EVALUATING LOCAL LAND USE ZONING POLICIES

Case Study of Informal Settlements in General Trias Philippines

Ivonne Astrid Moreno Horta

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by

Ivonne Astrid Moreno Horta

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Degree Assessment Board

Chairman	Proffesor Ir.R. Groot
External Examiner	Professor J. de Jong
First Supervisor	Drs. Johan de Meijere
Second Supervisor	Dr. Ing. Erik de Man

INTERNATIONAL INSTITUTE FOR GEO-INFORMATION SCIENCE AND EARTH OBSERVATION
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DEDICADATORIA

Para mi familia y mi amor.

A mis padres, Florentino y Marlene porque con su entrega total, me han enseñado el valor del trabajo y la dedicación. A mis hermanos de los cuales he extrañado sus burlas, chistes y comentarios que me hacen sonreír. A Mauricio porque su apoyo y voz de aliento me han impulsado a andar el camino del conocimiento.

ABSTRACT

The emerging of informal settlements and the development of urban areas in unplanned places are common phenomena among countries of developing economies. In order to constrain the urban development and the rural-land conversation, governments have formulated public policies as 'a way of distributing rights to get access to, use and benefit from land' (Darin-Drabkin, 1977)

As part of such policies, local land use zoning policies establish where to allocate the different land use activities and where to allow or *not* to allow land use conversions, aiming to achieve a planned urban development. However in practise new informal settlements are emerging leading to a difference between the 'paper' policy and the ground development.

Theory states that policies are ineffective when they fail to change the behaviour of the target group (Bresser and Klok,1988). This research evaluates the causes that generate the difference between the policy's objectives and the development of informal settlements on the ground, using as case study the municipality of General Trias (Philippines). The policy evaluation looks at the influence of the institutional context on the policy, identifies the factors that motivate the development on the ground, and evaluates the spatial patterns in the rise of informal settlements.

Local governments enact land use zoning policies within the national policy framework. However the power of voting of informal settlers influences the local government not to enforce the policy instruments (zoning ordinance) in the informal settlements. This creates a context within which informal settlers are not evicted but at the same time remain informal. Settlers face informality through the development of urban infrastructure, a task that is achieved gradually, obtaining funds by using political patronage and the exchange of votes for public investment. The higher the development, the lower the fear of eviction and the closer to formality.

The strategies of survival of low-income urban population are based on the search for land outside the formal market but as close as possible to the socio-economic opportunities of the formal city. This generates a spatial pattern in the rise of informal settlements, which tend to emerge near sources of employment and social facilities. The research recommends to consider the rise of informal settlements in the vicinity of formal development as additional criteria in site selection for formal development.

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ACRONYMS

CLMDS	Cluster Land Management and Development Strategy of the Provinces of Cavite and Laguna.
CLUPD	Comprehensive Land use Development Plan
DA	Department of Agriculture
DAR	Department of Agrarian Reform
DENR	Department of Environment and Natural Resources
DILG	Department of Interior and Local Government
DOTC	Department of Transportation and Communications
DPWH	Department of Public Works and Highway
EMB	Environmental Management Bureau
HLURB	Housing & Land Use Regulatory Board
HUDCC	Housing and Urban Development Coordinating Council
LGU	Local Government Unit
LMB	Land Management Bureau
NAMRIA	National Mapping and Resource Information Authority
NEDA-Board	National Economic and Development Authority Board
NHA	National Housing Authority
NLUC	National Land Use Committee
PEZA	Philippines Economic Zone Authority
PPFP	Provincial Physical Framework Plan
PTA	Philippine Tourism Authority
RPFP	Regional Physical Framework Plan

1. INTRODUCTION

This chapter describes the research problem, the conceptual framework, the questions and objectives and the workflow of the research. The problem is described first from a general perspective using the problem tree methodology for the identification of causes and effects. Then the context of the case study area is described. Key concepts are defined in order to avoid ambiguity in the terminology. The formulation of questions and objectives are presented in a logical framework (Log-frame).

1.1. Problem Statement

Policies are an expression of what government wants to achieve, in other words, they are an explicit statement of a governance objective. They establish the driving framework of governmental actions and determine the relations between institutions and target groups.

Effective policies change the behaviour of the target group through the application of policy instruments. In the land use-zoning arena, effective policies influence the target group decision on where to develop the land and on which activities to carry out on those developed areas. This means, that policy effectiveness depends of the acceptance or rejection of policy instruments by the target group.

When land use zoning policies do not change the behaviour of the target group, a difference between the 'paper' policy and the ground development arises. The degree of such discrepancy varies from carrying out activities in existing buildings without the pertinent permit, to the transformation of the land to undesired uses (from the government perspective).

The causes of the difference between policy objectives and outcomes are interrelated. However they can be categorised into two spheres: institutional and target group. In the institutional sphere, weak inter-institutional coordination and low integration of public policies affect the effectiveness of policy instruments. In the target group sphere, deficient access to affordable land and shelter and the push of the community against policy instruments, constrain the implementation of the policy.

The effects of the difference between land use zoning policy and ground development are: emerging of informal settlements (in undesired areas), urban sprawl and difficult provision of urban services, which lead to inadequate urban development. (Refer to Figure 1.1)

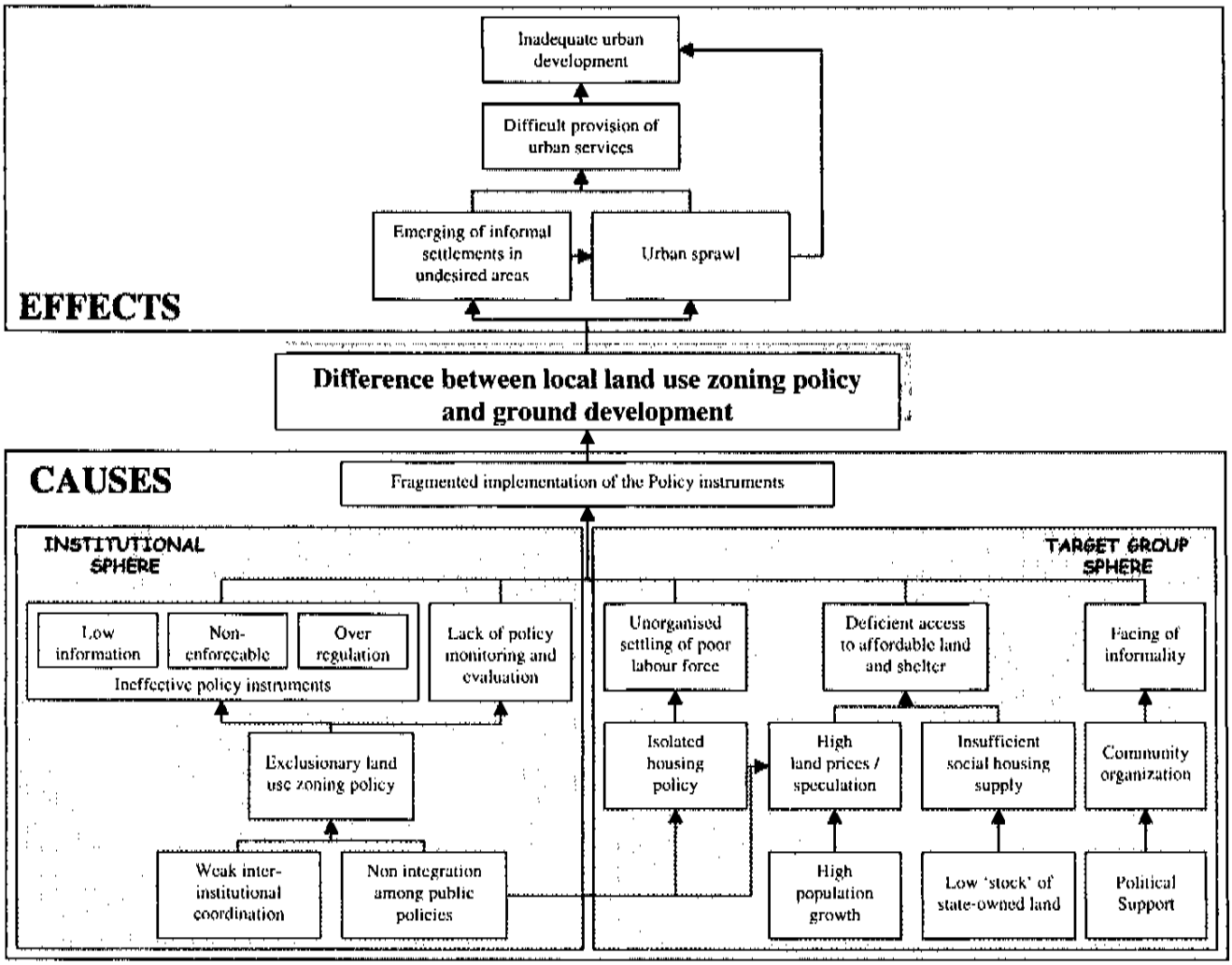

Figure 1.1 Problem Tree: Gap between Land use Zoning Policy and Ground Development

1.2. Case Study: General Trias – Cavite (Philippines)

This study evaluates local land use zoning policies using as a case study the rise of informal settlements in the municipality of General Trias - Philippines. For the last decade the municipality has experienced a high dynamism in land uses due to a national policy that established in 1994 a national special economic zone within its territory.

In 1995 General Trias formulated a land use zoning policy that reserved 6.6% of the municipality's land for the development of industrial activities. The policy aimed to expand industrial activities, to consolidate commercial and institutional activities in the CBD (*poblacion*)[1] and to protect the remaining agricultural land. The phenomenon of informal settlement conformation was simply ignored by the policy.

[1] The *poblacion* area encompasses the old plaza, the municipal hall, the municipal church, the public market, the central business district, and the old prime residential area. (General Trias NEDA CLUDP /2000)

The land use in 2000, indicates that the 1995 land use policy only succeeded in the allocation of industrial estates and in the consolidation of the CBD. However new residential units emerged in zones designated for agricultural purposes and informal settlements grew especially in areas located near the industrial sites and along main roads.

In the same year, the municipality formulated again a land use zoning policy in order to catch up with the rapid land use changes. This new policy expands the area for the development of industrial activities by a factor of five and recognises the residential developments on the agricultural land. Regarding the informal settlements, the policy identifies their proliferation. However it does not formulate policy measures to address the phenomenon of informal housing in the municipality.

1.3. Concepts

1.3.1. Land use Zoning Policy

Land use zoning is as regulatory policy characterised by government intervention on the human-land relationship. It distributes the rights to use and benefit from the land. Its purpose is to ensure that physical developments follow the government's plan of *which* activities should be located *where* and *which irreversible transformations should not occur where* (Meijere, 1999).

1.3.2. Policy Instruments

Policy instruments are the institutional tools used to achieve government's goals. They could be:

- **Legislative,** use regulations and administrative decisions based on law enactment. E.g. zoning ordinances
- **Informative,** increase the target group's awareness of the land use regulations; this instrument is based on education and persuasion.
- **Financial**, use government spending and taxing powers to shape private initiatives. E.g. preferential tax treatment in industrial sites.
- **Direct government activity,** through the execution of specific programmes. E.g. squatter relocation

1.3.3. Land Use Zones

Land use zones are the layout of the land use zoning policy. It shows the demarcation of residential, commercial, institutional, industrial and recreational activities and the definition of open space.

The lay-out subdivides the land into zones and for each zone land use activities are regulated. The purpose is to ensure that **a)** incompatible activities, such as heavy industry and housing are separated; **b)** building activities are kept away from environmental sensitive areas; **c)** network utilities satisfy the land use demand and **d)** urban development is kept in balance with the environmental protection and natural hazards mitigation (Hoch, Dalton, So, 2000).

1.3.4. Informal Settlements

Informal settlements are also denominated squatter settlements. It comprises all buildings that are constructed on invaded private or public land. Occupants do not hold the legal right (title) to make use of the land.

1.4. Conceptual Framework

To evaluate the local land use zoning policy, the research is based on the studies of Bresser and Klok (1988). According to their theory one should be aware of two premises to evaluate policies. First, polices instruments aim to change the behaviour of the target group. Secondly, the factual effectiveness of policies is the result of factors -circumstances- that influence the behaviour of target groups. (Refer to Figure 1.2)

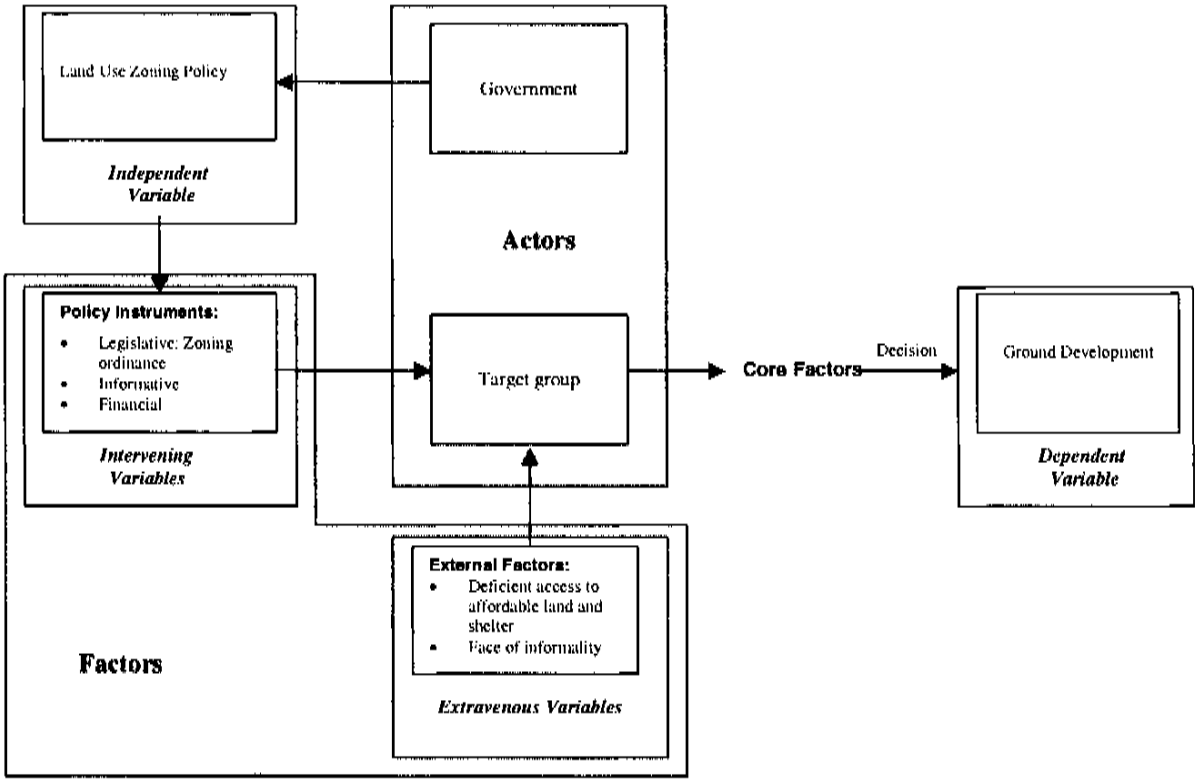

Figure 1.2 Conceptual Model for Policy Evaluation

In order to make the decision to change or *not to* change behaviour, the target group evaluates the pros/cons of the policy, as well as the particular circumstances and needs that may be affected or satisfied by the policy. Then based on the evaluation of such factors, the decision to accept or reject the policy is made it.

Policies are effective when the target group's decision is mainly influenced by the policy instruments. In the same manner, policies are ineffective when the influence of the external factors motivates the target group to reject the policy. (Refer to Figure 1.3)

The fact that target groups take actions as a manifestation of a decision converts them into actors, in the same way as policymakers. They (as the policymakers do) act under their rationality and evaluation of choices. Even the poorest and most oppressed actors have a choice between different courses of action and operate with a notion of rationality (Wit, 1996). This means that the interaction between policy makers and target population determines the degree of difference between the policy objectives and the outcome.

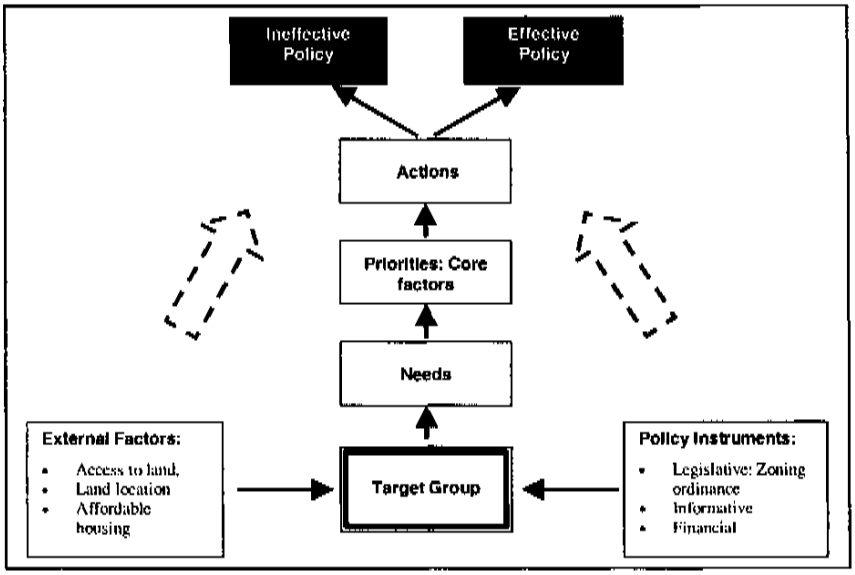

Figure 1.3 Influence of External Factors and Policy Instruments Over the Effectiveness of the Policy

1.4.1. Actors

- **Target group**

The target group of land use zoning policies may be any land developer acting as a group or as individual. It could be a company or a household.

- **Policymakers**

The Philippine government structure has four levels: national, regional, provincial and municipal. The land use zoning policy is formulated at municipal (local) level under the influence of the higher levels' policies.

1.4.2. Factors

In the decision making process those factors that determine the final decision of the target group are called core factors. Policy instruments are the factors set up by policy makers to facilitate and promote the behavioural change of the target population in favour of the policy objectives. All circumstances outside the policy instruments that are affecting the acceptance of the policy are denominated external factors or non-policy factors.

The term locational factors involves all the circumstances that determine the site of the informal settlements and that are related with the specific characteristics of the land. For instance, surrounding land use, infrastructure, natural resources (water) and proximity of social facilities.

1.5. Questions and Objectives

Table 1.1 Questions and Objectives in the Context of the Logical Framework

	QUESTIONS	OBJECTIVES
Goal	How to increase the effectiveness of land use zoning policies?	To contribute to the understanding of land use zoning policies
Purpose of the Research	**What are the causes that generate the difference between land use zoning policy and ground development?**	**To identify the causes that generates the difference between land use zoning policy and ground development.**
Outputs	How does the institutional context influences local land use zoning policies?	• To analyse the inter-institutional context behind the formulation of the local land use zoning policy • To evaluate the local land use zoning policy. • To examine the policy instruments • To review the monitoring and evaluation of the land use zoning policy
	What are the factors that motivate the target group to adopt or to reject the policy instruments? How does the target group handle the status of being informal?	• To identify the core factors that motivate the target group to adopt or reject the policy instruments • To identify how the target group faces the status of being informal • To determine the role of the community organisation in the push against policy instruments
	Is there any spatial pattern in the rise of informal settlements?	• To evaluate the locational factors of the informal areas.

1.6. Workflow

Figure 1.4 shows the sequence of the research steps. Once the objectives are defined, the literature review supports the elaboration of the conceptual framework. Data is gathered in the field, then it is processed and analysed.

The analysis consists of the review of the relationship between the governmental institutions and the target group. From the side of the policymakers, the purpose is to study how the institutional context affects the application of the land use zoning policy. From the target group perspective, the purpose is to identify what are the core factors that drive the target *not* to consider the policy instruments.

The research conclusions focus on the causes that generate the difference between the local land use zoning policy and the ground development. Based on the conclusions, recommendations are given.

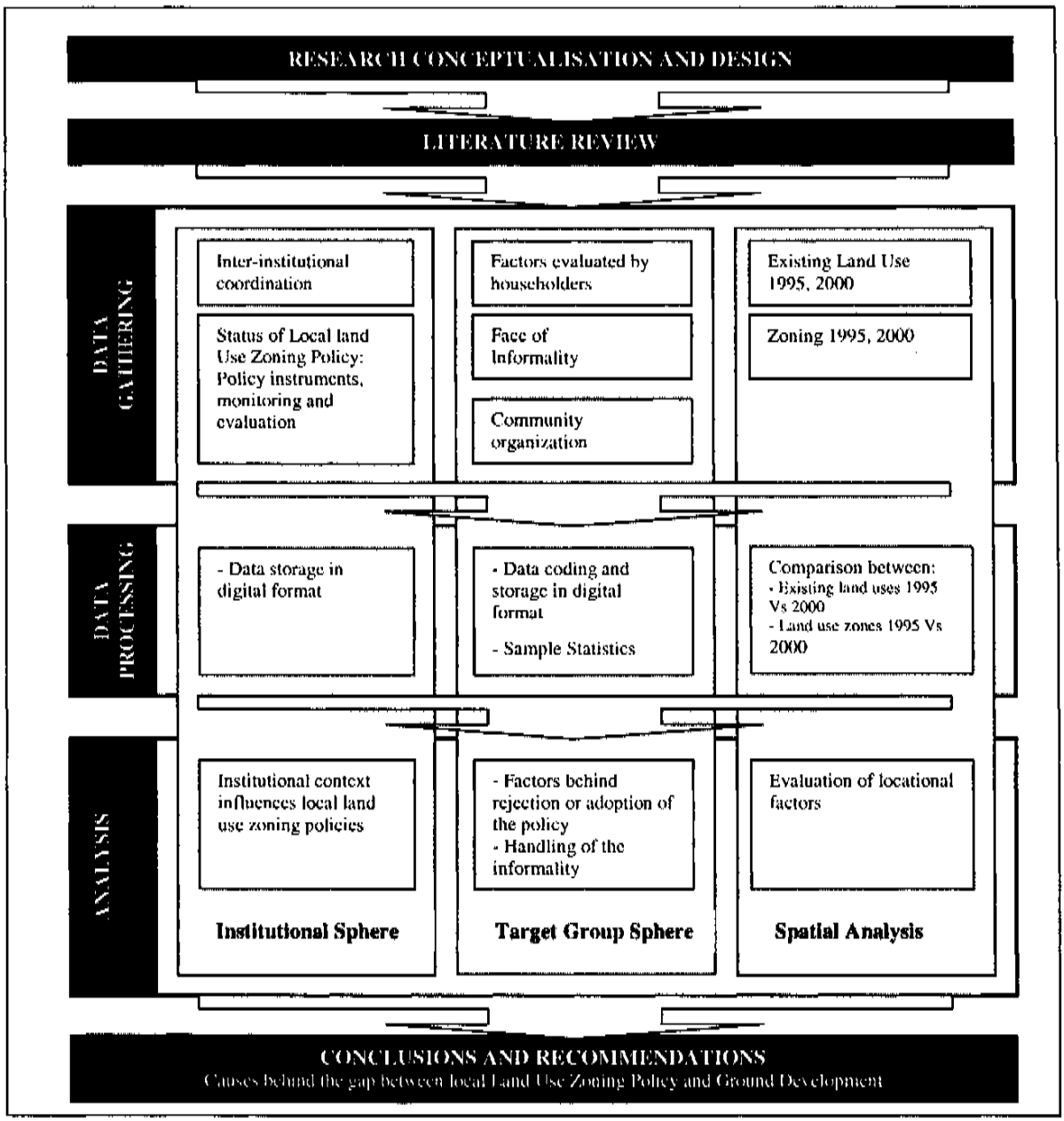

Figure 1.4 Workflow of the Research

2. LITERATURE REVIEW

The aim of this chapter is to answer the research questions through the review of studies and papers produced in the field of public policies and land use zoning. It starts with an evaluation of the pros and cons of land use regulations. It is followed by the review of the institutional context of the local land use zoning policies, the analysis of the ways used by the target group to handle informality and the review of possible spatial patterns in the rise of informal settlements.

2.1. Necessity of Land Use Regulations

Basically the literature shows two juxtaposed positions regarding the benefits of regulatory policies. The arguments in favour claim the need of governmental interventions with the aims to achieve the targets of **a)** appropriate management of the resources, **b)** equitable access to land and **c)** control of urban growth. The counter arguments allege that limitations of the land rights constraint the best economically use of the land and contribute to the imperfection of land markets, moving away private initiatives and investments.

2.1.1. Arguments in Favour

Management of the resources, In order to have appropriate land management and management of resources, governments have the power to limit the right of private owners and users to dispose of the land, in particular for environmentally motivated reasons (Van der Molen, 1998)

Welfare distribution, In almost all developing countries, there is now the tendency to assign to the state a wider authority and initiative as an agency for improving social standards and the life of the community. Governments therefore see the need and justification to use land as an instrument of general economic and social development; to improve the living standards of the people, especially the landless and low-income classes. (Acquaya and Asiama, 1986)

Growth control, 'Government interventions in the land market are often part of spatial strategies aimed at reducing the growth of large cities, developing small and intermediate-size towns and lagging regions.' (Rondinelli, 1990)

2.1.2. Arguments Against

a) Regulatory policies affect the functioning of land markets. The fewer the restrictions are, the stronger the incentives for land investment. Salazar and Gershon (1995) recommend the removal of all restrictions on the sale and rental of the land, including those related to minimum and maximum size, in order to improve efficiency in land markets.

b) Regulatory policies often discriminate against poor people. Zoning may be intentionally designed to keep out low- and moderate-income residents, or it may have more benign purpose –for example, to maintain an area's low-density rural character- but less benign effects on those who are demanding high density and multifamily affordable housing. (Hoch, Dalton and So (eds.) 2000).

2.1.3. Pros vs. Cons

Currently there is an emerging tendency to abolish land use regulations and to decrease the state intervention in the land market. But can the market provide access to land and housing at affordable costs for an increasing urban population? Whereas there is a risk of distorted regulatory policies that favour powerful groups, the answer leads to re-focus the policy formulation and application, towards more effective clear and transparent regulations and procedures. Rather than 'getting rid of government' it is necessary to question the mode of governance, who it privileges and who it marginalizes; in what arenas it is effective/ineffective; and how to evolve more appropriate modes of governance. (Healey, 1997)

The UN-FIG (1999) analysis regarding the tendency of land administration in the twenty first century, annotates: 'Land use will become more and more complicated with more different and usually contradictory interests to accommodate in planning process, driven in principle by the interest for sustainable land use at the same time as the competition for well-located land will increase. This will probably make land use planning more complicated, more time-consuming and also decreases the possibilities for exploitation of land in favour of a more conservative view on change of land use.'

2.2. The Influence of the Institutional Context on Local Land Use Zoning Policies

The literature indicates that the following elements may affect the effectiveness of the land use zoning policies:

- Government coordination
- Inter-policy coordination
- Status of the Policy instruments: Legislative, Information
- Monitoring and evaluation of the land use zoning policy

2.2.1. Government Coordination

Weak and uncoordinated government actions constrain the implementation of policy instruments at local level. Burgess and Bier (1998) explored the policy framework regarding land use and development in a traditionally rural county at northeast Ohio-USA, which is experiencing rapid population growth and loss of farmland. They identified a "sprawl" of the public sector, which limits the application of public policies and promotes unplanned growth. 'By default, the "policy" has been to promote random growth. The best word to describe the public policy situation is fragmentation. Public involvement is split among different levels of government—federal, state, and local—and among jurisdictions or agencies within each level. But there is no effective vehicle for coordination, or even communication in many cases'.

An other example of the effects of poor government coordination of policies, is identified in Philippines by the World Bank project: Land Administration and Management/2000. The project formulation indicates problems related with overlapping mandates and multiple land management and administrative processes. 'Fragmented responsibilities for land management and administration among several government agencies without appropriate mechanisms for coordination have resulted in ineffective land management and administration'

Under complex government structures the difficulties of inter-level coordination may be increased owing to: **a)** Opposite interests among governmental levels (vertical fragmentation) and/or among authorities at the same level (horizontal fragmentation). **b)** Unclear responsibilities and functions.

Opposite Interests Among Governmental Levels

Different government levels may have opposite interests 'The effectiveness of national policies varies directly with the willingness of local governments to cooperate in their implementation.' (Hoogerwerf,1985).

- **Vertical fragmentation**; provincial and local governments may restrict the application of national governments policies. In the Netherlands such restriction can be illustrated by the policy of the central government against fast growth of suburbs. The norm of the central government was that the number of inhabitants of a suburb should increase by no more than 1% per year. That norm was exceed, because the suburbs wanted to grow faster and because they had the power to do so. (Hoogerwerf,1985).

- **Horizontal fragmentation**; agencies and departments ranked at the same governmental level may have contradictory goals. For instance, in the Philippines the philosophy of Department of Agriculture (DA) is to preserve and protect agricultural land, which may contradict the goal of the Economic Zone Authority (PEZA) to promote industrialisation. 'When strict agreements between departments are lacking, departments can promise nothing to local governments, so the policy cannot be implemented, and it cannot be successful.' (Hoogerwerf, 1985).

Unclear responsibilities and functions: Who is in charge?

In the presence of unclear responsibilities and functions, policies are formulated but it is difficult to determine who is in charge of the implementation of what part of the policy. In which cases act the national level, the local level or any other level? Who is in charge of the policy monitoring and evaluation? Leading to an uncertainty of the effectiveness of the policy implementation.

In sum, the literature shows evidence that insufficient government coordination increases the probability of policy failure. Hoorgerwef (1985) states: 'fragmentation of the governmental apparatus impairs the effectiveness of public policies. The fragmentation is fertile soil for endless discussions, consultations, bureaucracy, conflicts, and stagnation around policies.'

2.2.2. Inter-Policy Coordination

Cities have sprawled out across regions, supported by increasing population, transportation systems and job generating activities. This has led to new challenges in the sphere of planning that demand an integrated and holistic approach of public policies. Fast urban growth has framed public concern in matters such as cost of time spent in travel, the relation between workplace and home, the quality of life in different parts of the city, the availability of space for low value but necessary land uses, the administration of natural resources and the quality of green spaces. (Helay, 1997)

Consequently there is a new demand to integrate land use-zoning policies with other policies, such as housing, financial, taxation and transportation policies. 'Land policy must be consistent. It is common for governments to implement sectoral and spatial policies that are incompatible with the overall objectives of land policy. Many zoning laws fail because the economic incentives that are embedded in other policies are not compatible with the restrictions imposed by the zoning legislation. For example, the concern of governments with the excessive conversion of land from rural to urban uses often leads to zoning restrictions. But these frequently coexist with policies, such as taxation (implicit and explicit) of agriculture, subsidies to urban housing and public utilities, and better access to health and educational services in urban centres, that often weaken the zoning laws.' (Salazar and Gershon, 1995)

The higher the integration of land use zoning policies with other policies, the less is the effect of external factors (deficient access to affordable land and shelter) on the target group's acceptance or rejection of the policy. (Refer to figure 2). This means that in presence of a high inter-policy coordination policy instruments can be more effective.

2.2.3. Status of the Policy Instruments

Legislative: Over-regulation

Having as a starting point the need and benefit of regulatory policies, the interrogate is: How much regulations? In this respect (Mullin, Kotval and Moriarty-Lempke, 2000) suggest an answer 'only those regulations that are required to meet local needs.' This view represents the centre of the dynamic actor –oriented policy analysis, within which local needs and target group priorities constrain and determine policy implementation.

Then the challenge is to regulate but not to over-regulate. Mullin, Kotval and Moriarty-Lempke /2000 state: 'Concerning regulations, we have to balance two great American phrases: "There ought to be a law" vs. "Government governs best when it governs least"'.

To this respect, Dunkerley (1983) argues that in order to bring a more efficient an equitable use of urban land, policies should arouse the simplification of the existing complex, and in large part unworkable framework of planning and regulatory controls.

Zoning regulations vary widely between countries; some countries have an elaborate and detailed set of requirements and procedures with a dominant role of government bodies, and some other countries are moving towards involvement of private parties in the regulation control. In Western Europe, for instance, there is a tendency towards deregulation. In the Netherlands since the early 1980s the government came up with proposals of deregulations, 'it indented to achieve several objectives: to reduce the number of rules and make them more transparent; to centralize regulation and make it more uniform; to reinforce the legal rights of all parties and to expedite the procedures (Reducing the workload and the expenditure on administration).' (Meijer and Visscher, 1998)

In sum, in the presence of over-regulating policies, the policy instruments might affect the functioning of the land market and may generate complex, time demanding and costly procedures. This kind of circumstances may represent factors that motivate the target group not to comply with the policy instruments.

Is the legislation enforceable?

Zoning ordinance is an official document that has two parts: a map and a text. Most zoning ordinances include the following articles: definitions, general provisions, zoning district regulations, special development standards, and administration and enforcement. The ordinance also sets out procedures for amending the zoning map and text, including requirements for public hearing and for notice to both nearby property owners and the public (Hoch, Dalton and So (eds.) 2000).

In order to enforce the zoning ordinance, local governments issue the following permits:

- **Locational clearance,** which could be of a different nature, such as imposing the planned land use, or only prohibiting undesired land use unless there is a permit.
- **Building permits** for building and alteration of real state, often issued together with an approval of building regulations.
- **Development permits** for new buildings, often issued together with an approval of environmental regulations. (Van der Molen and Osterberg, 1999)

When local authorities do not have the institutional capacity to detect emerging building activities in unauthorised areas or when it cannot control the use of the land, policy instrument cannot be enforced. This lack of enforcement is analysed by the target group generating specific circumstances -factors- that play a role in the acceptance or rejection of the policy instruments. 'When the state does not assert its authority, state property may become de facto private property if individuals (squatters) establish their rights by physical possession and acquire communal recognition of their facto rights.' (Salazar and Gershon, 1995)

On the other hand, enforcement of the policy instruments may be open to criticism, especially when the land use zoning policy is isolated from the housing and financing policies, or when the policy underprivileged low income groups. Zoning may inhibit the construction of affordable housing, by imposing large lot sizes, prohibition of multifamily dwellings and minimum floor area, although it may have benign purposes –for example, to maintain an area's low-density rural character – the effects are less benign. (Hoch, Dalton and So (eds.) 2000). Salazar and Gershon (1995) also states ' The enforcement of property rights is not evenhanded and tends to discriminate against the poor'

In such cases when policies involve public polemic, particularly when there is deficient access to affordable land and shelter, the enforcement of the policy instruments is surrounded by a degree of moral ambivalence. This gives to the target population a major push against the policy instruments.

Information

In order to apply a land use zoning policy the target group should be informed of the:

- **Policy instruments**, including the procedures and instances to follow the regulations
- **Zoning Ordinance**, this with the aim to clarify to landowners and users what land uses and sort of development is allowed in their land.

The institutional context ought to facilitate access to land information, through a transparent and readily accessible system. In the case of land use zoning policy, the information is generally provided by the local planning department, which also is in charged of applying the policy instruments.

An accessible system makes the target group aware of the land use zoning policy and creates incentives to follow the public policy. 'A powerful discourse, energetically -diffused-, has the capacity to change what people think and what they do, and to maintain these changes.' (Healey, 1997)

2.2.4. Monitoring and Evaluation

Monitoring and Evaluation challenge the continued relevance of effective policies and allow the identification of ineffective polices. Healey (1997) indicates the need of a reflexive critical 'monitoring' to keep and eye on whether the policy still 'makes sense', whether it still satisfies the priorities of the target population and whether a new storylines has emerged over time.

In effective policies, once policy instruments have been accepted, there is a change in the rationality and acting of the target population, which might demand a re-interpretation of the factors that influence the policy effectiveness, following by the re-shape of the policy and the policy instruments.

Ineffective land use zoning policies decrease the governmental control over the use and development of the land, which generates a gap between ground land use pattern and the zoning ordinance. Such differences are spatially manifested through the land use outcomes and could be monitored and evaluated using a combination of geographical information systems -GIS- and remote sensing -RS-. These tools facilitate land-use data acquisition, geometric data processing and allow the retrieval of the allocation of land use activities.

In sum, when monitoring is carried out there is a higher possibility that the policy instruments achieve the goal of changing the behaviour of the target population.

2.3. Ways of Handling Informality

The literature shows that power is the common denominator in the structuring of socio-economic relations. Power influences the rules that set up public and private land rights and generate particular circumstances that define who holds the (legal) rights to dispose (make use of) the land. 'Inequalities arise because some groups have captured control of favoured niches in social and economic life. Having achieved this control, they then find ways to hang on to it. ' (Healey, 1997)

In the land administration arenas, the possession of land gives power to manage resources, to obtain economical benefits and to influence policies. Push and pull forces defined who hold the access to land (-legal- backing by the law or –physical- de facto) and how to make use of the land (land use activities). 'Land Issues are also power issues. Economic and political power facilitates the concentration of land and as a result intensifies the concentration of power amongst few. Many members of the society are forced to live under marginalized conditions.' (Kirk, Löffler, and Zimmermann, 1998)

Meijere (1999) defines these forces as the poverty push and the power push. The poverty push, is the push of people who need a piece of land for survival, for basic food and shelter and have no right of access to land. The power push aims to accumulate wealth in instead of satisfy basic needs.

