfare	Urban Environment	Urban Economy
Law and Administration	1	1 1/9	8/9	1	1	1	3/5	1	2/3	5/7
Disaster Mitigation and Prevention	8/9	1	1	1 1/6	7/8	3/4	4/5	1	2/3	1/2
Land Use	1 1/8	1	1	1 4/7	1	1 1/6	6/7	1 2/5	1	1 1/7
Urban Density	1	6/7	5/8	1	2/3	6/7	3/5	8/9	3/4	4/5
Urban Services	1	1 1/7	1	1 1/2	1	6/7	1/2	5/6	2/3	1
Transportation	1	1 2/7	6/7	1 1/6	1 1/6	1	1/2	1 1/9	7/9	5/7
Housing	1 2/3	1 2/9	1 1/6	1 2/3	2	2 1/7	1	1 3/4	1 3/7	1
Social Welfare	1	1	5/7	1 1/9	1 1/5	1	4/7	1	2/3	3/4
Urban Environment	1 1/2	1 5/9	1	1 1/3	1 1/2	1 2/7	5/7	1 1/2	1	2/3
Urban Economy	1 2/5	1 8/9	7/8	1 1/4	1	1 3/8	1	1 1/3	1 1/2	1
Sum	**11 2/5**	**12**	**9**	**12 5/6**	**11 1/2**	**11 3/7**	**7 1/8**	**11 6/7**	**9 1/9**	**8 1/4**

From this the final normalised matrix was computed as has been described in the previous chapter. The table below is the result of this computation. The table also shows the final weights of the themes as a result of the AHP analysis of expert opinions.

Table 18: Final normalised matrix and assigned weights of themes. (Source: Author)

Normalised Matrix (N)	Law and Administration	Disaster Mitigation and Prevention	Land Use	Urban Density	Urban Services	Transportation	Housing	Social Welfare	Urban Environment	Urban Economy	Weight (Average) (W)	Weights % (Rounded off)
Law and Administration	0.09	0.09	0.10	0.08	0.09	0.09	0.08	0.09	0.07	0.09	**0.09**	**9**
Disaster Mitigation and Prevention	0.08	0.08	0.11	0.09	0.08	0.07	0.11	0.09	0.07	0.06	**0.08**	**8**
Land Use	0.10	0.08	0.11	0.12	0.09	0.10	0.12	0.12	0.11	0.14	**0.11**	**11**
Urban Density	0.08	0.07	0.07	0.08	0.06	0.07	0.09	0.08	0.08	0.10	**0.08**	**8**
Urban Services	0.09	0.09	0.11	0.12	0.09	0.07	0.07	0.07	0.07	0.11	**0.09**	**9**
Transportation	0.08	0.11	0.09	0.09	0.10	0.09	0.07	0.09	0.08	0.09	**0.09**	**9**
Housing	0.15	0.10	0.13	0.13	0.18	0.19	0.14	0.15	0.16	0.12	**0.14**	**14**
Social Welfare	0.09	0.08	0.08	0.09	0.10	0.08	0.08	0.08	0.07	0.09	**0.08**	**8**
Urban Environment	0.13	0.13	0.11	0.10	0.13	0.11	0.10	0.12	0.11	0.08	**0.11**	**11**
Urban Economy	0.12	0.16	0.10	0.10	0.09	0.12	0.14	0.11	0.16	0.12	**0.12**	**12**

As expected, the inconsistency of this matrix is extremely low because the values are derived from consistent matrices. It is at 0.0077. The results are visualised as a star diagram that shows the importance or weights given to each theme of the IMPL 2021 evaluation framework by the experts.

Discussions are made regarding the proposals given in the IMPL 2021 regarding each theme in light of the weights that have been assigned. Some comparisons have also been made, where possible and where data was available, to gauge the extent of the success of IMPL 2021 in that theme. Therefore, the themes are discussed in the order of the weights that have been allocated starting with the highest weights.

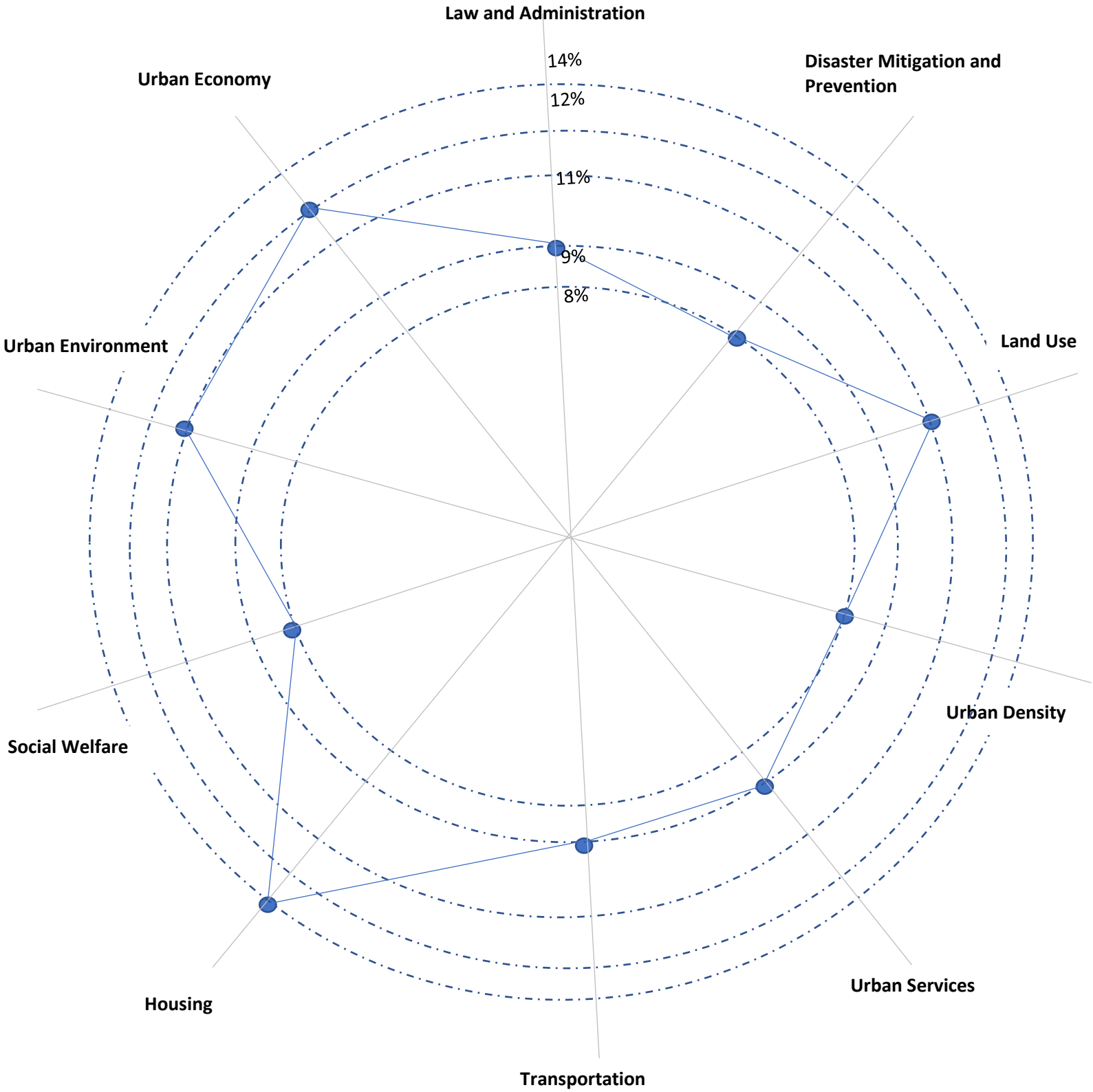


Figure 36: Star diagram of the weights assigned to the 10 themes. (Source: Author)

7.2.2.1 Housing

The figure shows that the highest weight is attributed to housing by the experts questioned for the evaluation of IMPL 2021. At 14%, housing has achieved this status mainly because housing is already a big challenge in the city. As Lahore is a mega city with a population of more than 11 million (11,126,285) (Pasha, 2021), it is always low on fulfilling the demand for housing. This coupled with the fact there are not many government initiatives that are in place for this problem and the ones present, including the National Settlement Policy, has failed to deliver over the years. Further issues are presented by the rapidly increasing population coupled with urbanisation due to in migration.

Another factor that contributes to this deficit in the demand gap of housing is the fact that land prices have increased significantly over the years. With rising inflation, it is becoming unaffordable for the residents to buy housing. Secondly, the lack of rental initiatives and the social stigma associated with social and rental housing, is also a hindrance in the provision of housing.

