

3 RESEARCH DESIGN

3.1 RESEARCH QUESTIONS

The theoretical framework of the previous chapter provides a basis for a research design. The research design is fundamentally based on the central question. The central question of this research project is the following:

“What is the impact of contemporary migration of the urban and rural poor on the quantity and quality of urban infrastructure services in Trujillo, Peru?”

Five sub questions are formulated:

1. *“What is the size and direction of the migrations flows concerning the metropolitan area of Trujillo?”*
2. *“What are the characteristics of the migrants and their settlement in the poor urban areas in Trujillo?”*
3. *“Which infrastructure services and in what quantities and qualities are delivered within the poor urban areas of Trujillo?”*
4. *“How does the process of obtaining and delivery of infrastructure services to the urban poor take place?”*
5. *“What linkages exist between migration, migrants, infrastructure services and the process of delivery of these services?”*

These way in which these five research questions are investigated is elaborated on in this chapter.

3.2 CONCEPTUAL MODEL

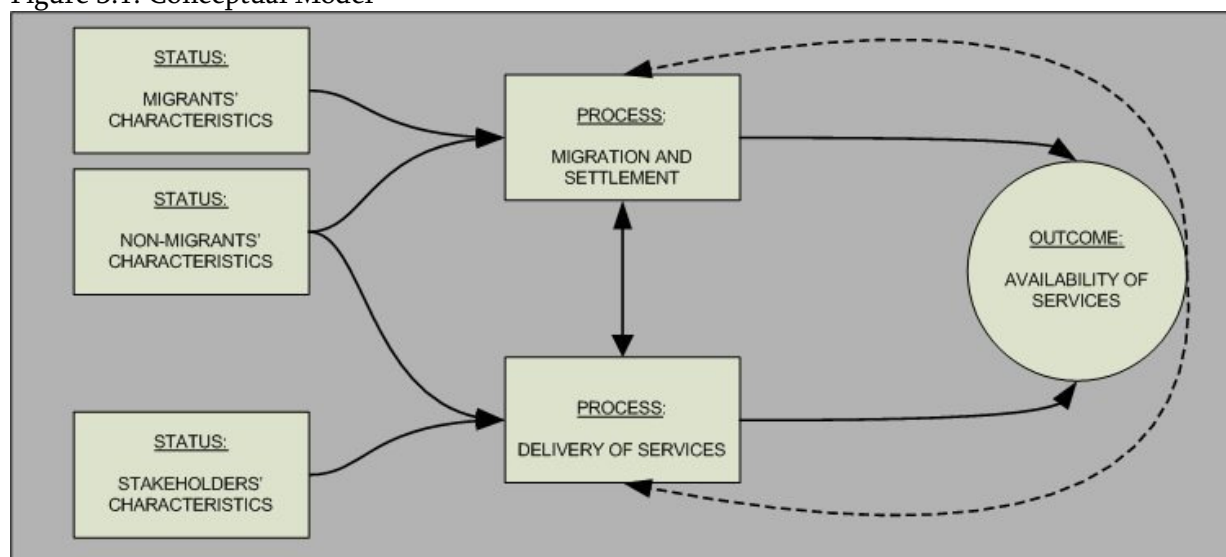
This section shows the conceptual model that provides a comprehensive overview of the research. The conceptual model is used for studying the interaction between migration and urban infrastructure services, i.e. as stated in the research questions. At the end of this chapter, a research model specifically designed for this research is presented.

The conceptual model consists of two elements that have a direct impact on the use of services (see fig. 3.2), and three that have an indirect influence. These elements can be studied relatively separately from each other, and they require different methodological approaches and indicators. The conceptual model shows which of these elements are directly related to each other, as well as the direction of the relation. The arrows from the status blocks to the process blocks indicate that the status influences the process in a unidirectional way. The two indicated processes influence each other, which is shown by the two way arrow. These processes lead to the outcome, the circle

indicating the availability of services. This is the availability and use of services in a specific area. Finally, some feedback loops exist, indicated by the dashed lines.

The element of the non-migrant population contains the group of people that does not move towards new settlements. They have a direct influence on the process of the delivery of services, as well as on the migration and settlement of migrants. The migrants are all of those that move to new settlements, whether they were born and raised in the close-by neighbourhood or not.