2.3.1. Poverty Push

The poverty push satisfies its need for land through physical access to land in instead of through the legal acquisition of land rights. Land use zoning policy represents a force to keep informal settlers away. The poverty push gains power through social interactions and community organisations to counteract the policy instruments.

In democratic societies this poverty push is increased by the vote, which represent a power not only to elect but also to be eligible. Informal settlers use this electoral power to push against the policy instruments, looking for a formal recognition through political channels.

Wit (1996) makes a review of the dynamics of survival of the urban poor in Madras slums. The study shows that politics are a fundamental factor in the process of urbanization and implementation of urban policies. 'Voting behaviour is not (so much) determined by ideology, but rather by the expectation or actual receipt of some material inducements or rewards... Hence, inducements such as (improved) shelter, employment or welfare measures may be provided in a specific (policy), which is in fact designed to influence voting behaviour before or in between elections.'

There are situations in which politicians take advantage of the urgency of the community's priorities and get the votes but fail in the delivery of the promised good and services. Abbott, Martinez and Huchzermeyer (2001) made a literature review of the relationship between informal settlement and authorities. They mention cases in Latin America where the participation of the community in politics set up channels of communication and negotiation in favour of poor urban population. However the misuse of these channels for the gain of votes, by making empty promises, leads to apathy and low levels of participation in such initiatives.

In spite of such situations, the power of the vote plays an important role in policy implementation. In the Indian context, Wit (1996) annotates how politics crucially influence the implementation of policies and programmes and how the general attitudes of officials depend on their connections to the slums.

2.3.2. Power Push

Power push is the search for access to land by the economically strong. This group aims to accumulate wealth in those areas where profitable activities may take place. The economic and political characteristics of this group may influence the content of the land use zoning policy, the policy instruments and the distributions of land rights. The power push influences:

- *where* to develop *what* activities
- and *who* to keep away and *who* to let in.

'As the people who exercise the power push are wealthy, they tend to have close relationships with the societal and political power structures. They generally are the same people, at least belong to the same social class. The entire legislative structure is then supporting the acquisition of rights of access to land (and the right to have sanctions applied on violations of these rights). Given their power, these rights are used massively and almost all land with some potential for exploitation is claimed in one way or another by power groups (ownership rights or at least exploitation – extraction rights such as logging and mining).' (Meijere, 1999)

2.4. Spatial Pattern in the Rise of Informal Settlements

Some external factors that motivate low-income population to establish informal settlements in certain areas are related with the characteristics of the site, such as surrounding land use, topography, water, connection to the infrastructure network and the proximity of social facilities. Lee (1979) identifies that the location of site itself and the accessibility factors is a factor that must be considered in analysing land development.

Such factors are spatially tangible. For instance, assuming that the priority of the target group is to be near of job opportunities, settlements may emerge near industrial or commercial. There is little literature on the relation between informal settlements and spatial patterns in the settlements formation. Abbott's (2001) work in the informal settlements of Cape Town - South Africa and Bello Horizonte - Brazil identifies that economic processes tend to shape the way in which informal settlements form and develop.

Abbott proposes a methodological approach to informal settlements upgrading based on spatial integration. His argument is that the issue of spatial integration, is not an end in itself but a mechanism of social integration at different scales. At the settlement level, the spatial issues are related primarily to movement, attenuation of physical risk and the identification of economic opportunities. Inside the settlement, the spatial integration deals with the creation of effective and sustainable social space. Finally, at household level it deals with the improvement of the dwelling unit.

3. STUDY AREA: GENERAL TRIAS

This chapter gives a description of the case study area in the context of land use zoning policies. It gives a brief profile of General Trias and the land use. It describes the history of encountering pressures and conflicts over the use of land in the municipality. It reviews the urbanisation trend and current circumstances of housing development. Finally, the chapter analyses the municipality's rapid population growth in relation with the land use changes.

3.1. Profile

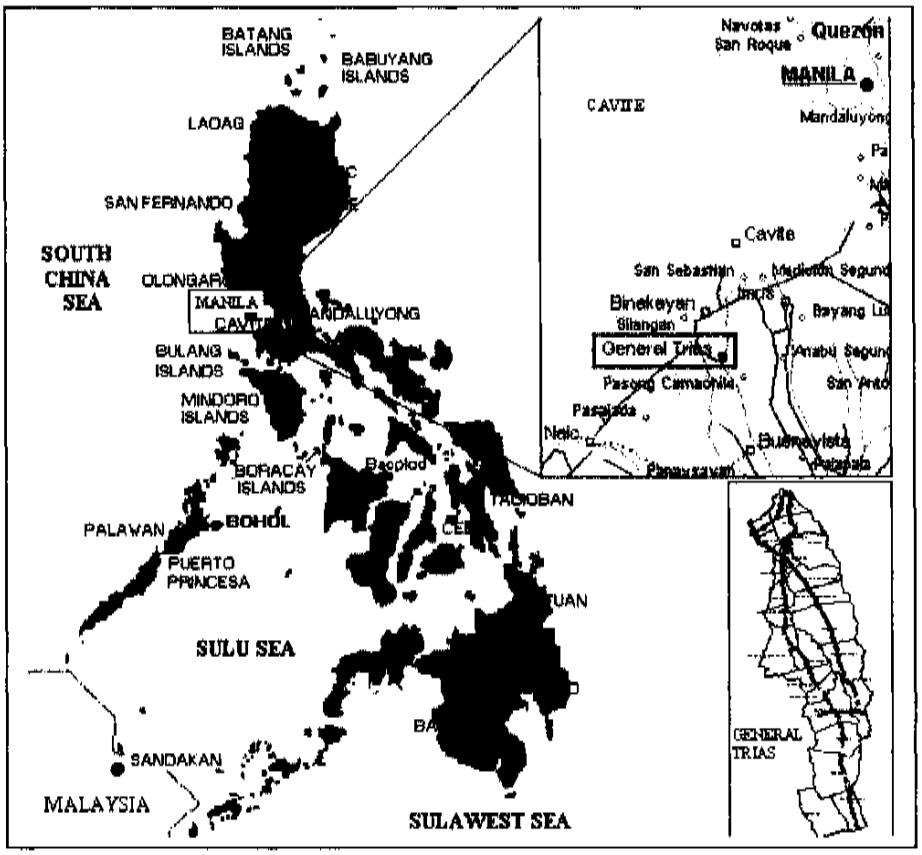

Figure 3.1 Location of General Trias

General Trias is situated in The Philippines at the southern part of the National Capital Region (Metro-Manila), between 14°13' – 14° 25' latitude North and 120°51' – 120° 56' longitude East. (Refer to Figure 3.1) The distance from the National Capital Region is 35 km, the municipal area is 8828 Ha. Administratively it belongs to region IV Southern Tagalog and to the province of Cavite (Refer to Figure 3.2)

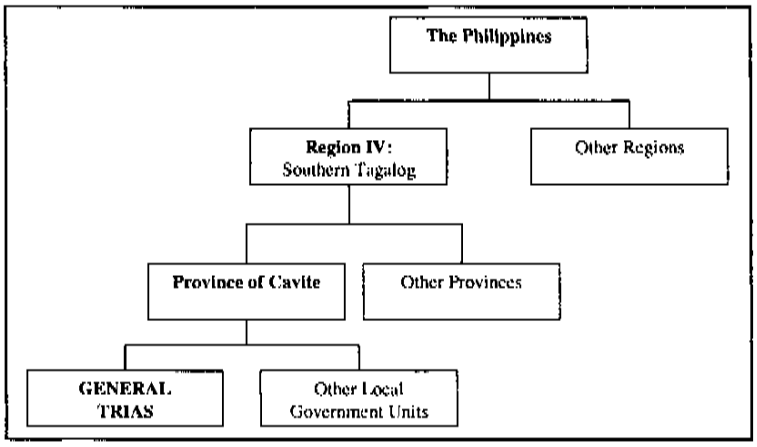

Figure 3.2 Administrative Hierarchy of General Trias

3.2. Land Use Dynamism

The common denominator of General Trias' land use policy has been the development of large industrial areas of national importance. The industrial allocation started in the uplands of Manggahan and extended later into the agricultural lowlands located between the municipality of Rosario and General Trias (Refer to Map-01). This land use policy started in the Marcos period (1965 – 1986). The irrigated lowland areas were considered prime agricultural land reserved for rice production, while the no irrigated and less productive uplands of Manggahan planted mainly with rice, corn, banana and coconut were subject to conversion to industrial and agribusiness use.

This land use policy formulated at national and provincial levels was incorporated into the municipal development plans with particular consequences, 'lowland villages became more vulnerable to the exigencies of commercial rice production and upland villagers faced the actual loss of their land resources' (McAndrew, 1994)

Land values showed a sharp increase especially after the construction of the national road: Trece Martires – Dasmariñas and the capacity of tenants to uphold legal claim of tenure was diminished. In 1978 the case of New Cavite Industrial City illustrates this clearly. Share-tenants of 285 ha lost their tenure rights after a 10 years legal dispute. As compensation they received some cash and the promise of title to 400m2 home lots. Once the landlord gained the control of the land, the property was sold to the State Land Investment Corporation and promoted as New Cavite Industrial City.

In the lowland the first sign of land conversion from agricultural to industrial uses started in 1980 as part of the national government program to promote export-oriented industrialization. In this year presidential proclamations Nos 1980 and 2017 declared and reserved the agricultural area of Salinas, Rosario, Tejeros and Bacao, as a site for the Cavite Export Processing Zone (CEPZ). The land was mainly owned by the Philippine National Oil Corporation (PNOC) and cultivated with irrigated rice by 90 small land-tenants.

The conversion of the agricultural land was not accepted by the land tenants for whom the farming activities were the main source of income. In 1981 a farmers association petitioned the District Court of Agrarian Relations to stop the bulldozing, hired by the Export Processing Zone Authority. The legal dispute was controversial and brought to the Supreme Court. The first verdict supported the farmers' arguments, however it was later overruled by a presidential decree.

Despite the government efforts to industrialise the area, business and industrial production were only consolidated after 1994 when an aggressive national policy regulated and allocated areas for the Philippine industrial activities. In fact 1995 land use map registered that only 0.14% of the municipal area was being used for industrial activities.

The new industrialisation policy was sanctioned by the republic act No. 7916/1994, which creates the Special Economic Zones and the Philippine Economic Zone Authority (PEZA). This policy allocates the Special Economic Zones, establishes a legal framework to attract foreign investment and promote liberalisation of business.

According to the new regulation the Cavite Export Processing Zone is administrated by the Philippine Economic Zone Authority (PEZA) and new industrial estates are annexed in the barangays of Bucnavista II and Javalera (Refer to Map-01). The republic act No. 7916 supports the municipal land conversion from agricultural uses into non agricultural uses (residential, commercial, industrial) producing the consolidation of industrial activities.

The majority of the industrial estates are administered by the Special Economic Zone Authority. (Refer to Table 3.1)

Table 3.1 Industrial Estates in General Trias

Administration	Industrial Estate	Preferred industries	Developer / operator
Philippine Economic Zone Authority (PEZA	Cavite Economic Zone (Annexation)	Light to medium, non-polluting industries	JD Holdings, Inc, Majestic and Landscape Corporation
	Cavite Eco-industrial Estate	Light to medium, non-polluting industries	Cavite Eco-industrial Estate
	Gateway Business Park I, II and III	Light to medium, non-polluting industries: mainly electronic and electrical products	Gateway Property Holding, Inc.
	PEC Industrial Park	Garments & textiles, semiconductors, food processing, pharmaceuticals	Philippine Estates Coorporation
	Taipan Gold Industrial Park	Electronics and electrical products, transportation equipment and parts, machinery equipment and parts, wearing apparel.	Taipan Gold Empire Corporation
Non-PEZA Industrial Estate and Manufacturing Industries	New Cavite Industrial City		
	Indocoil Philippines		
	SMC Meat Plant		

Source: Philippine Economic Zone Authority Sep/2001

3.3. Trends in Urbanisation

Spatially The National Economic and Development Authority (NEDA) has identified a sub-region denominated Cavite-Laguna (CALA). In this sub-region General Trias together with other 12 local government units conforms a spatial body known as Metro CALA. (Refer to Figure 3.3) This spatial conformation represents 'an urban growth-forming tool for the developing of a metropolitan structure through the strategic provision of infrastructure as well as the land management system geared to develop the desired level of land use intensities in designated areas.' (NEDA CLMDS Final Report/2000)

The special attention of NEDA for Metro CALA leads to the fast growth of the area. Within the Region IV, this area has the second largest population and the highest annual population growth. The area is growing faster than the National Capital Region and the national average (Refer to Table 3.2)

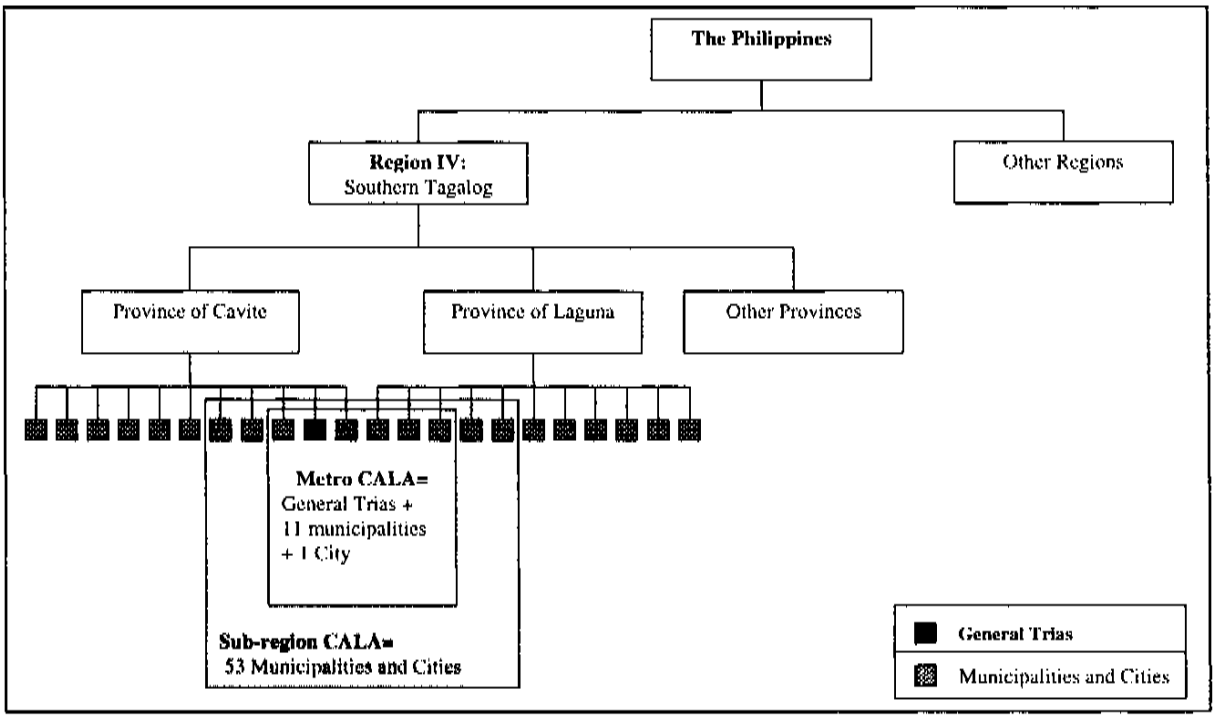

Figure 3.3 Spatial Hierarchy of General Trias

Table 3.2 Metro CALA Population Growth

Administrative Unit	Total Population 1995	Total Population 2000	Annual Growth Rate 1995 -2000
Metro CALA	1,629,406	2,128,810	5.5%
Total– Region IV	9,943,096	11,793,655	3.5%
National Capital Region	9,454,040	9,932,560	1.0%
Philippines	68,431,213	76,498,735	2.3%

Source of Data: National Statistic Office

In 2000 a NEDA study of the area, known as Cluster Land Management and Development Strategy (NEDA CLMDS) clearly attributes the rapid population growth in the area to the national policy of industrial allocation. In the emerging Metro CALA the large industrial estates, industrial parks and economic zones are located.

The majority of these industries are administered and registered with the Philippine Economic Zone Authority (PEZA) which enables them to enjoy special incentives offered by the national government. By September 2001 Metro CALA has registered about 1,328 hectares of industrial land (1,5% of the total Metro CALA area), most of this land (32%) is located within the General Trias territory.

NEDA identifies the type of urban development of Metro CALA as an expansion of the centre (National Capital Region) to its peripheral areas, generated by a shift in terms of economic activities from a predominantly agricultural to an industrial area. In terms of land utilisation this has generated rapid land conversion leading to sporadic and spread urban growth.

In General Trias the residential areas of Pasong Kawayan II, Buenavista I, Buenavista II, Alingaro, Pasong Camachile I, Pasong Camachile II and Santiago emerged in areas that the municipality initially reserved as agricultural in the Comprehensive Land Use Plan (CLUDP) of 1995. Later in the CLUDP of 2000 (NEDA CLUDP) these were recognised as residential areas. This local government decision responds to a new land management policy that seeks to adjust the municipality to the increasing demand for land for housing.

3.4. Housing Development

Housing is being affected by two dynamic factors: the first one is housing shortage which is related with rapid population growth and the increase of housing demand. The second is the rapid increase of land values in residential areas.

3.4.1. Housing Shortage

With the data available is difficult to have an updated quantification of the shortage of housing, but it is still possible to determine the proportions of the housing demand and to compare them with new housing projects. Based on the 1990 housing survey of the National Statistics Office, General Trias has estimated the housing demand for that year in 433 units. Adding to this figure the increase of number of households, the housing demand is quantified in 9,556 units for the year 2000. Under the pattern of rapid population growth it is expected that the demand will reach 16,200 units in the year 2005. (Refer to Table 3.3)

Table 3.3 Current and Projected Housing Demand

Items / Data	Year			
	1990	1995	2000	2005
Population	52,888 [3]	66,837 [3]	107,691 [3]	173,517 [2]
Number of Households	10,308 [3]	13,743 [3]	23,299 [3]	39,499 [2]
Number of Dwelling Units				
(a) Housing Demand [1]	433 [1]	-	-	-
(b) Increase in Number of Households	-	3,435 [3]	9,556 [3]	16,200 [3]
(a+b) Total Housing Demand	**433**	**3,435**	**9,556**	**16,200**

1Estimation done by the municipality based on the 1990 Housing Data of the National Statistic Office

2 Estimated based on the annual growth rate

3 Source of Data: National Statistics Office

How much of this demand has already been supplied

The Philippines has a National Shelter Programme called 'Balanced Housing Strategy' under which private developers have to destine 20% of their total construction project area in low-cost socialised housing projects. By January 2000 such programs counted 21,531 units (Refer to Table 3.4). Aside of the 'Balanced Housing Strategy', General Trias currently has 6 relocation/resettlement projects for displaced squatter households of the National Capital Region and other regions. Table 3.5 shows the list of these relocation projects.

Table 3.4 List of Socialised Housing Projects /2000

Name of Socialised Housing Projects	Number of units (house & lots only)	Land Area (ha)
Country Meadow	1,356	8.6
Mari Cris Complex	4,259	27.1
Belmont Hills SHP	1,494	9.1
ACM Paramount Subd	1,150	7.5
Grand Riverside Subd. I	657	5.3
South Square Village	2,188	14.0
Bel Aldea Subd SHP	624	4.0
Belvedere Towne III	3,008	18.0
Sunny Brooke I	3,936	17.6
Sunny Brooke II (SHP)	2,631	18.3
Amparo Ville (SHP)	228	1.7
Total	**21,531**	**131.2**

Source of data: General Trias Office of the Municipal Planning and Development Coordinator

Table 3.5 Relocation/Resettlement Projects / 1999

Name of Project	Number of Units
Alingaro Relocation Site	2,135
Javalera Relocation Site Phase I	497
Javalera Relocation Site Phase II	544
Pabahay 2000	3,192
Tinungan Relocation Site	60
Metro Asia Realty Corp. Tenants Relocation Site	87
Total	**6,515**

Source of data: General Trias Office of the Municipal Planning and Development Coordinator

Despite the massive socialised housing and resettlement programs, affordable housing is still not accessible to the majority of the poor since they simply cannot afford to pay the amortisation. Most of the housing units of such projects are still *unoccupied* producing a shortage of housing for the poor. An indicator for this shortage is the sprouting of informal settlements in the municipality. (Refer to Map-03)

3.4.2. Land Values

The industrialisation has pushed land values up. The increment varies from 29% in the period 1990-1995 to about 344% for the period 1995-2001. This has generated land speculation and a subsequent increase of housing prices. (Refer to Table 3.6)

Table 3.6 Increase in Land Values in the Low-density residential areas

Low-density residential area		
Year	Average Price (Pesos per m2)	Increase (%)
1990	350[1]	--
1995	450[1]	29%
2001	2000[2]	344%

1 Source of data: NEDA CLMDS /2000

2 Source of data: General Trias Office of the Municipal Planning and Development Coordinator /2001

3.5. Population Growth

3.5.1. Growth Rate

The municipality of General Trias registered a total population of 107,691 in 2000. The annual growth rate has increased rapidly in the last decade from 4.8% in 1995 to 10.0% in 2000. The highest increase occurred in the period 1995-2000 which coincides with the enactment in 1994 of a Special Economic Zone within the General Trias' territory. The population growth shows an exponential trend. (Refer to Table 3.7 and Figure 3.4)

Table 3.7 Total Population / Annual Growth Rate

Censal Year	Total Population	Annual Growth Rate
1970	29,635	
1975	34,807	3.3%
1980	39,745	2.7%
1990	52,888	2.9%
1995	66,837	4.8%
2000	107,691	10.0%

Source of Data: National Statistic Office

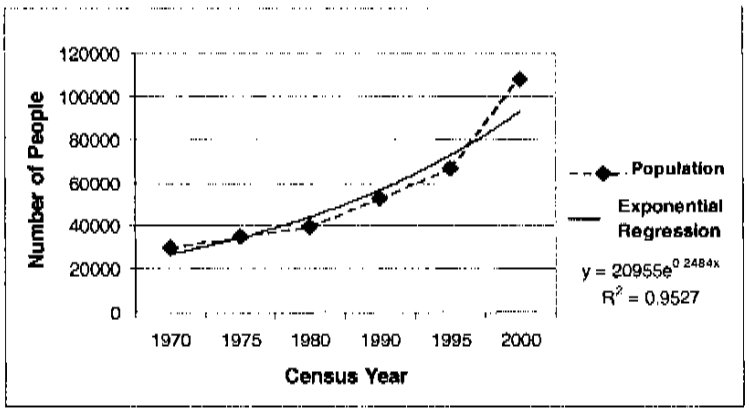

Figure 3.4 Growth Rate

3.6. Age Structure

The estimated composition of General Trias' population in 2000 is shown in the Table 3.8. The population pyramid is wide in the base and narrow in the top showing a young population. 65% Of the population is less than 29 years old (Refer to Figure 3.5).

The analysis of the labour force supply reveals that 62% of the total population is in their economically productive years, (between 15-64 years). This high percentage of the population in working-age is related with the continuously expanding industrial activities in the municipality, which attracts migrants in working ages. (NEDA CLMDS /2000)

Table 3.8 Estimated Population 2000 by Sex and Age Group

Age Group	Male	Female	Total
0-4	7107	6967	14074
5-9	6461	5941	12402
10-14	5601	5266	10866
15-19	5493	5937	11430
20-24	5169	5688	10857
25-29	5277	5520	10797
30-34	4415	4394	8809
35-39	3877	3554	7431
40-44	2908	2707	5615
45-49	2154	2240	4394
50-54	1400	1492	2892
55-59	1184	1331	2515
60-64	862	1123	1985
65-69	646	746	1392
70-74	430	557	988
75-79	216	396	612
80-84	216	193	409
85 & over	108	114	222
Total	**53524**	**54167**	**107691**

Source of Data: Census1985 Population by Sex and Age Group,
Census 2000 Total Population

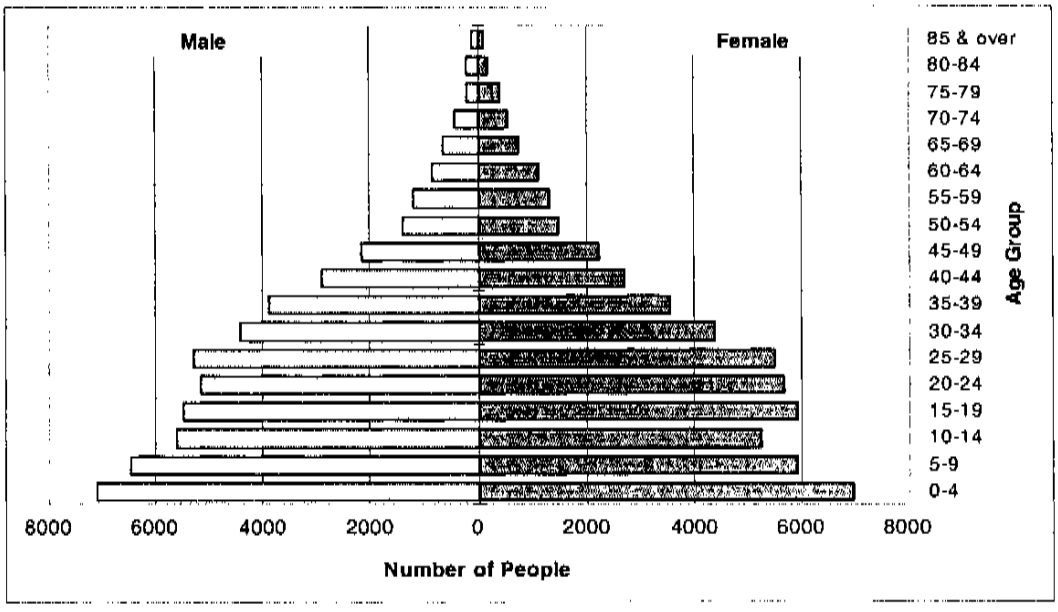

Figure 3.5 Population Pyramid

4. ANALYSIS OF THE INSTITUTIONAL CONTEXT

The chapter examines how the institutional context influences local land use zoning policies. The analysis starts with a description of the Philippine Institutional framework, followed by the review of the inter-government level coordination. After that, based on the General Trias case study, the local land use zoning policy and its policy instruments are reviewed. At the end of the chapter a summary of the findings is presented.

In this research, the term ***local government*** is used to refer to the city or ***municipal level***, although the Philippine Local Government Code of 1991 also includes provincial and neighbourhood '*barangay*' levels.

4.1. Philippine Insitutional Framework

The current Philippine Constitution (1987) declares state ownership of all lands of the public domain and essential natural resources. National conservation and protection areas (integrated areas) and prime agricultural lands are under full supervision of the State. To promote equitable access to land, the Constitution also promulgates the social function of the land and enacts the right of state intervention over its use and development.

In the Philippines there are four levels of governmental interventions on the land: national, regional, provincial and local. The national, regional and provincial levels set up the rules and guidelines by which Local Government Units (LGU) enact the management of the land through zoning ordinances. These guidelines serve the municipality as a framework that defines *how* the local government should regulate *what* activities, *where*. In some cases, especially those relating with environmental matters and farmland preservation, the national levels directly regulates the use and development of the land at local level –*what* and *where*. (Refer to figure 4.1)

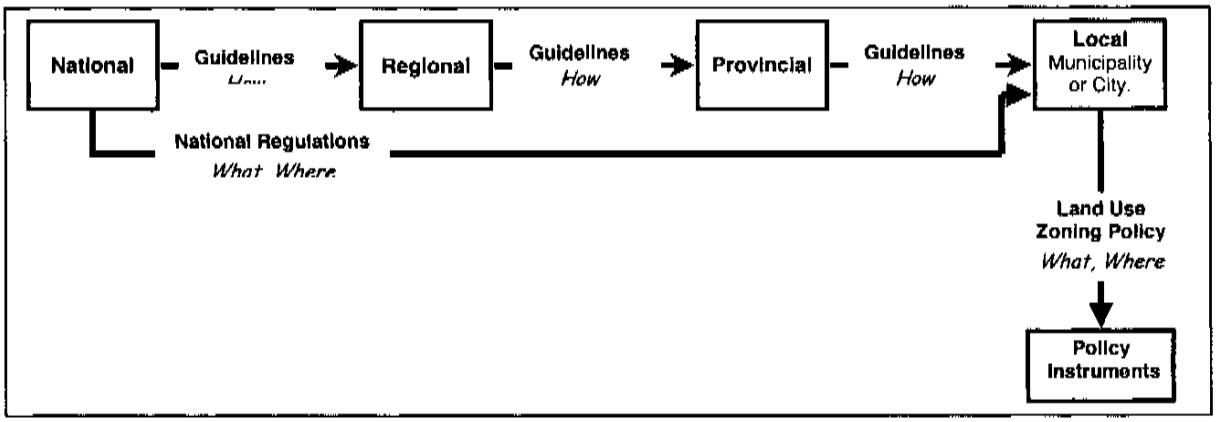

Figure 4.1 Levels of Governmental Intervention in Land Use Zoning Policies

The regulation of land uses in the Philippines has a hierarchical structure. The national government is in charge of land classification and land use conversion, whereas local governments concentrate on land use zoning. Land classification involves the declaration of land as public domain. Land use conversion is the change of land use from agricultural uses into non-agricultural uses. Land use zoning is the delineation of land uses within the local territorial jurisdiction, which should be consistent with the (national) land classification.

Policies regarding management and regulation of land resources are formulated through Land Use Plans. At national, regional and provincial levels such plans are denominated respectively: National Physical Framework Plan (NPFP), Regional Physical Framework Plans (RPFP), Provincial Physical Framework Plans (PPFP).

At local level the plan is known as Comprehensive Land Use Plan (CLUDP), which has a zoning ordinance as implementation mechanism. Local governments are in charged of the implementation of all land use regulations: land classification, land conversion and land use zoning. In the case of land classification and land conversion, the task is done in coordination with national agencies (Refer to Figure 4.2)

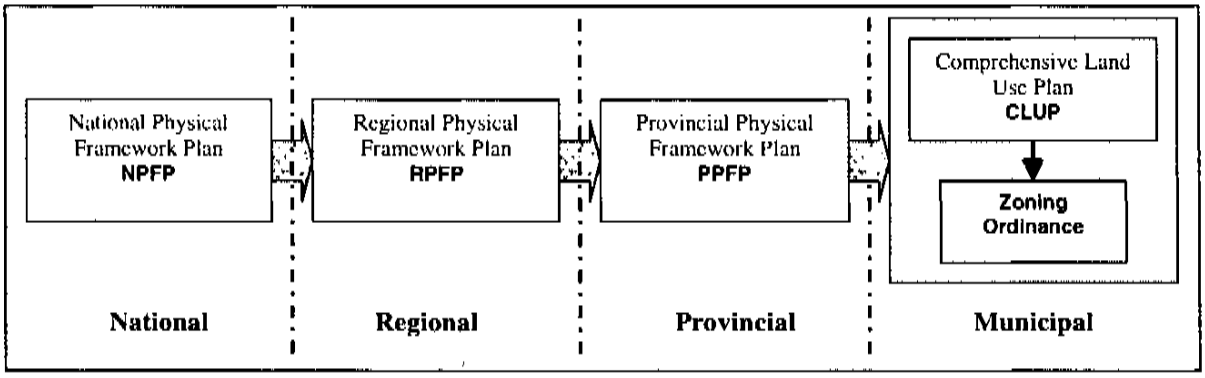

Figure 4.2 Ideal Plan Linkages in the Management and Development of Land

4.2. Inter-government Level Coordination

Several agencies, governmental bodies and departments at national, regional and provincial level influence the formulation and implementation of local land use zoning policies.

4.2.1. National Level

At national level, five agencies are responsible for the coordination and consistency of local land use zoning policies in respect of national plans and policies. The agencies are: National Land Use Committee (NLUC), the Inter-Agency Steering Committee, the Housing and Urban Development Coordinating Council (HUDCC), the National Economic and Development Authority Board (NEDA-Board), and the Department of Interior and Local Government (DILG).

Regarding sectoral issues, there are other national agencies that shape local land use zoning policies. The Philippine Economic Zone Authority (PEZA) is responsible for policymaking and land use coordination inside national economic zones. The Department of Environment and Natural Resources (DENR) is responsible for the management of lands of the public domain and all natural resources. The Department of Agrarian Reform (DAR) and the Department of Agriculture (DA) are in charge of the protection of agricultural lands. The Department of Public Works and Highway (DPWH) together with the Department of Transportation and Communications (DOTC) affect land allocation and land development regarding infrastructure projects and public works. Finally, the Philippine Tourism Authority ensures land availability in tourism development areas. (Refer to Table 4.1)

Table 4.1 National Agencies & Local Land Use Zoning Policies.

Agency	**Main Functions Concerning Land Use Policies**	
	Role	**Functions**
National Land Use Committee **(NLUC)**	Coordinating body	Prepares the National Physical Framework Plan. It is in charge of the coordination, integration of all land use and physical planning activities of national line agencies and bodies.
Inter-Agency Steering Committee	Coordinating body	Ensures that the municipal land use policies are consistent with the Medium-Term Philippine Development Plan and other national policies, plans and programs.
Housing and Urban Development Coordinating Council **(HUDCC)**	Coordinating body	Central housing and urban development policy-making body which supervises and coordinates the implementation activities of the agencies involved in housing finance, the delivery of shelter, and the regulation of land use development.
		Dependent Agency / **Functions**
		Housing & Land Use Regulatory Board **(HLURB)** — • Reviews and formulates the national guidelines and standards for land use plans. • Provides technical assistance to the local government units in the preparation of Comprehensive Land Use Plans (CLUDP).
		National Housing Authority **(NHA)** — Prescribes guidelines for the reservation, conservation and utilization of lands for housing and resettlement.
National Economic and Development Authority Board **(NEDA-Board)**	Coordinating body	Is the Philippines premier social and economic development planning and policy coordinating body.
Department of Interior and Local Government **(DILG)**	Coordinating body	Is responsible for the general supervision of the local government units to ensure that land use plans are prepared in accordance with the national guidelines and ordinances.
Philippines Economic Zone Authority **(PEZA)**	Land Classification	Is responsible for policy-making and land use management inside the economic and industrial zones.
Department of Environment and Natural Resources **(DENR)**	Land Classification	Is responsible for the conservation, management, development and use of lands of the public domain and all natural resources.
		Dependent Agency / **Functions**
		Environmental Management Bureau **(EMB)** / Land Management Bureau **(LMB)** — The two bureaus determine to a large extent the availability and access to land resources by different sectoral groups.
		National Mapping and Resource Information Authority **(NAMRIA)** — Is responsible for the production of topographic base maps at various scales needed for the land use plans.
Department of Agrarian Reform **(DAR)**	Land Conversion	Defines rules and regulations for the conversion of agricultural lands to non-agricultural uses.
Department of Agriculture **(DA)**	Land Classification	Is in charge of the protection of the agricultural land.
Department of Public Works and Highway **(DPWH)** / Department of Transportation and Communications **(DOTC)**	Land Classification	These two departments affects land allocation and land development through the planning, design, construction and maintenance of national infrastructure and public works.
Philippine Tourism Authority **(PTA)**	Land Classification	Ensures land availability in tourism development areas.

Adapted from: Santiago, 1998

Other sources: Executive Order No. 204, Republic Act 6975, Executive Order 90, Republic Act NO. 7916, Land Use Guidebook/ 1997

4.2.2. Regional, Provincial and Local Levels

At Regional level, a Land Use Committee reviews Provincial Physical Framework Plans (PPFP) and Comprehensive Land Use Plans (CLUDP) of highly urbanised cities. The regional office of the Housing & Land Use Regulatory Board (HLURB) provides technical assistance to the local government units on land use and housing regulations and ratifies the physical framework plans of provinces (PPFP) and the Comprehensive Land Use Plan (CLUDP) of highly urbanised cities.

The Provincial Land Use Committee, the Local Development Council and the Sangguniang Panlalawigan review the Comprehensive Land Use Plans (CLUDP) of non-highly urbanised cities and municipalities. However the final approval of the plan is made by the Sangguniang Panlalawiga, which holds the local legislative power. The Local Development Council is in charge of the implementation and monitoring of the CLUDP.

Table 4.2 Regional and Provincial Agencies & Local Land Use Zoning Policies

Regional	Provincial	Local
Regional Land Use Committee • Prepares the Regional Physical Framework Plan (RPFP) • Review of physical framework plans of provinces (PPFP) • Review the Comprehensive Land Use Plan (CLUDP) of highly urbanised cities*	**Provincial Land Use Committee** • Prepares the Provincial Physical Framework Plan (PPFP) • Assist the Sangguniang Panlalawigan to review the municipal comprehensive land use plans and zoning ordinances.	**Local Development Council** • Review of the Local Comprehensive Land Use Plan and zoning ordinance (CLUDP) • It is in charge of the implementation and monitoring of the CLUDP
HLURB Region IV • Provides technical assistance in land use and housing regulations to the local government units. • Ratifies the physical framework plans of provinces (PPFP) and the Comprehensive Land Use Plan (CLUDP) of highly urbanised cities*		**Sangguniang Panlalawigan** Local legislative power that approves Comprehensive Land Use Plans (CLUDP) and zoning ordinances.