Therefore, this theme has emerged as the most important for evaluation of urban master plan for the case study.

IMPL 2021 has also identified housing as one of the key issues to be addressed by the plan. In fact, it tops the list as 'Land Management and Housing'. The general proposals for this were in the form of upgradation of slums, renovation of older parts of the city, control on piecemeal development and speculation and management of the people residing in the dangers of the riverbed. For the latter, IMPL 2021 suggests the development of a flood management plan with the relocation of the vulnerable residents to safer places with sufficient compensation. However, later in the tenure of the IMPL 2021, there was an announcement for the development of land across the river (west of Lahore) for managing the high influx of people in the city.

As a matter of fact, the population of the Lahore metropolitan area was estimated to be 10,259,070 in 2021 (LDA, 2004), however, these estimates have been proved wrong and the population had already reached 11,126,285 by 2017 (Pasha, 2021). There were proposals given in the master plan for the provision of a total of 1,265,183 units by 2021. However, it was stressed once again that LDA does not have enough financial resources to reasonably develop the land for this purpose. This proposal of infill development and densification turned out to be unsuccessful and still the majority of the land is

developed at an increasingly lower density as shown by the increase in the low density areas from 47.6% in 2005 to 58.0% in 2015 with an estimated increase to 74.8% by 2040 (Ibrahim & Riaz, 2018).

Another issue observed was that despite being the number one issue, the short term plan that followed these proposals did not have specific plans for housing. There are general guidelines for the improvement of the existing housing in the private housing schemes in the suburban areas. The plan indicates towards tax incentives and fee in case of speculation for these schemes to encourage people to build houses rather than leave the land for speculation. The plan also proposes the development of trunk and other infrastructure for these areas to encourage the development of housing. However, there were no specific short or long term plans as to how to achieve these proposals in the IMPL 2021.

Another of the hinted proposal that touched this aspect was that of river side development which would include some form of housing. The Ravi Riverfront Urban Development Project covers more than 100,000 acres of land and has been advertised as the world's biggest such project. However, the project has been observed to be a lucrative real estate marketplace and not for the lower and middle income groups (Hussain, 2022). Moreover, it has also been observed that 'large projects do not equate to basic housing' (Hussain, 2022).

However, housing is not only the problem of Lahore but of the whole country. In 2018, the urban housing demand for the country was of 350,000 units per year with 62% need coming from the lower income groups. In contrast the urban supply per year was only 150,000 units in total (Hasan & Arif, 2018).

Therefore, it can be said that housing is one of the most important and problematic areas of the IMPL 2021. This being said, it can also be said that the plan performs poorly in this regard based on the limited availability of data. The use of the indicator framework combined with the weights assigned can be used for better evaluation of IMPL 2021.

7.2.2.2 Urban Economy

The second highest weight has been assigned to urban economy at 12%. Lahore is a commercial and trade centre with nationwide businesses and clientele. The concentration of commercial activities was concentrated in the CBD at the time of the development of the plan and hence the IMPL 2021 proposed the development of a new Finance and Trade Centre for land had already been acquired. This is the most important and biggest project proposed for the economic development of the city.

Generally, the GDP of the city has been on the rise, though there are no benchmarks to compare it to as the IMPL 2021 does not offer any forecasts or goals in this regard. The latest data available for the city is of 2019 when the estimated GDP by purchasing power of parity was at 84 billion USD. The projections made are showing a growth rate of 5.6% per year and the estimated GDP by 2025 is to be 102 billion USD (City Mayor, 2007). The contribution of the city to the national economy has also been steady with 11.5% in 2017 (Express Tribune, 2017)).

There are two main industrial estates in the city, Kot Lakhpat and new Sundar Industrial estate among others. Though recently the trend has shifted to the service sector in the recent decades with 42% of the workforce employed in sectors such as finance, real estate and cultural services along with being the largest software producing city in Pakistan. However, there are still around 9000 industrial units in the city and the IMPL 2021 has made proposals for improving their efficiency and limiting their growth into the neighbouring residential areas. There are also proposals for the relocation of high polluting and hazardous industries outside the limits of the metropolitan area.

Along with the proposal of the finance and trade centre in the south of the city there are a couple of more proposals for the development of of business districts. However, as shown by the figure below, the finance and trade centre project is not even half completed and most of the land lies vacant till date.



Figure 37: Development status of Finance and Trade Centre Lahore (Source: Waqas, 2015)

Out of five of the majore projects, only two (Expo Centre and Emporium Mall) are completed and the rest are still under planning phase. Thus it can be assumed that the IMPL 2021 has failed to deliver what it promised in terms of urban economy due to the visible delay in the proposed projects. This also shows that the growth of the city's economy is organic or stems from some other economic policies but not necessarily the IMPL 2021.

7.2.2.3 Land Use

Land use measures refer to the restrictions to the use of land that can be made through planning and zoning regulations, environmental controls, building regulations and limitations with respect to land tenure. The AHP analysis has given the theme landuse a weight of 11%. This is the third highest weight along with urban environment for the themes of the evaluation framework.

The IMPL 2021 and many other recent and old research have mentioned urban sprawl as one of the greatest challenges of the urban centres of Pakistan (LDA, 2004; Ghaffar, 2015; Ghaffar et. al. 2015 and Hussain & Nadeem 2021).

The literature has data up to 2014 where the landuse change can be observed for the main landuses. Despite the attempt by IMPL 2021 to keep the agricultural land safe, it can be seen that there is approximately 13 percent of negative change in the area for agriculture (Ghaffar, 2015). The table also shows a negative change in the area of open/barren land in favour of urban or built-up land which has a positive change of around 41% (Ghaffar, 2015). This trend is still gaining momentum and the development of housing and other uses in the south-west of the city is predominant despite there being vacant land in the already established such schemes.

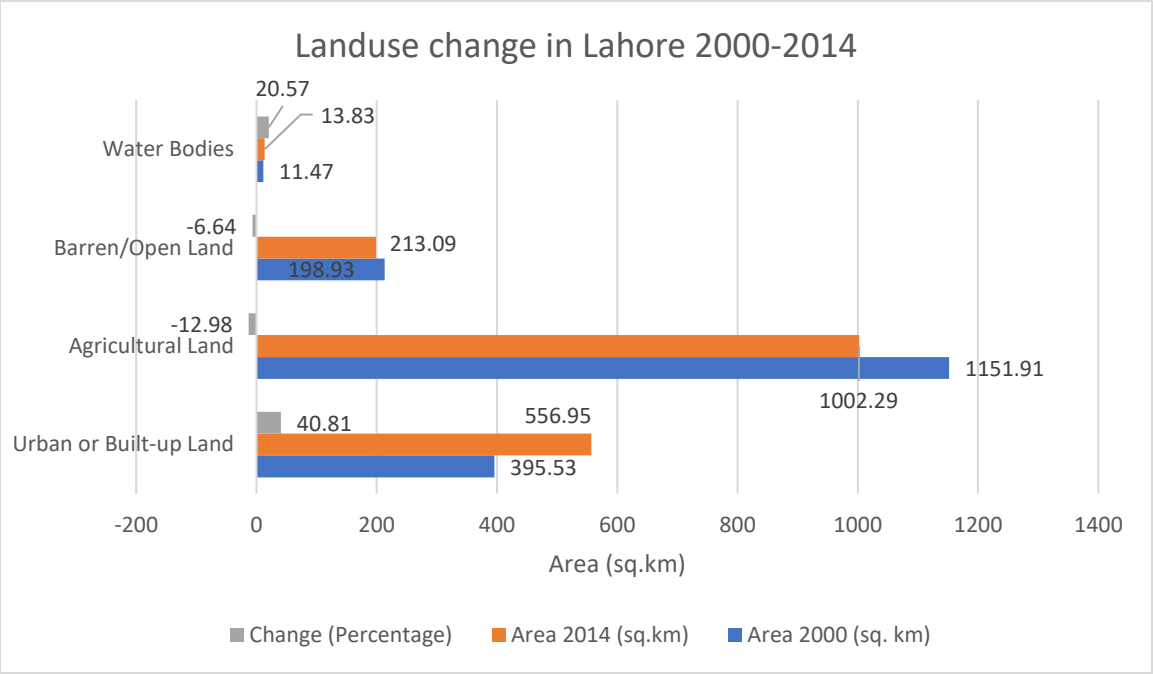


Figure 38: Landuse change in Lahore 2000-2014. (Source: Adopted from Fahad et. al. 2021)

Another challenge presented in the IMPL 2021 with counter proposals was that of the trapped villages that become enclosed as the urban areas spread sporadically. As the expansion was not coordinated, the trapped villages find themselves in between big residential developments with urban facilities that clashes with their rural cultures and as they lose their agricultural land in this process, they find it very difficult to either accept or overcome these differences.