Figure 3.1: Conceptual Model



The elements are studied via both quantitative and qualitative indicators. For the status of the migrant population, the characteristics include income, household size, migration patterns, and reasons for migration. The non-migrant population is considered via their use of services, income, and household size. For the process of migration and settlement the indicators used are the different migration flows (quantitative and qualitative) at different levels (country, department, and district), urban developments, urbanisation levels, patterns of settlement, and the construction of houses are considered. The stakeholders' characteristics are analysed by considering the actors' responsibilities, size, and efficiency. The process of delivery of services is considered via the interests and strategies of the stakeholders, the functioning of the market, existing subsidies, and the costs of services. The final outcome, the availability of services, is studied in detail via; the type of services offered, the quality and prices of the services, usage statistics and availability.

The interaction is studied mainly via the strategies and behaviour of different individuals or actors. The strategies followed by the migrants to the migration and settlement process are considered by the actions taken to settle. The characteristics of the population determine their behaviour and influence. The same applies for the stakeholders; the processes are an outcome of their characteristics and choices made. The interaction of these processes is studied via the neighbourhood organisation and the way actors deal with each other. Finally, the influence on the outcome is studied via specific results of actions taken. The feedback loops are not explicitly considered in this research,

3.3 CONCEPTS AND DEFINITIONS

Throughout this research, various concepts and definitions are used. In this section, the most important ones are provided.

Poor urban settlements:

The term ‘poor urban settlements’ and the group of people qualified as the urban poor are similar to that of slums and slum dwellers in other research. The term poor urban settlement largely follows the typology of slums as defined by the UN Habitat; a group of individuals living under the same roof in an urban area who lack one or more of the following:

- Durable housing of a permanent nature that protects against extreme climate conditions;
- Sufficient living space which means not more than three people sharing the same room;
- Easy access to safe water in sufficient amounts at an affordable price;
- Access to adequate sanitation in the form of a private or public toilet shared by a reasonable number of people;
- Security of tenure that prevents forced evictions. (UN Habitat, 2006; see Appendix B-3 for more details)

More detailed information is provided in the analysis of the studied cases, so that the discussion whether or not an area is considered a slum is less relevant.

Recent settlement: A recent settlement is a neighbourhood that has been established within approximately the last 5 years. Thereby, all migrants living in these settlements are considered recent migrants, according to Peruvian and international standards (Bilsborrow, 1998, pp. 6).

Migration: The movement of a person from one administrative division to another with the intention to change usual residence (Bilsborrow, 1998, pp. 3-5). Migration is thus considered at different spatial levels (district, department). The level at which migration is considered is mentioned in the relevant sections. This research excludes external migration, only internal migration is considered.

Urban - Rural: The difference between urban and rural areas is considered a difference in population size of the centre in an area. The distinction between urban and rural areas is considered on district and department level, and follows the definition used by the Peruvian National Institute of Statistics (INEI) where possible.

Throughout the analysis, the different legal-spatial divisions of Peru are used. These divisions are also presented graphically in Appendix A Figure 2 to 4. Peru is divided into 25 departments, of which La Libertad is the focus of this research. La Libertad is divided into 12 provinces, of which Trujillo Province contains about half of the total population of the department La Libertad. The following divisions and according authorities exist:

1.	Nation	Peru	National Government
2.	Department	La Libertad	Regional Government
3.	Province	Trujillo Province	Provincial Municipality of Trujillo
4.	District/Populated Centre	e.g. La Esperanza	Municipality
5.	Neighbourhood	e.g. Nueva Jerusalén	Local representatives

The terms human settlement (*Asentamiento Humano*), marginal urban neighbourhood (*Barrio Urbano Marginal*), young town (*Pueblo Joven*) and similar ones are not used in this research. Instead, we use the term neighbourhood.

The populated centres are areas within a district that have gained importance and independence. In Trujillo Province, only some populated centres have been created (see Appendix D Table 8). For this research project, the populated centres Alto Trujillo and El Milagro are most important. The populated centre Alto Trujillo is part of El Porvenir, and the populated centre El Milagro part of Huanchaco. Most of the analysis is done at the level of districts. Only in some cases is are the populated centres considered separately. The level of analysis is mentioned in the respective tables.