Source: Local Government Code 1991 and Executive Order No. 72
* In the case of National Capital Region this action is taken by the National HLURB

4.2.3. Review

The review of the institutional settings behind land use zoning policies reveals weak government coordination owing to a variety of guidelines, low inter-level coordination and low inter-agency coordination.

- **Variety of Guidelines**

Local land use zoning policies have numerous planning guidelines and manuals provided by national government agencies 'A quick review of these guidelines and manuals reveals considerable overlap. They also require planning outputs of numerous nomenclatures that are confusing to local officials and planners... The issuance of numerous guidelines and the apparent overlap among them clearly suggest the absence of a coherent system to coordinate the production of local comprehensive development and land use plans. For this reason, the intended integration of local plans with sectoral and higher level plans remains largely as ideal rather than real.' (NEDA Guidebook on Land Use, 1997)

- **Low inter-level coordination**

Low inter-level coordination was perceived in the visit to the different governmental agencies. National officials have two main concerns regarding the implementation of local land use zoning policies. The first is the influence of politics on policies and the second is the low institutional capacity to apply policy guidelines.

In an interview conducted on the 5th of September /2001 the Director of Plans & Programs Group of the Housing and Land Use Regulatory Board (HLURB) said:

> *'(local) politicians work more in function of their votes rather than in function of the national mandates and policies. Besides that, they (local politicians) have a short-term perspective limited by their term of office... Some local government units have already formulated good land use plans but unfortunately the new administration prefers to deny the last administration's work'*

In the same interview the lack of training of local officials was framed as a problematic issue in the implementation of land use plans. To this respect, the Land Use Guidebook (1997) identifies: 'What is often referred to as "plans" by local government units are really simple socio-economic profiles or basically a "list of projects"... Many local government officials are also unaware or unfamiliar with higher-level sectoral and physical framework. The same officials have openly admitted that ... land use planning is undertaken only on the insistence of national sectoral agencies and the NEDA.'

- **Low inter-agencies coordination**

Despite the governmental efforts to coordinate the classification and allocation of the land, policies may have conflicting effects encouraging competition among sectoral national agencies. Serote (2001) illustrates this with an example: 'The Local Government Code allows cities and municipalities to reclassify between 5% to 15% of their agricultural areas for urban purposes. On the other hand, the Agriculture and Fisheries Modernisation Act (RA 8435) prohibits conversion or irrigated and potential irrigable land to urban uses.'

There is also questioning of the role of inter-agencies coordination bodies. 'In the Philippine context, inter-agency committees are weak mechanisms for coordination which have not sufficient capability to ensure compliance of the involved agencies. These committees are essentially a body of "equals" which have no resource allocation powers to effectively facilitate the synchronization of plans and activities of the various sectoral agencies.' (NEDA Guidebook on Land Use, 1997)

4.3. Local Land Use Zoning Policies

A Local Government Code was enacted in 1991 in the Philippines by constitutional mandate. This code enhances local autonomy with the aim to transform 'local government units (LGU) into self-reliant communities and active partners in the attainment of national goals through a more responsive and accountable local government.' (Nolledo, 2001)

In this decentralised context the role of local governments regarding land use zoning policies was empowered firstly by the corroboration of the right of local governments to formulate their local comprehensive land use plans; and secondly by the devolution[2] of enforcement instruments (policy instruments) to the local government units (LGU).

Before the enactment of the local government code, Comprehensive Land Use plans (CLUDP) were formulated by local governments. However the approval was by the Housing and Land Use Regulatory Board (HLURB).

With the devolution of the enforcement instruments, local government units are in charge of the issuance of locational clearance, approval of subdivision schemes, development permits and enforcement of environmental laws. The procedures, requirements and other terms for the compliance of these permits are regulated by the zoning ordinance. (Refer to Table 4.3)

Table 4.3 Regulatory Powers Devolved to The Local Government Units

Land Use Zoning Policy	Devolved Functions				
	Functions		From	→	To
Policy Formulation	Formulation of Local Comprehensive Land Use Plans		(LGU) Local Government Unit	⇨	(LGU) Local Government Unit
	Approving of Local Comprehensive land use plans	In the case of cities and municipalities (such General Trias)	(HLURB) Housing and Land Use Regulatory Board	⇨	**Sangguniang Panlalawigan** + (PLUC) Assistance in the Review by Provincial Land Use Committee
		In the case of provinces or highly urbanised cities	(HLURB) Housing and Land Use Regulatory Board	⇨	(HLURB) Housing and Land Use Regulatory Board + (RLUC) Assistance in the review by Regional Land Use Committee
	Reclassification of agricultural lands (or land conversion) from agricultural uses to non-agricultural uses.		(DAR) Department of Agrarian Reform	⇨	(LGU) Local Government Unit*
Policy Instruments	Locational Clearance		(HLURB) Housing and Land Use Regulatory Board		
	Approving of subdivision schemes		(HLURB) Housing and Land Use Regulatory Board		
	Issuance of Development Permits		(HLURB) Housing and Land Use Regulatory Board		
	Enforcement of environment laws		(DENR) Department of Environment and Natural Resources		

*HLURB issues locational clearance for projects of national significance.
Source: Local Government Code/91, Executive Order 71/93 and 72/93

[2] Enacted by the Local Government Code of 1991 and the Executive Order 71 and 72

4.3.1. General Trias: Local Land Use Zoning Policy

As said in section 4.1, local land use zoning policies are enacted through Municipal Comprehensive Land Use Plans (CLUDP). Since the enactment the Local Government Code, General Trias has formulated two Comprehensive Land Use Plans: in the years 1995 and 2000[3]. The 1995 Plan allocated 73.6% as agricultural lands, 15.38% as residential-institutional lands and 6,60% as industrial-commercial lands.

This 1995 plan achieved the allocation of industrial and residential activities, however it failed to maintain the planned agricultural uses. Built up areas emerged within the agricultural zones during the period of 1995 to 2000 without the issuance of the correspondent local permits (locational clearance, and building permit).

The 2000 Comprehensive Land Use Plan (NEDA General Trias CLUDP) incorporated in the zoning ordinance the built up areas developed in the agricultural lands, which meant for the owners the legalisation of the building activities and the security of their investment. The fact that building activities had been mainly carried out on parcels without problems of tenure security, facilitated for the municipality the legal recognition of the buildings.

The guiding policy of the current (2000) comprehensive land use plan seeks for the balance between industrial/commercial and agricultural developments. The Zoning allocates new industrial sites adjacent to the current industrial estates and commercial activities, consolidates the *'poblacion'* as central business district, reserves land for new residential activities and introduces mixed zones. (Refer to Map-02 and Table 4.4)

The mixed zones correspond to a 'more flexible system of land use planning which departs from the very rigid separation of specific land uses... to determine land uses & densities' (NEDA General Trias CLUDP /2000) In practice this means the acceptance of different land uses within the same zone and the regulation of land use intensities.

Table 4.4 Description of the 20000 Land Use Zones

Zones	Description
Northern Mixed –Use Development	Light Industrial, General commercial and housing developments
Greater *'Poblacion'*	Growth of the urban area, General Residential, General Commercial, General Institutional
Agricultural Development	Most of these lands are classified as Strategic Agricultural and Fisheries Development Zones by the Department of Agriculture (DA).
	Existing Built-up Areas within Agricultural Development Area
New Residential Development	Serves as a transition zone between the agricultural area and the southern built-up area. General Residential, General Commercial, General Institutional.
Southern Mixed-Use Development	Light and medium industrial states and new residential subdivisions
Tourism-Oriented and Recreation	This area is mostly made up of Eagle Ridge and Gold and Country Club.

Source: General Trias Comprehensive Land Use Plan /2000

[3] Plans get the official approval in this year, but their formulation started before.

The comparison between the two plans (1995 and 2000) evidences an increase of industrial activities and a decrease of the agricultural land. This is not only due to the expansion of the industrial activities, it corresponds also to the allowed light industrial activities in mixed zones. Although the recreational lands have experienced a considerable increase, most of the new recreational land is private and corresponds to high-income recreation. Refer to table 4.5

Table 4.5 Comparison between Land Use zones 1995 and 2000

General Classification	Comprehensive Land Use Plan 1995		Comprehensive Land Use Plan 2000	
	Zones	% Use	Zones	% Use
Medium & Light Industrial - Housing	Light and Medium Industrial	3.48%	Southern Mixed-Use Development Area	27.40%
	Total	**3.48%**	***Total***	**27.40%**
Light Industrial - Commercial - Housing	Major Commercial - Light Industrial	1.11%	Northern Mixed –Use Development. Area	6.40%
	Light Industrial	2.01%		
	Total	**3.12%**	***Total***	**6.40%**
Residential - Commercial - Institutional	Residential - Institutional Mixed	13.08%	Greater '*Poblacion*' Area	5.10%
	Residential - Minor Commercial	2.08%	Existing Built-up Areas within Agricultural Development Area	5.30%
	Commercial	0.08%	New Residential Development Area	7.90%
	Cemeteries and Dumpsites	0.14%		
	Total	**15.38%**	***Total***	**18.3%**
Agricultural	Agricultural	71.64%	Agricultural Development Area	37.9%
	Pasture and Grassland	1.84%		
	Livestock / Fishponds	0.12%		
	Total	**73.60%**	***Total***	**37.90%**
Recreational Areas and Open Space	Open Space	2.19%	Tourism-Oriented and Recreation Area	10.00%
	Total	**2.19%**	***Total***	**10.00%**
Others	***Total***	**2.23%**	-------	------

Source: General Trias Comprehensive Land Use Plans 1995 and 2000

4.3.2. General Trias: Policy instruments

The only policy instrument adopted by the General Trias Land Use Zoning Policy is legislative through the zoning ordinance. Information as a policy instrument is only carried out when developers approach to the municipality requesting information about the municipal procedures to develop the land.

The Zoning Ordinance defines three types of regulatory permits:

- **Locational clearance**, it certifies that the current land use of the parcel or building corresponds with the allowed land uses for the zone where the property is located.
- **Building Permit**, in the case of new subdivisions it implies the issuance of the development permit. If the land has been already subdivided the only required permit is the building permit. Building permits are only issued once the developer (householder or private developer) has obtained the locational clearance.

- **Business permit**, consists in the registration of the industrial or commercial business. This permit is only issued when businesses are located in properties with locational clearance.
- **Zoning classification**, additional to above described permits, the municipality issues a document that gives information regarding of the status of the parcel with respect to the zoning ordinance.

Tables 4.6 shows the list of requirements needed to successfully apply for the locational clearance and building permits, the steps to get them approved and the office in charge of the permit issuances.

Table 4.6 Procedure to Obtain Locational Clearance and Building Permits

Requirements	Type of Development	Procedure
Locational Clearance • Site Development Plan • Vicinity map indicating the adjoining land uses • Survey Plan and Topographic Map • Title and Current tax receipt • Endorsement from the Mayor's office • When applicable clearances from the Department of Agrarian Reform (DAR), Department of Environment and National Resources (DENR), National Water Regulatory Board (NWRB) and National Irrigation Administration (NIA)	Residential and small commercial activities	Developer → Zoning Administrator Issuance
	• Subdivision for Industrial or commercial purposes • Condominiums	Zoning Administrator ← Developer → Municipal Mayor Issuance ← Zoning administrator (Inspection of subdivision)
Building Permit • Title and Current tax receipt • Locational Clearance • Topographic Map • Site Development Plan • Architectural, structural, sanitary, electrical and mechanical plans. • Filled out application for the utilities' connections • Costs • When applicable clearances from the Department of Agrarian Reform (DAR), Department of Environment and National Resources (DENR) and Department of Health (DOH)	Residential and small commercial activities	Developer (Locational Clearance) → Building Officials Issuance
	Major developments: • Industrial • Commercial	Developer (Locational Clearance + Environmental Clearance + Barangay Clearance) → Building Officials *Endorsement* Building Officials ← Municipal Mayor Issuance
	Development Permit (It applies in case of new subdivisions)	Developer (Locational Clearance) → Municipal Mayor *Endorsement* Zoning Administrator (Advice) ← Sangguniang Bayan Issuance

Source: Interview to the Municipal Planning and Development Coordinator/14 Sep.2001

4.3.3. Review of Policy Instruments

Policy instruments and Informal Settlements

In the 1995 Comprehensive Land Use Plan (CLUDP) Informal settlements were not included in the land use policy. The 2000 CLUDP identifies the illegal construction in invaded private and municipal government lands as key concern. The policy instrument that addresses such concern is the strict monitoring and control of illegal constructions. 'Neighbourhood '*Barangays*' officials and community associations should be mobilised to control illegal constructions and should report to the municipality to take necessary actions. This will prevent the proliferation of squatters (NEDA General Trias CLUDP /2000).

In practice the municipality is *not* running any activity or program to encourage *barangays* officials to report building activities in invaded lands. Personal opinions of officials is that informal settlers cannot be forced to vacate their homes unless an alternative or a relocation site has been set up for them. Moreover the new industrial estates and commercial projects demand most of the local government attention.

Over-Regulation

For poor householders, the lists of requirements of the regulatory permits are long and resource consuming. It demands the use of professional services, such as architect/civil engineer, sanitary engineer/master plumber and electrical engineer/master electrician, which are only affordable by private developers and a privileged group of householders. Besides it increases the value of formal land developments.

However at this stage of the research is too early to affirm that over-regulation is one of the factors determining the difference between the policy and the ground development. Are informal settlers considering the costs of the regulations as one of the factors that motivate them not to follow the policy? The point is elaborated in chapter 6.

4.3.4. Review of the Coordination between Local Land Use Zoning Policy and Local Housing Policy

The guiding housing policy of General Trias is to provide adequate low-cost housing for poor and low-income families; the main objectives are relocation of squatter settlements and provision of affordable housing for low-income residents. The target is that by the year 2015, there will be no squatters in any part of the municipality.

The municipality aims to implement the policy through the ensuring of compliance of socialised housing (quota by private developers), the provision of community services, the strict monitoring and control of illegal constructions and the provision of housing in the industrial establishments.

Ensuring Compliance of developers to socialised housing

There is a national policy within which private developers are required to develop 20% of either the total area of the subdivision project or the total cost of project. The national policy do not specify the location of such housing projects, therefore many developers of the National Capital Region have chosen to construct 20% of the project area in General Trias, where land prices are cheaper than in Metro-Manila.

In spite of the large housing projects located in the municipality, the demand for low-cost housing is still unsatisfied because the prices of the *socialised housing* are unaffordable for the poor. At the moment the phenomenon is so strong that there is an over-supply of this type of housing in the municipality and a backlog for housing for the poor. As an alternative the local government aims:

- To encourage municipal private developers to acquire the empty socialised housing units as a way to tie the 20% private investment in General Trias.
- To create a Local Housing Fund for the amortisation.

If implemented, this measure will represent part of the solution for the increasing housing demand. But settlers that cannot afford the amortisation and/or do not have collateral may be pushed away from the formal market.

Provision of community services

This measure seeks to encourage developers/owners to construct their own community facilities while the local government assumes maintenance and other costs. 'This will allow a relief of the local financial burden' (NEDA General Trias CLUDP, 2000). This kind of measure is a form of settlement upgrading involving the joint effort of the community and the local government. It shows the interest of the municipality in promoting the development of urban infrastructure through community cooperation.

Provision of housing in industrial establishments

The 2000 Comprehensive Land Use Plan mentions the importance of housing provision near industrial areas 'There should be a policy requiring all new industrial Estates/Parks and single large industrial establishments to provide dormitory type of housing for its workers who are non-residents of the host municipality. This will reduce the proliferation of squatters around these establishments' (NEDA General Trias CLUDP, 2000)

Although the recommendation represents an interesting solution for the supply of housing, it does not have instruments for its implementation and it is isolated from the municipal land use zoning policy. In fact in the land use zones/2000, there is not any area reserved for housing allocation of the incoming poor labour force.

4.3.5. Review of the Relation between Local Land Use Zoning Policy and the Especial Economic Zone (ECOZONE)

The Republic Act 7916 of 1994 and the Special Economic Zone Act of 1995 define the legal and operational Framework of the Special Economic Zones, which are zones 'highly developed or which have the potential to be developed into agro-industrial, industrial, tourist, recreational, commercial, banking, investment and financial centres whose metes and bounds are fixed or delimited by Presidential Proclamations'.

In General Trias one Special Economic Zone is located which contains Industrial Estates and Export Processing Zones. The land use is specialized industry, the policy instrument to implement such use is a national legislative framework that promotes industrial business in the area. The law enacts the following benefits for investors:

- Enterprises located in the zone are allowed to import capital equipment and raw materials *free* from duties, taxes and other import restrictions.
- The construction and operation of the industrial estates are also exempt from payment of all national internal revenue taxes and all local government impost and fees.
- The investment is protected through the possibility of its repatriation and the outward remittances of earnings do not need to be approved by the '*Bangko Sentral ng Pilipinas*'

The governmental body that administrates the Especial Economic Zones is the Philippine Economic Zone Authority (PEZA). According with the law, General Trias[4] retains its basic autonomy and identity with respect to the Special Economic Zone. In terms of the Land Use Zoning policy, the municipality holds the right to apply the regulatory permits. Even so, the Economic Zone Authority issues its own construction permits inside its jurisdiction.

The municipal mayor is one of the six members[5] of an advisory body of the Special Economic Zone, which advises on matters pertaining to policy initiatives, and gives assistance in problems related with labour. According with the law the advices and suggestions of the advisory board do not compromise the autonomy and independence of the zone.

Special Economic Zone and Housing (for labour)

Currently there is no contact between the municipality and the Economic Zone Authority (PEZA) to address the influence of the industrial estates over the development of the land. Although the Republic Act 7916 of 1994 and the Special Economic Zone Act of 1995 enact that PEZA shall coordinate with the local government units (LGU) and other relevant organisations the implementation of an integrated program to address housing for migrant workers.

PEZA officials manifested that in case the municipality comes with proposals they are willing to coordinate but that the initiative should emerged from the LGU.

4.3.6. Review of the Monitoring and Evaluation

The 2000 Comprehensive Land Use Plan formulates the land use zoning policy, the policy instruments but does not consider the monitoring and evaluation of the policy. Nevertheless the municipality is monitoring the nature and progress of the approved building and development permits to confirm the application of the technical specifications.

[4] Any local government unit

[5] The other members are: president of the association of investors, governor of the province, the president of an accredited labour union, the representative of the business sector in the periphery, the representative of PEZA.

4.4. Summary of the Findings

Table 4.7 Summarises the institutional context of the formulation and implementation of the General Trias Land Use Zoning Policy.

Table 4.7 Institutional Factors Affecting the Effectiveness of General Trias Land Use Zoning Policy

Level	Institutional Context	Findings
Local & National, Regional, Provincial	Government Coordination	• There is weak government coordination due to a variety of guidelines, low inter-level coordination and low inter-agencies coordination. • National agencies indicate that local politics and the persuasion of the settlers' vote restrict the implementation of the land use zoning policies at local level.
Local	Status of Policy Instruments	• The only policy instrument is the zoning ordinance, which defines regulatory permits: locational clearance, building permit, development permit and business permit. • In practice the municipality is *not* running any activity or program to encourage the reporting of building activities in invaded lands. • The lists of requirements of the regulatory permits are long and resource consuming.
	Inter-policy coordination	• In spite of the large housing projects located in the municipality, the demand of low-cost housing is still unsatisfied because the prices of the *socialised housing* are unaffordable for the poor. • The municipality is interested on the promotion of the development of urban infrastructure through community cooperation. • The municipality identifies that the provision of housing near the industrial estates will reduce the proliferation of informal settlements. However the reservation of areas for the incoming labour force is not included in the policy.
	Monitoring and Evaluation	• The Comprehensive Land Use Plan /2000 does not consider the monitoring and evaluation of the land use policy.

5. ANALYSIS OF THE PROCESSES ON THE GROUND

This chapter examines what factors motivate the development on the ground. It starts with an explanation of the data sources and the description of the informal settlements. It is followed by the identification of the core factors behind the behaviour of the target group. After that an analysis of the target group's way of handling informality and the role of community organisations is presented. It finalises with a summary of the findings.

5.1. Informal Settlements

The municipality does not have a quantitative assessment of the growth of informal settlements. However in the 2000 Comprehensive Land Use Plan, the sites of the informal settlements are identified. It gives the location of the settlements as points but does not give further information on the land development inside the informal settlements. (Refer to Map-03)

Three informal settlements were surveyed in the field. They correspond to the fastest growing settlements, according to the local officials assessment. The survey consists in the application of semi-structure interviews and questionnaires. Interviews were held with community leaders and questionnaires with households

Questionnaires were designed with open ended and closed questions. A test survey was conducted to determine the classes (options) of the multiple-choice questions; the class 'other' is one of the options. Despite the number of households per dwelling, in each dwelling a single questionnaire was conducted. When the head of the household was not available in the dwelling the respondent was a household member. Table 5.1 shows the name of the settlements and the details of the survey. (Refer to Appendix B)

Table 5.1 Informal Settlements and Details of the Survey

Name of the Informal Settlement	Number of conducted questionnaires	Number of Semi-Structure Interviews
Bacao-I (Sitio Kanluran)	26	2
Bacao-II (Taiwan)	24	1
Manggahan	36	1

5.2. Description of the Surveyed Informal Settlements

The informal settlements of Sitio Kanluran and Taiwan are located in the northern part of the municipality in the neighbourhoods '*barangays*' of Bacao-I and Bacao-II, close to the Cavite Export Processing Zone. Bacao-II is located just behind the fence of the Export Processing Zone.

The third settlement, Manggahan is located in the '*barangay*' of the same name, near to the New Cavite Industrial City and near the crossing of two national roads: Noveleta-Amadeo and Trece Martires – Carmona. (Refer to Map-04).

The settlements have different age and different degree of development. However, the three of them are receiving new settlers. The age of dwellings shows that new housing units were constructed one year before the questionnaires were conducted.

The quality of the access road is one of the factors that indicates the degree of the development of the urban infrastructure. Crossing age of the dwellings and quality of the access roads reveals that the oldest settlement (Manggahan) is the only one that has paved roads. (Refer to table 5.2)

Table 5.2 Characteristics of the Surveyed Settlements

Name of the Informal Settlement	Age of the dwellings		Area (Ha)	Population		Quality of Access Road
	Mean year of construction of the dwellings	Year in which the newest dwelling were built		Estimated number	Density (Person/Ha)	
Bacao-I (Sitio Kanluran)	1998	2001	3.78	223	59	Earth
Bacao-II (Taiwan)	1998	2001	3.97	300	76	Earth
Manggahan	1992	2001	3.05	300	98	Pavement

Source: Questionnaires 17-21 September 2001

Other indicators of the degree of urban development of the settlements are the quality of the construction materials. The survey reveals that in the oldest settlement (Manggahan) the materials are more durable than in the other two settlements. In Manggahan 72% of the external walls and 89% of the floor's material are in concrete, which contrasts with the predominant wooden walls and wooden/mixed floors of the other two settlements. (Refer to Figures 5.1 and 5.2)

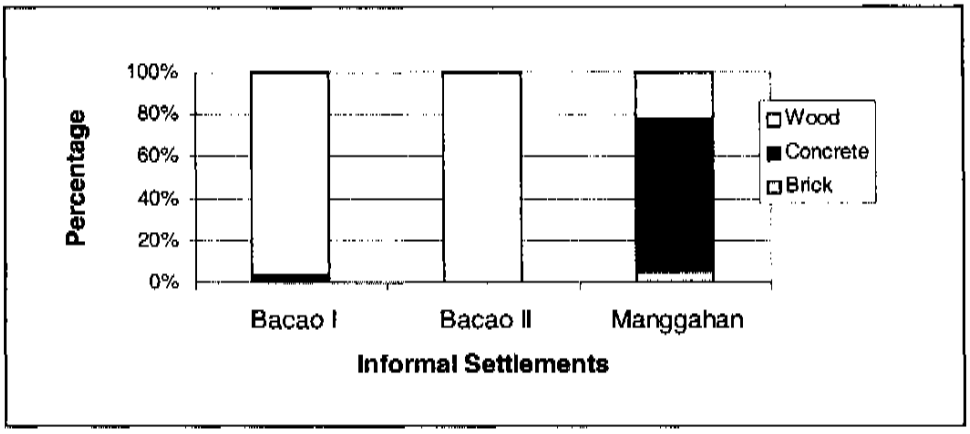

Figure 5.1 Major Material External Walls - Informal Settlements
Source: Questionnaires 17-21 September 2001

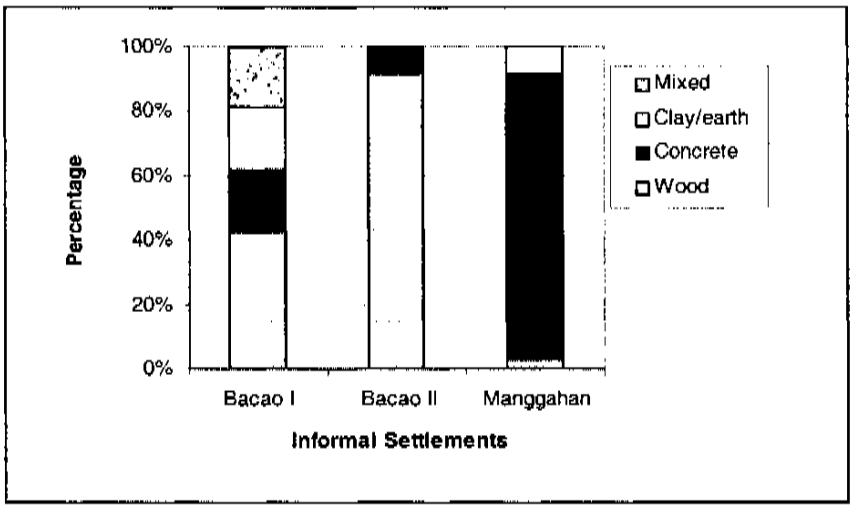

Figure 5.2 Major Material of the Floor - Informal Settlements
Source: Questionnaires 17-21 September 2001

In all three settlements metal sheets are the dominant material for the roof. In Bacao-I and Bacao-II the main source of drinking water is standpipes. In the oldest settlement (Manggahan) the main source of drinking water is public pipelines. (Refer to Figure 5.3)

In Bacao-I and Bacao-II the dominant type of toilet is latrine without connection to a disposal system. In Manggahan the most used type of toilet is bowl/bocket, 69% of these toilets makes the discharges to septic tanks and 31% discharges to groundwater. (Refer to Figure 5.4)

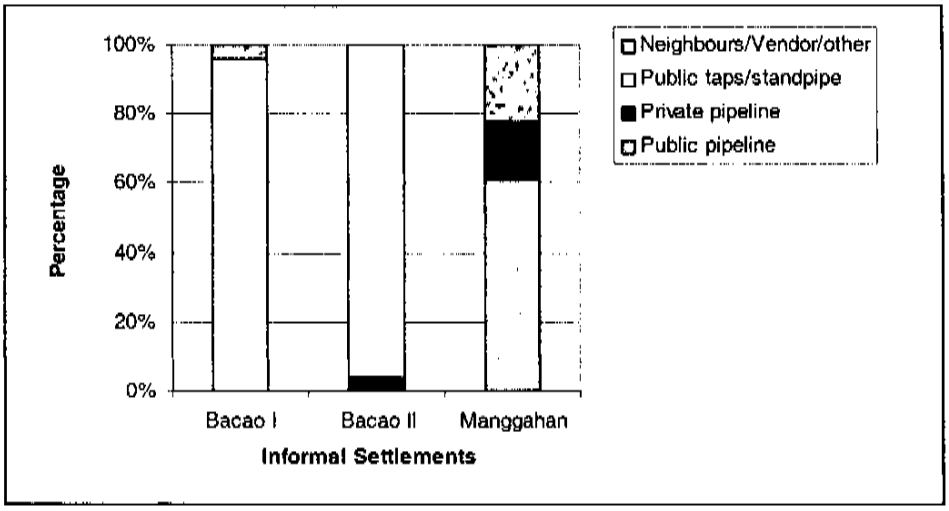

Figure 5.3 Major Source of Water for Cooking - Informal Settlements
Source: Questionnaires 17-21 September 2001

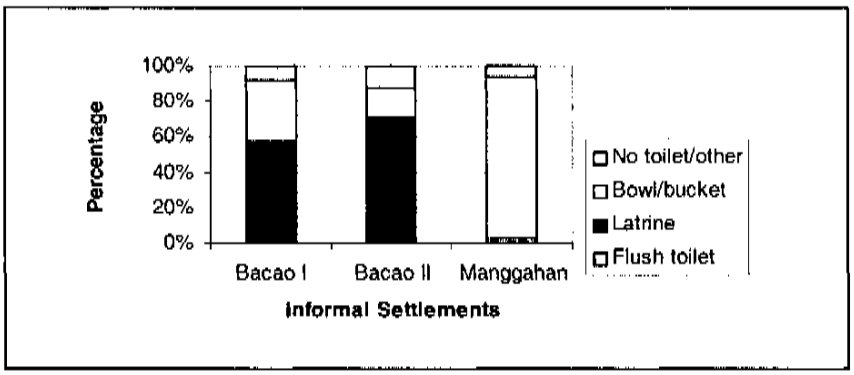

Figure 5.4 Type of Toilet - Informal Settlements
Source: Questionnaires 17-21 September 2001

5.3. Factors behind the behaviour of the target group

The majority (85%) of the informal settlers are migrants from other municipalities in the same island or from other islands of the country (Refer to Figure 5.5)

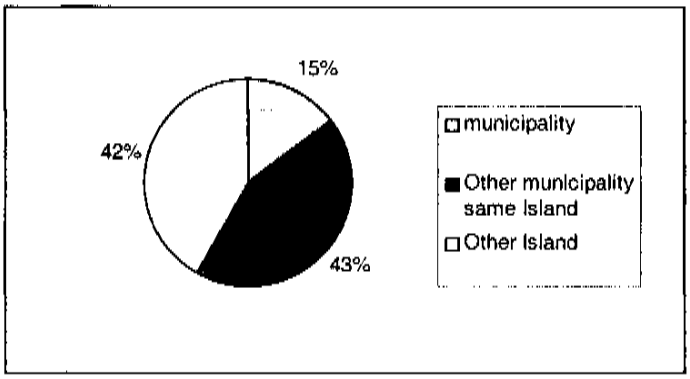

Figure 5.5 Emigration place – Informal Settlers
Source: Questionnaires 17-21 September 2001

In the survey, households were asked about the factors that motivate them to settle in the informal settlements. They listed them and identified the order of importance of the three most decisive factors. Some respondents even identify four or five motivation factors. For the analysis a value was assigned to each factor, as following:

First factor..... 5 – Very high importance
Second factor..... 4 – High importance
Third factor..... 3 – Medium level of importance
Fourth factor..... 2 – Low importance
Fifth factor..... 1 – Very-Low importance
Non-determinant factor..... 0 (zero)

For instance, a respondent who identified the following order of factors:

1st Proximity to job,
2nd State land
3rd Not sure

has the following values assigned:

Cheap land	Community Development	Proximity to job	Transportation availability	Proximity to roads	Proximity to school	State land	Political support	Not sure
0	0	5	0	0	0	4	0	3

After that, each column was summed. The result of the analysis shows that the first motivation factor to move into the informal settlements is proximity to job, following by the fact that settlers do not have to pay for the land and the factor of proximity to social services. (Refer to Table 5.3)

Table 5.3 Factors that Motivate the Migration Into Informal Settlements

Level of Importance	Factors
1st	Proximity to job
2nd	Cheap land/Free land
3rd	Proximity to roads
4th	Proximity to school
5th	Transportation availability
6th	State land
7th	Community organisation pro-land development
8th	Not sure

Source: Questionnaires 17-21 September 2001

As mentioned before the three informal settlements are near to industrial estates. The review of the location of social facilities reveals that the informal settlements are also close to main roads, social welfare facilities, schools and basketball courts. (Refer to Map-04)

The factor: cheap land/free land, reveals that low-income population moves towards informal settlement because of the cheaper options of land and housing. According to the community leaders, the lands of Bacao-I are owned by the State. In Bacao-II there is confusion about of who owns the land and the Manggahan lands have private ownership. The municipality does not have a cadastral database and there is uncertainty about the legal status of these lands.

88.4% of the total numbers of dwellings are owned by householders or household members and 11.6% of the dwelling have been rented. The oldest settlement (Manggahan) has the highest percentage of renting. (Refer to Figure 5.6)

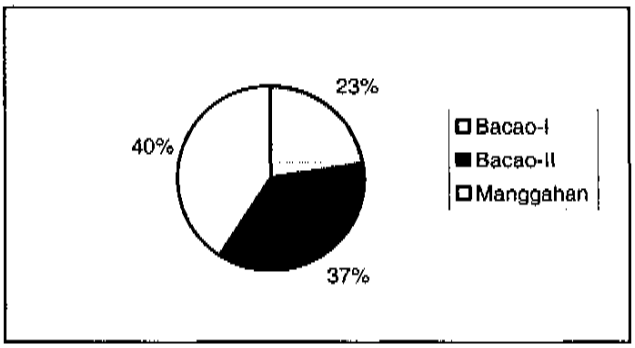

Figure 5.6 Renting Percentage – Informal Settlements
Source: Questionnaires 17-21 September 2001

5.4. Target group and policy instruments

In the questionnaires the following questions were asked:

Information	Do you know how to obtain building permits?
Enforcement	Do you think that the local government will penalise the houscholders who don't follow the regulations?
Community perspective of the enforcement	Do you think that the community is in the position to push against the land use regulations?

A majority (84%) of the informal settlers does not know how to obtain building permits. The estimate per settlement shows that Mangahans inhabitants (oldest settlement) are better informed, 28% of settlers know that the municipality requests building permits for land development and know how to obtain them. In the other two settlements (Bacao-I and Bacao-II) only 8% of the inhabitants in each settlements is aware of the regulatory permits. (Refer to Figure 5.7)

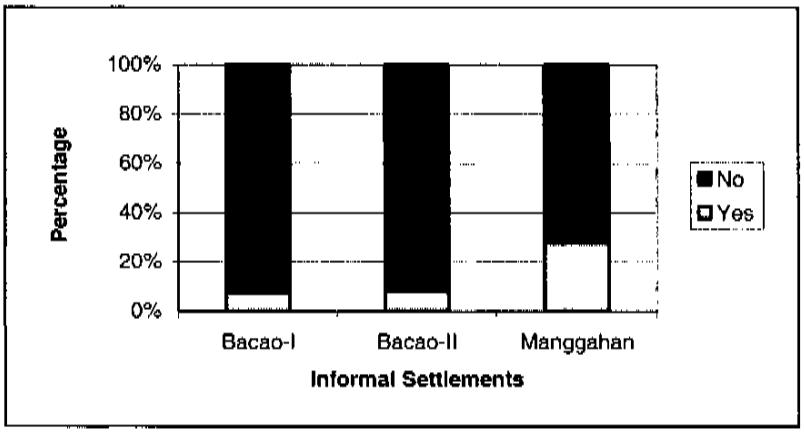

Figure 5.7 Building Permit Awareness – Informal Settlements
Source: Questionnaires 17-21 September 2001

79% Of the respondents has the view that the municipality may penalise informal settlers, however they also think that the community organisation (43%) and political representation (4%) will give them the opportunity to push against the policy instruments. (Refer to Figure 5.8)

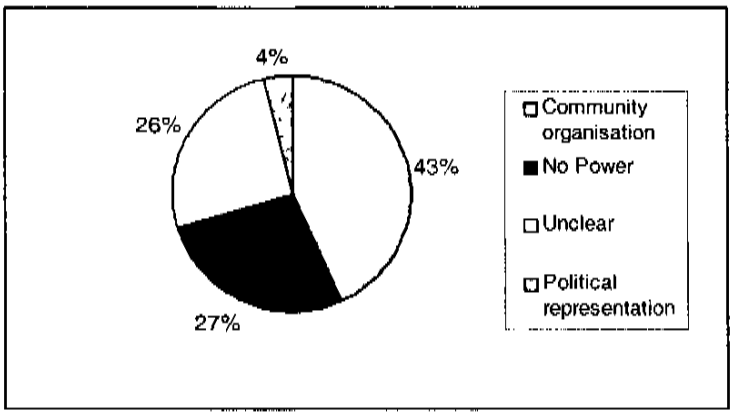

Figure 5.8 Informal Settler Perception of their Power Against Policy Instruments
Source: Questionnaires 17-21 September 2001

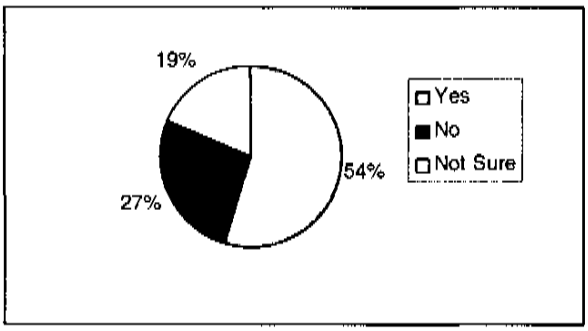

Figure 5.9 Plans of Future Investment In the Dwellings
Source: Questionnaires 17-21 September 2001

An indicator of the settlers' perception of the risk of eviction is the investment in dwellings. Settlers were asked about theirs plans for future investment in the dwelling. Only 27% of the respondents is not planning to make further investments. (Refer to Figure 5.9)

5.5. Facing Informality

The semi-structured interviews conducted with the community leaders are the source of data to find how the community handles the status of being informal. (Refer to Appendix B and Table 5.4).