In addition to the fact that the expansion is unplanned, it is also very controversial in terms of accusations for forced selling of land at lower prices than the market prices or the expected raised prices. This has given rise to many social problems over the years and ultimately, the rural residents end up selling their houses and moving further out of the city fringes or adding to the already burdened housing supply. The close proximity of the different economic classes results in further social issues leading to stricter gentrification and gated, guarded communities which causes further divide. However, a significant portion of the affected have managed synergy by providing for these upper-middle class of the society with labour (house-helpers) and food supply (mainly dairy). Others also enjoy the proximity to the perceived *ideal living.*

Of the three main organisations causing the rise of these trapped villages (Bahria Town and Defence Housing Authority), LDA is now the largest with the development of the Ravi Riverfront Urban Development Project (RRUDP) launched in August 2020 and proposed with the RRUDP Strategic Development Plan (SDP) and Feasibility Report in 2015. The project explores the northern and north-western parts of the city that were previously hindered by the presence of the river Ravi. It is a 5 trillion PKR project that aims at housing 8 million in a land cover (414 sq.km) comparable to the size of the built-up area of the city (Javed & Riaz, 2020). Contrary to the goals of IMPL 2021, the RRUDP will displace at least 69 villages and 5 other settlements in the north of the city (Cermeño, 2021).

This project has gained a lot of attention for not being mentioned clearly in the IMPL 2021 or its subsequent amendments (2013, 2015 and 2016) had any reference to the project (Alam, 2020) showing a disconnection between the plan and the project. Meanwhile, it is claimed that the poor quality of water in the river, the large sum of investment required, foreign consultancy led developments are a major issue and will not help solve the housing, social and economic problems in the city/district.

The final significant proposal made in the IMPL 2021 is the shifting of incompatible landuse from the built-up area of the city. This was proposed as one of the main objectives. An industrial sector of around 10,000 hectares of industrial zones in the south-west of the city around 45 km from the old city. However, after spending 350 million PKR on acquisition of land and initial planning of the industrial zone, it was observed in a recent soil test report that the water table at the site was lying just at 10m or more making the site unsuitable for an industrial estate (Husnain, 2021). The new plan is to establish Pakistan's first seafood species breeding and export hub by the name of 'Chunian Aqua Business Park'.

Once again, the failure of IMPL 2021 can be seen at this point that proposals were made without basic data collection resulting in a change at the end of the planning tenure. There were other proposals for a couple of similar industrial estates away from the city centre but there is limited data available to make discussions at this point.

7.2.2.4 Urban Environment

Together with landuse, urban environment has also received a weight of 11% by the experts consulted for the evaluation framework of IMPL 2021. This may be considered a low weight compared to the current levels of pollution in the city of Lahore. Lahore seems to have taken a permanent place as one of the most polluted cities in the world for many years now. The situation has reached an alarming level the level of fine particulates in the city have risen forty times the acceptable levels in the WHO guidelines (Ali, 2021). Lahore also routinely comes at the top for poor air quality. The main reasons for this are use of low grade fuel by factories, increase in the use of personal vehicles and resulting congestion, removal of vegetation cover and seasonal burning of crop remnants to clear fields. Other reasons include the coal-fired power plants, burning of waste, coal powered brick kilns around the city along with vehicular emissions (Ali, 2021).

The recent years have seen a drastic increase in smog in the winters where the thick grey cover over the city stays for days causing people to suffer from various respiratory diseases including asthma, lung damage, strokes, bronchial infections and a general decrease in life expectancy. All over the country a staggering 128,000 deaths are attributed to air pollution caused diseases (Ali, 2021). The situation is even worse for the children and those with acute health conditions. So much so, that the city government was forced to make an ‘Anti-Smog Squad’ to penalise factories operating and using low quality fuel despite the ban to curb smog in the city.

The proposals made by IMPL 2021 in this regard are far from satisfactory. The vague indications towards improvement of air and water quality do not suffice and have led to the present condition of the city. The short term plans for the first five years developed for IMPL 2021 only list the following initiatives under environment (LDA, 2004):

1. Air quality and noise monitoring at the busy traffic intersections/industrial estates
2. Ground water quality and water distribution system monitoring
3. Relocation of slaughterhouse

4. Surface water quality monitoring

As clearly observed, this is very vague and do not give concrete guidelines or plan of action necessary to improve the environmental conditions of the city.

The situation is similar in the other parameters of environment. There is a rapid loss of vegetation and agricultural land as mentioned in the sections on landuse and urban density. The drastic change of landuse and land cover is leading to environmental issues such as intense urban heat islands and habitat loss to indigenous plant and animal species such as ring-necked parakeets, mulberry, guava and mango.

In the study conducted in 2007 by World Bank (World Bank, 2007), unsustainable development was costing the country 1 billion PKR per day. The amount can be assumed to have increased manifold now.

Following the same suite, the quality of ground and surface water is also deteriorating by the day and there is a need for development of billion dollars of water cleaning and replenishing projects to save the city from its serious implications. IMPL 2021 states that at the time of its implementation, there were no wastewater treatment plants in almost 90% of the industries located in and around Lahore (LDA, 2001). One proposal was the relocation of these industries in planned industrial estates such as the one proposed at Chunian, the fate of which has already been explored in the previous section.

This is supported by the evidence provided by the deteriorating ground water quality downstream from the Ravi Syphon towards Lahore. There is presence of heavy metals as lead and nickel with the amount of E. cli bacteria over the permissible limits in the drinking water (Ayesha, 2010). Other than waste disposal in the water bodies and discharge of domestic and industrial effluents into the river, seepage from the municipal landfill sites has also been observed as a cause of pollution in the ground water (Akhtar & Zhonghua, 2014). The country statistics in this regard are even more alarming as 40% of deaths are attributed to water borne diseases stemming from consumption of polluted water (Ghulam et. al. 2016).

Sewage, street runoff and industrial waste is continuously leeching into the ground water. It is estimated that the wastewater discharge into the river Ravi has increased from 990 cusecs in 2006 to 3304 cusecs in 2013 (Hussain & Sultan, 2013).

The progressively deteriorating quality of groundwater, which is the principal source of water for the residents of Lahore, it can be said that the IMPL 2021 has failed to deliver on its goals to improve the water table and quality with proposals of wastewater treatment and developments to replenish aquifers.

7.2.2.5 Law and Administration

This theme has gained a 9% weightage from the experts and as the research maintains its findings in the initial literature review that the city's planning institutions lack the capacity to develop and implement urban management plans while there are still no clear legislative measures to ensure plan development and implementation at the municipal, provincial and national levels (Yuen & Choi, 2012) this is an apt weight for this theme.

Keeping this in context, the IMPL 2021 suggested that the local institutions be strengthened 'to prepare and implement strategic master planning through authorization of legal measures' (LDA, 2004). This has yet to be realised and the planning authorities are still struggling in this regard.

Though one of the suggestions made in the IMPL 2021 have been realised and that is the consolidation of the entire division of Lahore (along with the neighbouring districts of Sheikhupura, Nankana Sahib, and Kasur) and have a comprehensive planning for these under a divisional authority. LDA achieved this status in 2013 through an ordinance.

If one focuses strictly to the law and administration in context to this research, IMPL 2021 proposed that during the last phase of the plan, the last ten years, a review of the IMPL 2021 should be carried out early on and relevant modifications be made accordingly. Amendments were made in the plan (that were made public) in 2013, 2015 and 2016. The 2013 amendment just focuses on land use changes made in the agricultural residential and institutional uses and maintains the horizontal sprawl of the city in the south-west (Alam, 2020). It was the same in 2015 when 17,000 acres of agricultural land in the peri-urban area was reclassified to be used for residential purposes. The 2016 amendment just came with the prescription of landuses in Lahore and in the neighbouring cities as LDA extended its jurisdiction at the division level (Alam, 2020).

From these amendments it can be clearly observed that the driving forces for these changes were not necessarily the review or evaluation of the performance of the proposals of IMPL 2021, but rather the capitalist interests of LDA or political figures to create a profitable land market on the expense of agricultural land, environment and the health and safety of the residents.

Therefore, IMPL 2021 has made some progress in this theme of plan evaluation framework, however the full results of these measure are yet to be researched and seen as time passes and LDA develops the Master Plan of the whole division till 2050.