The province of Trujillo is located within the department La Libertad, and consists of the following eleven districts:

- Trujillo;
 - La Esperanza;
 - El Porvenir;
 - Florencia de Mora;
 - Victor Larco Herrera;
 - Huanchaco;
 - Laredo;
 - Moche;
 - Salaverry;
 - Simbal;
 - Poroto.
- } Metropolitan Area of Trujillo

The two populated centres that are considered in this research project are:

- Alto Trujillo (located in El Porvenir);
- El Milagro (located in Huanchaco).

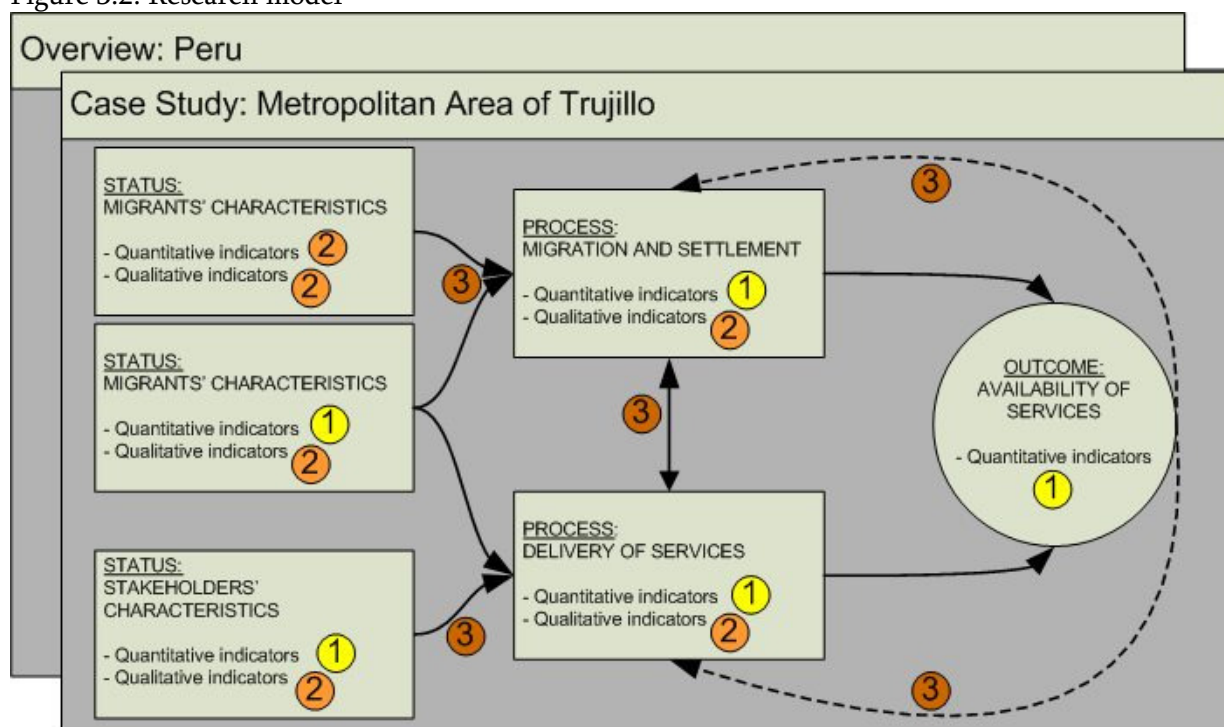
This research focuses on the metropolitan area of Trujillo. The metropolitan area of Trujillo refers to the urban area within Trujillo Province¹. This is basically the whole of Trujillo Province, excluding the rural districts Poroto and Simbal.

3.4 RESEARCH MODEL & STUDIED ELEMENTS

The research questions are answered by analyzing the various elements and their links. The way this is done is presented in Figure 2, the research model.

The research is carried out at two levels. First, there is the general overview of Latin America and Peru. The theoretical framework focussed on developments in Latin America as a region. The relevance for attention to Latin America as a whole is that comparable developments concerning both migration and infrastructure service delivery take place in different countries. From this framework, the Peruvian situation is better understood. This is especially the case on the aspects related to the changing roles of public authorities and private providers of infrastructure services. The Peruvian case is elaborated on in the research, and used to provide a framework for the developments in the metropolitan area of Trujillo.