The interviews reveal that the main topic of discussion during the community meetings is the improvement of the urban infrastructure of the informal settlement. Settlers' perception is that the higher the degree of development of the settlement, in terms of urban infrastructure, the lower the risk of eviction. Among the three informal settlements, the one that has a more developed urban infrastructure (Manggahan) is where households do not feel the risk of eviction. This means that the gradual development of the informal settlement conducts to its *the facto* formalisation

The role of the community organisation is crucial to achieve the development of the informal settlement. In order to request public investment for the informal settlements, community leaders support political parties, and vice-versa with the aim to gain the informal settlers' vote, political parties support the community organisations. In two of the three informal settlements (Bacao-II and Manggahan) the front door of the dwellings were numbered during the latest election by one of the political parties, which facilitated the registration of the voters.

An other example of this reciprocal support is that although the zoning ordinance enacts that business permit must be issued in parcels with locational clearance and title, in the informal settlement of Manggahan there are shops holding this permit.

Consequently, the implementation of the local land use zoning policy is shaped by the relationship between the government as policy makers and the informal settlers as a target group. Informal settlers are not powerless; they hold the power of voting which makes both actors in the policy implementation.

5.6. Community Organisations and Local Politics

The qualifications to be an eligible voter or elective officials[6] in the Philippines are: to be a Philippine citizen, to be registered as a voter and to be resident of the respective territorial jurisdiction. As far as the citizen is a resident of the municipality there is no distinction between informal and formal settlers and any citizen holds the right to elect or to be elected. For instance, in the informal settlement of Manggahan one of the community leaders is also a member of the barangay council.

Community organisations are mediators between the informal settlers and the local government. The leaders are political agents that influence the vote of the community and at the same time search for the political support that will attract public investment in the settlements.

[6] Such the municipal mayor, vice-mayor, member of Sangguniang Bayan, barangay's captain '*punong*' or member of the barangay's council '*sangguianag*'

Community leaders interchange experiences with other Philippine informal settlements. Leaders are aware that the lack of affordable housing for the poor conducts to *de facto acceptance* of the informal settlements and that such acceptance increases proportionally with the degree of the development of the informal settlement. In this way, the community organisation represents the channel to achieve a gradual delivery of goods and urban services. Regardless of being a slow process, it is also the channel to development.

The exchange of votes for public investment is a form of clientelism. Nevertheless it represents at the same time the path for informal settlers to keep the physical access to land and to gain the provision of urban services.

Table 5.4 Summary of the Community Leaders Interview - Informal Settlements

	Frequency community meetings	Main topic of discussion	Political Representation	Way of facing the risk of eviction	Comments
BACAO-I	Monthly	• Improvement of the national irrigation administration road-canal. (access road) • Improvement of the barangay • How to keep the peace and order of the community	• Sometimes the barangay's captain comes to our meetings, even the barangay's civil police. • For us is important that the Captain is involved with our community organisation, politically we follow what the captain 's say.	• With the improvement of the roads and utility supplies is possible to apply for a municipal permit to occupy the land. • Anyway if there is not development of the settlement the municipality will transfer us in two years time. • Some people of the central barangay call us squatter but the barangay's Captain supports us.	• Dwellings are not numbered by political parties
BACAO-II	Twice a month	• Cleanness s of the road an how to improve the canal-road (access road)	• *The municipal mayor represents us.*	• Yes, we have made a formal petition to the local government to own the land. We cannot be evicted we will fight first.	• Dwellings are numbered by political parties.
MANGGAHAN	Twice a month	• How to improve the informal settlement	• The municipal mayor represents us. • One of the community leaders is member of the barangay council *'Sangguniang'*	• No one will say that we should leave. The settlement is very developed and for the municipality is too expensive to provide other area with the condition of this barangay (They do not feel any risk of eviction).	• Some of the shops have building permit issued by the municipality. • Dwellings are numbered by political parties.

Date of interviews: 17th - 19th of September /2001

5.7. Summary of the Findings

Table 5.5 summaries the factors that motivate the development on the ground and how the target group faces the status of being informal.

Table 5.5 Target Group Analysis of the Process on the Ground

Target Group Factors	Findings
Identification of Core Factors	• Proximity to job, • Land prices and ownership status, • Proximity to roads and transportation availability • Proximity to schools
Policy Instruments and Informal Settlers	• Majority of the informal settlers do not know how to obtain building permits and they are not interested to apply for the regulatory permits.
Way of Facing Informality	• Informal settlers are not powerless they hold the power of voting. • Informality is faced with the gradual development of urban infrastructure through the exchange of votes for public investment. This is the path for informal settlers to keep the physical access to land and to gain the provision of urban services.
Role of Community organisations	• The community organisations are mediators between the informal settlers and the local government. • Community leaders are political agents that influence the vote of the community and at the same time search for the political support that will attract public investment in the settlements.

6. INTERRELATION POLICY MAKERS AND TARGET GROUP

Chapters four provided the analysis of the institutional context, from the policymaking perspective, whereas chapter five analysed the processes on the ground, from the target group perspective. In this chapter both perspectives are related in order to make a holistic evaluation of the policy. It reveals the particular circumstances influencing the ground development in General Trias.

6.1. Policy-Makers Versus Target Group

The comparison of the institutional context and the factors driving the development on the ground, displays the position of policymakers and target group in topics of common interest. It provides understanding of the relation between community organisations and the local government. Finally, it allows the analysis of the factors evaluated by informal settlers in relation with the opportunities offered by the municipality.

6.1.1. Topics of common interest

The topics of common interest for policymakers and target group are social housing, policy instruments and urban infrastructure.

Social housing

Regarding social housing, the position of the municipality is that provision of housing near industrial estates will reduce the proliferation of informal settlements. However the land use policy does not allocate areas for the provision of housing of the incoming poor labour force.

In spite of the large housing projects located in the municipality the demand for low-cost housing for the target group is still unsatisfied and the high population growth pushes the demand up. 'Affordability of private housing is a main issue causing mismatch of housing supply and demand. While there appears to be a surplus in housing units, as indicated by low occupancy rates among private low-cost housing project, there is a great number of squatter families and low-income families needing housing' (NEDA General Trias CLUDP, 2000).

Policy Instruments

The only policy instrument formulated by the municipality is the zoning ordinance, which defines regulatory permits. In practice the municipality is not running any activity or program to enforce the regulatory permits in the informal settlements.

The majority of the informal settlers does not know how to obtain building permits and they are not interested to obtain them. They simply do not apply for permits. Therefore the long list of requirements of the regulatory permits is not directly influencing the behaviour of the settlers.

Urban Infrastructure

The municipality is interested in promoting the development of urban infrastructure through community cooperation. In the perception of the settlers the risk of eviction is lower when the degree of development, in terms of infrastructure, is higher.

6.1.2. Relation between Local Government and Community Organisations

The power of the municipality is based on its legal right to manage land use. Local government units formulate land use zoning policies and implement national and local land use policies. Informal settlers are not powerless, they are part of the electorate and hold the power of voting. Informal citizens (as formal citizens do) may elect or be elected for public positions, for instance, mayor, vice-mayor, member of the Sangguniang Bayan, barangay's captain or member of the barangay's council.

In practice this power pushes against the enforcement of regulatory permits in the informal settlements. In the informal settlement of Manggahan there are shops holding business permit issued by the municipality, despite the fact that the municipal zoning ordinance enacts that business permits can only be issued for parcels without titling problems and with locational clearance.

Community organisations serve as mediators between informal settlers and the local government, aiming to exchange votes for public investment in support of the development of the urban infrastructure. The development of public roads and network utilities represents for the informal settlements a reduction of the risk of eviction.

In an interview conducted on the 19th of September/2001, the president of the community organisation of the informal settlement of Manggahan said: *'Nobody will say that we should leave, the informal settlement is very developed and for the municipality it is too expensive to provide another area with similar conditions'*.

Urban infrastructure is the link of informal and formal development. In the informal settlements the infrastructure is developed gradually through political patronage, whereas in the formal areas it is developed by direct governmental actions. (Refer to Figure 6.1)

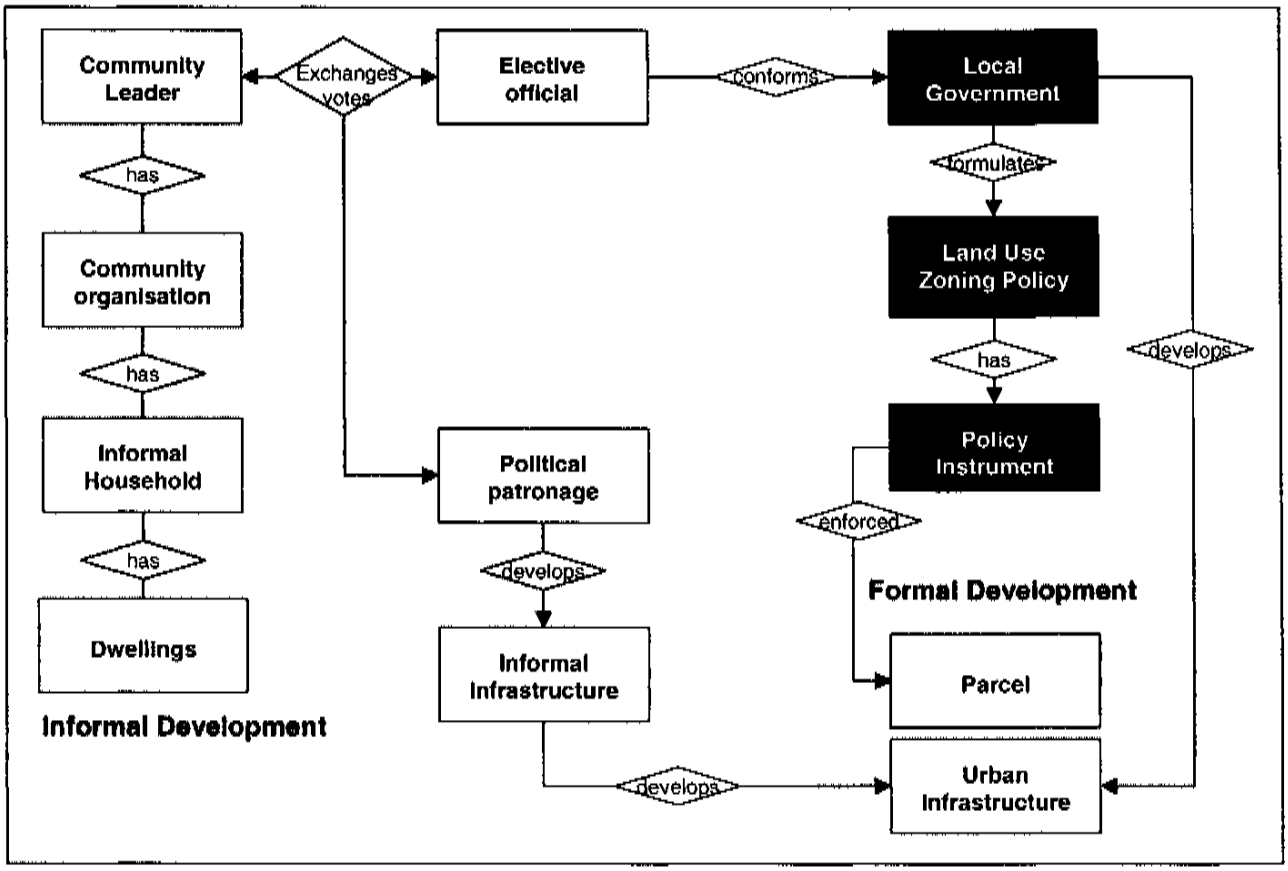

Figure 6.1 Power Relations Inside Informal Settlements Affecting the Implementation of Policy Instruments

6.1.3. Factors Influencing the Behaviour of the Target Group

The circumstances identified by informal settlers as driving factors that motivate them to move into the settlements are: proximity to job, no payment for the land, proximity to roads and social services, and state owned land or unclear ownership. The opportunities offered by the municipality regarding these factors may stimulate or influence the growth of informal settlement or the rise of new settlements.

Proximity to Job

The 2000 land use zoning policy allows the development of industrial activities in 34% of the territory, under the denomination of northern and southern mixed-use zones. At the moment there are 8 industrial estates, which mainly manufacture electronics and electrical products.

The local economy has been spurred by the manufacturing and real estates sectors. The increase in large-scale industries, commercial establishments and residential subdivisions is an indication that the municipality is an attractive location for the rise of informal settlements. (NEDA General Trias CLUDP, 2000).

Land Prices and Ownership Status

Land prices exclude low-income groups from the land market. Land is simply unaffordable and hence the need for land is satisfied by *de facto access*. This access is preferably practised in areas with and unclear ownership status, which reduces the risk of eviction.

Proximity to Roads and Transportation

Municipal records reveals that there is a total of about 84 km of roads in the municipality. This includes three national and four provincial roads. The main source of public transport along the roads is the jeepney, complemented with tricycles.

The comprehensive land use plan/2000 identifies that most of the national and provincial roads are paved and that transport services in terms of coverage and availability are adequate. However the projections of the demand indicate a high growth, which challenges the municipality to increase the investment in order to support the population and economic growth. (NEDA General Trias CLUDP, 2000).

Proximity to Schools

Elementary education in General Trias is provided through a network of public schools strategically located in the municipality. However, there is a growing deficiency in both manpower and facilities in education. The student-teacher ratio is 1:34 and the student-classroom ratio is 1:42. (NEDA General Trias CLUDP, 2000).

6.2. External Factors Versus Policy Instruments

The external factors affecting the behaviour of the target group and the development on the ground are:

- High population growth due to immigration of labour force
- The unsatisfied demand of low-cost housing.
- Lands with unclear ownership status.
- Roads of national and provincial importance.
- Schools distributed over the municipality.
- A majority of informal settlers that does not know how to obtain building permits and are not interested to apply for them.
- Informal settlers as part of the electorate.
- The exchange of votes for the gradual development of urban infrastructure between informal community organisations and local government.

The characteristics of the policy and the policy instruments influencing the development on the ground are:

Local Land Use Zoning Policy

- The Implementation of land use regulations is done at local level.
- The housing provision for the incoming labour force is not included in the policy.
- The municipality is interested in the promotion of the development of urban infrastructure through community cooperation.
- The policy is not monitored and/or evaluated.

Policy Instruments:

- The only policy instrument is the zoning ordinance
- In practice the regulatory permits are not enforced.

Figure 6.2 illustrates the particular circumstances influencing the ground development in General Trias

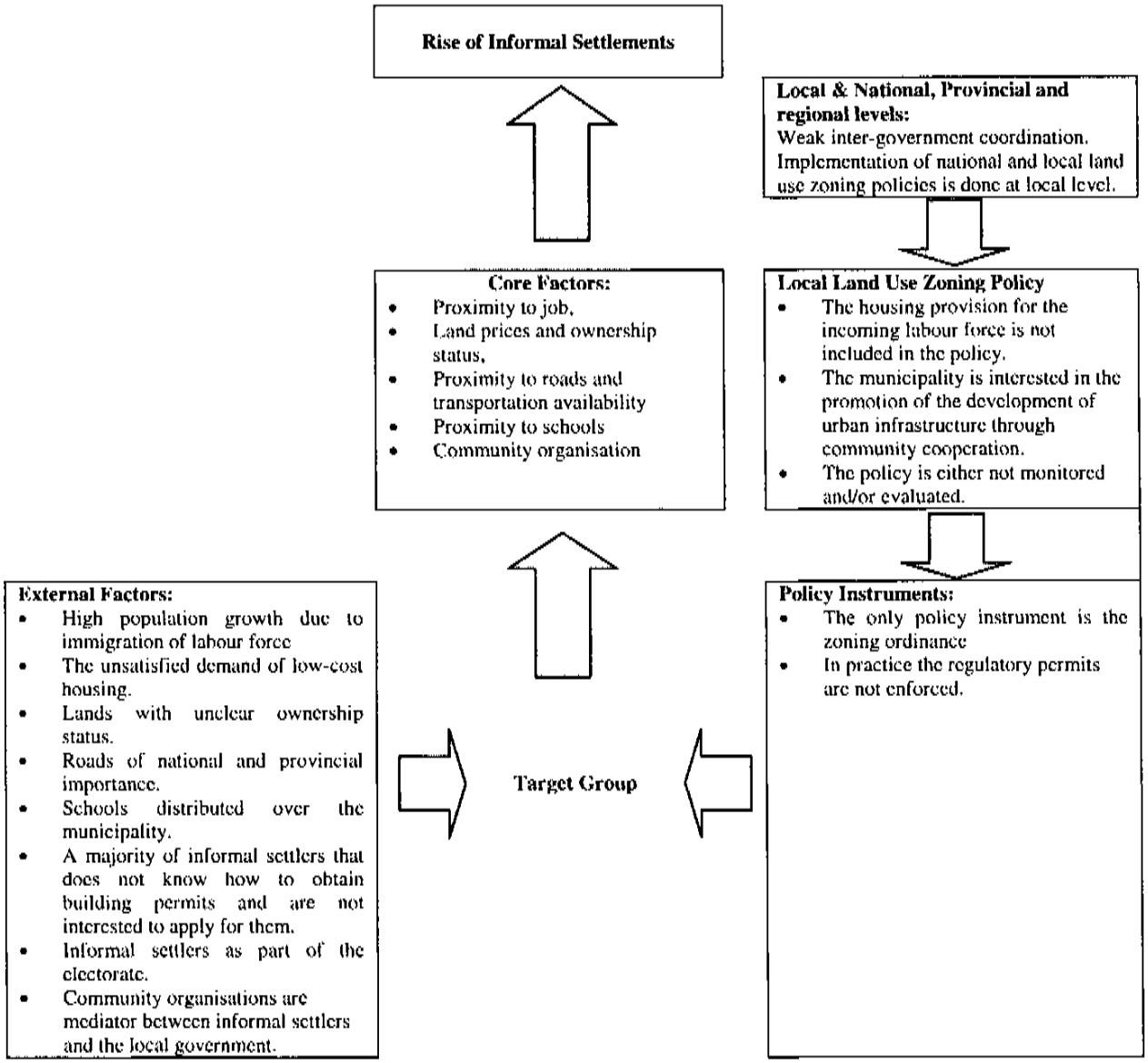

Figure 6.2 External Factors Vs Policy Instruments

6.3. Findings

The policy *formulation* is driven by national parameters and guidelines. While the policy *implementation* is driven by the direct interaction between the local government and the electorate. The local government follows national parameters and guidelines in the policy formulation but at the same time does not go against local stakes in the policy implementation. Hence the policy is implemented in a fragmented way and policy instruments are not enforced in the informal settlements.

For informal settlers the risk of eviction is a function of, the ownership status of the invaded lands, the political patronage and the degree of development of the urban infrastructure.

7. SPATIAL ANALYSIS

This chapter examines how the search of the poor for integration into the urban economy and the social inclusion generates a spatial pattern in the location of informal settlements. It starts with an explanation of the scale of the spatial analysis. After that, it makes an analysis of the spatial factors that motivate the target group to move into informal settlements. At the end the findings are presented.

7.1. Bi-Scale

The spatial analysis of informal settlements demands two different scales, the first one denominated *macro-level* allows the analysis of the informal settlements in relation with the formal development. The second one denominated *micro-level* deals with the specific dwellings allocation and distribution of the space inside the informal settlement. At macro level the smallest spatial unit for which data is gathered and processed (Basic Spatial Unit) is the settlement (boundary), at micro-level it is the dwelling unit.

Martinez and Abbott (2000) distinguish the importance of the two scales to analyse the settlement in different circumstances. They propose a bi-level model that allows the integration of both scales by a linked spatial database. The advantage of this model is that at macro-level, dwelling data could be made available enabling spatial analysis for land management and planning purposes. At micro-level the model provides data about the environment and the formal development surrounding the informal settlement.

The spatial analysis at macro-level provides the attractiveness of location for establishment of informal settlements and allows the identification of possible spatial relations with respect to formal development. At micro-level the spatial analysis provides the attractiveness for the location of dwellings inside the settlement. The interest of this research is to analyse where informal settlements rise and the identification of spatial patterns. This analysis is done at macro-level, being the basic spatial unit the settlement as a whole.

7.2. Spatial Pattern in the Rise of Informal Settlements

Map-03 gives the location of all informal settlements of General Trias. This shows a spatial pattern in the rise of informal settlements with respect to the formal development. They are located near the industrial estates, the *poblacion* (CBD) and along the main roads.

Informal settlers were asked about the motives (factors) to move into the informal settlement. Four factors out of seven are spatial, proximity to job, proximity to roads, proximity to schools and transportation availability. The non-spatial factors are cheap land/free land, state land and community organisation pro-land development.

Factors were measured in the three surveyed informal settlements in order to have a measure of what settlers considered an attractive proximity and attractive frequency of transport. Table 7.1 shows the measurement units of the factors.

Table 7.1 Measurement Units of the Spatial Factors

Factor	Unit of Measurement
Proximity to source of employment	Distance between the informal settlement and the source of employment
Proximity to roads / transportation availability	• Distance from the informal settlement to main roads • Frequency of public transport
Proximity to schools	Distance between the informal settlement and the school

To measure distances, sizes (areas) and shapes of the features are important:

- Distance between informal settlements and sources of employment

Both features are polygons, one approach to measure the distance is between centroids. However this method is not the most appropriate because the area of the source of employment is much bigger than the settlements. (Refer to Table 7.2). Therefore minimum and maximum distances between the centroids of the settlements and the boundaries of the source of employment are measured. (Refer to Figure 7.1)

Table 7.2 Area of the Informal Settlements and Source of Employment

Informal Settlement	Area (ha)	
	Informal settlement	Source of employment
Bacao I	3.78	80.99
Bacao II	3.97	80.99
Manggahan	3.05	80.58

Source of data: GIS calculation

- Distance between informal settlements and roads

Orthogonal distance between the settlements centroids and the road axis

- Distance between informal settlements and schools

Schools are point features; the distance between the settlements centroids and the point features is measured. (Refer to Figure 7.2)

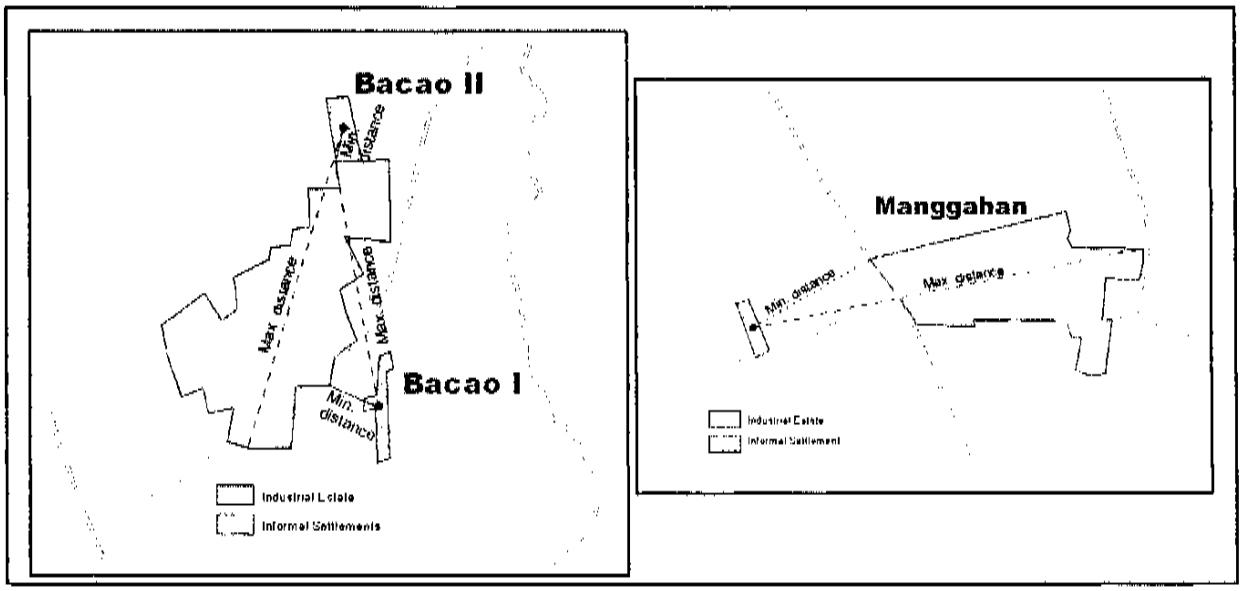

Figure 7.1 Measure of Distances Between Informal Settlement and Source of Employment

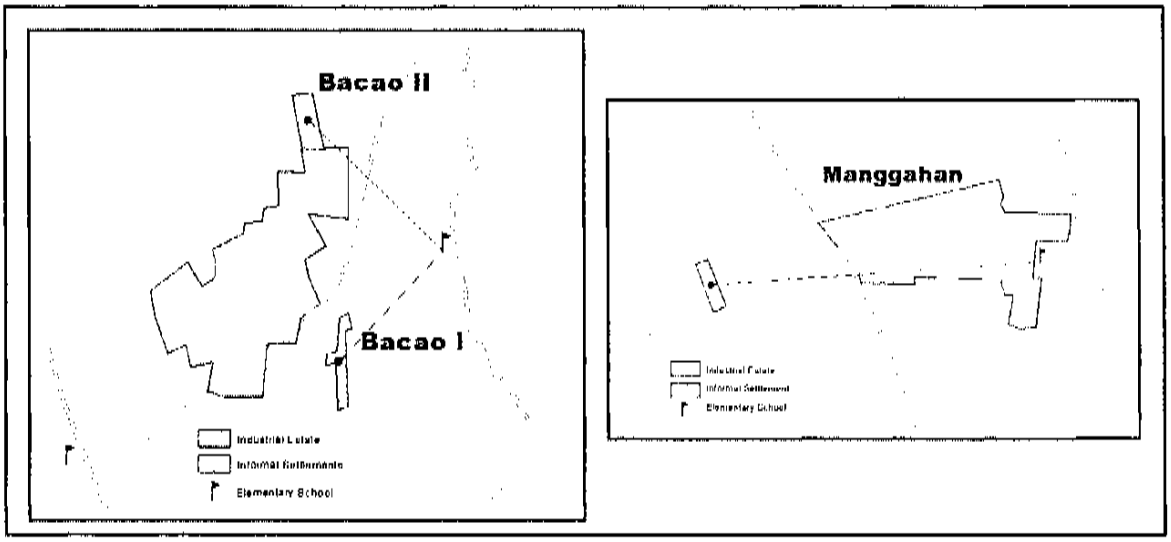

Figure 7.2 Measure of Distances Between Informal Settlement and Source of Employment

Table 7.3 details the specific measured values per informal settlements. (Refer to Map-04)

Table 7.3 Measurement of the Spatial Factors

Informal Settlement	Proximity from informal settlement to Distance (m)				Transportation availability
	Employment		Road	Elementary School	Main Road
	Maximum Distance	Minimum Distance			
Bacao I	1715	174	329	956	< 15 min
Bacao II	1260	270	460	1131	< 15 min
Manggahan	2440	980	167	1910	< 15 min.

Source of data: GIS

The analysis of the figures indicates that attractive lands for the establishment of informal settlements are located within 2.440m from the source of employment, within 460m from main roads and around 1910m from elementary schools.

7.3. Findings

The strategies of survival of low-income urban population are based on the search for social and economic opportunities, which are mainly offered by formal development. In the formal city land prices are high and land use regulations exclusive, which force the low-income population to seek shelter solutions outside the formal planning framework.

The best alternative is to look for cheap land outside the formal market, but as close as possible to the socio-economic opportunities offered by the formal city. This generates a locational pattern in the rise of informal settlements. Settlements tend to emerge near sources of employment and along roads.

The nature of formation of informal settlements is classified in three broad categories. The first category occurs in lands outside the urban area that are experiencing urbanism. The second comprises informal settlements in the urban-fringe area. The third correspond to dense informal settlements that take up small tracts of land within existing urban boundaries (in-fill settlements). (Abbott and Douglas, 2001) Low-income population that has been excluded from the formal land market establishes in-fill and urban-fringe settlements. Migration contributes to the formation of informal settlements outside the urban area and in the urban-fringe areas. (Laquinta and Drescher, 2000)

The informal settlements of General Trias correspond to the first two categories, they are located in the fringe lands of the *poblacion and outside the poblacion.* The majority of the inhabitants are migrants (85% inhabitants in the surveyed informal settlements). The *Poblacion* encompasses the central business district, the old plaza, the municipal hall, the municipal church, the public market and the old prime residential area. and in the urban-fringe areas.

The found spatial pattern of location of informal settlements near sources of employment and along roads applies for informal settlements formed in the urban-fringe area and outside the urban areas that have been settled through in-migration.

Figure 7.3 gives further explanation of the spatial changes of this type of informal settlements:

a) Undeveloped Greenfield

b) Land use zoning are enacted, middle and high-income population have a planning framework for the urban development. Low-income groups cannot access the land.

c) Once land use zones are delineated, capital is invested following planning regulations. Such capital input attracts low-income labour force. The labour force looks for shelter supply near the source of employment but outside of the formal development.

d) Local government and private owners try to evict informal settlers. Not all the settlements survive, this depends on the land ownership status, the political patronage and the degree of development of urban infrastructure.

   Urban infrastructure links formal and informal development and represent the integration of the informal settlements into the formal city. Informal settlers start a gradual development process with the aim to reduce the risk of eviction. At micro-level, the construction of roads and network utilities changes the spatial configuration of the settlement.

e) The higher the development of the urban infrastructure the lower the risk of eviction and the closer to the formality. The integration of formal and informal infrastructure, improves the accessibility to the settlement. At macro-level, the locational configuration with respect to the formal city changes and informal settlements become less peripheral.

   At micro-level, the gradual development of the urban infrastructure leads to spatial changes. Priorities are concentrated on the development of roads that allows the start of small-scale business whose existence strongly depends on accessibility. [7] The density of dwellings increases due the attraction of new migrants. [8]

[7] In the interviews conducted on the 17th and 18th of September /2001, the community leaders of the settlements of Bacao-I and Bacao-II identified that the main topic that is being discussed in the meetings is the improvement of the access road. In Manggahan the access road is already paved being the main topic of discussion the improvement of utilities.

[8] The three surveyed informal settlements are receiving new settlers. The age of the newest dwelling is less than one year

8. CONCLUSIONS AND RECOMMENDATIONS

This chapter evaluates how far the research questions have been answered. It explains the limitations of the study and gives recommendations for further research.

8.1. CONCLUSIONS: Causes that Generate the Difference Between Land Use Zoning Policy and Ground Development

The development on the ground is driven by the interrelation between policy instruments and external factors. Low-income population analyses both factors and set the priorities for its decision. They decide to be *informal*, which offers housing supply at affordable prices. Beyond the shelter other needs are still unsatisfied, such as food, education, health and clothing. To supply these needs income is required. Therefore, the priority of the low-income population is shelter in areas located near sources of employment.

In General Trias the local land use zoning policy does not tackle the low-income population priorities. It does not offer alternative supply of affordable shelter in areas near sources of employment. Abbott, Martinez and Huchzermeyer (2001) state 'squatting is not necessarily the preferred choice of migrants seeking shelter; it is the only option available... This phenomenon cannot be stopped except through the provision of alternative accommodation ahead of the land occupation.'

Hence the policy does not influence the decision of the low-income population where to develop the land. The enforcement of the policy in commercial, industrial and high-income residential areas indicates that the policy is only changing the behaviour of those who can afford to be formal.

The low-income population is not targeted by the policy. This is the cause of the difference between the objectives and outcomes of the policy. In this study, the low-income population is denominated 'target group' of the policy, in the same position as any other land developer. The analysis shows that the policy only targets formal development. Low-income population is not part of the policy's target group.

8.1.1. Influence of the Institutional Context on the Local Land Use Zoning Policy

The national government affects local land use zoning policies in two ways. First it delineates and manages national conservation and protection lands (integrated areas) and prime agricultural land. Second it defines the rules and guidelines by which Local Government Units (LGU) enact land use zoning policies. The function of the Regional and provincial government is to support the national government in its respective areas of jurisdiction.

The local government formulates land use zoning policies and their implementation, in agreement with national land use regulations, national parameters and guidelines. However, when the local government has to implement a policy that may go against local stakes, the policy is implemented in a fragmented way.

The direct interaction between the government and the electorate at local level shapes a local agenda that does not always meet national policies. In the Philippines informal settlers are part of the electorate and actions against them may have a political cost.

Hence the local response is the compliance of national policies and parameters in the policy formulation, but not in the enforcement of the policy instruments in the informal settlements. Such conflicts of interests among different governmental levels create a weak inter-institutional context that affects the achievement of the policy objectives on the ground.

The policy is not monitored and not evaluated which makes it difficult to measure the policy performance and evaluate its relevance.

8.1.2. Factors that Motivate the Target Group to Adopt or Reject the Policy Instruments.

Informal settlers identified the factors that drive them to move into informal settlements. They listed the factors in order of importance. The first factor is proximity to job, followed by, cheap land/free land, proximity to roads, proximity to school, transportation availability and community organisation pro-land development.

The spatial factors are proximity to job, proximity to roads, proximity to schools and transportation availability. The non-spatial factors are cheap land/free land, state land and community organisation pro-land development.

The factor proximity to job is spatially tangible in the three surveyed informal settlements. They are located near industrial estates. The review of the location reveals that the settlements are also close to main roads and schools. The factor cheap land/free land indicates the search of low-income population for affordable land and shelter. In terms of ownership, the availability of state land or private land of which land rights are not asserted influence the decision to establish, or move into the informal settlement.

The majority of the informal settlers does not know how to obtain building permits and is not interested to apply for the regulatory permits. Hence the development on the ground is driven by external factors rather than by policy instruments.

8.1.3. Way of Handling Informality

Informal settlers are not powerless, they are part of the electorate and hold the power of voting. In practice this power pushes against the enforcement of regulatory permits in the informal settlements. In General Trias the oldest of the three surveyed informal settlements has business permits issued by the municipality, even though the municipal zoning ordinance enacts that business permit can only be issued in parcels without titling problems.

The push against the policy instruments creates a context in which informal settlers have low risk of eviction but are still not formal. Informal settlers are aware that urban infrastructure links informal and formal development. In the perception of the settlers the risk of eviction is lower when the degree of development, in terms of infrastructure, is higher. Hence informal organisations give a high importance to the gradual development of urban infrastructure.

Community organisations serve as mediators between informal settlers and the local government, aiming to exchange votes for public investment in the development of urban infrastructure. The leaders are political agents that influence the vote of the community and at the same time search for the political support that will attract public investment in the settlements. The gradual development of the informal settlement is achieved through political patronage

The risk of eviction is a function of the ownership status of the invaded lands, the political patronage and the degree of development of the urban infrastructure.

8.1.4. Spatial Pattern in the Rise of Informal Settlements

Informal settlements formed in the urban-fringe area and outside the urban areas that have been settled through in-migration tend to emerge near the sources of employment of the formal development and along roads.

The strategies of survival of low-income urban population are based on the search for social and economic opportunities, which are mainly offered by formal development. This attracts low-income labour force that looks for shelter at affordable price.

In the formal city land prices are high and land use regulations exclusive. Hence the low-income population seeks for shelter solutions outside the formal market, but as close as possible to the socio-economic opportunities offered by the formal city. This generates a locational pattern in the rise of informal settlements which tend to emerge near sources of employment (CBD, industrial estates, commercial areas) and along roads. (Refer to Map-03)

8.2. Limitations of the research

8.2.1. Updated Spatial Data

There is only one set of images. Aerial Photographs taken in 1997, scale 1:25,000. More snapshots including an updated set of images would provide a better understanding of the growth patterns inside the informal settlements.

8.2.2. Sample size of the informal settlements

Factors identified by households as their motives to move into informal settlements are based on the survey of three most dynamic informal settlements. Further research should consider a bigger sample size.

8.2.3. Boundaries

- Land use zoning policies
  Land use zoning policies are enacted at local level and their jurisdiction is limited by administrative boundaries.
- Informal settlements
  The phenomena of informal settlements do not have administrative boundaries, rather it is driven by factors that extend across municipalities and cities.

The main factors that drive the rise of informal settlements are spatial and depend on proximity. Therefore the analysis of the local land use policy should consider the characteristics of lands that surround informal settlements, including the neighbouring municipalities. In spite of the administrative jurisdiction of the land use zoning policy.