7.2.2.6 Disaster Mitigation and Prevention

Disaster mitigation and prevention theme has received the lowest weight along with urban density and social welfare. The IMPL 2021 has observed floods as one of the disasters faced by the city and that requires immediate proposals for its management.

In this regard, the IMPL 2021 proposed the following:

1. Improvement of the present flood protection works, eight spurs, or bunds
2. Studies for flood management of river Ravi, and ensuring its implementation
3. Increasing the capacity of the river Ravi and adopting flood routing measures,
4. Alternative flood management measures such as widening of water ways, diverting excess flows upstream of river syphon, construction of embankments and raising of previous embankments,
5. Removal of encroachments in the flood plains, legislation to forbid encroachment of river plain.

As it can be seen from the proposals made that there are none that are concrete. The mentioning of flood analysis and consequent flood management policy does not ensure its conduction as these are without any legal binding. As a matter of fact, there is still only a draft of the national flood management policy that has still not been approved (Tari & Van De Giesen,2012) and therefore the presence of such measures at the provincial level are slim.

The situation of the floods is further deteriorated due to the progressive loss of tree cover (from 12,359 trees in 2007 to 3,520 in 2015 (Butt, 2019)) along with silting of the drains (400,000 cubic metres (JICA, 2004)) and pavement of the earth's surface which further increases surface runoff.

Major fluvial floods have hit Lahore in 2007 and 2008 causing great damage to the northern parts of the city which are the oldest and most densely populated. These fluvial floods are becoming more frequent due to many factors including the climate change. Single events of above average rainfalls have occurred in 2010, 2014, 2015 and 2018 as well that have caused damage to the low lying areas of the city.

Despite the desperate need for drainage and flood management plans, the financial cuts seen by the concerned wing of LDA, the Water and Sanitation Agency (WASA), 18 billion PKR in 2017 to just 9 billion PKR in 2019 are making the process even more difficult (Butt, 2019).

After the 2010 floods a tribunal inquiry was made and its report is still suggesting that there be development of further flood fighting plans and make them pro-active rather than reactive. Other

proposals are similar to the ones given in IMPL 2021 regarding the improvement of the existing embankments, development of second defence banks, drainage system cleaning and upgradation and access to funding (Judicial Flood Inquiry Tribunal, 2010).

Therefore, in the light of the increased frequency of flood events and the similarity of the proposals being made many years later (which indicates that these have not been implemented already) combined with further financial cuts being made against flood management, it can be said that the IMPL 2021 has once again performed poorly in the disaster prevention and management theme of the plan evaluation framework.

7.2.2.7 Transportation

Transportation has received the weightage of 9% along with urban density and law and administration. This in contradiction to the proposals of IMPL 2021 where transportation has been allotted the highest budget in the first five years plan (LDA, 2004). Proposals made include the capacity improvement projects for the existing transport system, new road projects to manage the congestion on roads, Lahore Ring Road project, supplementary works to previous programs, area traffic management, parking and traffic control management, introduction of regular operation and maintenance system of public transport and the initiation of bus terminals development and operational management.

Further proposals included the development of road safety strategy and traffic management strategy. The road safety strategy was to be made following the guidelines for accident reporting, accident data analysis, accident prevention (control speed, calm traffic, meet the needs of vulnerable road users), and accident research and prevention cell. One of the main proposals was the development of light rails and heavy rail transit systems as had been identified in the previous plans. There are also given guidelines for the financial policies to achieve the proposals, including, formation of urban transport fund, levying of betterment tax, obligation of employer to meet commuting cost etc.

Rapid urban population growth has led to more motor vehicular usage and in the case of Lahore, the ownership of private vehicles is increasing at the rate of 7% per year (Shirwani, 2020). This has resulted in higher levels of emissions into the urban air and regular congestions on the roads. Along with the increase in the pollution, the traffic management measures have seemed to be incapable to handle the traffic problem in the city (Aziz & Bajwa, 2004). It has also been observed that the operation of the first bus rapid

transit line in the city's most congested road has not caused any significant changes to the pollution in the area and the congestion on the road (Aziz & Bajwa, 2014).

During the tenure of the plan there have been numerous transport projects regarding the widening of roads, construction of underpasses and flyovers e.g., Lahore Ring Road, widening of Ferozepur Road, Canal Bank Road under passes, new crossings over canal (Mall Rd 2nd Bridge), Muslim Town bridge etc. This has decreased the congestion on the major roads for most of the day but peak hours show a very contradictory picture.

The most recent development in the transport planning of Lahore is the final report for Lahore Urban Transport Master Plan (LUTMP) (JICA 2012). The situational analysis if of the study claims that despite the lowering of congestion on some roads, 'Lahore transport system is 'living on borrowed time using but not maintaining – its road network, while adding little to its infrastructure inherited…' (JICA, 2012, p5-2). The right of way left along the roads is regularly being abused by hawkers, parking and illegal encroachments. This will over the time cause these roads to face congestion as right of way is decreasing and number of vehicles in increasing. The report sheds light on the decades old proposals for the development of trunk public transport network in the city which now needs to have three urban rail projects and seven bus rapid transit systems (for forecasts made till 2030) with efficient feeder services to make the projects successful (JICA, 2012).

Despite the challenges being faced in this theme, the IMPL 2021 has had a better performance here than in any other theme discussed in this research. The development of the Bus rapid transit (2013) and the rail transit system (2020) are both the first of its kind in the country where public transport is often a neglected sector of urban transport. This along with the major road improvement projects and the installation of Intelligent Traffic Management system in the city makes the performance of IMPL 2021 in this theme satisfactory without undermining the seriousness of the urban air pollution and its consequences in the city.

7.2.2.8 Urban Services

Also among the lower weight with 9% are the urban services. This research includes water supply, sewerage disposal and solid waste management in the urban services. The weight assigned to the urban services theme is the same as that allotted to transportation and law and administration. This section will

attempt to analyse water supply, sewerage, and solid waste management separately in context to the actual conditions and the proposals made by IMPL 2021.

Water Supply

At the time of the plan the daily water consumption varied from 227 to 454 litres per day per capita or 50-100 gallons per day per capita (LDA, 2004). This is a big difference and would have made the demand analysis and the consequent proposals a challenge for LDA.

System flaws were identified as incomplete water distribution network, direct pumping system, un-metered connections, illegal connections, excessive pumping hours, lack of high capacity of tube wells and inadequate billing system (LDA, 2004). These were the main problems identified in the water supply system of the city which was hindering the financial stream of WASA and the quality of service provided to the citizens.

In line with the issues, the proposals made by IMPL 2021 were to check the decline in the water table, reduce daily consumption, reduce pumping cost, make WASA financially viable organisation by reducing leakage, more metered connections, computerisation of subdivisions, comprehensive survey to get accurate data, new water supply connections (conversion of illegal connections), automation of the current 316 tube wells for increased efficiency. The extent of the success of these proposals cannot be gauged by this research as sufficient data was not available.

However, IMPL 2021 wanted to increase the percentage of the people supplied from 70% in 2001 to a 100% by the end of the tenure of the plan. This has been true as stated by a study conducted by the Urban Unit (Urban Unit, 2010) that states that more than 95% of the residents of Lahore have access to water. The quality and quantity however are still an issue as recoded by the same study. The water pressure in the WASA supply is not adequate and most households had installed suctions motors to extract water from the supply. Moreover, the limited timings (sometimes as low as 3 hours per day) means that the residents have to store water at the residence for use over the day. On the other hand, the quality of the water supplied was also not up to the mark and it has recorded to be murky, muddy or smelly with high levels of E-coli and not safe for drinking (Urban Unit, 2010).

For water supply it has been observed that even though it has almost achieved the goal of percentage of service delivery, the system needs to still upgrade itself in terms of the quality and quantity of the water

supplied. This could be a great challenge as the water pollution is still on the rise, the population growth is also on the rise while the present level of ground and surface water are decreasing with no significant measures to increase the reserve and mindful use of the resource.

Sewerage system

IMPL 2021 identified that there were only 45.83% of the residents were being served in 2001 and proposed to increase this to a full 100% at the end of the plan period. This has proven to be true to a great extent and only 0.1% of the population said that they have no access to any level of service of sewerage disposal. Others had some form of service available such as underground line connected municipal sewer (85%), open sewer (1.3%), pit/hole connected to municipal sewer, septic tank, underground line but not connected to municipal sewer, and pit/hole (Urban Unit, 2010).