Figure 3.2: Research model



The case study of Trujillo provides the in-depth insights in the processes and detailed data necessary to answer the research questions. As can be seen in Figure 2, four steps can be distinguished:

1. Analysis of the existing data and information on:
 - a. Characteristics of the non-migrants;
 - b. Migration flows and patterns of settlement;
 - c. Characteristics of stakeholders.
 - d. Infrastructure services use;
 - e. Delivery of infrastructure services;
2. Collection of data on and insights in:
 - a. Characteristics of migrants;
 - b. Characteristics of the non-migrants;
 - c. Process of migration and settlement;
 - d. Process of delivery of services;
 - e. Elements not yet covered with the analysis of the existing data (1).
3. Combining the above via an analysis of the links;
4. Conclusion drawing on the case study and combining them with information obtained from the literature overview.

3.5 DATA COLLECTION AND DATA ANALYSIS

Different methods of data collection are used for this research. The sources can be divided into background literature, secondary data, and primary data.

There is an extensive study of the background literature, which has been used to develop the research model and provide the theoretical background. All the background literature consists of

books written by various scholars, chapters in books, articles in scientific papers, and information available on websites. All background literature that is used is referred to in the bibliography, and comes from a variety of sources. For the case of Trujillo, the Environmental Atlas of Trujillo (MPT, 2003) and the works of Rosner (1999) and Amemiya Hoshi (2003) are important. The selection of literature for Trujillo was heavily limited to works with a sufficient level of novelty and scope. The literature used is published either in English or Spanish.

Secondary data is used for both the theoretical overview, the Peruvian situation and for the case study of Trujillo. The secondary data as used for the theoretical overview is obtained from the academic literature, and contains publications from the UN Habitat, the ECLAC and the World Bank. The data used for the overview of the Peruvian situation is mainly collected from the National Bureau of Statistics (INEI). For the case of Trujillo, the secondary data derives mainly from the planning department of the Provincial Municipality (Plandemetru), the work of Rosner (1999), the water supplier Sedalib, the electricity provider Hidrandina, and the various supervising authorities (SUNASS, OSINERGMIN and OSIPTEL). Most of the used data is displayed in the Appendices.

The collection of primary data is done through surveys, interviews, field trips and observations. The interviews are used to get detailed information on the actors (authorities, local representatives, companies and NGOs). They were carried out in formal interviews (where prepared questions were asked, tape-recorded, summarised and thereafter confirmed by the respondent) as well as in a more informal manner (where notes were taken immediately). A list of the interviewed people can be found at the end of the bibliography, as well as in the respective sections in the text. Field trips were undertaken with various parties² to observe their methods and acquire information on the area in which they operate.

In total 240 surveys were carried out. The data from the surveys is available on the CD attached to the cover of this thesis. To obtain a copy of the raw data, please contact the author. The surveys were carried out in three different locations in the northern part of Trujillo (see Appendix A Figure 6 for a map). The areas were selected on basis of their age, location, legal status and level of poverty. They had to be recent, poor, urban settlements, in different districts of the metropolitan area of Trujillo with different levels of security of plots. In total, the survey covers an area of 2,676 plots, of which about 9% is surveyed. The selection of the individual cases (persons) that were surveyed depends only on their location; the share of the surveyed households is similar in each neighbourhood (e.g. in every set of blocks of houses of the sample of El Milagro VII, about 7% is surveyed).

The surveys provide detailed information at the neighbourhood level. The three selected areas are the neighbourhoods Sector VII (in populated centre El Milagro), Nueva Jerusalén (in district La Esperanza) and Barrio 2B (in populated centre Alto Trujillo). These neighbourhoods include the bordering squatter settlements. For an overview of the studied areas, see Appendix A Figures 6 and 7.

The data for the selected neighbourhoods is highly representative for the recent settlements in the same district or populated centre. Thus all settlements of the populated centre Alto Trujillo that have been established within the last five years, are similar to the sample of Alto Trujillo 2B. Thereby, differences between the three samples (Alto Trujillo 2B, El Milagro VII and La Esperanza

NJ) represent differences between recent settlements of the whole of Alto Trujillo, El Milagro, and La Esperanza. The case of El Milagro VII is partly located within the Industrial Park of the Regional Government. The aspects of the research that are concerned with the legal status of these settlements in El Milagro VII are representative for all of the settlements in the Industrial Park, and not necessarily for the rest of El Milagro.