8.3. Recommendations

To bridge the difference between land use zoning policies and the outcomes on the ground, local governments should offer alternatives for the supply of affordable shelter in areas near sources of employment. Reality shows that it is difficult for local governments to catch up the backlog of shelter in urban areas, especially in the presence of high population's growth. Traditional housing programs are only feasible if the target group can afford them, and in part, if public investment can be recovered.

The growth of informal settlements cannot be stopped, thus local land use zoning policies should target low-income population, formulate measures to deal with the informal settlements and facilitate the upgrading process.

The research recommends to consider the rise of informal settlements in the vicinity of formal developments as additional criteria in the site selection for formal development. This requires further spatial analysis of the location of sources of employment. The steps to carry out such analysis are:

a) Identification of the factors that motivate low-income population to establish or move into the informal settlements.

b) Measurement of the factors that have spatial manifestation, in order to estimate what distances and land attributes are considered attractive.

c) Mapping of the attractive areas for the establishment of informal settlements. Location of new sources of employment in areas that environmentally and physically can support the formation of informal settlements in their vicinity.

This approach aims to steer the location of informal settlements. It facilitates the integration of informal settlements through the development of urban infrastructure and avoids informal development in areas affected by natural hazards or in other undesirable areas.

Annex C presents the mapping of attractive areas using the factors identified by informal settlers in this study.

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APPENDIX B: Data Sources

Methods of Data Collection and Data Sources

Research Outputs	Data Sources: Primary – Method of Data Collection	Primary – Sampling	Secondary
1. Inter-institutional coordination	 Semi-structured interview to officials: • Housing and Land Use Regulatory Board (HLURB) • Department of Environment and Natural Resources (DENR) • Department of Agrarian Reform (DAR) • Philippine Economic Zone Authority (PEZA) • University of the Philippines (UP) – School of Urban and Regional Planning (SURP)	Purposive sampling - key informants.	 • Terms of Reference for contracting the Comprehensive Land Use Plans /1996 • Model of Zoning Ordinance HLURB/1996 • Guidebooks on Sustainable Land Use Planning and Management/1997 • Local government Code/1991 • Executive Orders 71, 72 • Republic act 7916/ 1994 • Medium Term Philippine Development Plan 1999-2004 • NEDA Cavite-Laguna (CALA) Urban Development and Environment Management Project (NEDA CLMDS)/ 2000
2. Status of Local land Use Zoning Policy: Policy instruments, monitoring and evaluation	 • Office of the Municipal Planning ad Development Coordinator	Purposive sampling - key informants.	 • General Trias Municipal Comprehensive Land Use plans 1995, 2000
3. Factors evaluated by householders 5. Face of Informality	 • Household Survey: 85 Questionnaires	Systematic sampling *	----------
4. Community organization 5. Face of Informality	 • Semi-structured interview: 4 ccommunity leaders	Purposive sampling - key informants)	----------
6. Existing Land Use 1995, 2000 7. Land Use Zones 1995, 2000	----------	----------	 • Maps of the Municipal Comprehensive Land Use Plans 1995, 2000 • Aerial Photographs of the area 1:25,000 /1997

* Systematic Sampling

The type of sampling is systematic with a sample size of 30 dwellings per informal settlement. The sampling was originally designed on the selection of buildings through the use of remote sensing images. However once on the field (sep./2001) the available snapshot (Aerial photographs scale 1:25.000/1997) did not clearly delineate the dwellings of the informal settlements. Therefore a more pragmatic way of sampling was conducted.

Before starting the survey the community leader gave an approximate estimation of the number of dwellings, based on which the systematic sampling was determined. Questionnaires were conducted every 1 or 2 alternate buildings, depending of the total number of buildings divided by the sample size.

Name of Interviewee, Organisation and Position

Interviewee			Purpose	Date
Organisation	**Position**	**Name**		
University of the Philippines (UP)	School of Urban and Regional Planning	Dolores A. Endriga	Fieldwork preparation	4th Septemer/2001
Housing and Land Use Regulatory Board (HLURB)	Director of Plans & Programs Group	Petronila V. de Castro	Interview	5th September /2001
Department of Agrarian Reform (DAR)	Supervising Agrarian Reform Officer	Angelita Noble	Interview	5th September /2001
National Mapping and Resource Information Authority (NAMRIA)	Information Officer IV	Victoria N. de Nera	Data collection	6th September/2001
University of the Philippines (UP)	Associate Professor School of Urban and Regional Planning	Ernesto M. Serote	Fieldwork preparation	10Th September/2001
	Professor School of Urban and Regional Planning	Federico B. Silao		
Department of Environment and Natural Resources (DENR)	Project Director Strengthening Local Environmental Planning and Management (Local-EPM Project)	Nestor Venturillo	Interview	11th September/2001
Municipality of General Trias	Municipal Vice-mayor	Luis Ferrer	Interview	12th September/2001
Municipality of General Trias	Department Head Office of the Municipal Planning and Development Coordinator	Jemie P. Cubillo	Interview	14th September/2001
	Municipal Information Officer	Vic J. Columna		
Informal Settlement Bacao-I	Community Leader (Second Chief)	Eduardo Erquisa	Interview	17th September/2001
	Community Leader (President)	Expedito W. Bonde	Interview	
Informal Settlement Bacao-II	Community Leader (Vice-president)	Eusebio Managaysay	Interview	18th September/2001
Informal Settlement Manggahan	Community Leader (Councilman of the Barangay)	Mariano Cubcubin	Interview	19th September/2001
Zone Administrator	Cavite Economic Zone	Digna Torres	Interview	20Th September/2001
Housing and Land Use Regulatory Board (HLURB) Region IV	Head Town Planning and Zoning Unit	Lilia Lumbera	Interview	21st September/2001

Effectiveness of Land Use Zoning Policy – HOUSEHOLD SURVEY (1/2)

URBAN PLANNING AND LAND ADMINISTRATION

Barangay _____

Household No. _____

1. Ilang pamilya ang nkatira dito?
(How many families live in the dwelling?) _____ ☐

2. Gaano katagal ka na dito? Taon_____ buwan_____
(How long have you been living in this community?) *Years_____ months_____*

3. Saan ka galing?
(Where Do You Come From?)
- Parehong syudad *(Same city)* 1
- Ibang syudad *(Other city)* 2
- Kanayunan mula sa parehong isla *(Rural area in the same island)* 3
- Kanayunan mula sa ibang isla *(Rural area from other island)* 4

☐

4. Bakit ka pumunta rito? Ilista ayon sa importansya
(Why did you move here? List them in order of importance)
- Mura ang lupa *(Cheap land)* 1
- Community developers *(Community developers)* 2
- Malapit sa trabaho *(Proximity to job)* 3
- May sasakyan *(Transportation availability)* 4
- Malapit sa kalye *(Proximity to roads)* 5
- Malapit sa eskuwelahan *(Proximity to school)* 6
- Lupang pampamahalan *(State land)* 7
- Suportang pampulitika *(Political support)* 8
- Iba *(Other)* 9
- Hindi sigurado *(Not sure)* 10

☐

5. Marunong ka bang kumuha ng "building permit"?
(Do you know how to obtain building permits?)
- Oo *(Yes)* 1
- *Hindi (No)* 2
- Hindi malinaw *(Not clear)* 3

☐

6. Palagay mo ba paparusahan ng pamahalaang lokal ang mga hindi sumunod sa regulasyon?
(Do you think that the local government will penalise people who don't follow the regulations?)
- Oo *(Yes)* 1
- *Hindi (No)* 2
- Hindi segurado *(Not sure)* 3

☐

7. Sa palagay mo ba nasa posisyon ang komunidad na ipaglaban ang sarili nilang saloobin ukol sa land use regulations?
(Do you think that the community is in the position to push against the land use regulations?
- Organisasyon ng komunidad *(Community organisation)* 1
- Representasyong pulitikal *(Political representation)* 2
- NGO 3
- Hindi *(No)* 4
- Hindi ganoon kalinaw *(Not really clear)* 5
- Iba *(Other)*... Specify_____ 6

☐

8. Ikaw ba ang nagbayad para sa lupa?
(Did you pay for the land? To who?)
- Developer 1
- Ibang tao *(Private citizen)* 2
- Organisasyon ng komunidad *(Community organisation)* 3
- Pinuno ng komunidad *(Community leader)* 4
- Hindi *(No)* 5
- Iba *(Other)*... Specify_____ 6

☐

9. Sinong nagmamay-ari ng bahay?
(Who is the owner of the house?)
- Sarili *(Household-Own)* 1
- Kamag-anak *(Relative)* 2
- Komunidad *(Community)* 3
- Inuupahan *(Rent)* 4
- Iba *(Other)*... Specify_____ 5

☐

10. Anong taon itinayo ang bahay na ito?
(In approximately what year was this house built?)

Building development	Taon *(Year)*	Description of the improvements, please tick				
		Istruktura *Structure*	Bubong *(Roof)*	Banyo *(Toilet)*	Kusina *(Kitchen)*	Kuwarto *(Room)*
1.Itinayo *(Built)*						
2.Pagbabago *(Improvement)*						
3. Pagbabago *(Improvement)*						
4. Pagbabago *(Improvement)*						

11. May babaguhin ka pa ba sa bahay na to?
(Are you planning to make further investments in the house?)
- Oo *(Yes)* 1
- *Hindi (No)* 2
- Hindi segurado *(Not sure)* 3

☐

12. May nahihiraman ka ba ng pera?
Do you have access to credit?

- Bangko *(Bank)* 1
- Kooperatiba *(Cooperative)* 2
- Komunidad *(Community group)* 3
- Tagapautang *(Moneylender)* 4
- Kamag-anak *(Relative)* 5
- Iba *(Other). Specify* _____ 6
- *Hindi (No)* 7

13. Saan ginaganit ang lupa?
What is the land use?

- Tirahan *(Residential)* 1
- Komersyal *(Commercial)* 2
- Trabahuan *(Workshop)* 3
- Tirahan at komersyal *(Residential /Commercial)* 4
- Tirahan at trabahuan *(Residential/Workshop)* 5
- Iba *(Other)*..... *Specify* _____ 6

14. What is the major construction material of the external walls?

- Brick 1
- Semento *(Concrete)* 2
- Adobe 3
- Kahoy *(Wood, logs)* 4
- Bakal, yero *(Tin, zinc sheeting)* 5
- Kawayan *(Bamboo)* 6
- Canvas 7
- Iba *(Other)*..... *Specify* _____ 8

15. Saan gawa ang bubong?
What is the major material of the roof?

- Semento *(Concrete)* 1
- Asbestos 2
- Bakal *(Metal sheets)* 3
- Kahoy *(Wood)* 4
- Adobe 5
- Dahon ng niyog *(Thatch)* 6
- Iba *(Other)*..... *Specify* _____ 7

16. Saan gawa ang sahig?
What is the primary material of the floor?

- Parquet 1
- kahoy *(wood)* 2
- Tile 3
- Linolyum 4
- Sement *(Concrete)* 5
- Lupa *(Clay/earthen floor)* 6
- Iba *(Other)*..... *Specify* _____ 7

17. Saan kumukuha ng tubig pangluto at inumin?
What is the main source of water for drinking and cooking?

- Tubo ng tubig para sa publiko *(Connection to public pipeline)* 1
- Tubo ng tubig na pampribado *(Connection to private pipeline)* 2
- Poso *(Public tops/ standpipe)* 3
- Balon *(Well)* 4
- Kapit-bahay *(Neighbours)* 5
- Nagtitinda ng tubig *(Water vendor)* 6
- Ilog, sapa, look, lawa *(River, stream, lake, pond)* 7
- Tubig-ulan *(Rainwater)* 8
- Iba *(Other)*..... *Specify* _____ 9

18. Anong klaseng kubita ang ginagamit dito?
What is the type of toilet that is used in your household?

- May pang flush *(Flush toilet)* 1
- Arinola *(Latrine)* 2
- Inodoro / timba *(Bowl/bucket)* 3
- Walang banyo *(No toilet)* 4
- Iba *(Other)*..... *Specify* _____ 5

19. Anong klaseng disposal system meron dito?
What disposal system is this toilet connected to?

- Imburnal *(Sewer system)* 1
- Septic tank 2
- Wala, sa ibabaw ng lupa naiiwan *(None/discharges to surface or groundwater)* 3

20. Anong klaseng ilaw ang ginagamit dito?
What is the main source of lighting?

- Kuryente *(Electricity)* 1
- Gaas, lampara *(Kerosene, oil or gas lamps)* 2
- Kandila o flashlight na de batirya *(Candles or battery-powered flashlights)* 3
- Walang ilaw *(No lighting)* 4
- Iba *(Other)*..... *Specify* _____ 5

21. Ano ang ginagamit niyong pangluto?
What fuel do you use most often for cooking?

- Gas 1
- Kuryente *(Electricity)* 2
- Kahoy *(Wood)* 3
- Uling *(Coal)* 4
- Gaas *(Kerosene)* 5
- Lupang pinroseso, dumi *(Peat, manure)* 6
- Iba *(Other)*..... *Specify* _____ 7

COMMUNITY LEADERS INTERVIEW

Date of the interview: *17th of September / 2001*

1. **Name of the barangay:** *Sitio Kanluran, Bacao-I*
2. **Name of the community leader:** *Eduardo Erquisa*
3. **Method of election:** *Volunteer*
4. **Name of the position:** *Second Chief after the president*
5. **How long have you held this position?** *01* Years _____months
6. **How long have you been living in this community?** *03* Years _____months
7. **Approximately how many people currently live in this community:** *200* inhabitants
8. **Do you organise general community meetings?** *Yes*
9. **How often are these meetings held?** *Monthly*
10. **In average how many people attend the meetings?** *It's difficult to say a figure, it varies, it depends of the meeting's publicity and arrangements.*
11. **What is the main topic of discussion?**
    - *How to keep the peace and order of the community*
    - *Improvement of the national irrigation administration road-canal*
12. **Do you have any political representation?** *The president decides for whom with should vote and we follow the president's advice.*
13. **Do you know that the municipality has building and land use regulations?** *No at all*
14. **Do you know how to obtain a building permit?** *No*
15. **Who is the owner of the land?** *The government*
16. **How are you confronting the risk of eviction (if there is any)** *I'm not sure if the government says that we have to go we will go.*
17. **Do you like to live here, why?** *Yes, it's near my work.*
18. **Comments: Houses are not numbered.**

COMMUNITY LEADERS INTERVIEW

Date of the interview: *17th of September / 2001*

1. **Name of the barangay:** *Sitio Kanluran, Bacao-I*
2. **Name of the community leader:** *Expedito Wally Bonde Osiana*
3. **Method of election:** *Elected leader*
4. **Name of the position:** *President of the community organisation*
5. **How long have you held this position?** *02* Years _____months
6. **How long have you been living in this community?** *03* Years _____months
7. **Approximately how many people currently live in this community:** *230 inhabitants at June 2001*
8. **Do you organise general community meetings?** *Yes*
9. **How often are these meetings held?** *Monthly, every last Sunday of the month*
10. **In average how many people attend the meetings?** *50 people*
11. **What is the main topic of discussion?**
    - *How to leave better, how to improve the barangay*
12. **Do you have any political representation?** *Yes, the Barangay's Capitan. The big barangay is Central Bacao-I and as any other barangay it has a Barangay council. Sometimes the barangay Capitan comes to our meetings, even the barangay's civil police has came to discuss how to live in peace. For us is important that the Capitan is involved with our community organisation, politically we follow what the Capitan says.*
13. **Do you know that the municipality has building and land use regulations?** *Yes, I have assisted to the central barangay meetings and I've been informed that there is a municipal ordinance that regulates the matter of building permits.*
14. **Do you know how to obtain a building permit?** *Yes to obtain it, it's necessary to go to the municipal hall and apply for it.*
15. **Who is the owner of the land?** *The government*
16. **How are you confronting the risk of eviction (if there is any)** *We are not planning to apply for the building permit, because of the status of this barangay we cannot obtain it. But if we have more development in the barangay, we will apply for a governmental permitt... More development in the barangay means improvement of the road and utility supplies. Anyway if there is not development of Sitio Baracay, the municipality will transfer us in two years time. Some people of the central barangay call us squatters but the barangay's Capitan support us.*
17. **Do you like to live here, why?** *Yes, we are near the market, the church and the factory and personally I like to leave here because is quiet.*
18. **Comments: The municipality has numbered the houses; only the new houses or those that are under construction haven't got a number.**

COMMUNITY LEADERS INTERVIEW

Date of the interview: *18th of September / 2001*

1. **Name of the barangay:** *Bacao-II, Taiwan*
2. **Name of the community leader:** *Eusebio L. Manaqaysay*
3. **Method of election:** *Elected leader*
4. **Name of the position:** *Vice-president*
5. **How long have you held this position?** *03* Years _____months
6. **How long have you been living in this community?** *04* Years _____months
7. **Approximately how many people currently live in this community:** *We have 60+ houses and approximately there are 5 people per house. Something likes 300 inhabitants.*
8. **Do you organise general community meetings?** *Yes*
9. **How often are these meetings held?** *Twice a month, on Sundays*
10. **In average how many people attend the meetings?** *30 people*
11. **What is the main topic of discussion?**
    - *Cleanness of the road and how to improve the road. Canal-road.*
12. **Do you have any political representation?** *Yes, Mr. Obuy Campaña, he is the municipal mayor. The name of his political party is Maqdalo.*
13. **Do you know that the municipality has building and land use regulations?** *No*
14. **Do you know how to obtain a building permit?** *No (He doesn't show any interest in the subject)*
15. **Who is the owner of the land?** *No one for sure knows if it is government land or private land. In this area some parcels are owned by people who live in USA and they rent or lease the land. And what happens is that the tenant doesn't take proper care of the property. I think not even the municipality clearly knows who the owner of the land is.*
16. **How are you confronting the risk of eviction (if there is any)** *Yes, we have made a formal petition to the local government to own the land. We cannot be evicted we will fight first.*
17. **Do you like to live here, why?** *The factory and the commerce zone is very close, this area is developing fast, because by law is a national economic zone.*
18. **Comments: The municipality has numbered the houses; only the new houses or those that are under construction haven't got a number.**

COMMUNITY LEADERS INTERVIEW

Date of the Interview: *19th of September / 2001*

1. **Name of the barangay:** *Manggahan*
2. **Name of the community leader:** *Mariano Cubcubin*
3. **Method of election:** *Elected leader of the central barangay (Kawayan)*
4. **Name of the position:** *Councilman*
5. **How long have you held this position?** *12* Years _____months
6. **How long have you been living in this community?** *Since 1979, this is 22* Years ____months
7. **Approximately how many people currently live in this community:** *300 inhabitants, 70 houses.*
8. **Do you organise general community meetings?** *No in this small barangay (Informal settlement of Manggahan), only in the central one.*
9. **How often are these meetings held?** *Twice a month, on Sundays*
10. **In average how many people attend the meetings?** *9 people*
11. **What is the main topic of discussion?**
    - *How to improve this small barangay (Informal settlement of Manggahan)*
12. **Do you have any political representation?** *Yes, the municipal mayor.*
13. **Do you know that the municipality has building and land use regulations?** *Yes, I have heard something about but it's not clear to me.*
14. **Do you know how to obtain a building permit?** *Yes, but it can only be issued when you are the owner of the land*
15. **Who is the owner of the land?** *Private*
16. **How are you confronting the risk of eviction (if there is any)** *Nobody will say that we should leave. The barangay (informal settlement) is very developed and for the municipality is to expensive to provide other area with the condition of this barangay (They don't feel any risk of eviction).*
17. **Do you like to live here, why?** *General Trias and the whole Cavite offer good opportunities to work and this barangay (Informal settlement of Manggahan) is peaceful, we know each other.*
18. **Comments:**
    - **Some of the shops have building permit issued by the municipality**
    - **The municipality has numbered the houses; only new houses or under construction ones haven't got a number.**

APPENDIX C: Attractiveness of Location for Establishment of Informal Settlements

a) Identification of the factors that motivate low-income population to establish or move into the informal settlements: proximity to source of employment, proximity to roads/ transportation availability, proximity to schools and ownership status.

b) Measurement of the factors that have spatial manifestation, in order to estimate what distances and land attributes are considered attractive

Informal Settlement	Land Ownership	Proximity from informal settlement to Distance (m)				Transportation availability
		Employment		Road	Primary School	Main Road
		Maximum Distance	Minimum Distance			
Bacao I	Estate	1715	174	329	956	< 15 min
Bacao II	Unclear	1260	270	460	1131	< 15 min
Manggahan	Private*	2440	980	167	1910	< 15 min.

*The owner is not claiming the land rights

c) Mapping of the attractive areas for the establishment of informal settlements. Location of new sources of employment in areas that environmentally and physically can support the formation of informal settlements in their vicinity.

Criteria for mapping the attractiveness

- Sources of Employment

The highest value of the minimum distance is 980m, and the highest value of the maximum distance is 2440m. Figures are approximated to 1000m and 2500m. Any land around 1000m from the source of employment is highly attractive for the establishment of informal settlements. Areas located between 1000m – 2500m from the source of employment have medium attractiveness. Finally areas beyond the 2500m from the source of employment are not attractive.

Distance from source of employment		
<1000 m	1000-2500 m	> 2500 m
High Attractiveness	Medium Attractiveness	None Attractiveness

- Roads/Transport

The highest value of the distance is 460m and the frequency of public transport along the main road is about 15 minutes. The distance is approximated to 500m. Distances below 500m from the main road and with public transport at least every 15 m have high attractiveness for the establishment of informal settlements. Distances beyond 500m from the main roads are not attractive

Distance from Primary Road	Transport <15 min
<=500 m	High-a
> 500 m	None

- Elementary Schools

The minimum distance is 956m and the maximum distance is 1910m. Figures are approximate to 1000m and 2000m. Distances below 1000m from the elementary school are highly attractive for the establishment of informal settlements. Areas located between 1000-2000m from the school have medium attractiveness. Finally areas beyond the 2000m from the school are not attractive.

Type of School	Distance from School		
	<=1000	1000-2000 m	> 2000 m
Elementary school	High-a	Medium-a	None-a

Overlay: Decision table

- Roads/transport & School Attractiveness

Proximity to road and transport involves two variables. Therefore in the decision table the road/transport have more influence than school attractiveness.

		Road/Transport Attractiveness		
		High	Medium	None
School Attractiveness	High	High	Medium	Medium
	Medium	High	Medium	None
	None	Medium	Medium	None

$= R$

- Source of Employment & R (Roads/Transport/School)

Source of employment is the most important factor. It is combined with the R, which involves the other variables. In decision table, both R and source of employment have the same influence.

		Source of Employment		
		High	Medium	None
R (Roads/Transport/School) Attractiveness	High	High	Medium	Medium
	Medium	Medium	Medium	None
	None	Medium	None	None

APPENDIX D: Fieldwork Photographs

BACAO-I

BACAO-II

MANGGAHAN

Dwelling Numbering by Political Parties

Informal activities near Industrial Estates

Industrial Estate (Maxon Systems Incorporated)

PRIMARY SCHOOL ATTENDANCE AND ACCESSIBILITY

Eric E. Melgares Alvarado
March, 2002

PRIMARY SCHOOL ATTENDANCE AND ACCESSIBILITY

by

Eric E. Melgares Alvarado

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Degree Assessment Board:

Prof. Dr. F. I. Masser	Chairman	**UPM (ITC)**
Prof. Dr. H. F. L. Ottens	External examiner	**University of Utrecht**
Drs. E. J. M. Dopheide	First supervisor	**SOC (ITC)**
Dr. Ir. J. Turkstra	Second supervisor	**UPM (ITC)**

INTERNATIONAL INSTITUTE
FOR GEO-INFORMATION SCIENCE AND EARTH OBSEVATION
ENSCHEDE, THE NETHERLANDS

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ABSTRACT

The high rate of primary school absenteeism in rural areas in developing countries in general and in Bolivia in particular is the result of many factors associated with poverty conditions of rural population. Spatial factors play also an important role in explaining the low primary school attendance

This research was aimed to explore the factors behind the low primary school attendance, with special attention for the role of the spatial factors and to establish the relationships between spatial and non-spatial factors with respect to primary school attendance.

The study area is located within the Taboada Central school catchments area in Mizque, Bolivia. Government representatives at the regional level, the Taboada community leader, one local NGO and the school director were interviewed. In addition, a survey was conducted using questionnaires to gather primary information from the local people. Likewise, secondary data was collected from sources such as Mizque region representatives from national agencies, the CLAS project in Cochabamba, and the local NGO CEDEAGRO.

A sample of 63 questionnaires was conducted to household heads which children may attend Taboada Central School because they live in the area of influence. Main reason to choose Taboada Central school area was because it has the highest rate of absenteeism in the Section of Mizque, located within the Province of Mizque. Statistical tests were used to analyse the association between the identified factors and levels of school attendance.

In this way the study found child labour, distance, lack of roads, migration, language, geographical barriers and illnesses as major factors against primary school attendance, which were surveyed in the field. A 29% of children do not attend to school, 35% do it temporarily and 36% permanently.

Main findings support the role of spatial accessibility, such as distance, lack of roads and the presence of geographic barriers as factors explaining low children school attendance in the Taboada Central School in the Section of Mizque.

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Eric Melgares

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1. INTRODUCTION

Low primary school attendance is a problem faced in many developing countries. The attendance problem depends on many different factors derived often from structural problems in developing countries. Spatial accessibility to primary school facilities is one of the factors that might explain primary school attendance among children. This problem is the topic of this research.

1.1. GENERAL BACKGROUND

Studies of Bicol in the Philippines (USAID, 1976) and in the region of Potosi in Bolivia, (Evans, H., 1982) shows that in developing countries the spatial accessibility is related to the physical access to the services located in the cities. Likewise, factors influencing the access to the services are strongly related to the physical characteristics and socio-economic situation of the region and the country. These studies also confirmed that in developing countries, most of the education services are located in larger settlements and have weak linkages with their hinterland and the accessibility from the hinterland to the educational facilities located in the city. Both cases illustrate that a high percentage of the potential students came from outside the places in which school facilities are located. The children from the hinterland areas, in which there are not educative attendance have to move from their home to the city in order to get the educational services.

A region is not only a functional system; it is also a diversified set of relationships and interactions within the economic, social and physical environments. These interaction processes are carried out by the spatial relationships among the cities and towns (Rondinelli, 1985). In this regard, if space is an important part of the regional planning, then distances, obstacles regarding transport, communications, location of activities and people and provision of services for them are also important (Berliant and Raa, 1995).

Therefore, distance and travel time are important factors that may influence the primary school attendance in rural areas. However there are other problems that also influence the school attendance to primary education, which are further explored in this research.

1.2. PROBLEM STATEMENT

Problem of accessibility is observed when there is lack of infrastructure to be used by rural population living in isolated places. In these cases the physical accessibility (lack of roads and transport facilities) to school facilities, its position in relation to the geographic location of the

potential users and the distances is determinant. Basically this means that accessibility is related to the location of the facilities, its capacity to offer educational services to the population and functionality with respect to the locations of the users.

The problem of accessibility in relation to the levels of attendance to educational facilities is more complex. Many other aspects not only spatial accessibility contributes to school attendance. The following factors could be analysed in order to investigate how are they affecting the children school attendance.

- Need of manpower (child labour). Rural families need the children for helping in activities in the field related to agricultural production. This characteristic is particularly relevant during harvest season.

- Education quality. The national government is responsible for educational attendance to the population through their provincial agencies, but lack of funding and personnel turns quality of this service down, which might affect the willingness of parents to send their children to school.

- Population illnesses. The low health attendance to the population in some rural areas might have its influence on absenteeism in primary schools.

- Poverty levels. The poverty level among population might be an explaining factor for a number of reasons also important because some of the children must work to generate some income to contribute to his/her family.

- Language. If the teaching language at school is different from the one used at home, then this might become an obstacle in school attendance. For example, Quechua is the traditional language in the region of Mizque, Bolivia. The local population commonly uses it but for children attending school some subjects are performed in Spanish, the national official language.

Many factors might be related to socio-economic aspects, but this study is focusing on the spatial context, aimed to analyse its connotations and effects in the province of Mizque, in which around 40 percent of the scholar population does not attend primary school facilities (Soriano, 1996). But according to INE the 45 percent of the Mizque population are not attending to the school.

1.3. RESEARCH APPROACH

This research is aimed to analyse the relationship between spatial accessibility and attendance to primary schools. The catchment area of the Taboada School in the Municipal section of Mizque, department of Cochabamba, Bolivia is taken as a case study area.

The precarious economic development in the province of Mizque shows that it is essential to think about the spatial phenomena in addition to the economic characteristics. The proper understanding of spatial events and relationships are important for a balanced development of a region.

The educational facilities, for some authors called "central facilities" (Bach, 1979), are located in the city of Mizque and in some small peripheral communities. The "sphere of influence" (Haggett, 1965) of these services in its existent location is not related to the communities location because many of them are located far away then the people that are living there have to face the distance like a main constraint in order to get the services.

But not only the distances are affecting to the school attendance, there are socio-economic incident factors as were mentioned in the previous section.

1.4. RESEARCH OBJECTIVES

This study analyses the affecting factors to the primary school attendance in the municipality of Mizque, Bolivia. How related are those factors with the school attendance and how this can affect to the population in a specific area.

Findings of the study will help to Governmental and non-governmental institutions, researchers and planers to make improvements in aspects such as the criteria which the services are given to the population and that these criteria being according to the rural reality in the Country.

1.4.1. General objective

The main objective of this research is: **To explore the factors behind primary school low attendance.**

1.4.2. Specific objectives

1. Identify the location and characteristics of primary school facilities in Mizque (supply)
2. Identify and qualify the potential demand for primary school services.
3. Describe the attendance levels to primary schools
4. Identify the incident factors on primary schools children attendance.
5. Analyse the role of spatial accessibility in primary school attendance

In the log frame context, the main objective, specific objectives (outputs), their indicators and activities that will be carried out for each objective is showed bellow (See table 1).

1.5. RESEARCH QUESTIONS

The research questions are formulated according the objectives approach in order to make coherent the research findings and support those objectives. The research questions are:

1. What is the current distribution of the education facilities in Mizque in terms of location and capacity?
2. Where is located the potential demand of primary school facilities with respect to the target school area?
3. What are the primary school attendance categories and how can be measure?
4. What are the affecting factors avoid the primary school attendance in Mizque?
5. What is the role of the spatial accessibility in primary school attendance?

Purpose TO EXPLORE THE FACTORS BEHIND LOW PRIMARY SCHOOL ATTENDANCE			
Objective 1 Identify the location and characteristics of primary schools facilities (supply).	***OVI*** - Primary schools facilities Distribution Served population in primary school age (6-13). - Enrolment rates	***MoV*** - District Direction of Education annual report. - Key stakeholders interviews	Assumptions The data is available and updating.
Objective 2 Identify and qualify the potential demand for primary school services.	***OVI*** - Population in primary school age (6-13). Attendance and dropout rates Enrolment in primary school rate	***MoV*** - District Direction of Education annual report. - Statistical national institute national census data.	***Assumptions*** The statistical data are updating by communities.
Objective 3 Describe the attendance levels to primary schools	***OVI*** - Attendance and dropout rates	***MoV*** - District Direction of Education annual report.	Assumptions The data is available and updating by school.
Objective 4 Identify the main factors that influence attendance to primary schools	***OVI*** - Enrolment in primary school rate - Attendance and dropout rates - Main economic activity of the population	***MoV*** - District Direction of Education annual report. - Key stakeholders interviews. - Households field survey data	***Assumptions*** The reported rate of absenteeism per school is for last year.
Objective 5 Analyse the role of spatial accessibility in primary school attendance	***OVI*** - Distance from home (Bolivian standards for rural areas) - Accessibility degree according to the roads availability	***MoV*** - CEDEAGRO annual report. - Key stakeholders interviews. - Households field survey data	***Assumptions*** The roads conditions are improved.
Activities 1 - Procure digital geographical data (topographic base map). - Carry out semi-structure interviews with key persons (District Director of Education, CEDEAGRO) - Digitise geographic data and create maps (primary schools location map). - Create a database.	Inputs Funds for digital data. Key person availability. Accurate data for mapping production and an expertise. Official statistical data in digital format.		***Assumption*** The fieldwork activities are carried out on time.
Activities 2 - Procure digital geographical data (topographic base map). - Procure provincial statistical data related to the school age population per year. - Digitise geographic data and identify the location of the communities - Create a database.	Inputs - Funds for digital data. - Funds for statistical data. - Accurate data for mapping production and an expertise. - Official statistical data in digital format.		
Activities 3 - Procure regional statistical data related to attendance to schools per year. - Procure a set of indicators that help to measure the attendance to schools. - Create a database.	Inputs - Funds for statistical data. - Accurate data for mapping production and an expertise. - Official statistical data in digital format.		
Activities 4 - Determine the location of the people according to attendance categories - Carry out semi-structure interviews with key persons (CEDEAGRO, Community leaders) - Carry out questionnaires to the householders.	Inputs - Digital tools and techniques availability. - Key persons availability. - Target group availability.		
Activities 5 - Establish the relationships between attendance and distance through a statistical test - Analyse the existent roads and determine the accessibility degree to each one of the communities with respect to the schools location	Inputs - Digital tools and techniques availability.		

Table 1: Logical framework.

1.6. THESIS STRUCTURE

The below thesis chapters structure will be follow in order to achieve the research objectives:

- **Chapter One** is refers to the background of the problem, the problem approach, the research objectives related to the logical framework and questions related to thesis structure.
- **Chapter Two** gives a overview related to the topic, literature about spatial and socio-economic accessibility are revised from the general aspects like a concepts up to the use of indicators in order to measure school attendance.
- **Chapter three** shows the research methodology used are describe the study process step by step.
- Chapter Four contents a description of the study area focused in the Taboada school area, the boundaries and the political organization of the administrative units (province, Section and Canton).
- **Chapter Five** covers the analysis of the stakeholders perception, where is presented the results of the key persons interviews and the households questionnaires, and also the relationships between variables are established through the chi square test.
- **Chapter Six** describes the results of the measurement factors during the field survey and the chi square statistical test is performed in order to establish the association (relationships) degree between the variables and the attendance categories.
- **Chapter Seven** gives the research conclusions and recommendations on the research results.

In order to explain the relation between the research objectives, questions and chapters (See figure 1), the following figure is showed:

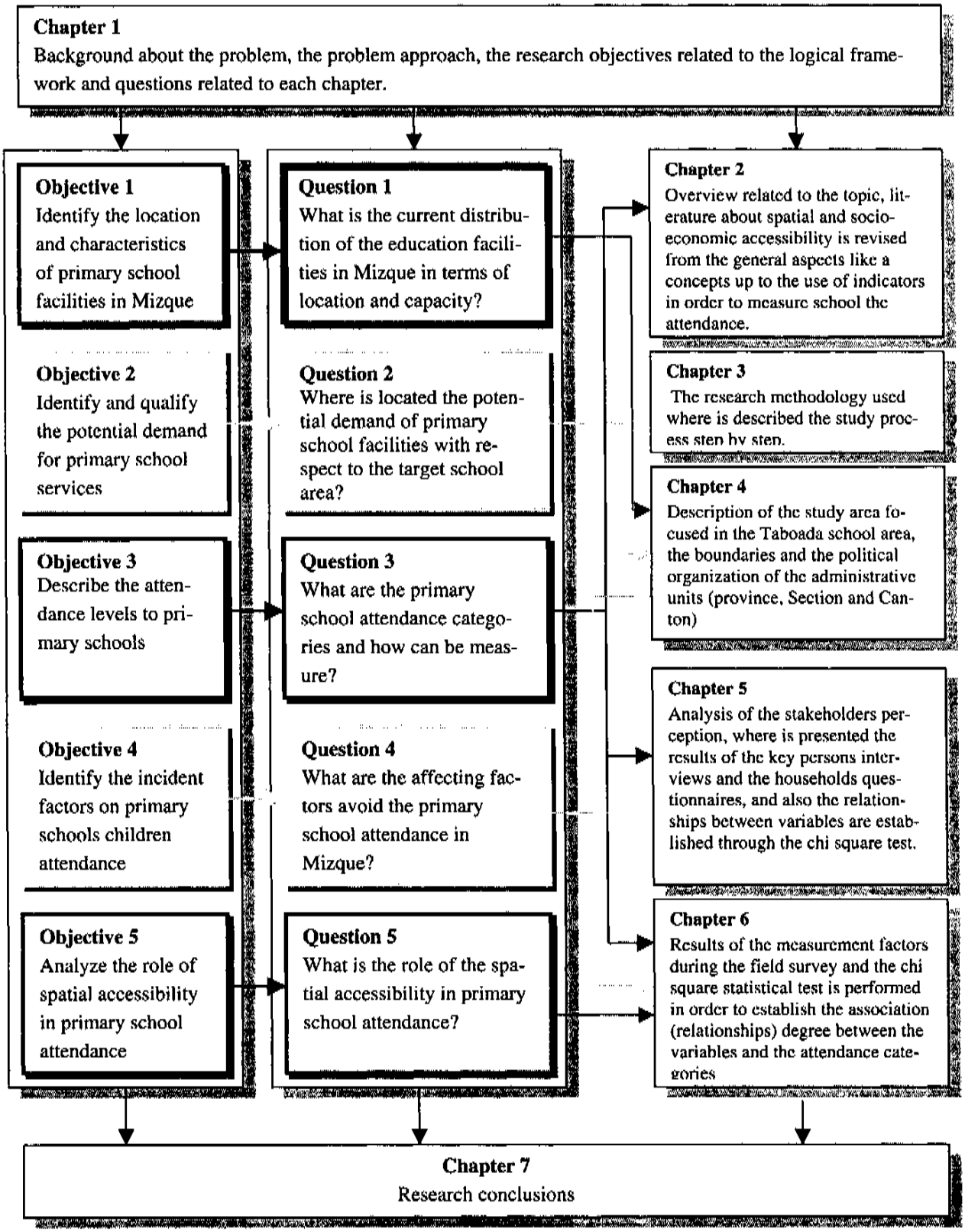

Figure 1: Thesis structure

2. REVIEW ON SCHOOL ATTENDANCE AND ACCESSIBILITY

HOW EASY IT IS TO GET THERE
(Al-Sahili and Aboul-Ella, 1992)

The accessibility to the primary school is affecting for many factors in developing countries, and was studied for several international aid agencies. In order to refer to the accessibility to primary education in rural areas it should refers to the same time to the incident factors that affect the children's attendance to the schools. These factors are spatial as a distance, socio-economic as a necessity of child labour in the family's economic activity, the parent's literacy level, and cultural as the gender and the language.