The IMPL 2021 made proposals to improve the sewerage disposal which was identified to be inadequate in terms of flow management, experienced frequent blockages and overflows and untreated disposal into the river Ravi (LDA, 2004). For this proposals were made as development of new pumping stations, new sewerage districts to be planned and their management proposals made and establishment of five sites identified in the plan for treatment which had suggestion for oxidation ponds which was held up due to lack of funds. In addition, there were guidelines to reduce the aquifer pollution at shallow levels which have proved to be not adequate as already seen in the section on urban environment. The proposal of wastewater treatment is still under the planning phase with land acquisition and hiring of consultants underway (WASA, 2021).

With respect to the quality of service provided too, the observations are not up to the mark. The sewerage/drainage system is defective with it being mixed with rainwater causing it to overflow during seasons of heavy rain into homes and floods the streets. Furthermore, the residents are facing frequent blockages in the system that they are forced to get fixed out of their pockets (Urban Unit, 2010).

Therefore, similar to the water supply, sewerage disposal has also achieved its mark of expansion of service delivery to over 95% in one way or the other. The quality of the service however still remains to be resolved and the plan proposals have not been implemented or have had the desired outcomes in this regard.

Solid Waste Management

At the time of the plan, only 70% of the solid waste generated was being collected by a combination of government and non-government organisations. Proposal of development of suitable land fill sites for 5 proposed service areas of the city was made and the use of 6 sanitary landfills as the method of solid waste disposal was given in IMPL 2021. Furthermore, an increase in the percentage of people served from 70% to 100% was once again proposed.

With respect to service provision, 54.4% of the households in Lahore reported that private collectors would collect solid waste from home. 24.7% households said that they dumped in open heap. Municipal collector service was available to only 12.1% households in Lahore. The remaining 8.8% households employed different means, such as they threw in municipal bin, arrange community collectors, and even sold waste to hawkers (Urban Unit, 2010). It can be seen from the above mentioned data that till the mid of the tenure of the plan, the coverage had not improved and around 25% of the households were still dumping waste openly.

With respect to the development and operation of sanitary landfill sites, only one has been made operational in 2016 till date. The inauguration of this site at Lakhodair was preceded by the closure of the now extremely overused old landfill site of Mehmood Booti. The new site claimed to have used the state of the art technologies for waste segregation, compact filling and wastewater treatment. However, due to the lack of systematic development of further lots on the site, the waste is being openly dumped on the site at the moment (Randhawa, 2020). There is serious leachate seepage and wastewater discharge is untreated which has also been observed in the section on urban environment (Randhawa, 2020).

The failure of implementation of the proposals coupled with the fact that the population of the city and solid waste produced is increasing and there are no concrete measures to alleviate the situation. Therefore, another failure of IMPL 2021 has been observed in the solid waste management.

7.2.2.9 Social Welfare

This theme has received the lowest weight of 8% making it equal in ranking to disaster prevention and management and urban density. The discussion on social welfare is made with respect to health and education as these are prominent in the IMPL 2021.

IMPL has based its education related proposals on the national ‘Education for all by year 2010’ policy. The first five year plan had the construction of 924 primary schools, 184 high schools and

51 colleges, all with minimum area requirements. Ample area was also allocated to the educational landuse in the periphery of the city where many private and public institutions have been constructed over the tenure of the plan.

Lahore has been called the largest producer of science, technology, information technology engineering etc. professionals in the country (Raza, 1999). The current literacy rate for Lahore is at 64% which is higher than the national average but by no means up to the standard of even some developing countries. There are numerous educational institutions in the city that attract hundreds of thousands of students every year from different parts of the country and even internationally e.g., from Afghanistan. There are new institutes emerging at a fast pace and now the challenge is more towards the management of the quality of the education given rather than the provision of the service.

Many of the country's best medical and dental colleges are in the city with 17 nursing schools and 20 medicine schools. In addition, there are a number of educational institutes for dentistry, pharmacy, veterinary and biotech. The list for educational institutions for business, engineering, architecture, accounting and finance, computer sciences, allied health sciences, fashion and law is also very extensive.

The low literacy rate is a result of many other social, cultural or even misinterpreted religious reasons and cannot be based on the provision of schools and colleges. The IMPL 2021 has not made proposals with respect to the socio-cultural aspects and relies only on the physical aspects of building schools and increasing the number of shifts to accommodate more children.

There is no concise data available on if LDA managed to make the schools as it proposed and therefore the success or failure of IMPL 2021 regarding education cannot be made based on the available data.

In the health sector, IMPL 2021 has proposed the construction of 44 primary health centres, 19 polyclinics, 5 general hospitals and increasing the bed count by 1096 in the already existing health centres. Once again there is no data to measure if these proposed health facilities were developed or not.

However, the performance of the IMPL 2021 could be made regarding the level of health of the residents over the years. Lahore is increasingly experiencing outbreaks of many infectious or vector borne diseases (Siddiqui & Mehfooz, 2017) such as dengue, cholera, respiratory diseases and now recently Covid-19.

The city's increasingly polluted environment is also one of the major cause of deteriorating health of the residents. IMPL 2021 has failed to anticipate this and has made baseless proposals for the health of the residents. Incidences of respiratory and related diseases due to unacceptable air quality and water borne diseases due to the pollution of drinking water are at the top of the list with various international and national studies giving alarming figures as has been discussed in the previous sections.

Based on these parameters, it can be said that IMPL 2021 had flawed proposals for alleviation of health sector and has therefore failed in improving the health of the citizens regardless of the increase in the number and quality of health services which has occurred over the tenure of the master plan.

7.2.2.10 Urban Density

Urban density, explained as the number of inhabitants per area unit, has received a weight of 8% by the experts for this framework of plan evaluation making it the lowest in terms of weight and on the same level as disaster management and social welfare.

IMPL 2021 has outlined some measures for infill development to increase the density of the existing boundaries of the urban metropolitan area. A detailed set of calculations are available with the capacity of each town to accommodate the population and increase in population. The plan aims to incorporate 70% of the demand in these areas.

However, as the trend was in 2001, the urban density continues to decrease as land speculation is uncontrolled and the land prices and house construction is so expensive that people are forced to seek cheaper options away from the city. The approval of housing schemes further and further away from the current high density areas by LDA plays a major role in this regard. The 2015

amendment in the IMPL 2021 to add an additional 17,000 acres of land under the residential use is in contradiction to the proposals made in the initial document of the plan.

IMPL 2021 also presented some guidelines for densification by increasing smaller division of land, increasing the permissible building height and taxing vacant land left for speculation. However, despite these proposals, the density has decreased over the years as shown by the following data:

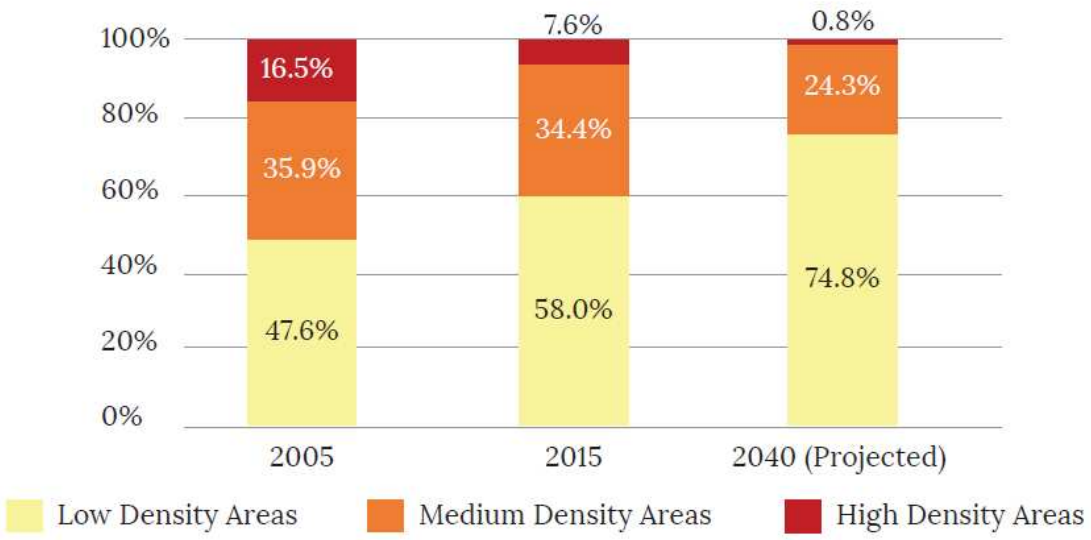


Figure 39: Change in Urban Built-up density of Lahore (Ibrahim & Riaz, 2018)

This is a clear indication of the proposals being just present on paper and not actually being implemented by LDA in its jurisdiction. Therefore, with the help of the discussion made above and the ones in the previous sections of housing and landuse, the IMPL 2021 has failed to achieve what is proposed in the urban density theme as well.

