HNE Eberswalde
Hochschule für nachhaltige Entwicklung

Master Thesis

Submitted in fulfillment of the requirements for the degree of Master of Arts

"Attitudes, Awareness, and Practices on Waste Management of Communities involved in Rural Tourism Case Study of the Community Amaru in Cusco, Peru"

Submitted by: Leysi Del Pilar, Apaza Vasquez
Hirschgraben 15,
22089, Hamburg
16210728

Faculty of Sustainable Economics
Degree Program: Sustainable Tourism Management

First advisor: Hon. Prof. Dr. Nicole Häusler
Second advisor: M.A. Birte Kaddatz

Submission day: 02.09.2019

Table of contents

List of figures

List of tables

“…La tierra misma se enluta
Por que las aguas parecen
Y así los tormentos crecen
Como la hierba cicuta
Parece que ni se inmuta
El hombre frente a este duelo
Pues derrama sobre el suelo
Sus sobras y desperdicios
Desacrando a los oficios
Y el canto de los abuelos…”

Nano Stern

List of abbrevations

Climate and Clean Air Coalition	CCAC
Dirección General de Salud ambiental	DIGESA
Dirección Regional de Salud Cusco	DIRESA Cusco
Greenhouse Gases	GHG
Instituto Nacional de Estadística e Informática	INEI
Integrated Solid Waste Management	ISWM
Intergovernmental Panel on Climate Change	IPCC
Juntas Administradoras de Agua y Saneamiento	JAAS
Knowledges, Attitudes and Practices	KAP
Ministerio de Comercio Interior y Turismo	Mincetur
Ministerio de Cultura del Peru	MICUL
Ministerio del Ambiente del Peru	MINAM
Municipal Solid Waste	MSW
No Governmental Organisations	NGOs
Promoción delPeru	PromPeru
Solid Waste Management	SWM
Theory of the Planned Behavior	TPB
Waste Management	WM

Acknowledgments

I would like to thank my thesis advisor, Hon. Pr. Dr. Nicole Häusler first, from whom I always received rapid and enriched feedback. I would also like to acknowledge M.A. Birte Kaddatz as the second supervisor of this thesis. I am gratefully for her valuable comments, which helped me to move forwards and steered me in the right direction.

I am grateful to my beloved husband for his continuous encouragement, providing me with love, patience, and moral support in my life and throughout the process of this study. This achievement would not have been possible without him.

I am also grateful to my friends for our conversations, their valuable ideas, and for the time they spent reviewing and commenting on my work. It definitely has improved the quality of this paper.

My thanks are also extended to the head of the environmental department of the Pisac's district Bernabe Sutta particularly for his desire and effort put in the improvement of the rural Waste Management situation in Pisac.

Finally, I must express my very profound gratitude to the residents of the Community Amaru, for their warm reception and support during the field research. They have shown me that with solidarity, community organization and courage it is possible to successfully fight against social, economic, and environmental injustices.

Leysi Del Pilar Apaza Vásquez

Abstract - English

The aim of this investigation is to analyze the current awareness, attitudes, and practices towards waste management of inhabitants in the rural community Amaru (Cusco, Peru). A village involved in rural tourism with no provision of basic waste treatment services. The research was conducted in six months. The two research methods utilized to collect the primary data included semistructured interviews and ground observations that were conducted during the time in the research area. The major findings that emerged were as follows:

A) The respondents' attitudes towards solid waste management are positive. In their society, pollution is rejected and they recognize the importance of their role in achieving a litter-free community. The good performance of their waste management system and the progress of their positive attitude are based partly on the norms, strategies and awareness-raising labor made by the communal government. As well as by tourism, which in an attempt to ensure a favorable environment for tourists, has contributed to the improvement of the overall littering condition.