This chapter starts with a general consideration about accessibility to primary schools, followed by an overview related to the concepts and definitions of accessibility. After this an extensive description about the incident factors and how they have been faced in other developing countries and in Bolivia is presented; finally it makes a reference to the use of indicators designed to measure the school attendance.

2.1. GENERAL OVERVIEW

During the first steps addressed to improve their development in the social and economic field, developing countries perceived that investing in education means not only the upgrading of political, economic and social conscience but also of increasing the number of skilled workers and better levels of manpower; aspects that are directly related to the improvement of the education country's system (World Bank, 1980).

In this regard, a positive approach and new policies on education were introduced in developing countries. Education was assumed according to the significance of the interrelation between the following aspects:

- As a basic human need.
- As a means of meeting other basic needs, and
- As an activity that sustains and accelerates overall development (World Bank, 1980).

Several studies carried out in Africa, Asia and Latin America show that people are moving in rural areas for a variety of reasons varying from subsistence impulses (migration) to the socio-economic needs satisfaction (getting services). Many of the transport activities among the rural places are carried out through poor roads without bridges by foot and also with the

additional use of animal traction and bicycles. Transport services are available only to transport goods from markets outside the area to the communities and vice versa.

When reaching basic services is difficult, a lot of time, effort and costs are spent to get them from the isolated rural communities. The lack of access not only results in isolation but also in a constraint to improve their living conditions and contributes therefore to the poverty. Services supply in rural areas, as well as the location of facilities and distances are determinant for the local people living conditions. This aspect becomes crucial for the social development of the whole region.

Access to different services and/or facilities depend on the *locations* and *mobility* of the people. Accessibility is defined as the provision of access through which the people in a specific area easily reach the services and facilities. This involves the distance, time, effort and cost to satisfy the necessities.

There is a clear association between poor access to services and per capita income in developing countries. Poor access to basic and social services is a visible sign of poverty and its effects can be seen at the lowest living standards (World Bank, 2002a).

Lack of access to basic and social services lead to poor conditions of health, low skills, poor education and in general to limited opportunities. This may result in low productivity and income, thus contributing to the consolidation of the vicious circle of poverty and underdevelopment.

2.2. SPATIAL ACCESSIBILITY DEFINITIONS

The world is based on accessibility; the roads and transportation systems have determined most of the relationships between complementary areas where exchange activities are held and where the supply/demand of services is manifest in order to satisfy population needs.

Accessibility is described as the ways by which one place may be reached from another (Johnston, 1981). The spatial accessibility can be measured through route distance, travel time, and travel costs. Accessibility may be applied between two places to show the relationship between the location of the services (supply) and the location of the settlements where the people that would use these services (demand) live, e.g. accessibility to educational facilities.

Accessibility problems emerge when provision of services to the population in isolated regions is affected by lack of physical infrastructure (roads), as well as a result of the geographical location of the potential users and the distances. Basically this means that the accessibility is related to the location of the facilities, its capacity of providing services to the population and the functionality with respect to the locations of the users.

Most educational facilities, for some authors called central facilities (Bach, 1979), are located in central cities or towns with an acceptable level of services and infrastructure available to the population. The sphere of influence of these services in its existent location is not related with the capacity of services to the population (Haggett, 1965) because most of them live in scattered settlements that do not have access to these services for many reasons. One of the most important reasons is the spatial accessibility through roads because roads in the region are either in bad conditions or do no exist anymore.

Therefore, the analysis of the interaction between population and the location of facilities and the complex relationships between them will provide insight of how accessible the locations are for the population and the reasons behind this.

Accessibility is referred to supply and demand of services, the spatial locations of facilities, functions and the juxtaposition of land uses structure. Two important definitions of accessibility are established on the basis of their measurable conditions: the relative accessibility and the integral accessibility. (Ingram, 1970)

2.2.1. The Relative Accessibility

The Relative Accessibility is refers to the degree of connection between *two* places. It should take into account that the relative accessibility between two points may not be equal. In rural areas the relationships between the communities location and the place where the service are supplied can be analysed in order to establish the accessibility degree from origin to destination point. In these cases the accessibility degree is measured by the travel distance or the travel time and may be measured in kilometres or hours. For example, the distance and time that a child should travel in order to get at school on time.

2.2.2. The Integral Accessibility

Integral accessibility is the degree of interconnection between a location with *many* other places. The integral accessibility can be explained as a derivation of a set of relative accessibilities to a point. This aspect refers to the network that allow the interconnection among places in a region where it is possible to get more than one location for a given service.

The integral accessibility becomes important because it establishes the degree in which different places are connected to the services supply according to the whole region demand. The integral accessibility can be measured in time, in distance or in costs, depending on the way in which the researcher wants to determine the accessibility. An example is the possibility to choose a shorter path from home to the school or to choose another facility to which the community is connected.
Two important definitions of accessibility are the supply of services and the demand of these services. From another point of view, accessibility may be defined as the inherent character-

istics of a place with respect to overcome some forms of spatially operating sources of friction, e.g. time and distance (Ingram, 1970). Ingram gives a reference to the location of the activity as an important aspect of accessibility. From the opposite side, De Jong and Ritsema van Eck (1996) point out that accessibility is related to the location that people wish to access in getting the services. This definition is relevant from the point of view of the location of the people.

The accessibility from home to the facilities is a weighted sum of spatial and non-spatial accessibility factors. The spatial factors describe the connectivity and barriers in the surface transportation systems (roads and railroads). These spatial networks are ruled by spatial interactions such as distance and time. Non-spatial factors describe problems with respect to the socio-economic framework.

2.3. BASIC SERVICES AND ROAD CONNECTION BETWEEN RURAL PLACES

Poorly articulated and non-integrated spatial systems are characteristic of the developing countries. The lack of physical access to schools is one of the major causes of the low-enrolment and attendance, as primary schools facilities are not available within the area or are too far away from home. The cases of Ghana and Bangladesh cited in Chowdhury (1995) found these characteristics as well as affirm that availability of school facilities in places within a reasonable distance from children's home is a prerequisite for improvement of the school enrolment and attendance.

Therefore it is important to know the accessibility criteria for reaching a destination point in which educational facilities are located. In the case of Bolivia there is not a precise criteria in order to establish the maximum walking distance from home to school in rural areas. For the United States, De Chiara and Koppelman recommends a walking distance of 800 meters for children in primary school age. For Bolivia this cannot be the case, but walking distances up to 30 minutes would be acceptable according to the conversations about that between the teachers, pupils and the researcher during the fieldwork (September, 2001).

Most of the rural areas in Bolivia have few towns with sufficient basic services, like education and medical premises. Their area of influence is sometimes very big, as they have to provide also services to the far away scattered settlements, which are not able to offer these basic services to the population in a permanent basis.

Children in rural areas of Bolivia have to move from home to schools located in larger towns in order to get the service. Here the spatial accessibility becomes a very important aspect because the linkage between settlements where the people live and the town where the school is located is a determinant factor that influence the attendance levels of children to school.

Therefore, the school attendance in rural areas is strongly related to the education supply to the population. This can be related to low density of rural population, distances and travel time, as well as the existence of roads. Another important aspect is the barriers and interactions among stakeholders in the social environment where education activities are carried out.

In Bolivia, around 80% of the rural population is concentrated in the highlands and the valleys (30 % country's land area) where the long distances and the "rugged" topography result in high cost for transportation, communications and social services distribution (USAID, 1980).

In order to precise the effective service area of a town (influence area) in the case of Potosi Bolivia, Rondinelli and Evans (1983) developed a model to measure the accessibility degree of population from the hinterland to the services in a region. This model can be used to assess the alternative solutions to improve the physical access to the services

Rondinelli and Evans (1983) suggested measuring the levels of accessibility to school facilities using two important factors plus an additional factor designed to evaluate the alternative solutions for improving the access:

- The convenience of travelling to an existing school facility, which is high in areas where there are many establishments within easy reach, and declines as the number of facilities (establishments) falls and the travel time increases.

- The relative importance of some specific functions on the assumption that some of the basic services are more important than others from the point of view of the served target population or local residents.

- The population of the zone to arrive at the zone's total accessibility.

Relative importance is based on observed travel patterns, and is estimated in terms of: Average frequency of visits, the average time of travel and the proportion of the population that normally uses the services (Rondinelli and Evans, 1983).

There are other aspects that can determine the primary school attendance levels that not only refer to the education facilities supply by the government to the population. We must assume that school attendance level will not improve automatically if the facility is there. Some population segments cannot attend to school for social, economic or other reasons.

2.4. PRIMARY EDUCATION AND SCHOOL ATTENDANCE IN DEVELOPING COUNTRIES

Many developing countries have concentrated their efforts to improve the education system in the last years mostly in the rural areas. Examples of these efforts are the supply programs, educational reforms, and upgrading of non-formal education.

Despite the improvements in the primary education services in rural areas in many developing countries, the rate of enrolment and attendance levels remains low. The improvements in rates of school enrolment in primary education tend to conceal the school absenteeism, repetition and the dropout as well as the attendance levels among the children population (Chowdhury, 1995).

The problem of accessibility to primary education, absenteeism and dropout remains. It should be noted that higher rates of students are repeating grades; they are inflating and hiding the high amount of school dropouts. The rate of dropouts is also affected by the fact that some students are older than the standard age for every grade, which is a common characteristic in primary education among rural schools (Coombs and Ahmed, 1974).

Against these considerations, what are the factors that affect the attendance levels to the primary schools?

2.4.1. Cultural aspects and primary education

From a cultural point of view, the correlation between "...school attainment and being indigenous." mostly in the females case, and also between "...school attainment and category poverty..." is very relevant because both shows a strong relation. In fact among the Bolivian rural society the indigenous female students have most disadvantages than the males to access to the education services. (Psacharopoulos and Patrinos 1994: 61)

The perception of the parents indicates the enrolment of their children in the education system is not an important issue for the rural families due to the low benefits that would mean the children education for them. The chief of household refuses to invest in their children education mainly in the case of the girls who have low opportunities to education enrolment than the boys. The characteristic of education opportunities according to gender is reflecting later in the market employment opportunities where the males have higher chances than the females (Psacharopoulos and Patrinos, 1994).

On the other hand, the perception of the householders about the education for their children was surveyed resulting that majority of respondents consider that the education is useful for their children to learn to write and to read as well as to count and to calculate. Only a third part of the interviewees assures that the primary education is an integral part of the children's life and that is very useful to develop important activities many fields (UNESCO, 2002a).

The same study found that around 50 percent of the respondents connect the education skills with the employment opportunities, improve the family income through the increase productivity and the opportunity to carry out trading relationships in the city market.

The use of non-local languages is also a conflicting issue in rural areas in relation to the use of the official national language in the education process. About this issue the World Bank considers that the relevance and reactivation of the local languages is politically and culturally sensitive (World Bank, 1980).

According to the Law Educational Reform (1994), Bolivia is moving towards the use of the local language during the first two years of the primary education in order to reduce the school absenteeism and the illiteracy levels caused for this factor (Ministry of Education of Bolivia, 1994).

Nowadays the language is influencing school attendance levels because the children are native language speakers and the education system uses the national language as a learning media. Obviously these inconsistencies in the rural areas educational system provoke the children's dropout and repeating due to the use of the national language. Studies carried out by the Bolivian government say that in the valley's zone of the country the school an attendance level among the Spanish speakers is higher than the Quechua speakers most of them located in the rural areas.

Finally, is important to understand that to reach a good literacy level is not only necessary the children's enrolment to primary education is also necessary that the children complete the full primary education cycle (PDEM, 1999).

2.4.2. Child labour and primary education in developing countries

The children labour required in agricultural activities also affects school attendance. The children participation as work force in those activities in rural areas of the country is increasing while the attendance levels are decreasing due the poverty conditions of the rural families. For example, in India 40 % of the children between 6 to 11 years old who do not attend the school must work full time in order to improve their family's economic income (World Bank, 1980). For some parents in rural communities in Bolivia it is not important that their daughters attend to the school because of cultural aspects. The girls must attend to the domestic labours at an earlier age.

Children from families with less educated parents, children with fathers who worked as a farmers and children of mothers who are not working outside of their family activities are more likely to work at an early age. It is important to note that children labour participation is higher among the rural people than the urban people, and this is reflected in the school attendance levels. The indigenous population is more concentrated in rural areas (Psacharopoulos and Patrinos, 1994).

In rural areas the children labour is determinant in overall family income; therefore, while the children labour increases with the child age, the level of school attendance decreases. This characteristic is noticeable in primary education higher grades (age above 8 years old).

2.4.3. Illnesses and malnutrition, a reality among the developing countries rural population

Illnesses and malnutrition affect the school attendance taking into account that in rural areas of the country the lack of the basic services as fresh water, sewerage and health services provoke many problems in children's health. Epidemic illnesses are common during the winter season in which children present respiratory problems and during the summer season the problem is related to gastrointestinal. Precisely, during that season the peaks of children's school absenteeism due to the illnesses increase (Soriano, 1996).

Despite national health programs that pretend to eradicate the infectious illnesses, the population in the rural areas is still suffering this problems due to the low nutritional levels caused by the poor living conditions as a reflect of the country's economy.

Studies were carried out for both the National Department of Education and Health one of Bolivia in order to analyse the impact of the poor levels of proteins consumption among the population and it was detected that the children are more affected for that.

In comparison, studies about the malnutrition effect on schooling in other developing countries established the relationship between Protein-Energy Malnutrition, which is caused by the poor diet; and cognitive development during the infancy concluding that while mild to moderate malnutrition does not cause primary learning deficit, it does affect cognitive processes. Additionally, worm infections, impaired hearing and sight, and temporary hunger all affect the school attendance levels and have serious effects on school performance (Levinger, 1994).

2.5. SCHOOL ATTENDANCE INDICATORS

In this section some indicators around the problem of school attendance will be presented. The following indicators will be discussed in order to perform a further analysis of the factors on school absenteeism:

- Permanent and temporary absenteeism (dropout),
- Coverage of Primary Educational, and
- Gross and net children education enrolment.

These indicators are used to measure the extent of absenteeism in their different forms respect to the primary school age population (UNESCO, 2002b).

2.5.1. The dropout rates (DR)

The dropout problem is the more serious than others in terms to find out the school absenteeism problem. The children leave the school without completion the grade in a given school year before to obtain skills in basic literacy and calculations.

Through this indicator it is possible to measure the number of school population who neglected the school after his enrolment (registry) in the educative system.

But according to the dropout characteristics it should be taken into account that there are two different types of dropouts, the definitive and temporary dropout.

a. The Definitive Dropout Ratio (DDR)

The Definitive Dropout Ratio is the extent of children who have neglected the primary school without completion the given school year grade. It shows the number of children that abandon the school before starting the school year and they do not come back to the system for different reasons.

The data to be used in order to calculate this ratio is the number of enrolled pupils in a given year (E) and the number of promoting pupils at the end of the same year (P). Then it is possible to calculate the DDR using the follow operation

$$DDR = \frac{P_E - P_P}{P_E} \times 100$$

This equation calculates the DDR by difference between pupils enrolled (E) per year and the number of pupils promoted data (P) for the same year, divided by the number of pupils enrolled, expressed in percentage meaning the number of children who are abandon the school definitely in a given year.

b. The Temporary Dropout Ratio (TDR)

This indicator calculates the number of people that neglect the school after his enrolment in a given year and they come back after a period of time during the same year. The difficulty to calculate this indicator is the availability of data about monthly permissions and non-attendance. The way in which this indicator can be calculate is:

$$TDR = \frac{PE - PA}{PE} \times 100$$

Where:

$$P_A = \frac{A1 + A2 + A3 + \ldots\ldots An}{N}$$

This equation calculates the TDR by difference between enrolment pupils (E) per year and the annual attendance average (A) for the same year divided by the number of pupils enrolled also expressed in percentage. The annual attendance average (A) result of the monthly attendance reports total sum divided by the number of monthly reports (in the Bolivian situation: 9 times).

2.5.2. Enrolment and Education system coverage indicator (ER)

The population does not register in the system for different reasons. A way to measure the degree of population participation in education is the population enrolment in education rate. This indicator is useful to measure the extent of coverage of an educational program. It is a comparison between the children enrolled in school and the total school age population. According to UNESCO (2002a) there are two different types of enrolment ratios: gross and net enrolment ratios and can be disaggregate by a number of variables.

But according to the dropout characteristics it is should take into account that there are two different types of dropouts, the definitive and temporary dropout.

a. Gross enrolment ratio (GER)

This indicator is a "crude" measure of population participation in school, and is the most commonly used indicator of coverage. It shows the overall coverage of an educational system in relation to the population eligible for participation in the system. This indicator measures the number of people in school age population are participating in the country's national program. With this indicator it is possible to compare for example the success or not of an educational program in urban areas in comparison to its success in rural areas. The equation to calculate this ratio is:

$$GER = \frac{\text{Pupils in Primary schools}}{\text{School age population for primary school}} \times 100$$

This equation establishes the proportion of total pupils in primary school without age restriction and the primary school age population (6 to 13 years old). GER is defined as a number of children in primary grades divided by the total school age population and is expressed as percentage.

b. Net enrolment ratio (NER)

The Net of Enrolment Ratio is used to estimate the number of population in primary school age who are not enrolled. The equation used to calculate this indicator is:

$$NER = \frac{\text{Pupils in Primary school age enrolled in primary school}}{\text{School age population for primary school}} \text{ X } 100$$

This indicator is obviously more accurate than the Gross one. This NER results by dividing the total number of pupils, who are between 6 to 13 years old by the total primary school age population.
The difference between GER and NER is the numerator; the denominator in both cases is the same. The numerator for GER is the total number of pupils enrolled in primary education and the numerator for NER is pupils enrolled in primary school grades who has between 6 to 13 years old. Thus, the NER is always less than or equal to the GER because it excludes the children above the school age (6 to 13) who are enrolled in primary school.

2.6. SUMMARY

The poverty conditions in which rural families are living in general terms is an important factor that derived in spatial and socio-economic incident factors that avoid of the children a regular attendance to the school.

The spatial component is an important part of the broad accessibility topic; it affects the school attendance when there are no available local roads and other complementary physical elements in order to access to school from home or origin community. Spatial accessibility is also conditioned by the location of facilities in relation to the location the settlements.

In that sense, the considerations in the present chapter show that the distance and the travel time constitute the spatial incident factors that will be further analysed.
The socio-economic frame can be considered determinant for the set of incident factors as a family economic income, child labour, cultural perception of the population towards the education of the children and its benefits.

The effects of the problem of school attendance can be measured with indicators, like the definitive and Temporary dropout ratio, and the gross and net enrolment ratio.
Those indicators are useful in the sense that is able to measure the extent of school absenteeism, population enrolment and system coverage.

In the following school attendance is measured by using the related education institutions and householders information about the characteristics of the children going to school as indicator. Other indicators could not be applied due to data constraints.

3. RESEARCH METHODOLOGY

The purpose of this chapter is to explain the preparatory activities before the fieldwork where the main aspects like the research objectives; the needed information and the sampling method were defined. Besides, the data collection process, carried out in the field to obtain the primary and secondary data according to the research requirements is discussed. Finally the post-fieldwork activities are explained in the data analysis and processing part

Most important information that was used was the national census information of 1992 (INE[1]) is used which was the latest. The results from the 2001 census were not yet available at the time of this research. The Municipal Development Plan of Mizque information, the Direction of Education District in Mizque from 1997 to 1999 data, reports and interviews with key persons, as well as the survey (questionnaires) carried out in the school area of influence to the households. All of this information is used in order to analyse which are the incident factors that influence primary school attendance.

3.1. PREPARATORY ACTIVITIES

In order to face the research, the first steps were to know which kind of data were available and obtains this in the pre-fieldwork phase. After that it was necessary to manage some previous data in order to select the study area where the problem was manifested with more intensity.

The research problem, the research objectives and the research questions were formulated in this phase according to the literature and data review about the educational problem in Bolivia, focused the rural area of the Mizque municipality.

The preparation for the fieldwork consisted of revising and gathering literature available, maps, statistical data and some other related information about.

The revision of those data was important because they gave the possibility to do preliminary approaches and interpretations before leaving to the field about the sample area, key persons and institutions that was visited it to carry out the interviews, questionnaires and secondary data obtained.

[1] Statistics National Institute from Bolivia.

3.2. SAMPLING SCHEME

In order to carry out the fieldwork phase in a better way, a sampling scheme was designed. But before, the spatial distribution of the municipality schools was identified in order to choose the target area. The spatial distribution of the settlements in towns and communities was established using topographic maps on analogue and digital format having a scale 1:250,000 and 1:50,000 from IGM[2] Bolivia.

Based on this preliminary approach, the target school was chosen according to statistical data related to the attendance rates to the school. Then, a stratified representative scheme was designed according to the distance between the area school facilities and settlements located in the influence area of Taboada School.

3.2.1. Choosing the target school area (catchment area)

On basis of the interviews information and data from SEDUCA the government office for educational issues, the Taboada school area was selected. This school shows one of the highest absenteeism rates among the school nucleus of the Municipal Section of Mizque (See figure 2).

a. Method of sample selection

The main condition for the sample selection is the distance, and then the sample selection was done taken into account the information related to the communities location. All of them belong to the same area that is geographically defined because mountains and rivers surround it. This aspect will be explained later.

The places were possible to locate on the topographic base map and also its approximate distance from the school. In addition, valuable information was obtained from the school Director with respect to the community leader as well as about the communities where the attendant and non-attendant population are living. All that information allowed constructing the definitive spatial scheme of Taboada school influence area.

The communities were selected according to their size; the small communities with less than 5 families were excluded. Once selected the communities, the target households were selected by simple random method.

b. Sample size and description

Currently 257 are enrolled in the educative system in the area of influence. Each one of the strata in which the area was divided has a number of the communities from which it was chosen a number of households were selected for the questionnaires.

[2] Spanish abbreviation of the Military Geographical Institute, Bolivia

holds from 8 communities in the third (12 to 18 km). All of them are organised into farmers Unions[3] belonging to two Municipal sections, Taboada and Vicho Vicho (See figure 3).

The population in the Canton level is organized in farmer unions. The town of Taboada where the Central School is located has only a 384 inhabitants but its influence area has a maximum of 18 kilometres along the roadway and embracing many communities.

c. Stratified sampling

Given the availability of the data and the geographical characteristics of the area, stratified sampling was performed taking into account the distance, criteria that were considered as a determining factor. The final scheme was constructed on basis of the main roadway, the element of spatial reference whereby the stratification was done (See figure 3).

The proportionate stratified sampling was also done in order to reduce the spatial heterogeneity existent among the householder's communities located in several points of the area of influence of Taboada School. The procedure steps are showed below (See table 2). But is also important to take into account that the density into each one of the strata is different as the number of households was different into each one of them.

STEPS	PROCEDURE	DESCRIPTION
1	Identify all elements or sampling units in the sampling population.	The number of households was decided in the Taboada school catchment area.
2	Decide upon the different stratum into which the area will be divided	According to the distance, the area was divided in 3 strata.
3	Place each element into the appropriate stratum.	On basis of the base map, the communities and the corresponding households were placed into the correspondent stratum
4	Number every element in each stratum separately.	Every element into each stratum was coded.
5	Decide the total sample size	The sample size was decided on the 10% of the area population.
6	Determine the proportion of each stratum in the study population.	The number of sampling units for each stratum was selected considering the number of communities existent inside them (population density).
7	Determine the number of sampling units to be selected from each stratum.	

Table 2: Procedure for a proportionate stratified sampling selection

Taking into account the above considerations, the stratification was constructed on a base map according to the following ranges of distance (See figure 3):

[3] The people in this area are organised into Unions, which represent the basic people organization and can involve more than one community.

d. Sample units

The sample units were the households although eventually the unit of interest was the child in school going age. Each one of the households can be in charge of more than one child.

For the perception analysis were taken only the pupils that are attending temporarily or are not attended to the school because they are directly affected for the factors; but for the statistical analysis of the situation al the sample is involved.

3.3. DATA COLLECTION PROCESS

The fieldwork activities were carried out considering three main parts, the semi-structured interviews with key persons, questionnaires survey to selected households and collection of secondary data and maps (See table 3).

DATA TYPE	COLLECTION METHOD
PRIMARY DATA	Semi structured interviews. Ministry of Education official. Community leaders. NGO's representatives Questionnaires. Selected households
SECONDARY DATA	Documents and maps review. Census data. Official reports. Regional Maps. National or regional plans. Earlier research.

Table 3: Data collection method.

3.3.1. Research Primary data

The data gathering considered the following data collection method:

a. Semi-structured interviews with key persons

In general terms, the interviews were oriented to ask issues related to supply and demand of education and its accessibility (See appendix B). The type of information that was required and that was collected in the interviews during the fieldwork were useful in the sense to determine some of the school attendance affecting factors from the point of view of the institutions.

b. Conduct the Survey (questionnaires) to selected households

Basically, the questionnaires were addressed to households in the rural communities from the Taboada school catchment area (sampling population) (See annex xx). The questions were basically addressed to get important information through which it was possible to arrive to conclusions about the factors that influence in the primary school attendance.

3.3.2. Research Secondary data

Official documents, maps, and other sources of secondary data were needed in order to undertake this research as explained below.

a. Socio-economic secondary data

Documents and maps were necessary to review data related to this topic in the Government agencies, municipality of Mizque, CEDEAGRO and others sources.
The following table shows the socio-economic data that was obtained during the fieldwork phase (See table 4).

Data/info Requirement	Data Availability	Information	Year	Level
Statistical information	Statistical National Institute (Cochabamba)	Potential school population (6 to 13). Statistics about enrolments an drop-outs in the Province	1992 and 1998	Provincial And Sectional
Administrative information	District Direction of Education (Municipal Section of Mizque)	Municipal schools names and locations Statistics about enrolments an drop-outs in the municipality section Use of the Language in education	1998 and 1999	Sectional
Administrative and social information	Target school nucleus	Characteristics of school attendance (pupils origin places) Statistics about enrolments and drop-outs in the area	1999	Target School area
Administrative and socio-economic information	CEDEAGRO (Mizque)	Schools location Statistics about enrolments an drop-outs in the area	1999	Sectional and Target school area

Table 4: socio-economic data collected

b. Spatial secondary data

The spatial secondary data review allowed gathering data related to the geographical location of primary schools, the location of settlements and communities and the road network information. The topographic base map was getting in this phase (See table 5).

Data/info Requirement	Data Availability	Information	Year	Type	Scale
National geographic data	Geographic Military Institute (Cochabamba) CLAS (Cochabamba)	Topographic map. Roads map. Settlements location.	1966 and 1998	Analog and Digital	50.000 and 250.000
Educational services system in the Municipality of Mizque.	Direction of Education District (Municipal Section of Mizque)	Municipal Section Schools location, names, capacity and levels.	1999	Analog	50.000
Educational services system and physical condition of accessibility in the Municipality of Mizque.	CEDEAGRO local NGO (Mizque)	Municipality section Schools location and levels. Provincial roads conditions	1999	Analog	50.000 and 250.000

Table 5: Spatial data collected

3.4. ANALYSIS OF THE DATA

Once data were collected through primary and secondary sources in the field, they were coded and the input data was prepared in the appropriate software in order to start processing.

3.4.1. Editing the data

Before starting processing, the data were ordered in a better way making a convenient cleaning and minimised the errors, inconsistencies, and other mistakes that could be occurred in the field.

The interference method was used in order to minimise the problems and possible mistakes made during the fieldwork or inconsistent responses given for the interviewees. This method consists of verifying the truthfulness of the responses of a questionnaire through the use of crossed questions.

3.4.2. Coding the data

Once all the data were completely cleared they were prepared for coding. In this phase it was also how to communicate the research findings to the lectors. The quantitative and qualitative data were distinguished and also was transformed in numbers in order to introduce them to the database.

3.4.3. Data processing

The data were processed using two different computer tools: a spatial and a statistical software in order to arrive at certain conclusions.

a. The statistical data analysis

The statistical analysis allowed to find out the relationships between the research variables, i. e. in this study the relation between the school attendance categories and the incident factors.

This analysis part is divided in two sections; the first one refers to the analysis of the households perceptions about the factors that influence children's school attendance. Obviously this involves the households whose their children attend temporarily or not attend. The second one refers to the analysis of a number of factors in order to establish the incidence degree on school attendance.

3.5. SUMMARY

The preparatory activities allowed organizing the data available before starting the data collection process and also the field strategy design where the method of sample selection was done.

During the data collection process the primary and secondary data was collected in order to find out the incident factors behind the dropouts in the Taboada school area.

Once the data were collected, the statistical analysis was carried out. This analysis helped to find out if an association existed between the explored factors and the school attendance.

Finally, the gathering and the data processing allowed arriving at a set of conclusions on the factors behind primary school attendance.

4. RESEARCH STUDY AREA

This chapter is a general description of the study area as a framework of the research. The general information about the province of Mizque in focus on the Taboada zone is presented, after that the spatial and socio-economic information is described in order to mark the research baseline refers to the geographic and demographic boundaries. The specific information about the education in Bolivia, its structure and organization is explained as well as the data about the attendance and absenteeism characteristics in the Municipality Section of Mizque is discussed, and finally, a brief description of the school nucleus of Taboada area is presented, information referred to the involved Communities and population and also the absenteeism characteristics of this specific area.

4.1. GENERAL INFORMATION

The study area took place in the province of Mizque. In the Province the focus was on the factors behind primary school absenteeism. One school was selected, the Taboada School and its influence area, because this was the one with the highest rate of absenteeism in the first Municipal Section of Mizque for which a number of factors are responsible, which will be described and analysed later on. The present research seeks to analyse the characteristics of the school attendance in the Taboada School catchment area.

The agricultural production is the main economic activity in the zone. The children in school age participate in these production activities that become a family activity in which their participation is obligatory.

The rural family has assigned traditionally the activities to the various household members and the work is distributed according to the degree of difficulty and necessity of physical effort. For example the children participate in the preparation of the soil, sowing and harvesting according to the productive cycle of the various crops during the agricultural calendar.

The rate of migration in the municipal section of Mizque is 6% of the total municipality population (INE, 1992). The temporary migration is characteristically rural-rural, and the definitive one is rural-urban. The people migrate because they need to improve their employment opportunities and the family income. The constant disintegration of the agricultural property is another cause for the migration. The definitive migration represents a 12% of the total of the migrations.

4.2.3. Taboada roads connections

The road network that links the municipality is structured around the Cochabamba-Aiquile paved (cobble-stone) roadway. In the case of the town of Taboada, local roads (dirt roads) exist and connect the nearest communities with the main roadway. The communities located in the high zones are practically disconnected from this road structure; they have only paths normally used by people and animals.

During the rainy season the few existent roads are impassable due to the rise of rivers and floods in the surrounding areas which leads to a situation where the area is isolated, interrupting the circulation of people and goods.

4.3. SOCIO-ECONOMIC INFORMATION

A high percentage of the provincial population lives in the rural areas, without the basic services and having a very low income (INE, 1992). Inside the region are many peasants communities; their income is mainly based on agricultural activities.

The inhabitants from area of study are predominantly Quechua origin, with high productive agricultural vocation. In the past this zone was very important in the supply of agricultural products to the mines in the departments of Potosi and Oruro.

The native language is Quechua, spoken by 96% of the population (INE, 1992). A portion of the people speaks also Spanish as their second language.

4.3.1. Provincial level General information

The population of Mizque Province is 27,959 inhabitants living on an area of 2.730 square kilometres; the estimated population for the year 1998 was 30,371 inhabitants. The average family size in the province is 5 members (INE, 1992).

The rural population represents the 86% of the provincial population, which are living in 182 rural base communities. The 14% urban population is concentrated in urban centers as a Mizque, Tin Tin, Vila Vila, Rakaypampa and Mina Asiento (Soriano 1996).

The population distribution in age groups shows the group of people between 15 and 64 years old represents 50% of the population, next to the group of people between 0 and 14 years old representing 43.5% of the total provincial population.

To illustrate the problem of attendance taking the age group population from 6 to 19 years old according to 1992 national census was 8,847 inhabitants, 32% of the total province population; of which only the 52% are attend to some education facility, el 30% attended some time and the 18% never attended (See table 6) (INE 1992).

The categories of attendance from the next table were measured taking into account the data about the dropouts, attendance records and its relationships. In that sense, the people that are going to the school normally is refers to the children who are going to the school without any constraint, the people that some time went to the school but now are not going is the attended population finally, the people that currently are not part of the system for different reasons is the never attend population.

ATTENDANCE		AGE GROUPS			TOTAL
		6-11	12-14	15-19	
Permanent attend	#	3,192	943	427	4,562
	%	68.8	49.7	18.5	51.6
Dropouts	#	460	721	1,496	2,677
	%	9.9	38.0	64.8	30.2
Not enrolled	#	988	234	386	1,608
	%	21.3	12.3	16.7	18.2
Total people		4,640	1,898	2,309	8,847
Percentage		52.4	21.5	26.1	100.0

Table 6: Primary and Secondary age population (6 to 19) according to a school facility Attendance: Mizque Province
Source of data: INE 1992

According to the last table, is relevant the data about the attendance among the younger population (6 to 11) they represent the 68 percent of who attend normally to the school face to 18 percent of the older group (15 to 19), the way that can be this explained is the majority young population in the province. It should notice that the source has different data than the municipal development plan of Mizque data because use another field survey, the data are showed of different way because each age group were taken from the previous system, (before the reforms) each one of the age groups belonged to the basic, intermediate and medium education.

From the total population group until the 19 years old, the 68% represent to the primary education population. The population group pyramid shows the characteristics of the younger population structure of the province of Mizque.

4.3.2. Municipality level (section of Mizque[4])

a. Population data

According to the national census of 1992 the population was 20,176 inhabitants in the Municipality Section of Mizque the largest of the province with 7,165 in school age (5 to 19), a population of 4,481 in primary school age (6 to 13) and an attendance rate of 55.06% from the school age total population. We must take into account that is the official national data according to the Statistical National Institute INE Bolivia (INE, 1992). The data from the last census (2001) is not available yet.

Like can be seen in the figure 2, the largest part of the population lives in the Canton of Mizque (See figure 6).

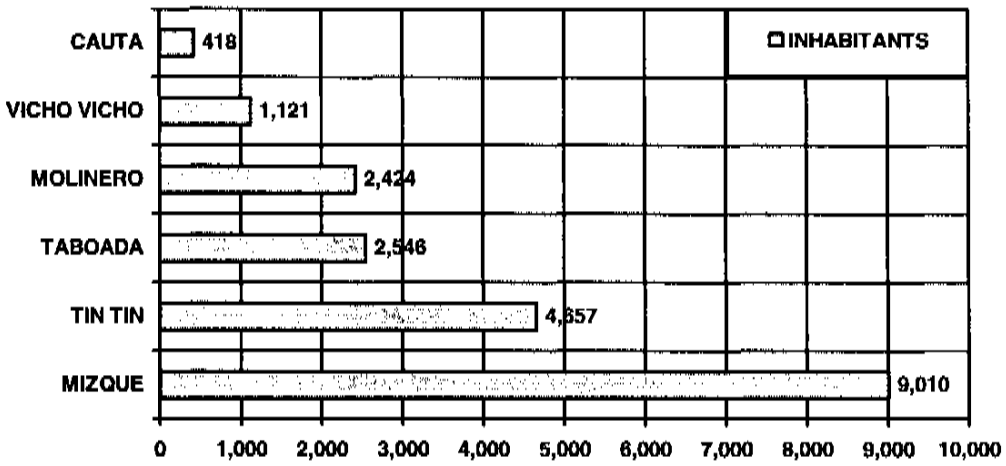

Figure 6: Population per Canton, Municipal Section of Mizque

Source of data: INE 1992.

The projections of growth population from the National Planning Unit and Institutional Development dependent office of the National Education Secretary, on basis to their own survey estimate an increment up to 27,691 inhabitants (1999) in the municipal section of Mizque. Primary and secondary school population (6 to 19) of 8,332 inhabitants (See table 7). The municipality used this data in order to elaborate the PDEM[5].