Conclusions and Recommendations

The final chapter begins by summarising the course of this research and linking the aims and objectives established in the beginning with the outputs developed. The chapter also follows on the limitations identified and how these have influenced the final results. Finally, this chapter draws conclusions regarding the post-hoc urban master plan evaluation of IMPL 2021 with derivations made from the discussion of results in the previous chapter followed by recommendations and possible further study initiatives.

The research followed a very systematic and informed process of identification of the research problem/question. This was further developed with sound backing of the available literature and justifications of the need for the research which went beyond the obvious knowledge gap identified. The quest for achieving the research objectives led to the development of a strategic methodological framework. The mix of literature review, case study relevant interpretations and empirical data collection and analysis then followed and resulted in the final conclusions and discussions.

The research paid special attention to the ethical considerations of research. Care was taken to lay information to the best of the knowledge and data availability and biasness and political agenda was avoided at each step of the research. The responses of the experts for the general questions and AHP matrices are also kept anonymous with the option of communication of results in case the respondent shows interest. In this chapter conclusions are made from the discussions made in the previous chapter.

Conclusions from the research

One of the trends observed by the AHP analysis is that the range of weights assigned is not wide. The highest weight is that of 14% while the lowest goes to 8% showing a difference of only 6% which is quite small with three themes at 9% and three themes at 8% out of the total ten themes. An inference can be made from this result that the experts lay a certain level of importance on

each theme and consider them all significant for efficient performance of the evaluation of a master plan. It also shows that though some themes are considered more important than the others, the difference attributed does not exceed more than 6%.

In addition to this, the weights attributed by the experts is not always consistent with the significance attributed to the same in the IMPL 2021. Examples include the theme of transportation that received a weight of 9% (second lowest) in the AHP analysis but the highest budget was allotted to transport related projects in the short term proposals of IMPL 2021. Same goes for the land use theme and the opposite was observed for the environment theme where the significance given in the IMPL 2021 was observed to be lower than the one attributed by the AHP analysis (11% and second highest). On the other hand, themes that showed to have consistency were those of housing and urban economy which received a high weight in the AHP analysis and a great significance in the IMPL 2021.

The remaining conclusions are regarding the performance of IMPL 2021 in the light of the proposals made.

Firstly, it was observed that when compared to the available data and occasional benchmarks in the IMPL 2021, that the plan has performed in some themes to some extent but has been unable to deliver in others. In the themes of law and administration, the alleviation of LDA to a divisional authority can been seen as one of the success points with respect to the proposals made of a managing Lahore in relation to the neighbouring areas, cities and villages. Similarly, in urban services, the plan has managed to reach the objective of covering a higher percentage of residents for water supply, sewerage and solid waste collection (Urban Unit, 2010). The performance of the transportation theme also has some success points with the increase in the public transport initiatives and implementation of further strategies to improve the accessibility of the same (JICA, 2012).

Nonetheless, the overall performance is far from satisfactory as is supported by the discussions made in the previous chapter. While there is some progress, the efforts tend to be either short

term or lacking quality. The other themes such as housing, environment, landuse and urban density, have very poor results to show.

Following the same suite, significant delays were observed in the development or implementation of some important proposals. For example, the construction of the finance and trading centre and the construction of multiple Bus Rapid Transit and Light Rail networks have been proposed since the 1980s, endorsed by the IMPL 2021 but still nowhere near completion (JICA, 2012). The same can also be said about the relocation of industries (Husnain, 2021) proposed in the landuse theme and the construction of sanitary landfill sites (Randhawa, 2020) in the urban services theme. In general, all the themes had this element of delay present in the application/implementation of the proposals made in the IMPL 2021.

One of the reasons for the delays can be the next item observed of faulty forecasts and inability of the plan to adapt to the fast changing urban conditions. Almost all the forecasts made in the IMPL 2021 were off in reality. This is true starting from the estimates of urban population of Lahore which may have led to the distortion of all the other derived forecasts such as those of housing demand, transport demands, urban services demand etc (Pasha, 2021). On the same lines are the proposals made without proper background research for their feasibility. This is true for the proposals of development of the industrial site in Chunian which has now fallen through as the soil is unsuitable for the construction of one (Husnain, 2021).

Similarly, a disconnection (or lack of connection) has been observed at times in the plan proposals and the actual projects that have been initiated. Examples include the start of the development of the Ravi Riverfront Urban Development Project, the matter of trapped villages, the issue of increase in lower density urban areas and reduction in the percentage of agricultural and green areas (Hussain, 2022; Ghaffar, 2015; Ghaffar et. al. 2015 and Hussain & Nadeem 2021).

In another observation it was seen that the plan has focused on quantity over quality in some of the themes. This is supported by the examples of the increase in the service area of water supply, solid waste collection and sewerage coverage (Urban Unit, 2010). However, the quality of the service remains yet to be improved as the water quality is below the approved WHO standards,

the solid waste collected is not disposed of properly results in air and water pollution and the sewerage is untreated and ending in the river Ravi causing greater issues than the ones it solves (Randhawa, 2020). The same is also true for the proposals made for the social welfare themes where the focus is more on the number of schools and hospitals (Siddiqui & Mehfooz, 2017; Bureau of Statistics Punjab, 2018) provided rather than their quality assurance or fighting the root cause of the low literacy rates and poor health of the residents.

A lack of strictness in the implementation of the proposals made by the IMPL 2021 was also observed as there are instances where the plan has been neglected in favour of land markets or political agendas. This is most clearly observed in the theme of housing, landuse and urban density. The approval and development of housing schemes away from the city centre and now beyond the river mainly on the expense of the agricultural land that was supposed to be conserved is the most appropriate example of the plan giving in to the land market forces (Hussain, 2022). Similarly, the starting and stopping of mass transit system in the city based on the change of the ruling government is also a clear example (JICA, 2012).

A reactive rather than proactive approach was also observed to have been taken by the IMPL 2021 and its implementation in its tenure. There are many examples to support this claim including the development of the Ravi Riverfront Urban Development Project, the conversion of the Chunian Industrial Estate to Aqua Business Park and the establishment of Anti-Smog Squad to cut the levels of air pollution. The same is also true for the transportation theme where the widening of the roads has been adopted to fight congestion issues which is considered to be a short lived solution (JICA, 2012). The conclusion made about focusing on quantity over quality is also in line with this focus on short term solutions and observed in the theme of social welfare (Urban Unit, 2010). Rather than a long term approach of changing the socio-economic and cultural dynamics for increasing literacy in the city, the plan focuses on the number of schools, colleges and universities available. The incidence of resolving the health situation of the residents by only adding to the number of health institutions rather than improving the quality of water, air quality and the general quality of environment falls in the same category.

Next in this discussion is the point of lack of public participation in the development of the proposals. This has been observed in a number of themes but is most specifically noticeable in the housing theme. The literature observes that little is being done to house the poor, the actual people in need of housing and the market situation is making it harder and harder for the remaining to have access or to afford housing in the city (Hasan & Arif, 2018). The associated issue of trapped villages is also another example where the present residents of the neighbourhood are not taken into consideration while planning the development of the area (Cermeño, 2021). The difference of the weights attributed by the experts to the various themes and the importance given by the IMPL 2021 also points in the same direction in addition to the results of the general questions analysed in the previous chapter.

The final conclusion, and the one most pertinent to this research, is that of the inefficiency of the monitoring and review of the plan if one was conducted, as it has been clearly mentioned in the IMPL 2021 and there have been amendments in the plan, but a supporting document is not available to support this. The three amendments made to the IMPL 2021 seem to stem from either market forces or political agendas but not necessarily from the review and evaluation of the performance of IMPL 2021 (Alam, 2020) as none of the amendments adopt to the changes observed or the development on the areas where the plan was failing such as environment or increasing the pace of the development of the projects.

Contribution of the research and its findings

The research was founded on the fact that there is a significant knowledge gap in the literature about plan evaluations specific to the case study. The first few chapters of the research develop on the idea that the concept of plan evaluation is very region and planning system sensitive. This led to the finding that one of the reasons for the high underperformance of the urban management plans was that of the missing step of evaluation and monitoring. Which has led to the repetition of planning process mistakes and the plan output performance has almost always been unsatisfactory. Upon further investigation of the research problem at hand, it was discovered that there is negligible research and data available for even the basic elements of plan evaluation such as the suitable approach, method and tool with respect to the case study which

was contrary to the level of research available for the same but in developed countries or some developing countries as well.