B) Meanwhile the residents have an acceptable level of awareness and concern about consequences of improper waste management in the crop fields, the water and the air. However, the level of awareness varies since they can only establish relatively complex relation between soil and water waste pollution. Most respondents lack knowledge of the relationship from improper waste management and diseases, they can not describe symptoms, recognize contagious sources, name concrete diseases or describe ways to diminish the risk to contract it.

C) In terms of solid waste management their practices show firstly a congruence with their positive attitudes towards proper domestic waste disposal methods. And secondly a level of awareness, they practice waste segregation, composting, participate in the regular clean-ups and deposit the inorganic waste only in the official designated communal dumpsite.

The findings suggest that their self-government model has undoubtedly had an influence on the generation of values in favor of good practices in waste management.

.

Abstract - German

Ziel dieser Masterarbeit ist es, das aktuelle Bewusstsein, die Einstellungen und die Praktiken der Einwohner der ländlichen Gemeinde Amaru bei Cusco in Peru bezüglich ihres Abfallmanagements zu untersuchen. Obwohl Amaru im ländlichen Tourismus tätig ist, ist kein grundlegendes Abfallmanagement vorzufinden. Um das Ziel der Masterarbeit zu erreichen, wurden Forschungsarbeiten über einen Zeitraum von sechs Monaten durchgeführt. Semi-strukturierte Interviews und Beobachtungen vor Ort wurden als die zwei Forschungsmethoden zur Erfassung der Primärdaten ausgewählt. Die wichtigsten Ergebnisse lauten wie folgt:

A) Die Einstellung der Befragten zur Abfallentsorgung ist positiv. Zum einen wird Umweltverschmutzung in ihrer Gesellschaft abgelehnt, zum anderen erkennen sie die Bedeutung ihrer Rolle bei der Erreichung einer abfallfreien Gemeinschaft. Die gute Leistung ihres Abfallentsorgungssystems und der Fortschritt ihrer positiven Einstellung beruhen zum Teil auf den Normen, Strategien und Sensibilisierungsmaßnahmen der kommunalen Regierung. Die Bestrebung, eine positive Umgebung für Touristen zu schaffen, hat innerhalb der Gemeinde zur Verbesserung des allgemeinen Abfallzustands beigetragen.

B) Indessen sind die Bewohner sensibilisiert und besorgt über die Folgen einer unsachgemäßen Abfallentsorgung auf den Feldern, im Wasser und in der Luft. Der Kenntnisstand variiert allerdings, da nur ein relativ komplexer Zusammenhang zwischen Boden- und Wasserverschmutzung hergestellt werden kann. Den meisten Befragten fehlen Kenntnisse über den Zusammenhang zwischen unsachgemäßer Abfallentsorgung und Krankheiten. Sie können keine Symptome beschreiben, ansteckende Ursachen erkennen, konkrete Krankheiten benennen oder Wege beschreiben, um das Risiko einer Ansteckung zu verringern.

C) In Bezug auf die Entsorgung fester Abfälle, zeigen die Praktiken der Befragten eine Übereinstimmung zwischen ihrer positiven Einstellung gegenüber ordnungsgemäßen Entsorgungsmethoden und ihrem Erkenntnisstand. Die Bewohner von Amaru trennen Müll, kompostieren, nehmen an den regelmäßigen Aufräumarbeiten teil und deponieren den anorganischen Abfall nur in der offiziellen kommunalen Mülldeponie.

Die Ergebnisse deuten darauf hin, dass das Selbstverwaltungsmodell des Amaru-Volks, zweifellos einen Einfluss auf die Generierung von Werten, zugunsten bewährter Verfahren im Abfallmanagement, hatte.