[4] It is the geographic administrative unit contained into the Province administrative boundaries.
[5] PDEM (Spanish abbreviation) Municipal Educational Development Program of Mizque.

Kind of data	Year and source	Inhabitants	School pop	%
Base year	1992 - INE	20,176	4,481	22.21
Projection	1996 - INE	22,088	4,697	21.30
Projection	1999 - INE	21,821	4,778	21.90
Projection	1999 - PDEM	27,691	6,090	30.08

Table 7: Municipal section of Mizque: Base data, projection and comparison
Source of data: INE 1999 and PDEM 1999

According to the last table, a remark can be made about the data provided by the two institutions. Whereas INE estimates a total population of 21,821 and primary school population (6 to 13) of 4,778 for the year 1999, PDEM gives for the same year values of 27,691 and 6,090 respectively. This means a 10% difference in school population.

4.4. EDUCATIONAL SYSTEM IN BOLIVIA

The educational system in Bolivia had been reorganized in 1994 and its structure included two different types of education in the country, the formal education, and the alternative education. The primary education is included in the formal system that is the framework of this research.
The formal education is refers to the national regular system the primary, secondary and superior education, and is addressed to the whole population; in the case of primary education the people between 6 to 19 years old.

The Alternative Education is guided to complete the formation of the people and facilitate the access to the Education those who for reasons of age, physical and mental exceptional conditions have not begun or concluded their studies in the Formal Education.

The formal education in Bolivia is the public service that the national government gives to the population with the objectives to educate and to perfect to them, adapting it to the country's national and regional reality. A big part of her is predicted to be giving during determining children's age according to the mental, physical and social growth of the people, between the 5 to 19 years old, knowing as a school age (Ministry of Education, 1994).

According to the above considerations, children of 5 year-old attend to the initial education; the children between 6 to 13 year-old belong to the primary education level and the people from 14 to 19 year-old should attend to the secondary education. In this classification is also included the superior education to people older than 19 year-old.

According to the national census of 1992 the population between 5 to 19 year-old (school age population) of the country was 2'364, 870 inhabitants from which the 73% attended to the school. From the school-attending people, the 64% belong to the urban areas and the 36% is from the rural areas of the country. The school attendance population data according to the gender in rural areas of Bolivia shows that the 55% are males and 45% females (INE, 1992). The projection shows an increment in school age population for 1998 of 2'826, 706.

4.4.1. Bolivian educational system structure

According to the Education Reform Law (Ministry of Education, 1994), the Education system is organized in the country's jurisdiction as National Education level and the departmental jurisdiction in each one of the 9 Bolivians departments through the Prefectures. In the municipal territory level, many of them (municipal associations) should take part in only one Education Jurisdiction of the education system called Education District. Some of them are organized in Sub-district Directions in order to keep attention on larger municipalities or isolated regions.

a. Nucleus and Educational units

Each Education District conform a nucleus system, each nucleus is a education net heading by one Central school and a number of nurseries and/or smaller schools in its jurisdiction normally with first 2 primary grades (See figure 7). In the rural areas, the nucleuses are organized according to the community's interests, culture, language, and accessibility.

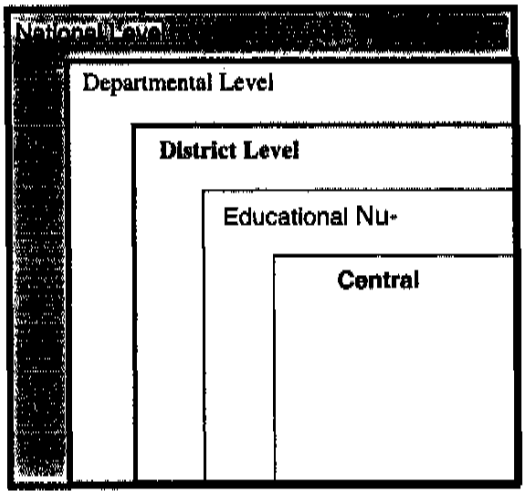

Figure 7: National Education Svstem Confiauration

Source of data: Ministry of Education, 1994

The Central school has the grades from 1st to 8th one director (manager) that depends directly of the Direction of District Education of Mizque and they of the Departmental Secretary of Education (SEDUCA) independent office of the departmental government of Cochabamba. Some nucleus has sectional schools with only two initial grades of primary school.

The location of the central schools and the configuration of the nuclear area are defined according to instructions emanated from the ministry of Education.

These dispositions determine the nuclear way of the educational structure according to the following approaches (PDME, 1999):

- Socio-economic, for the likeness of productive activities and common commercialisation.
- Educational, for the group of communities that they share a same language and common culture.
- Municipal jurisdiction, for the location of the communities and educational units inside of a same municipal territory.

The approaches for the determination of the central schools are the following (PDME, 1999):

- Equidistance among the central schools also with the sectional schools.
- Better conditions of accessibility.
- Better or improved infrastructure.
- Readiness of the complete primary school grades.
- The great demands of the service on the part of the population (served area)

(Ministry of Education, 1994).

Summarizing, the Government through the Ministry of Education have incorporated changes addressed to improve the schooling attainment mainly in the rural areas where traditionally the educational levels have been affected for a number of factors that now that law pretends to solve.

The main things that the law pretend to face is the use of the local language in the primary initial grades, the configuration of the facilities structure in the regional geographical space according to the distance. All of the changes are addressed to reduce the illiteracy and the high levels of dropout.

4.4.2. Primary education in Bolivia

The primary education system in the Bolivian rural areas had historically a low range of coverage implying low levels of access by the population due to a number of socio-economic, administrative and spatial factors.

The education rates shows that the attendance levels are improving but proportionally remains the problem of absenteeism despite to the improvements and changes. These were some of the problems that pushed to introduce the Education Reform in 1994.

The population in primary school age includes children from 6 to 13 years old. The national population in primary education age is 1'362, 179 inhabitants from which 608,500 are in the rural areas of the country. The projection shows an increment for 1998 of 1'596, 602 inhabitants that were in primary school age (6 to 13) in whole country (INE, 1992).

In some isolated regions in the rural areas of the country there is the trend among the population to start the primary education one-year later, this means when children's are 7 years

old. This is because younger children cannot walk long distances easily, and as a consequence the parents wait one year more to let their children go to school.

In the national education framework, due to ongoing reforms, the local languages are becoming to be used in several rural regions taking into account that in Bolivia other indigenous languages exist.

4.5. THE PRIMARY EDUCATION ATTENDANCE AND ABSENTEEISM IN THE MUNICIPALITY OF MIZQUE

In this section the data available in the Departmental Prefecture of Cochabamba related to the percentage of children distribution to each one of the schools in the municipality section of Mizque will be show in order to know the attendance and absenteeism levels.

School Nucleus	Attend %	Non attend %
Tin Tin	96	4
G. Vizcarra	82	18
Taboada	74	26
Raqay Pampa	94	6
Laguna Grande	87	13
Uchama Baja	84	16
Thaqu Thaqu	93	7
Mizque	88	12
Santiago	87	13
Ichu Katha	98	2

Table 8: Percentages of attendance and absenteeism in the Municipality Section of Mizque

Source of data: SEDUCA. 2001

During the data collection phase it was difficult to get these data because the Departmental Secretary of Education official was not available and the staff members could not cooperate because of confidential information. The following information (See table 8) could be obtained from SEDUCA[6] and was useful in order to choose the target school area.

The current registered population per nucleus in the municipality of Mizque and their characteristics of attendance and absenteeism are showed in the table 8.

In order to appreciate the characteristics of attendance, the table 8 shows the attendance and absenteeism percentages in the Province of Mizque. It indicates that the Taboada nucleus has the highest rate of absenteeism of 26 percent, which is very high compared with the Ichu Katha nucleus with only 2 percent of absenteeism.

4.6. TABOADA, THE TARGET SCHOOL NUCLEUS

The town of Taboada is located in the first section of the province, to 10 kilometres from Mizque. The roadway that connects Mizque with Aiquile and the city of Sucre is the way in order to arrive to the zone, crossing the Mizque River on which unfortunately does not exist a Bridge but is possible to cross it by car during the dry season. During the rainy season the people should be use a bridge located several kilometres far away, being that in the main barrier.

There is only a main roadway route through which the people are moving. That route is the spatial longitudinal axis and the main connector of the area; all the activities are carry out through this roadway and communicate the area with Mizque and other important places.

The Canton[7] of Taboada has 2,547 inhabitants, which includes the town with the same name and other communities grouped in farmer unions. The town of Taboada where the Central School is located have only a 384 inhabitants, but its area of influence has a maximum of 18 kilometres along the roadway, and embracing many communities summing a total of 2,099 inhabitants (See table 8). The primary school age population (6 to 13) represents 516 children. Do not exist updating data, but is considered that the number of inhabitants did not increase notably given the municipal population growth rate of 0.14 (INE, 1992).

The population in this area is organized into Unions[8], each one of them has a number of affiliated communities distributed in the geographical space (See table 9). The sample is distributed inside the influence area of the Taboada School.

UNIONS	Inhabitants	6 to 13 Population	Percentage
Taboada	463	106	22.9
Monte Aguada	156	38	24.3
Kurumayu	253	62	24.5
Montecillo	323	68	21.1
Tajras	251	85	33.9
Thipa Thipa	487	115	23.6
Calera	166	42	25.3
TOTAL	2,099	516	24.6

Table 9: Population belong to Taboada School influence area according to Unions organization

Source of data: INE 1992

[6] Spanish Abbreviation of the Departmental Secretary of Education

[7] Is the smallest geographic administrative unit, is contained in the Section administrative boundaries.

[8] The people in this area are organized into Unions that represent the community base organization and can involve to more than one community.

The Taboada area was selected for the study because it presents the highest rate of school absenteeism in relation to the others inside the municipal section of Mizque (SEDUCA, 2002). Also the geographical configuration of the zone is important because of the "closed" topography. Mountains and the Vicho Vicho River surround the area to the east, the Chajramayu River to the south, and the Mizque River – the bigger one- to the north and the Tipajara Mayu to the west (See figure 7).

The Taboada nucleus has two school facilities, the Taboada and the Puente Pampa schools. The Taboada School is a central school located in the north of the area in the town with the same name, has the complete primary grades (1st to 8th grades), at the moment has 210 enrolled children, the students attend to this central school from far away located communities up to 18 kilometres of distance mostly in the case of the 3rd grade to up.

The sectional school of Puente Pampa with 47 children only has available only two initial primary grades, the population served belongs to the near communities and is located to the south of the area crossing the Mizque river.

The children that are attending to these school come from diverse places, towns and communities located not only along the roadway but also in the near mountains. The children that live in far away communities have long walks towards the school from those communities and they don't have a road that links them with the main roadway.

4.7. SUMMARY

The heap of incident factors in the low level of attendance to the school is increased for the long walks that some children should carry out from their communities in order to attend the school.

The Province, Section of Mizque and Canton of Taboada boundaries were established, the socio-economic baseline was presented in order to know the framework in which the research it is based.

On the other hand the National Education Structure where the education activities it develop give us a framework in terms to understand how the system are working and which are the administrative conditions that the population should be face in order to attend to school.

Moreover, the changes introduced in 1994 with the National Education Reform Law focusing the rural education from of point of view of the national reality introduce improvements in order to face the affecting conditions on the school attendance and take into account options like a non-formal education with the international cooperation addressed to solve some of that problems in the regional and even in the local level.

Despite to the improvements in the education system introduced by the new Law, the absenteeism remains a problem in Bolivia.

5. THE INVOLVED STAKEHOLDERS AND THEIR PERCEPTION

The perceptions of the actors involved in primary education problem in the rural area of Taboada School are described in this chapter. The interviews and questionnaires are used to show the perception of respectively the local government; the Community leaders; the local NGO; the school directorate and the sampled households on the problem of primary school attendance.

5.1. THE INSTITUTIONS PERCEPTION

5.1.1. Local government

The Municipality of Mizque represent the local government, has the responsibility to carry out the local planning. The municipality dependent office of education is the District Direction of Education heading by the District Director of Education the Ministry representative in the local level. The Municipal education council takes part in the educational development as well.

According to the information available in this office, until 1998 there were 9 full primary school facilities in the Municipality of Mizque that were serving 4,603 children in 1997 and 5,005 children in 1998.

According to Mr Jose Velasquez Navia, Director of the Education District, two basic aspects can distinguish the school attendance problem: the different types of absenteeism and the incident factors on this problem.

Related to the absenteeism, the rate available refers only to the dropout rate 11 % (1998), data related to the temporary absenteeism is not available because there are no registered data, but the rate easily reach up to 18 percent.

In order to understand the problematic it should be taken into account that the people affected belong to four different types of absenteeism, the permanent absenteeism or dropout, temporary absenteeism, non enrolment population and the education service coverage.

According to the local government, there are many affecting factors and the spatial aspects refer to the *distance* from home to the school and the *time* involved to arrive to the school. The socio-economic factors that were mentioned were *children labour* helping to their families to improve the economic income during the cropping and harvesting season.

In this context, it is also important to mention the girls participation is influenced by the *domestic work* care to their relatives and *shepherding* activities.

The *language* is also an important factor, the children are Quechua speakers (the local language) and the teaching-learning process is normally in Spanish. Despite to changes in the education towards a bilingual education, this factor remains important as other cultural ones type.

Currently, the local government office is preparing an alternative regionalized calendar in order to try to reduce the rates of absenteeism. This calendar is being designed according to the season's influence on the children's attendance to school.

5.1.2. Community leaders

The Community leaders are the population representatives who are in charge of defending the interests of the people that live in the communities located in the study area. Their responsibilities are organized, to suggest and to require the attention of institutions in charged of the supply necessary services to the population.

The Community leader from Taboada communities Mr. Rufino Vallejos express the population point of view in order to describe his perception about the rural education in the area.

For the community leaders the rural education shows problems but also improvements. Every time the changes are adapted to their reality. Nowadays the lessons in the two first grades are given in Quechua but also the children are starting to learn in Spanish; is a bilingual education system. It is also remarkable that the Taboada school the most appropriate facility in the area to accommodate all of the 210 children from 1st to 8th primary school grades and also has an adapted room for the boarding that is very helpful children coming from far away.

The problem of the low attendance is related to the poverty among the population, this issue is increasing every time and it pushes the population to carry out their agricultural activities with the children participation. Consequently the children do non-attend to the school mostly during the crop and harvest season.

The children participation in agricultural activities is crucial in the rural family because they help to improve the family economic income taking into account that every one in the family must have a particular responsibility in those activities.
Most of these activities are agricultural but also they carry out other activities whit the same objective, normally to improve their economic income.
In addition, the long walks of the children in order to arrive to the school due to the distance from communities represent a big constraint for them, which is even worse due to lack of roads and the bad conditions of the roads.

Other affecting factors are the floods during the rainy season This problem affects mostly the people from far away communities. The illnesses also represent an important cause, for example the last year a flu epidemic occurred among the infantile population.
This overall figure is a result of poverty not only among the population but also of the State contributing to the children's school low attendance and absenteeism.

5.1.3. CEDEAGRO local NGO

CEDEAGRO is the only non-governmental organization that is working with the assistance of international institutions as the UNICEF. Most of the education facilities were supplied as part of the education program by combined work between the Municipality and this NGO.

This organization promotes Mizque's development, implementing several programs with the international support; one of them is Education. Its main aim in this field is to reduce the alarming rates of dropout and illiteracy among the population.

In education they try to assist most of the area population with alternative programs or bilingual alternative education, improvements in the educational infrastructure and local roads in order to improve the linkages among places into the province.

According to this organization the problem should start to be solved with the supply not only of school facilities but also with integral development programs that includes the improvement of roads and productive infrastructure that allows the upgrading of the life conditions.

Related to the problem of absenteeism they have data of the period of 1997 - 1998, where the increment of dropout rate was from 9 percent in 1997 up to 11 percent in 1998. They do not have certain information about the temporary absenteeism due to the difficulty to get a register about the control of permissions and non-attendance cases per day, but the data reach up to 15 percent approximately.

According to them the 21 percent of the school population (5 to 19 years old) in Mizque are not enrolled in the education system, most of them are girls. That means that the education service coverage in the municipality of Mizque is 79 percent.
In order to face the problem of absenteeism it is necessary to explore the affecting factors on school attendance levels. The effects of them can be See in four different types of absenteeism, the definitive dropout, the temporary dropout, the rate of non-enrolment and the rate of education service coverage.

Summarising, to this NGO the problem of absenteeism is a result of the low levels of family economic income directly related to the low levels of agricultural production and productivity These conditions derive in *economic* problems and the direct effect is the necessity of children labour in the family economic activity or domestic work.

According to them, there are other factors less important involved, they are: *cultural* aspects as a language and the customs; the *distances* from communities to the schools and consequently the *time* involved in order to arrive to the school facilities and the lack of local *roads* that hamper the spatial accessibility.

5.1.4. School director (headmaster)

The Taboada School Director, Mr Flavio Flores, is the responsible person for the control of education activities in the town of Taboada and its area of influence. He is the representative of the educational authorities in the school.

He knows valuable information about the origin of the children and data about the absenteeism in that school and some of the factors faced by the children in order to attend the school.

According to his information, the Taboada School is a central School with the complete primary grades, (1st to 8th). Currently this school has 210 registered students from which 190 are attending regularly.

The children are coming from near places but also from far away communities they are located at distance of 15 kilometres approximately as a Khochi, Calera and others, the children should walk in order to arrive at the school because a transport system does not exist. Some of them have the possibility to stay in the small school adapted boarding but due to the small size of this facility there are few places available.

The rates of attendance are increasing every year, but effectively the data are really worrying the records of temporary and definitive absenteeism are around 25 percent. But the data about the served population are unknown for this school.

According to this source the most important factor is the poverty, which is the focus of the problem, a condition that is extreme in many cases. The derived factors of this are the following three:

Child labour. The children must work next to their families in the agricultural activities during the cropping and harvesting season and shepherding during the year; also they carry out domestic labour, and they work as assistants in different activities.

Distances. The children have to move from home to the school, they have to walk and the time involved in order to arrive at the school becomes very long. They face also the lack of transport and local roads.

Culture, some parents still think that the education is not really necessary for their children; they believe that the children are more useful working in the field helping to their family. The girls are most affected by this factor, because they should learn the domestic care and prepare for the marriage.

5.1.5. THE HOUSEHOLDS PERCEPTION

To inquire about the households perception about the factors influencing the school attendance, a survey was carried out taking into account if they think that the child labour, distance to school, lack of roads, geographic barriers, cultural factors, illnesses and migration, are factors that influence the attendance to school. For this purpose a sample of 83 children - attending temporarily and no attending to school - was taken, from these children 46% does not attend to school and 54% attend temporarily.

According to the households, the attendance or non-attendance of their children is mainly due to the child labour, distance to the school, lack of roads, cultural factors and migration (Figure 9). Between 12 and 72% of the households attribute the school attendance of children to the factors mentioned above. From these factors, the child labour was the main factor causing absenteeism, but even the migration, which is the less frequent perceived factor, for 12% of the households as an important factor.

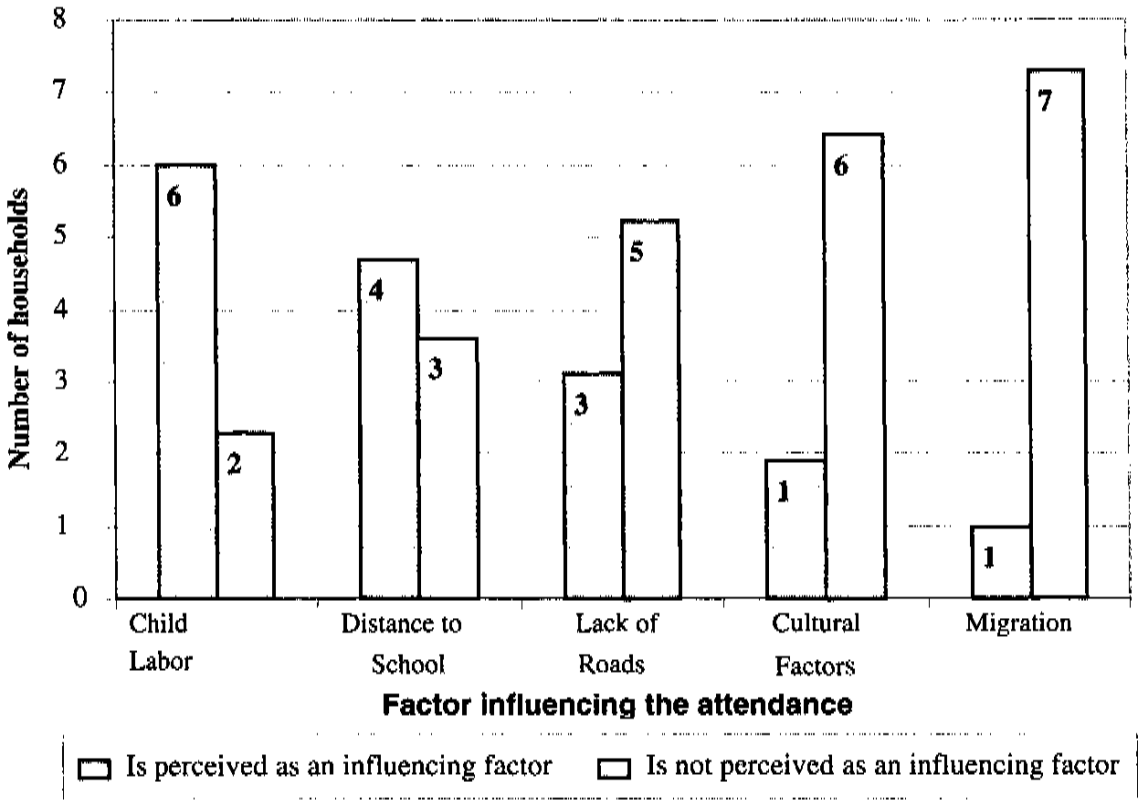

Figure 10: Households perception about factors influencing the attendance to primary school.

For those households who perceive that a given factor is the cause for the school absenteeism there's a group who have children that attend temporarily to school and another group of non-attendant children.

In the group of children non attending to school between 19 and 29 households perceive that child labour, distance to school, lack of roads and cultural factors are factors that influence their school attendance. In the group of temporarily attendant children the perception of the factors influencing the attendance varies much more, because between 9 and 41 households attribute the temporary absenteeism to the migration, lack of roads, distance to the school and child labour (Figure 10).

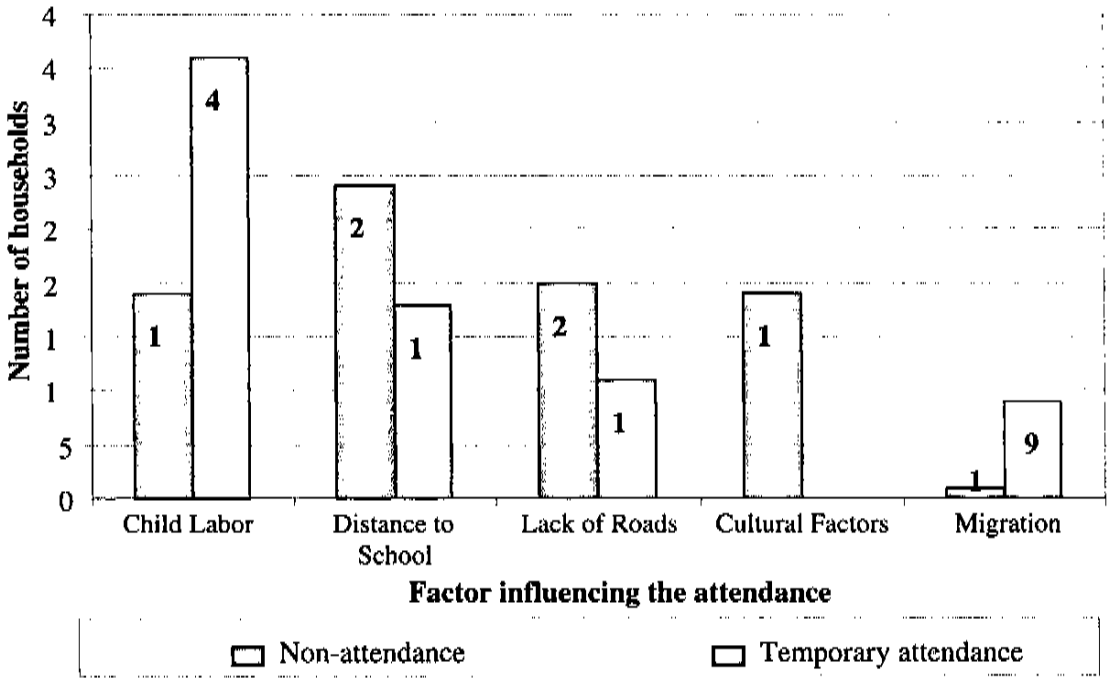

Figure 11: Temporary attendant and non-attendant groups by factor.

5.2. SUMMARY

The majority of the institutions involved perceive that the factors are predominately the distance, child labour and culture (language and customs) because they were mentioned most of the time, followed by the lack of roads, the travel time, the migration and the illnesses orderly by importance (See figure 7). According to all the information presented, the key stakeholders perception data can be summarised in the following figure:

6. RESEARCH VARIABLES AND RESULTS

The school attendance can be temporary or permanent, independently of the causes that origin it becomes to be inherent phenomena to the national and regional educative problematic.

Knowing the situation of children school attendance and the variables gathering in the fieldwork phase, its relationship in between can be analysed as an important procedure addressed to get important conclusions.

The dependent variable and the independent variables are described in this chapter. The school attendance, the age of the children, the school grade, the gender, the distance and the travel time from their origin community, the family activities, the accessibility range, among others.

6.1. MUNICIPALLITY OF MIZQUE SCHOOL ATTENDANCE CHARACTERISTICS

According to the national official data the rate of municipal school absenteeism in 1992 40% (INE, 1992), according to the Municipal Educational Development Program of Mizque (PDEM), the 1998 annual rate of school neglect was 10%. In 1997 the higher rate of school neglect was in the three last primary grades.

The percentage of school non-attendance in the municipal section of Mizque is higher than the department of Cochabamba.

Is not possible to determine exactly the temporary attendance to the school because there are not a registry about that, but on basis of the data collected during the fieldwork is can estimate 25% of non attendance (temporary and permanent).

6.2. RESEARCH VARIABLES

The research variables are all selected information related to the attendance problem that was collected in the fieldwork phase. Once all the data was ordered the preparation of the input data was doing for start the processing them.

6.2.1. The Dependent variable: School attendance

The school attendance variable is refers to the children school attendance characteristics, which is related to the influencing degree of the independent variables. Any classification about that was performed for the government despite to be important criteria to design the national indicators in order to measure the school attendance characteristics and face the problem. However, this variable was constructed according to data available, households and interviewees responses because.

Basically, it is should notice that children participation in the national educational system is not obligatory and the parents are not forced to sent their children to school. The children are free to carry out extra school activities that prevent their normal school attendance. On the other hand the education in isolated rural areas is not an important activity for the population.

Therefore, the research establishes three basic categories to describe the attendance characteristics of children to the school in the study area, which are the non-attendance, temporary attendance and permanent attendance categories.

a. The school non-attendance

Refers to the children in primary school age, 6 to 13 years old, who are not going to school. It is an important reference to explain the condition of children -who are or not enrolled in education system- that at the moment of the survey the parent in charge of them assumed their children school non-attendance. However, for the research purposes the child that are not going to the school during -at least- one month can be considered in the non-attended children group.

b. The temporary attendance

The children in primary school age that temporarily are affecting for some factors that prevent the regular attendance to the school during given periods of time in the same school year to come back later to conclude their studies, belongs to the temporary school attendance group. The children can be considered into this group when do not attend to the school a maximum of 30 days. Many factors (independent variables) can explain this school attendance characteristic.

c. The permanent school attendance

The children who attend to the school in a given school year and conclude their studies in a complete school calendar during the same year is considered in permanent school attendance group.

6.2.2. The independent variables

The independent variables are the affecting school attendance factors. This factors can be spatial or non spatial and can affect to the school attendance in different ways. These factors or independent variables are:

a. Gender

The gender factor becomes discriminatory when children are included in the familiar economic activities and assume specific responsibilities. The children carried out activities in order to support to their family's income, that situation provokes that the children cannot go to the school regularly.

The female's responsibilities start earlier than the males, around the 7 years old, because they should carry out the domestic and shepherding activities. The males' starts a bit later, their responsibilities are based in agricultural activities but also as laborers, bricklayer's assistant, etc.

b. Distance between the origin community and the School

This factor is related to the distances in kilometres from the communities to the school. In the Taboada School cases there are people who are going from 18 kilometres far and the children are go walking.

The more distant places are located in the mountain areas, in many cases the people in that place needs to reach the main roadway first in order to connect them with the school and other places, then the distance becomes to be longer. However, the people that are living near the roadway with the same distance can to reach the school earlier.

The difference between physical distance and the distance in time or travel time becomes to be important because the people that are living in the mountains in the Southeast of the school, e.g. 7 kilometres far away, has lower accessibility degree than the people that are living 15 kilometres far away in the border of the roadway who, obviously, has a higher accessibility degree to the school.

During the fieldwork phase it was possible to evaluate that situation and to do stratification according both variables. In that sense, according to the physical distance the stratification was done in three interval values 6 kilometres of distance each one through the roads or the routes that the children are using every time that they go to the school from their communities.

c. Main economic activity of household

The most of the families in the rural areas have a low income and their main economic activity the agriculture. Then in the familiar environment the members should participate as a work force according their age, gender and capabilities.

This characteristic makes important for the family the children participation and they invest their work force during the cropping and the sowing season more less one week each time.

- This variable was classified into three categories related to the family main economic activity.
- Farming activities, when the family carries out only agricultural activities.
- Mixed activities, when the farming activities are complemented with another economic activity as a transport, construction, trading, etc.
- Other activities, when the family economic activity is not directly related to farming activities.

d. Quality of spatial accessibility

According to the communities location, the accessibility degree are different because a community located in the mountain areas does not has the same accessibility opportunities than other located near the roadway, because the availability and proximity to the roads make the difference.

The way to measure the accessibility degree of each one of the communities located in the Taboada School catchments area is the categorization of the variable into types of roads existents that communicate them with the school. For this purpose was taken into account the route used for the population in order to arrive to the school and the result was:

- The first category of spatial accesses the route through the main roadway, *high accessibility degree.*
- The second category of spatial accesses the route through the local roads, *medium accessibility degree.*
- The third category of spatial accesses the route through the paths (no cars circulation), *low accessibility degree.*

e. Language

The origin language in the rural areas is the Quechua most of the children learn to speak the native language first and they need to speak Spanish as a second language. This learns process occur in the school, thus the transition are not comfortable as much to teachers as to children.

Obviously, each child assume those changes in different ways according his own family behaviour and how they motivate their children school improvements, otherwise the children is worried and leave the school.

The parents attitude faces to their children education is also important here, many of them wants that their children learn only to read and write something in order to be able to carry out their commercial activities in the towns market.

In that sense, the cultural variable was divided into 2 categories the children that speak *Quechua and Spanish* and those who speak only *Quechua*. But currently, the educational program is changed in the sense, which the school learning in the rural areas starts in the native language.

f. Migration

The migration is a social phenomenon in which the rural families take part in order to get better income and jobs in others places; these migrations can be temporary or permanent. The places of destination are the near towns or provinces and the cities of Cochabamba, Santa Cruz or Sucre.

The migration affect to the school attendance when this factor is temporary, and the children have to move with their families from the home community to other place to return later on. The maximum migration time data obtained during the fieldwork and assumed for some families was 90 days.

g. Attendance by age groups

The children age as a determinant factor of school attendance because the children's age is related to the their school enrolment and school attainment. This variable shows which groups are prone to attend permanently, temporarily or non-attend to the school.

Combined with other variables its analysis can explain why the children from a specific age group are not attending to the school. The age categorisation by groups was done observing the school attendance characteristic and the correspondent number of people related to each one of the age groups. Therefore, each one of the age groups has their own school attendance characteristics and the ranges in which each one of the groups is categorised are: 6 to 7, 8 to 10 and 11 to 13.

h. Parents literacy level

This variable show the behaviour of children according their parents literacy level as a significant factor that affect the children's attendance to the school. The children that are coming from parents more average literacy are more stimulate to attend the school than those who are coming from illiteracy parents families

The variable was categorised in 3 different ranges according to the average of both inside the total sample, father and mother, the ranges are: No literacy category, First and second grade category, third and four grade category.

i. Geographic barrier frequency

The geographic barriers also knowing as impedance are the natural obstacles that in some cases prevent the normal transportation of people and goods. This variable is refers to the frequency in which those barriers appear. The established categories for this variable are the following:

- No barrier, when there is no geographic obstacles;
- Temporal barrier when the barrier appear only during some period of time (season) seasonal presence of those barriers most of the time in the rainy season in places without infrastructure as a roads and bridges. The barrier referred in this category is among others the floods;
- Permanent barrier when the obstacle is there as a part of the geographic context as a mountains, streams and others.

j. Geographic barrier type

This variable shows specifically the type of the barrier. Therefore, the natural categorisation of this variable is refers to the circulation obstacles by rivers, streams and mud; but some areas can be free of barriers.

k. Children Illnesses

In the rural areas the children are affected for illnesses, particularly in some periods during the year, these problems affect the children school attendance.

According to the Health District Direction, the respiratory illnesses are more frequent in winter season and the gastrointestinal illnesses in the summer, but some years it presented epidemic periods.

This variable was categorised into 2 groups according to their frequencies during the year showing the affecting degree of the illness to the school attendance. Considering that the absenteeism for illnesses is normal if affect until three days maximum to the school attendance, the categorisation was:

- If the illness affects to the child school attendance one time per year is considered *normal*, the first category.
- If the illness affect to the child school attendance two times per year is considered *worrying*, the second category.
- If the illness affect to the child school attendance three times per year is considered *serious*, the third category.

6.3. MEASURED FACTORS ANALYSIS

To assess the attendance to the primary school a chi-square statistical test was carried out considering three degrees of attendance: Non attendance, temporary attendance and permanent attendance. The factors that can explain the degree of attendance are the following: Gender, distance to school, economic activity, access quality, migration, language, age group, parents literacy, barrier frequency and barrier type.

For the analysis, a sample of 130 children was taken. From these children 29% do not attend to school, 35% do it temporarily and 36% attend permanently. Following in this section, the analysis of the factors that influence the attendance are shown.

To assess the attendance to the primary school a chi-square statistical test was carried out considering three degrees of attendance: Non attendance, temporary attendance and permanent attendance. Where the chi-square test revealed a relationship, a Phi Crame's V at level α=0.01 was performed to measure the strength of the relationship. The factors what have been taken in account to explain the degree of attendance are the following: Gender, distance to school, economic activity, access quality, migration, language, age group, parents literacy, barrier frequency and barrier type.

For the analysis, a sample of 130 children was taken. From these children 29% do not attend to school, 35% do it temporarily and 36% attend permanently.

Following in this section, the analysis of the factors that influence the attendance are shown.

6.3.1. Gender

From a group of 130 children 46% were female and 54% were male. From these children, the degree of attendance varies by gender (Table 10), and according to the applied statistical tests these differences are significant **(N=130; X^2=9.11; df=2; *P*=0.01)**.

Also, the strength of the association between these two variables is significant **(Phi=0.265, *P*=0.01; Cramer's V=0.265, *P*=0.01)**. However, there's a relationship between the attendance to school and the gender, in the sense that female children are less attendant to school than male children.

Attendance	Gender		Total
	Female	Male	
Non attendance	25 66%	13 34%	38 100%
Temporary	15 33%	30 67%	45 100%
Permanent	20 43%	27 57%	47 100%
Total	60 46%	70 54%	130 100%

Table 10: Attendance degree by gender
Source: Fieldwork. September 2001.

6.3.2. Distance to school factor

From the 130 children interviewed 47% live between 0 and 6 kilometres away from school, 21% between 6 and 12 and 31% between 12 and 18. The degree of attendance is variable for children who live at different distances from school (Table 11).

Attendance	Distance to school (km)			Total
	0 – 6	6 – 12	12 – 18	
Non attendance	1 3%	11 29%	26 68%	38 100%
Temporary	23 51%	10 22%	12 27%	45 100%
Permanent	38 81%	7 15%	2 4%	47 100%
Total	62 48%	28 21%	40 31%	130 100%

Table 11: Attendance degree by distance to school

Source: Fieldwork. September 2001.

The differences observed are significantly different according to the performed statistical test, showing that there's a relationship between these variables **(N=130; X^2=57.56; df=4; *P*<0.0001)**. And also the strength of the association between these two variables is significant **(Phi=0.665, *P*<0.0001; Cramer's V=0.471, *P*<0.0001)**.. However, the majority of the children that live at a distance less than 6 km from the school attend permanently or temporarily to school while whose live far from 6 km attend temporarily or do not attend to school (See figure 12).