Table 3.1: Surveys carried out for this research project

Metropolitan area	District / Populated centre	Neighbourhood	Number of surveys	Number of plots	% surveyed
Trujillo	El Milagro	El Milagro VII	90	1,246	7.2
	La Esperanza	La Esperanza NJ	90	900	10.0
	Alto Trujillo	Alto Trujillo 2B	60	530	11.3
	Total		240	2,676	9.0

The selected neighbourhoods are representative for almost all of the poor recent settlements in the metropolitan area of Trujillo. Considering migration patterns, the three cases represent all the recent settlements of the northern districts Huanchaco, La Esperanza, Florencia de Mora, El Porvenir, and Laredo. The migration patterns and figures might be different in the districts Victor Larco Herrera, Moche, and Salaverry. The processes of settlement, delivery of services, the stakeholders involved, as well as the availability of services are highly similar in all recent settlements of the metropolitan area of Trujillo, except Alto Moche. The level and type of infrastructure provided in the recent settlements is not very similar to the older parts of the metropolitan area. Thus, the older parts of El Porvenir do not have much similarity with the recent settlements of Alto Trujillo. The census of 2007 (due to be published in June 2008) makes a further comparison possible, where especially similarities between migration patterns deserve comparison. In general, the data from the neighbourhoods is representative for most of the recently expanding settlements at the borders of the city.

The data from the surveys is analysed statistically in several ways. First, tables of frequencies and percentages are constructed. Second, some 5-scale variables are compared via their means (analysis of variance one-sample t-test). Third, all qualitative variables and some scale-variables of the questionnaires are compared via the Chi-square function and cross-tabulations with adjusted residuals. These allow non-parametric data to be compared independent of their distribution³. The Chi-square test statistic shows whether the distribution of variables of different categories are statistically dependent. The value for Chi-square is larger when there is dependency. The main means of interpreting is via the according level of significance, where <95%, 95% and 99% levels are used. A high level of significance is strong evidence in favour or dependency. The adjusted residual is similar in use to the Chi-square function, and provides information on the level of the different cells. A large difference between the expected value and the observed value indicates dependency. It behaves like a z-score, thus an adjusted residual larger than 2 indicates 95% significance, a value larger than 3 indicates 99% significance for that particular cell. The sign (+ or -) indicates the direction of the correlation. The analysis is done with SPSS version 15.0.

The tables on which the text in these chapters is based are included in Appendix C. An overview of all data is available on the attached CD. Most of the tables presented in Appendix C have strong correlations (e.g. Chi-square at 95% or 99% accuracy). This is partly due to the exclusion of most other tables, and partly due to the sample size of the survey. There were no significant differences

found between migrants and other settlers. This is explicable, as the differences are largest with those that do not settle in the recent settlements. There has not been made an extensive statistical comparison of those living in the recent settlements and those in other neighbourhoods. This is best done by comparing the data of this research with the census data of the 2007 census.

The survey is used to obtain information on various topics; it includes general aspects of the household, as well as the building and settlement process. The complete questionnaire in both English and Spanish can be found in Appendix J. All surveys were carried out in Spanish. Furthermore, it includes questions on all infrastructure services (i.e. water, sanitation, electricity, telecommunications and waste disposal). The questions are structured according to subject (e.g. the respective service), and are quite similar for the different infrastructure services to allow for comparison. There is a combination of open and closed questions. The categories as visible in the survey are for convenience only, as the category 'other' is always specified. On average, a survey took 25-40 minutes to complete. The surveys were all carried out by the author⁴, on a one-on-one basis with the respondents, where only one person in a group of people was selected to be interviewed, in order to prevent the copying of answers. The way the survey was carried out is thus similar in every case.

My experiences while carrying out the surveys were remarkably positive. Visiting these neighbourhoods without a guide did not lead to any threats or exposure to dangerous situations. Most visits were done during the day, though sporadic nightly visits were undertaken. Furthermore, most people were willing to spend the required time participating in the survey. My status as an independent foreign student (as opposed to being linked to an NGO or company) had a positive impact on the quality of the answers. The social desirability of answers was not influential⁵, as most of the surveys were carried out on a one-on-one basis and the respondents were open about all the topics.