Consequently, the research arrived at the development of a number of objectives that were to be fulfilled by this research. The research has added significantly to the gap in literature by systematically achieving the set objectives of this research. The aims (mentioned in the first chapter) and their fulfilment are described below.

Aim 1: To study the concept of plan evaluations, its development and its niche in the urban planning in general and in Pakistan.

A comprehensive literature review regarding the concept and evolution of plan evaluation was conducted. An extensive study of core literature including but not limited to Oliveira & Pinho, (2010), Alexander (2006), Alexander & Faludi (1989), Baer (1997), Brody & Highfield (2005) and Talen (1997) was done to develop on the basic knowledge held previously. The findings have been made part of this dissertation in an orderly fashion.

The research based on the extensive, systematic and case sensitive literature review reached to the conclusion that there was a significant absence of plan evaluation in Pakistan (Hameed & Nadeem, 2006). The research also led to the discovery of its non-existent presence in the legal framework and practice (Shah, Afridi, & Minallah, 2007). These, among other findings, contributed to the fulfilment of this aim of the research.

Aim 2: To identify and critically analyse the contemporary practices for urban plan evaluations around the world in order to categorise and filter the practices that have the potential for application in Pakistan.

To fulfil this aim secondary sources were explored in greater detail. The research developed a categorisation system of the approaches, methods and tools of urban plan evaluation from the contemporary and applied evaluation systems available. Discussion related to the conformance and performance approach of plan evaluation was made based on the prominent works of Oliveira and Pinho (2009; 2010), Laurian et. al. (2004) and Berke et. al. (2006) helped make

decision for the appropriate approach for Pakistan. Similarly, methods of PPIP (Alexander & Faludi, 1989), PIE (Laurian et. al., 2004 and Berke et. al., 2006) and PPR (Oliveira & Pinho, 2009) were discussed in detail to choose the right method for the case of Pakistan. The research then went on to explore the tool of indicators, which was deemed as the most appropriate for the case study. A deep analysis for its use, advantages and disadvantages, presumptions and assumptions, selection framework etc., was done to enable for the development of the indicator framework for the plan evaluation for IMPL 2021.

Aim 3: Develop an evaluation framework for the post-hoc evaluation of master plans in Pakistan through the study of existing indicator evaluation systems.

This aim was fulfilled with first the development of the themes of evaluation framework and second the indicator evaluation framework. The indicator systems of Urban Indicators Guidelines (UN Habitat, 2004), Eurostat Sustainable Development Indicators (European Union, 2020), Green Cities Porgramme (OECD, 2010), China Urban Sustainability Index (Li et. al., 2014), Urban Indicators for Mega Cities (Kotter & Friesecke, 2009), Reference Framework for Sustainable Cities (van Dijken et. al., 2012), Urban Audit Cities Statistics (European Union, 2017) and Urban Sustainability Indicators (Mega & Pedersen, 1998) were studied for this research. These were used to develop the themes for this research keeping in mind the chapters of IMPL 2021. Further study of these led to the shortlisting of indicators for use in the evaluation of IMPL 2021.

Aim 4: Gather and synthesise the opinions of urban planners, academics, and urban planning professionals in Pakistan regarding the plan evaluation criteria to develop weights of the indicators in the evaluation framework.

The literature also helped in the selection of the weightage and aggregation techniques to assign the weights of the themes developed. A number of weighting techniques were studied ranging from statistics based, Factor Analysis and Benefit of doubt, to more opinion oriented ones such as Public Opinion and Conjoint Analysis. However, as they all have their pros and cons, through a structured selection process (Gan et. al., 2017), Analytic Hierarchy Process (Saaty, 1990, 2008) was found to be the most suitable for this case study based research. However, of the

aggregation methods studied, all were found to be suitable for the research characteristics. This forced other factors of the research into the light using the discussion of Elshaikh and co-authors (2018) a decision for compensatory aggregation was made.

The data analysis chapter of the research outlines the process and the calculation of the weights of the themes according to the carefully selected expert interviews.

Aim 5: Draw conclusions and recommendations for future research and for the practical urban planning in Pakistan.

In the next pages, the conclusions and recommendations for the practical urban planning in Pakistan are outlined supported by the findings of this research. The limitations of the research, its contribution to the literature gap and further avenues of research are also presented. With this the research fulfils all the set aims.

Therefore, the research provides a strong study of the concept of plan evaluations, its development and its niche in the urban planning system in general around the world and also specifically for Pakistan. The research successfully identifies and analyses the contemporary practices for urban plan evaluations around the world in order to categorise and filter the practices that have the potential for application in Pakistan. The results of this study led to the research to move further and to develop an evaluation framework for the post-hoc evaluation of master plans in Pakistan through the study of existing indicator evaluation systems.

From here the research continues to gather and synthesise the opinions of urban planners, academics, and urban planning professionals in Lahore, Pakistan regarding the plan evaluation criteria to develop weights of the themes in the evaluation framework. And finally, the research makes conclusions and recommendations discussed in this chapter.

Limitations and further research

A number of limitations faced during the research have in one way affected the outcomes of the study but in the other have also identified gaps and avenues for further research. These are discussed in this section.

The availability of data was one of the most significant hurdle faced in the development and conduction of this research (UN, 2007 and Bell & Morse, 2012). The researcher and some of the experts consulted for this research have the opinion that LDA does conduct evaluations and monitoring reports, though these have never been made public and hence their analysis and contribution to the plan making and its performance is impossible to determine.

Furthermore, there are very few incidences where latest or incremental data was available to understand and assess the performance of the IMPL 2021 against the proposals made. The research had to go through a number of resource materials such as news reports and articles, government statements and associated reports from other sectors such as the Bureau of Statistics for the extraction of relevant data. The lack of consolidated urban indicators and reports was seen as a time consuming and challenging task in this research. Ideally, the inclusion of review and evaluation as a permanent stage in the urban planning process working towards making it legally binding and making the resulting reports public would be a great leap towards the betterment of planning system, urban plans and plan evaluation in Pakistan.

However, this lack of information and research was what started this research and further identification of knowledge gaps will point towards future research options such as the conduction and publication of plan evaluation reports based on the proposed framework or any other form of evaluation techniques. A study and preparation of a periodically updated urban indicator database will also be helpful for further research of this sort and will also be helpful for the planning processes.

Another limitation of this research was that of its avoidance and inability to have a holistic and integrated approach towards developing the reasons regarding the social, political and cultural aspects of the performance of IMPL 2021. The research was faced with time and financial resource limitations to undertake this endeavour and this could be dealt in further research on this topic. Therefore, a further insight into the role played by the socio-economic and political aspects of the planning realm on the performance of the master plans could be conducted.

Moreover, this research has developed the weights for the themes in the indicator framework and the research can be taken further by assigning weights to the indicators in each theme to understand the performance and its evaluation in a sounder manner. Therefore, conduction of a further study for assigning weights to all the indicators which may be listed not on the basis of only literature but also in combination with the inclusion of stakeholders and their opinions.

Recommendations

As the final step of this research a few recommendations are made mainly for the inclusion of master plan evaluation in the planning system and its related advantages in the planning process and the plan performance.

1. The concept of evaluation should be incorporated not only into the plan but also in the planning process (Alexander & Faludi, 1989; Laurian et. al., 2004 and Oliveira & Pinho, 2009). The IMPL 2021 does point towards the conduction of a review of the plan and make changes in the proposals in the light of its findings (LDA, 2004). However, there is firstly no legal binding on the LDA to perform this review and evaluation (LDA Master Plan Rules, 2014) and secondly the subsequent amendments made in the IMPL 2021 are perceived to have been made under market or political influences (Alam, 2020). Therefore, this research encourages the development of a review committee with multiple experts and the output of the review should be made public (Chelimsky, 1997). The conduction of this process should also be made legally binding on the planning and implementation authorities.
2. The plans made in the future should have clear goals and proposals with measurable benchmarks to assess the performance periodically and make relevant changes if necessary. Currently, the research was limited by the lack of measurable benchmarks (LDA, 2004) that could be used to assess how many and to what extent did the plan achieved for all of its goals.
3. The research also identified that the level of public participation is very limited in the plan evaluation process (based on survey results). The inclusion of public and other

stakeholders and experts would enrich the planning process and its output and will therefore help in a better performance of the plan.