The strength of the association between these two variables is significant as well **(Phi=0.324, *P*=0.009; Cramer's V=0.229, *P*=0.009)**. However, there is a relationship between these two, and mainly children whose don't attend to school belong to farmer families, while children whose families have mixed or other economic activities attend temporarily or permanently to school

Attendance	Economic activity			Total
	Farming	Mixed	Other	
Non attendance	30 79%	5 13%	3 8%	38 100%
Temporary	26 58%	16 35%	3 7%	45 100%
Permanent	20 43%	18 38%	9 19%	47 100%
Total	58 48%	30 21%	12 31%	130 100%

Table 12: Attendance degree by economic activity

Source: Fieldwork. September 2001.

6.3.4. Access quality

From the 130 children interviewed 32% have a low access quality, 27% have a medium access quality, and 40% have a good access quality. According to the quality of the access the degree of the children attending the school is variable (Table 13).

Attendance	Access quality			Total
	Low	Medium	High	
Non attendance	24 63%	8 21%	6 16%	38 100%
Temporary	12 26%	16 36%	17 38%	45 100%
Permanent	6 13%	11 23%	30 64%	47 100%
Total	42 32%	35 27%	53 41%	130 100%

Table 13: Attendance degree by road quality access

Source: Fieldwork. September 2001.

significantly different **(N=130; X^2=28.63; df=2; *P*<0.0001)**. Also, the strength of the association between these two variables is significant **(Phi=0.469, *P*<0.0001; Cramer's V=0.469, *P*<0.0001)**.

However, there's a relationship between the attendance to school and the language spoken by these children. A high percentage of children that speak only Quechua do not attend to school, while children that speak Quechua and Spanish attend the school temporarily or permanently.

Attendance	Language		Total
	Quechua	Quechua/ Spanish	
Non attendance	35 92%	3 8%	38 100%
Temporary	17 38%	28 62%	45 100%
Permanent	21 45%	26 55%	47 100%
Total	73 56%	57 44%	130 100%

Table 14: Attendance degree by spoken language

Source: Fieldwork. September 2001.

6.3.6. Migration

From a group of 130 children 9% migrate some time during the year and 91% remain at their communities. The degree of attendance to school varies due to the migration of children (Table 15), and differences are significant according to the statistical test applied **(N=130; X^2=9.59; df=2; *P*=0.008)**. Also, the strength of the association between these two variables is significant **(Phi=0.272, *P*=0.008; Cramer's V=0.272, *P*=0.008)**.

However, there's an association between the migration and the degree of attendance to school, but as the majority of the migratory children attend temporarily to the school, is assumed that the migration affect only this group of children, then, the children who attend to school temporarily are affected by migrations. Whereas the children that attend permanently to school belong to a no migratory group.

Attendance	Migration		Total
	Yes	No	
Non attendance	1 3%	37 97%	38 100%
Temporary	9 20%	36 80%	45 100%
Permanent	2 4%	45 96%	47 100%
Total	12 9%	118 91%	130 100%

Table 15: Attendance degree and migration

Source: Fieldwork. September 2001.

6.3.7. Age group

From a sample of 130 children 30% of them have between 6 to 7 years old, 45% between 8 to 10 and 25% between 11 and 13. The degree of attendance varies according to the age group at which the children belong to (Table 16), and the differences in the degree of attendance for children of different ages are significant according to the statistical test applied **(N=130; X^2=31.52; df=4; *P*<0.0001)**. Also, the strength of the association between these two variables is significant **(Phi=0.492, *P*<0.0001; Cramer's V=0.348, *P*<0.0001)**.Children that not attend the school are mainly children of 6 to 10 years old, while children that attend the school temporarily or permanently are mainly children from 8 to 13 years old.

Attendance	Age group			Total
	6 – 7	8 –10	11 - 13	
Non attendance	19 50%	17 45%	2 5%	38 100%
Temporary	3 7%	20 44%	22 49%	45 100%
Permanent	17 36%	22 47%	8 17%	47 100%
Total	39 30%	59 45%	32 25%	130 100%

Table 16: Attendance degree by age group

Source: Fieldwork. September 2001.

6.3.8. Parents literacy

From the 130 children in the sample 55% of their parents have no literacy at a secondary level, 30% have reached the first or the second levels in the primary school, and 15% of the children have parents that reached the fourth grade. The degree of attendance of children varies according to the literacy level of their parents (Table 17), and the differences observed between these two variables are significant according to the statistical test applied **(N=130; X^2=20.025; df=8; *P*<0.0001)**. Moreover, the strength of the association between these two variables is significant **(Phi=0.392, *P*<0.0001; Cramer's V=0.278, *P*<0.0001)**.

From the children that not attend the school a high percentage (74%) have no literate parents, while only a few children with literate parents don't attend school. Also is important to mention that a high percentage of children with non-literate parents attend to school permanently (55%) and the majority of the children with literate parents attend to school temporarily.

Attendance	Parents literacy level			Total
	No Literacy	First & second grade	Third & fourth grade	
Non attendance	28 74%	8 19%	2 5%	38 100%
Temporary	13 30%	21 46%	11 24%	45 100%
Permanent	30 64%	10 21%	7 15%	47 100%
Total	71 55%	39 30%	20 15%	130 100%

Table 17: Attendance degree by parents literacy level

Source: Fieldwork. September 2001.

6.3.9. Geographic barrier frequency

From the 130 children interviewed 33% have no geographic barriers to go to school, 24% of them have temporary geographic barriers and 43% have permanent barriers. The degree of attendance varies by the presence of geographic barriers in the way from home to the school (Table 19), and these observed differences are significant according to the statistical analysis that was carried out **(N=130; X^2=57.56; df=4; *P*<0.0001)**. Moreover, the strength of the association between these two variables is significant **(Phi=0.618, *P*<0.0001; Cramer's V=0.437, *P*<0.0001)**. However, mainly children that not attend to school have permanent geographic barriers, while children who attend permanently to school don't have geographic barriers.

Attendance	Barrier frequency			Total
	No Barrier	Tempo-rary	Permanent	
Non attendance		7 18%	31 82%	38 100%
Temporary	13 29%	15 33%	17 38%	45 100%
Permanent	30 64%	9 19%	8 17%	47 100%
Total	43 33%	31 24%	56 43%	130 100%

Table 18: Attendance degree by geographic barrier frequency

Source: Fieldwork. September 2001.

6.3.10. Geographic barrier type

For this case were selected only those 87 cases where geographic barriers were identified. From this sample, 61% of the children have stream barriers, 24% have river barriers and 15% have muddy barriers. The attendance varies according the type of the barrier observed (Table 19), and according to the statistical test carried out the observed differences is significant **(N=87; X^2=10.17; df=4; *P*=0.038)**. Also, the strength of the association between these two variables is significant **(Phi=0.610, *P*<0.0001; Cramer's V=0.431, *P*<0.0001)**. However, the degree of attendance is associated with the type of the geographic barrier between the home and the school. For those children that not attend to the school or attend temporarily, streams and rivers are their main barriers, while for children that attend permanently to school not only the streams are their main geographic barrier, their barriers are also muddy areas.

Attendance	Geographic barrier type			Total
	Streams	Rivers	Mud	
Non attendance	28 74%	7 18%	3 8%	38 100%
Temporary	17 53%	11 34%	4 13%	32 100%
Permanent	8 47%	3 18%	6 35%	17 100%
Total	53 61%	21 24%	13 15%	87 100%

Table 19: Attendance degree by geographic barrier type

Source: Fieldwork. September 2001.

6.4. SUMMARY

As the statistical analysis revealed, all of the factors considered in the present study have a strong effect on the attendance of children to the primary school. In all of the analysis carried out the chi-square test revealed a significant association between the variables analysed, moreover, measuring the strength of these relationships the Phi Cramer's V test revealed that these relationships were strong as well. However, factors as the gender, the distance school-home, the economic activity of children's family, the access quality, the migration, the language, the children's age, their parents literacy and the barriers frequency and barriers type influence the attendance of children to the primary school.

7. CONCLUSIONS

This study investigates how the primary school attendance is affected by a number of factors. This section summarizes the major findings and gives the conclusions structured according to the original the research objectives.

7.1. PRIMARY SCHOOL SERVICE SUPPLY

According projection data from INE (1992) only the 55 percent of the population was served in 1997 in the system conformed by 9 school facilities in the municipality section of Mizque all of them with full primary grades, from first to eighth grades. The majority of these schools facilities are distributed based upon recommendations from the Ministry of Education. Most of these school facilities are located in major existing centres in an area with very scattered settlements and low population density.

According to the existent facilities, the potential supply of Taboada school area reach up to 400 pupils, but at the moment of the fieldwork only 257 were attending and its catchment area involves communities located up to 18 kilometres to the south. An area surrounded by mountains and rivers.

7.2. PRIMARY SCHOOLS SERVICE DEMAND

The demand population in school age of Taboada target school area of 2,099 inhabitants of which the primary school age population (6 to 13) represents 516 children of which currently 257 are enrolled in the service system, 232 children represents to the non-enrolled and non-attendance children group and 27 that probably are attending to the school in the city of Mizque.

The population enrolled in primary school service is significantly reduced in the municipal educational system due to the high rate of non-enrolled population and the dropouts.

7.3. THE PRIMARY SCHOOL ATTENDANCE LEVELS MEASUREMENT

The field survey conducted as part of this research (September, 2001), used attendance classes based on the responses about the attendance of the sampled children (130 children). The following classes were considered:

- Non attendance
  According to the primary information, they are not registered in the system and permanently they do not attend to school.

- The temporary attendance
  They are registered in the school. To be considered into this range, they do not attend to the school at least 30 days.

- The permanent attendance
  According to the primary information they also abandon the school but only for few days and this is considered normal, less than 15 days.

From the field survey conducted as part of this research (September 2001), the non-attendance population represented 29 percent and the temporary dropout 34 percent of the sample.

7.4. Factors against children school attendance

From literature review and field survey a number of factors were identified that could explain the levels of primary school attendance. These factors were discussed with key informants and measured as part of the field survey. Using the Chi-square test the relationship between each factor and primary school attendance was tested. All the factors presented were strongly associated with the school attendance, where the chi-square test revealed a relationship and the Phi Cramer's V was performed to measure the strength of the relationship. The factors have been classified in spatial and non-spatial factors:

7.4.1. Spatial factors

- The distance was a clear factor affecting school attendance. The majority of the children that live at a distance less than 6 km from the school attend permanently or temporarily school, while those live far from 6 km attend temporarily or do not attend to school.

- The quality of the access to the school turned out an influencing factor as the majority of children for whom the quality of the access roads is low are mostly absent from the school, while those children who have a better quality of access attend the school more often.

- Geographic barriers proved to be a factor influencing primary school attendance. Children who attend permanently school in general do not have geographic barriers.

- As far as the type of geographic barriers is concerned, those children that do not attend school or attend temporarily, face streams and rivers as their main barriers, while for children that attend permanently school face mainly streams as muddy areas as their main geographic barriers.

7.4.2. Non-spatial factors

- The gender affects school attendance, in the sense that girls attend school less than boys.

- The family's economic activities proved to be influential from of point of view that mainly children who do not attend school belong to farmer families, while children whose families have mixed or other economic activities attend temporarily or permanently school.

- The language is a barrier for primary school attendance as a high percentage of children that speak only Quechua do not attend to school, while children that speak both Quechua and Spanish attend the school temporarily or permanently.

- The migration is a factor that makes that a certain number of the children attend school temporarily. Whereas the children that attend permanently school belong to a no migratory group.

- The age group that do not attend the school are mainly children of 6 to 10 years old, while children that attend the school temporarily or permanently are mainly children from 8 to 13 years old.

- The influence of the parents literacy on the attendance rate was demonstrated by the fact that a high percentage (74%) of the children that do not attend the school have illiterate parents, while only a few children with literate parents do not attend to school. High percentage of children with non-literate parents attends to school permanently (55%) and the majority of the children with literate parents attend to school temporarily.

7.5. THE ROLE OF SPATIAL ACCESSIBILITY IN PRIMARY SCHOOL ATTENDANCE

Taking into account the information obtained during the fieldwork through interviews with key stakeholders, secondary information and the field survey the spatial factors as the distance from home to school, the quality of roads, the frequency of geographic barriers and the type of geographic barriers turned out to be influential in primary school attendance. The absenteeism mainly was related with long distances to school, low accessibility roads and the

presence of geographic barriers. At the same it should be recognized that also a number of non-spatial factors play an important role.

Since the surveyed school is located in a relatively accessible area, those populated centres neighbouring it have a better chance to have a better quality access, while those populated centres located far from the school do not only have more possibilities to have less accessible ways, but also the chance to increase the geographic barriers and the difficulty to cross them.

The accessibility to the school is determined for the availability or not of roads and also the proximity of them to the children's home.

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APPENDICES

Appendix A

HOUSEHOLDS QUESTIONNAIRE

HOUSEHOLDERS QUESTIONNAIRE

Community name :	Date : ..... Code : .....
Household :	Surveyor : .....

1. What is their literacy level :
   Father : _____
   Mother : _____

2. How many children in primary school age live here (6 to 13 years old) :
   _____

3. What are their age and gender?

	age	gender
Children 1		
Children 2		
Children 3		

m= male
f= female

4. Are they going to school currently?

	yes	no
Children 1		
Children 2		
Children 3		

5. If some of them are not going,what are the reasons?
   Children 1 _____
   Children 2 _____
   Children 3 _____

6. What is their attendance type? Why?
   Permanent= P; Temporary= T; Non-attendance= N
   Children 1 [ ] _____
   Children 2 [ ] _____
   Children 3 [ ] _____

7. Which language is used for your children school education?
   Spanish ◯ Quechua ◯

8. Which is your main family economic activity?
   _____

9. Your children participate in those activities? Why?
   Children 1 _____
   _____
   Children 2 _____
   _____
   Children 3 _____
   _____

10. Which season do they participate in?
    Children 1 _____
    Children 2 _____
    Children 3 _____

11. Which school their children attend? Why?
    _____
    _____

12. How far is the school located?
    _____

13. Which transportation mean do they go by?
    _____

14. By that mean, how long do they take to arrive to school? _____

15. Is there car roads?
    _____

16. What type of roads are they using?
    Roadway ◯ Local road ◯ Footpath ◯

17. What are their conditions?
    _____

18. Are there geographic barriers located between home and the school? What type of barriers?

19. Do these barriers prevent their children's movement to school?
    _____

20. What is the frequency of those barriers?
    Permanent ◯ Temporary ◯

22. What is their opinion about the education service?
    _____
    _____
    _____
    _____

23. Surveyor remarks.

Appendix B

FIELD GATHERING DATA

	id	attendan	childl_p	dist_p	roads_	barr_p	cult_p	illn_p	gender	distance	econ_act	road_cls	migrati	language	age	par_lit	barri_oc	barri_ty
1	1	Temporary	Yes	No	No	Yes	No	No	Male	0 - 6	Farming	Mediu	No	Quechua and Sp	8 - 10	Third & fourth	Temporal	River
2	2	Permanent	No	No	No	No	No	No	Male	0 - 6	Mixed	Mediu	No	Quechua	11 - 1	First & second	Temporal	River
3	3	Permanent	No	No	No	No	No	No	Male	0 - 6	Mixed	Mediu	No	Quechua	8 - 10	No Literacy	Temporal	River
4	4	Temporary	Yes	No	No	No	No	No	Female	0 - 6	Mixed	Mediu	No	Quechua	8 - 10	No Literacy	Temporal	River
5	5	Temporary	Yes	No	No	Yes	No	No	Male	0 - 6	Mixed	Mediu	Yes	Quechua and Sp	11 - 1	First & second	Temporal	River
6	6	Temporary	Yes	No	No	Yes	No	No	Male	0 - 6	Mixed	Mediu	Yes	Quechua	11 - 1	No Literacy	Temporal	River
7	7	Non Attend	No	Yes	Yes	No	Yes	No	Female	13 - 1	Farming	Low	No	Quechua	6 - 7	First & second	Permanent	Streams
8	8	Temporary	Yes	Yes	Yes	Yes	No	No	Male	13 - 1	Farming	Low	No	Quechua and Sp	11 - 1	First & second	Permanent	Streams
9	9	Non Attend	No	Yes	Yes	No	Yes	No	Male	13 - 1	Mixed	Low	No	Quechua	8 - 10	First & second	Permanent	Streams
10	10	Non Attend	No	Yes	Yes	No	Yes	No	Female	13 - 1	Mixed	Low	No	Quechua	6 - 7	No Literacy	Permanent	Streams
11	11	Temporary	Yes	Yes	Yes	No	No	No	Male	13 - 1	Farming	Low	No	Quechua	8 - 10	Third & fourth	Permanent	Streams
12	12	Non Attend	Yes	Yes	Yes	No	Yes	No	Female	13 - 1	Farming	Low	No	Quechua	8 - 10	No Literacy	Permanent	Streams
13	13	Temporary	Yes	Yes	Yes	No	No	No	Male	13 - 1	Farming	Low	No	Quechua	8 - 10	Third & fourth	Permanent	River
14	14	Non Attend	Yes	Yes	Yes	No	Yes	No	Female	13 - 1	Farming	Low	No	Quechua	8 - 10	No Literacy	Permanent	Streams
15	15	Non Attend	Yes	Yes	Yes	No	Yes	No	Female	13 - 1	Farming	Low	No	Quechua	6 - 7	No Literacy	Permanent	Streams
16	16	Temporary	Yes	Yes	Yes	No	No	No	Male	13 - 1	Farming	Low	No	Quechua and Sp	11 - 1	First & second	Permanent	Streams
17	17	Non Attend	Yes	Yes	Yes	No	Yes	No	Female	13 - 1	Farming	Low	No	Quechua and Sp	8 - 10	No Literacy	Permanent	Streams
18	18	Non Attend	No	Yes	Yes	No	Yes	No	Male	13 - 1	Farming	Low	No	Quechua	6 - 7	No Literacy	Permanent	Streams
19	19	Non Attend	Yes	Yes	No	No	Yes	No	Male	13 - 1	Mixed	Mediu	No	Quechua	8 - 10	First & second	Permanent	Streams
20	20	Non Attend	Yes	Yes	No	No	Yes	No	Female	13 - 1	Mixed	Mediu	No	Quechua	8 - 10	No Literacy	Permanent	Streams
21	21	Non Attend	Yes	Yes	No	No	Yes	No	Female	13 - 1	Farming	Mediu	No	Quechua	8 - 10	First & second	Permanent	River
22	22	Non Attend	No	Yes	No	No	Yes	No	Female	13 - 1	Farming	Mediu	No	Quechua	6 - 7	No Literacy	Permanent	River
23	23	Temporary	Yes	Yes	Yes	No	No	No	Male	13 - 1	Farming	Low	No	Quechua and Sp	11 - 1	First & second	Permanent	Streams
24	24	Non Attend	Yes	Yes	Yes	No	No	No	Female	13 - 1	Farming	Low	No	Quechua and Sp	8 - 10	No Literacy	Permanent	Streams
25	25	Temporary	Yes	Yes	Yes	No	No	No	Male	13 - 1	Farming	Low	No	Quechua	11 - 1	Third & fourth	Permanent	Streams
26	26	Non Attend	Yes	Yes	Yes	No	No	No	Female	13 - 1	Farming	Low	No	Quechua	8 - 10	No Literacy	Permanent	Streams
27	27	Non Attend	No	Yes	Yes	No	No	No	Male	13 - 1	Farming	Low	No	Quechua	6 - 7	No Literacy	Permanent	Streams
28	28	Non Attend	Yes	Yes	Yes	No	No	No	Male	13 - 1	Other	Low	No	Quechua	11 - 1	Third & fourth	Permanent	Streams
29	29	Non Attend	Yes	Yes	Yes	No	No	No	Female	13 - 1	Other	Low	No	Quechua	8 - 10	No Literacy	Permanent	Streams
30	30	Temporary	Yes	Yes	Yes	No	No	No	Male	13 - 1	Farming	Low	No	Quechua and Sp	8 - 10	First & second	Permanent	Streams
31	31	Temporary	Yes	Yes	Yes	No	No	No	Female	13 - 1	Farming	Low	No	Quechua and Sp	8 - 10	No Literacy	Permanent	Streams
32	32	Temporary	Yes	Yes	No	No	No	No	Male	13 - 1	Farming	Low	Yes	Quechua	8 - 10	Third & fourth	Permanent	Streams
33	33	Non Attend	No	Yes	Yes	No	No	No	Female	13 - 1	Farming	Low	Yes	Quechua	6 - 7	No Literacy	Permanent	Streams
34	34	Non Attend	Yes	Yes	No	Yes	No	No	Female	13 - 1	Farming	Low	No	Quechua	8 - 10	First & second	Permanent	Streams
35	35	Non Attend	No	Yes	No	No	Yes	No	Female	13 - 1	Farming	Low	No	Quechua	6 - 7	No Literacy	Permanent	Streams
36	36	Non Attend	No	Yes	No	No	Yes	No	Male	13 - 1	Farming	Low	No	Quechua	6 - 7	No Literacy	Permanent	Streams
37	37	Non Attend	No	Yes	No	No	Yes	Yes	Female	13 - 1	Farming	High	No	Quechua	6 - 7	Third & fourth	Permanent	River
38	38	Non Attend	No	Yes	No	No	Yes	Yes	Female	13 - 1	Farming	High	No	Quechua	6 - 7	No Literacy	Permanent	River
39	39	Temporary	Yes	Yes	Yes	No	No	No	Male	13 - 1	Farming	High	No	Quechua	8 - 10	First & second	Permanent	Streams
40	40	Non Attend	Yes	Yes	Yes	No	No	No	Male	13 - 1	Farming	High	No	Quechua and Sp	11 - 1	First & second	Permanent	Streams
41	41	Temporary	Yes	No	No	No	No	No	Male	13 - 1	Farming	High	No	Quechua and Sp	11 - 1	No Literacy	Permanent	Streams
42	42	Temporary	Yes	Yes	No	No	No	No	Female	7 - 12	Farming	High	No	Quechua	11 - 1	Third & fourth	Permanent	Streams
43	43	Non Attend	Yes	No	No	No	Yes	No	Male	7 - 12	Other	High	No	Quechua	8 - 10	No Literacy	Temporal	River
44	44	Temporary	Yes	No	No	Yes	No	No	Male	7 - 12	Farming	High	No	Quechua	8 - 10	First & second	Temporal	River

	id	attendan	childl_p	dist_p	roads_	barr_p	cult_p	illn_p	gender	distance	econ_act	road_cls	migrati	language	age	par_lit	barri_oc	barri_ty
45	45	Non Attend	Yes	Yes	No	Yes	No	No	Female	7 - 12	Farming	High	No	Quechua	8 - 10	No Literacy	Temporal	River
46	46	Non Attend	No	No	No	No	No	No	Female	7 - 12	Farming	High	No	Quechua	6 - 7	No Literacy	Temporal	River
47	47	Non Attend	Yes	Yes	Yes	No	Yes	No	Female	7 - 12	Farming	Low	No	Quechua	8 - 10	First & second	Permanent	Streams
48	48	Non Attend	Yes	Yes	Yes	No	Yes	No	Female	7 - 12	Farming	Low	No	Quechua	8 - 10	No Literacy	Permanent	Streams
49	49	Non Attend	Yes	Yes	Yes	No	No	No	Male	7 - 12	Mixed	Low	No	Quechua	8 - 10	First & second	Permanent	Streams
50	50	Temporary	Yes	Yes	No	No	No	No	Male	7 - 12	Farming	Mediu	No	Quechua	11 - 1	First & second	Temporal	Mud
51	51	Temporary	Yes	Yes	No	No	No	No	Female	7 - 12	Farming	Mediu	No	Quechua	8 - 10	No Literacy	Temporal	Mud
52	52	Non Attend	No	No	No	No	No	No	Female	7 - 12	Farming	Mediu	No	Quechua	6 - 7	No Literacy	Temporal	Mud
53	53	Temporary	Yes	Yes	No	No	No	No	Female	7 - 12	Farming	Mediu	No	Quechua	11 - 1	First & second	Temporal	Streams
54	54	Non Attend	No	No	No	No	No	No	Male	7 - 12	Farming	Mediu	No	Quechua	6 - 7	No Literacy	Temporal	Streams
55	55	Permanent	No	No	No	No	No	No	Male	7 - 12	Farming	Mediu	No	Quechua	11 - 1	First & second	Temporal	Mud
56	56	Temporary	Yes	Yes	Yes	No	No	No	Female	7 - 12	Farming	Mediu	No	Quechua	8 - 10	No Literacy	Temporal	Mud
57	57	Non Attend	Yes	Yes	Yes	No	No	No	Male	7 - 12	Farming	Mediu	No	Quechua	8 - 10	No Literacy	Temporal	Mud
58	58	Temporary	Yes	No	No	Yes	No	No	Female	7 - 12	Farming	Low	No	Quechua	11 - 1	First & second	Permanent	Streams
59	59	Permanent	No	No	No	No	No	No	Male	7 - 12	Farming	Low	No	Quechua	8 - 10	No Literacy	Permanent	Streams
60	60	Non Attend	No	No	No	No	No	No	Female	7 - 12	Farming	Low	No	Quechua	6 - 7	No Literacy	Permanent	Streams
61	61	Permanent	No	No	No	No	No	No	Male	7 - 12	Farming	Low	No	Quechua and Sp	8 - 10	Third & fourth	Permanent	Streams
62	62	Permanent	No	No	No	No	No	No	Male	7 - 12	Farming	Low	No	Quechua	6 - 7	No Literacy	Permanent	Streams
63	63	Temporary	Yes	Yes	No	No	No	No	Male	7 - 12	Farming	Low	No	Quechua and Sp	11 - 1	First & second	Permanent	Streams
64	64	Permanent	No	No	No	No	No	No	Female	7 - 12	Farming	Low	No	Quechua and Sp	8 - 10	No Literacy	Permanent	Streams
65	65	Non Attend	No	No	No	No	No	No	Female	7 - 12	Farming	Low	No	Quechua	6 - 7	No Literacy	Permanent	Streams
66	66	Temporary	No	Yes	Yes	No	No	No	Male	13 - 1	Farming	Low	No	Quechua	6 - 7	First & second	Permanent	Streams
67	67	Non Attend	No	No	Yes	No	No	No	Male	13 - 1	Farming	Low	No	Quechua	6 - 7	No Literacy	Permanent	Streams
68	68	Permanent	No	No	No	No	No	No	Male	13 - 1	Farming	Low	No	Quechua and Sp	8 - 10	Third & fourth	Permanent	Streams
69	69	Permanent	No	No	No	No	No	No	Female	13 - 1	Farming	Low	No	Quechua	6 - 7	No Literacy	Permanent	Streams
70	70	Non Attend	No	No	No	No	No	No	Female	13 - 1	Farming	Low	No	Quechua	6 - 7	No Literacy	Permanent	Streams
71	71	Temporary	Yes	Yes	No	Yes	No	No	Male	7 - 12	Farming	Mediu	No	Quechua and Sp	8 - 10	Third & fourth	Permanent	Streams
72	72	Permanent	No	No	No	No	No	No	Female	7 - 12	Farming	Mediu	No	Quechua	6 - 7	No Literacy	Permanent	Streams
73	73	Temporary	Yes	No	No	No	No	No	Male	7 - 12	Mixed	Mediu	Yes	Quechua and Sp	11 - 1	Third & fourth	Permanent	Streams
74	74	Permanent	No	No	No	No	No	No	Female	7 - 12	Mixed	Mediu	No	Quechua	6 - 7	No Literacy	Permanent	Streams
75	75	Temporary	Yes	No	No	No	No	No	Male	0 - 6	Mixed	Mediu	Yes	Quechua and Sp	11 - 1	First & second	Temporal	River
76	76	Temporary	No	No	No	No	No	Yes	Female	0 - 6	Mixed	Mediu	Yes	Quechua	6 - 7	No Literacy	Temporal	River
77	77	Temporary	No	No	No	No	No	No	Male	0 - 6	Mixed	Mediu	Yes	Quechua	6 - 7	No Literacy	Temporal	River
78	78	Temporary	No	No	No	No	No	No	Female	0 - 6	Farming	Mediu	No	Quechua and Sp	8 - 10	No Literacy	Temporal	River
79	79	Permanent	No	No	No	No	No	No	Male	0 - 6	Other	Mediu	No	Quechua and Sp	11 - 1	First & second	Temporal	River
80	80	Temporary	Yes	No	No	No	No	No	Female	0 - 6	Other	Mediu	No	Quechua and Sp	8 - 10	No Literacy	Temporal	River
81	81	Temporary	Yes	No	No	No	No	No	Male	0 - 6	Mixed	High	No	Quechua and Sp	8 - 10	First & second	No Barrier	No Barrier
82	82	Temporary	Yes	No	No	No	No	No	Male	0 - 6	Farming	High	No	Quechua and Sp	8 - 10	First & second	No Barrier	No Barrier
83	83	Permanent	No	No	No	No	No	No	Female	0 - 6	Farming	High	No	Quechua	6 - 7	No Literacy	No Barrier	No Barrier
84	84	Permanent	No	No	No	No	No	No	Male	0 - 6	Farming	High	No	Quechua	6 - 7	No Literacy	No Barrier	No Barrier
85	85	Temporary	Yes	No	No	No	No	No	Male	0 - 6	Mixed	High	Yes	Quechua and Sp	8 - 10	Third & fourth	No Barrier	No Barrier
86	86	Permanent	No	No	No	No	No	No	Female	0 - 6	Mixed	High	No	Quechua	8 - 10	No Literacy	No Barrier	No Barrier
87	87	Permanent	No	No	No	No	No	No	Female	0 - 6	Mixed	High	No	Quechua	6 - 7	No Literacy	No Barrier	No Barrier
88	88	Temporary	Yes	No	No	No	No	No	Female	0 - 6	Mixed	High	No	Quechua and Sp	11 - 1	Third & fourth	No Barrier	No Barrier

	id	attendan	childl_p	dist_p	roads_	barr_p	cult_p	illn_p	gender	distance	econ_act	road_cls	migrati	language	age	par_lit	barri_oc	barri_ty
89	89	Permanent	No	No	No	No	No	No	Male	0 - 6	Mixed	High	No	Quechua	8 - 10	No Literacy	No Barrier	No Barrier
90	90	Permanent	No	No	No	No	No	No	Male	0 - 6	Mixed	High	No	Quechua	6 - 7	No Literacy	No Barrier	No Barrier
91	91	Permanent	No	No	No	No	No	No	Male	0 - 6	Farming	High	No	Quechua and Sp	11 - 1	First & second	No Barrier	No Barrier
92	92	Permanent	No	No	No	No	No	No	Male	0 - 6	Farming	High	No	Quechua and Sp	8 - 10	No Literacy	No Barrier	No Barrier
93	93	Temporary	Yes	No	No	No	No	No	Female	0 - 6	Mixed	High	Yes	Quechua and Sp	11 - 1	First & second	No Barrier	No Barrier
94	94	Permanent	No	No	No	No	No	No	Male	0 - 6	Mixed	High	Yes	Quechua and Sp	11 - 1	No Literacy	No Barrier	No Barrier
95	95	Permanent	No	No	No	No	No	No	Male	0 - 6	Mixed	High	Yes	Quechua	8 - 10	No Literacy	No Barrier	No Barrier
96	96	Temporary	Yes	No	No	No	No	No	Male	0 - 6	Mixed	High	No	Quechua and Sp	11 - 1	First & second	No Barrier	No Barrier
97	97	Permanent	No	No	No	No	No	No	Male	0 - 6	Mixed	High	No	Quechua and Sp	6 - 7	No Literacy	No Barrier	No Barrier
98	98	Permanent	No	No	No	No	No	No	Female	0 - 6	Other	High	No	Quechua and Sp	8 - 10	First & second	No Barrier	No Barrier
99	99	Permanent	No	No	No	No	No	No	Female	0 - 6	Farming	Mediu	No	Quechua and Sp	8 - 10	Third & fourth	Temporal	Mud
100	10	Permanent	No	No	No	No	No	No	Male	0 - 6	Farming	Mediu	No	Quechua and Sp	8 - 10	No Literacy	Temporal	Mud
101	10	Permanent	No	No	No	No	No	No	Female	0 - 6	Farming	Mediu	No	Quechua and Sp	11 - 1	Third & fourth	Temporal	Mud
102	10	Permanent	No	No	No	No	No	No	Male	0 - 6	Farming	Mediu	No	Quechua and Sp	8 - 10	No Literacy	Temporal	Mud
103	10	Non Attend	No	No	No	No	No	No	Male	0 - 6	Farming	Mediu	No	Quechua	6 - 7	No Literacy	Temporal	Mud
104	10	Temporary	Yes	No	No	No	No	No	Male	0 - 6	Mixed	Mediu	No	Quechua and Sp	8 - 10	First & second	Temporal	Mud
105	10	Permanent	No	No	No	No	No	No	Female	0 - 6	Mixed	Mediu	No	Quechua	6 - 7	No Literacy	Temporal	Mud
106	10	Temporary	Yes	No	No	No	No	No	Male	0 - 6	Mixed	High	No	Quechua and Sp	11 - 1	No Literacy	No Barrier	No Barrier
107	10	Permanent	No	No	No	No	No	No	Female	0 - 6	Mixed	High	No	Quechua and Sp	8 - 10	No Literacy	No Barrier	No Barrier
108	10	Temporary	Yes	No	No	No	No	No	Male	0 - 6	Farming	High	No	Quechua and Sp	11 - 1	First & second	No Barrier	No Barrier
109	10	Permanent	No	No	No	No	No	No	Female	0 - 6	Farming	High	No	Quechua	8 - 10	Third & fourth	No Barrier	No Barrier
110	11	Permanent	No	No	No	No	No	No	Male	0 - 6	Farming	High	No	Quechua	6 - 7	No Literacy	No Barrier	No Barrier
111	11	Permanent	No	No	No	No	No	No	Male	0 - 6	Mixed	High	No	Quechua	8 - 10	First & second	No Barrier	No Barrier
112	11	Permanent	No	No	No	No	No	No	Male	0 - 6	Mixed	High	No	Quechua	6 - 7	No Literacy	No Barrier	No Barrier
113	11	Permanent	No	No	No	No	No	No	Female	0 - 6	Farming	High	No	Quechua	6 - 7	First & second	No Barrier	No Barrier
114	11	Permanent	No	No	No	No	No	No	Male	0 - 6	Other	High	No	Quechua and Sp	8 - 10	First & second	No Barrier	No Barrier
115	11	Permanent	No	No	No	No	No	No	Female	0 - 6	Other	High	No	Quechua and Sp	8 - 10	No Literacy	No Barrier	No Barrier
116	11	Permanent	No	No	No	No	No	No	Female	0 - 6	Other	High	No	Quechua and Sp	11 - 1	Third & fourth	No Barrier	No Barrier
117	11	Permanent	No	No	No	No	No	No	Male	0 - 6	Mixed	High	No	Quechua and Sp	8 - 10	First & second	No Barrier	No Barrier
118	11	Permanent	No	No	No	No	No	No	Female	0 - 6	Mixed	High	No	Quechua and Sp	8 - 10	No Literacy	No Barrier	No Barrier
119	11	Permanent	No	No	No	No	No	No	Male	0 - 6	Mixed	High	No	Quechua and Sp	6 - 7	No Literacy	No Barrier	No Barrier
120	12	Permanent	No	No	No	No	No	No	Female	0 - 6	Other	High	No	Quechua and Sp	8 - 10	Third & fourth	No Barrier	No Barrier
121	12	Permanent	No	No	No	No	No	No	Female	0 - 6	Other	High	No	Quechua and Sp	6 - 7	No Literacy	No Barrier	No Barrier
122	12	Permanent	No	No	No	No	No	No	Male	0 - 6	Other	High	No	Quechua and Sp	11 - 1	First & second	No Barrier	No Barrier
123	12	Temporary	Yes	No	No	No	No	No	Male	0 - 6	Mixed	High	No	Quechua and Sp	11 - 1	Third & fourth	No Barrier	No Barrier
124	12	Permanent	No	No	No	No	No	No	Female	0 - 6	Mixed	High	No	Quechua and Sp	8 - 10	No Literacy	No Barrier	No Barrier
125	12	Temporary	Yes	No	No	No	No	No	Male	0 - 6	Mixed	High	No	Quechua and Sp	11 - 1	No Literacy	No Barrier	No Barrier
126	12	Temporary	Yes	No	No	No	No	No	Female	0 - 6	Other	High	No	Quechua and Sp	11 - 1	First & second	No Barrier	No Barrier
127	12	Permanent	No	No	No	No	No	No	Male	0 - 6	Other	High	No	Quechua and Sp	6 - 7	No Literacy	No Barrier	No Barrier
128	12	Temporary	Yes	No	No	No	No	No	Female	0 - 6	Farming	High	No	Quechua and Sp	8 - 10	First & second	No Barrier	No Barrier
129	12	Permanent	No	No	No	No	No	No	Male	0 - 6	Farming	High	No	Quechua and Sp	6 - 7	No Literacy	No Barrier	No Barrier
130	13	Temporary	Yes	No	No	No	No	No	Female	0 - 6	Other	High	No	Quechua and Sp	8 - 10	No Literacy	No Barrier	No Barrier