4. An issue identified with the IMPL 2021 was that of its faulty forecasts such as those of the population (Pasha, 2021). This can be improved by improving the techniques of forecasting on one hand but by also making the plan flexible that allows for adaptive changes to be made in light of the fast changing socio-economic characteristics of the city (UN, 2007; Bell & Morse, 2018 and Ossadnik et. al., 2016).
5. The strengthening and reforming of the legal backing for the plan processes, implementation and review will also encourage the planning authorities to be accountable and have more control over the development without giving in to the market and political influences (Nadeem & Hameed, 2006; Brody & Highfield, 2005; and Talen, 1997).
6. Lastly, the development of a holistic approach to planning could be incorporated into the planning system where the different themes are studies in relation to each other and more sustainable and long term proposals are made for achieving the goals of the plan (Alexander 2006; Alexander & Faludi, 1989; and Baer, 1997).

Therefore, this research concludes with the above-mentioned recommendations for the forthcoming urban development plans for the cities of Pakistan.

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Appendix

Questionnaire

Indicator based urban master plan evaluation framework using Analytic Hierarchy Process (AHP) for Pakistan: The Case of Lahore

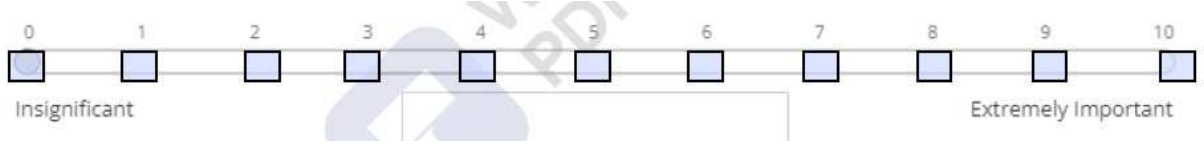
Structured Interview Questions

This research argues that most of the contemporary urban plan evaluation techniques are developed for the developed world and fails to demonstrate sufficient understanding of the developing world and its planning practices.
It further points to a wide gap between evaluation theories and practices and asserts that plan evaluation is one of the missing link in the planning process in developing countries taking the case of Pakistan.
To help narrow this gap, the research develops an indicator-based plan evaluation system for Pakistan and uses it to evaluate the Integrated Master Plan of Lahore 2021.

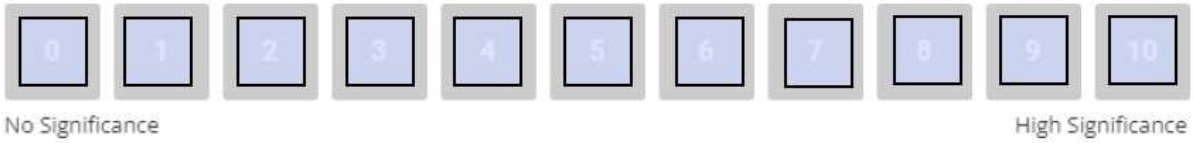
Question 1: What is your profession?

_____

Question 2: What significance do you attribute to post hoc plan evaluation for effective urban planning?



Question 3: In your opinion, what is the significance currently attributed to plan evaluations in the planning system of Pakistan?



Question 4: Do formal plan evaluation committees/teams exist for plans for Lahore, Pakistan?

A. Yes

B. No

Question 5: How do you think the plans should be evaluated for plans for Lahore, Pakistan? (Multiple answers possible)

A. plan assessment (ensuring that the plan embodies its outlined planning process' aims)

B. plan testing and evaluation (evaluating alternative ways to achieve the goals of a plan)

C. plan critique (a subjective review of a plan by other planners, similar to a book review)

D. comparative research and professional evaluation (comparing various plans, with or without considering outcomes)

E. post hoc evaluation of plan outcomes

F. Other (Please Specify)

Question 6: According to you, what qualitative or quantitative measures or any other tools (formal or informal) can be used to measure the performance of the plans, its goals and objectives? (Multiple answers possible)

A. Indicator: Performance measured against benchmarks or goals, may be qualitative or quantitative.

B. Value Driven: assigns value to one of the aspects of the plan and makes assessment for that aspect in isolation.

C. Holistic Case Studies: anecdotal in nature as they make assessment of the various plans made for a certain region over a stated period.

D. Invisible/Incremental: often carried out by the planning institutions in the form of technical reviews, capital programs, financial audits and consistency reviews.

Question 7: How do you think that these evaluations can contribute to the plan making process?

A. learning from previous planning experiences

B. to have a real judgment of planning effectiveness

C. To measure gap between the desired goals and actual outcomes

D. Promotes transparency and public participation

E. Other (Please Specify)

Question 8: In your opinion who oversees or should oversee the ensuring of integration of plan evaluations into the planning process?

A. Internal: Plan making authority

B. External: Auditors

C. Critique: Researchers

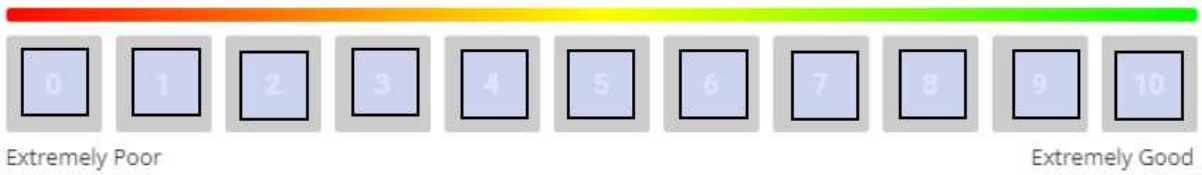
D. Other (Please Specify)

Question 9: Is there any public participation involved in the evaluation of plans?

A. Yes

B. No

Question 10: What is the extent of this participation if it exists?



Presented below are the Themes for plan evaluation matrix for IMPL 2021. You are required to assign importance to each theme with respect to the other themes (pair-wise comparison). The results will be used to assign weightage to the theme for the final indicator based plan evaluation framework.

	Extremely Important	Very Strongly to Extremely Important	**Very Strongly Important**	Strongly to Very Strongly Important	**Strongly Important**	Moderately to Strongly Important	**Moderately Important**	Equally to Moderately Important	**Equally Important**	Equally to Moderately Important	**Moderately Important**	Moderately to Strongly Important	**Strongly Important**	Strongly to Very Strongly Important	**Very Strongly Important**	Very Strongly to Extremely Important	**Extremely Important**	
Law and Administration	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Disaster Mitigation and Prevention
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Land Use
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Density
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Services
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Transportation
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Housing
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Social Welfare
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Environment
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Economy

	Extremely Important	Very Strongly to Extremely Important	Very Strongly Important	Strongly to Very Strongly Important	Strongly Important	Moderately to Strongly Important	Moderately Important	Equally to Moderately Important	Equally Important	Equally to Moderately Important	Moderately Important	Moderately to Strongly Important	Strongly Important	Strongly to Very Strongly Important	Very Strongly Important	Very Strongly to Extremely Important	Extremely Important	
Disaster Mitigation and Prevention	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Land Use
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Density
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Services
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Transportation
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Housing
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Social Welfare
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Environment
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Economy

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Land Use	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Density
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Services
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Transportation
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Housing
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Social Welfare
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Environment
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Economy

	Extremely Important	Very Strongly to Extremely Important	**Very Strongly Important**	Strongly to Very Strongly Important	**Strongly Important**	Moderately to Strongly Important	**Moderately Important**	Equally to Moderately Important	**Equally Important**	Equally to Moderately Important	**Moderately Important**	Moderately to Strongly Important	**Strongly Important**	Strongly to Very Strongly Important	**Very Strongly Important**	Very Strongly to Extremely Important	**Extremely Important**	
Urban Density	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Transportation
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Housing
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Social Welfare
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Environment
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Economy

	Extremely Important	Very Strongly to Extremely Important	**Very Strongly Important**	Strongly to Very Strongly Important	**Strongly Important**	Moderately to Strongly Important	**Moderately Important**	Equally to Moderately Important	**Equally Important**	Equally to Moderately Important	**Moderately Important**	Moderately to Strongly Important	**Strongly Important**	Strongly to Very Strongly Important	**Very Strongly Important**	Very Strongly to Extremely Important	**Extremely Important**	
Urban Services	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Housing
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Social Welfare
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Environment
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Economy

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Transportation	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Social Welfare
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Environment
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Economy

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Housing	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Social Welfare
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Environment
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Economy

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Social Welfare	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Environment
	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Economy

	Extremely Important	Very Strongly to Extremely Important	**Very Strongly Important**	Strongly to Very Strongly Important	**Strongly Important**	Moderately to Strongly Important	**Moderately Important**	Equally to Moderately Important	**Equally Important**	Equally to Moderately Important	**Moderately Important**	Moderately to Strongly Important	**Strongly Important**	Strongly to Very Strongly Important	**Very Strongly Important**	Very Strongly to Extremely Important	**Extremely Important**	
Urban Environment	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Urban Economy