1 Introduction

One of the greatest challenges that our modern society is facing is the steady growth of the generated waste. According to Kaza et al. 2018, p 17, in year 2016 approximately 2.01 billion tonnes of municipal solid waste was generated. The picture is not engouraging as this amount is expected to increase to up to 3.40 billion tonnes by 2050 under a business-as usual escenario. Similarly, the average waste generation per capita and per day amounts to 0.74 kilogram. That rate fluctuates widely from 0.11 to 4.54 kilograms and is mostly linked to income and urbanization level. It is within this context where urban and rural Solid Waste Management (SWM) take on importance. This investigation will focus on rural Waste Management as nearly 50 percent of the global population lives in rural areas (The World Bank 2019b).

Peru, the country in which this study is located, is not an exception of this trend. In fact, there the incorrect handling of waste has been creating increasingly acute social and environmental problems (Defensoría del Pueblo del Peru 2007, p 35). The lack of awareness and knowledge among the Peruvian community about WM issues, and the ignorance of the effects that improper WM could have, has definitely worsened the problem (Gobierno Municipal de Cusco 2015, p 214). Furthermore, the present case study has even more challenges regarding proper SWM because it is located in a rural area. It is in those areas where SWM confronts more difficulties mainly due to the neglect of the responsible government entities in their SWM efforts (Mihai 2017, p 41).

The aim of this thesis is to give insights on the current awareness, attitudes, and practices towards Waste Management of the resident´s in Amaru, a rural community involved in rural tourism and with no provision of basic waste services. This subject is relevant since the effectiveness of WM projects depends not only on technical, legal, and financial factors, but also on social factors (Mihai & Taherzadeh 2017). In fact, Chandrappa & Das 2012, vii affirms that numerous SWM projects have failed due to the insufficiency of this factor during its implementation.

The aim of this thesis is to give insights on the current awareness, attitudes, and practices towards Waste Management of the resident´s in Amaru, a rural community involved in rural tourism and with no provision of basic waste services. This subject is relevant since the effectiveness of WM projects depends not only on technical, legal, and financial factors, but also on social factors (Mihai & Taherzadeh 2017). In fact, Chandrappa & Das 2012, vii affirms that numerous SWM projects have failed due to the insufficiency of this factor during its implementation. The roadmap for thesis is as follows: Section 2.1 will start by giving a brief overview of rural tourism in Peru since the present case study is involved in rural tourism activities. Section 2.2 will describe the geographic, social and economic situation of Amaru. The Chapter 2.3 will deal with the touristic offer, that have been used to impulse the tourism development in the village. Chapter 2.4 will provide a framework to understand the SWM

system. A sustainable way to manage waste will be presented in chapter 2.4.1 followed by the negative repercussions that a precarious implementation of SWM can have on a society 2.4.2. Chapter 2.4.3 will focus on the differences between SWM urban and rural areas. In chapter 2.4.4 the results of a waste characterization study will be given concisely. The purpose of section 2.5 is to briefly explain the concept of attitudes. In chapter 2.6 awareness and its relationship with SWM will be put forward. The relationship from tourism and waste generation will be put in scrutiny in chapter 3.7. The scientific applied methods in the present investigation will be meticulously explained in chapter 3. This chapter is going to start with the stages of the research section 3.1. Chapters 3.2 and 3.3 will give details of both applied methods the observation and the interviews respectively. In chapter 3.5 the way in which the interview sampling was set will be given. This research has been a long process a description of the evolution of this process will be given in chapter 3.6. The results and its interpretation will be provided in chapter 4. Chapter 5 will start answering the research questions. The next section, will highlight the strengths and limitations that this study has. Suggestions for further research will be presented in section . Based on the weaknesses found during the analysis of the results, some recommendations will be given in chapter 6. The last part of this research will be covered in the conclusion in chapter 7. This chapter will attempt to synthesize the results of the research. Finally, section 8 will report the experiences of the researcher through the whole investigation process. It will also provide a personal critique about errors that were made during the investigation.

1.1 Problem formulation

This investigation is a case study on current awareness, attitudes and practices towards WM of inhabitants of Amaru, a rural community in the Peruvian Andes which is involved in rural tourism and which has no provision for basic waste treatment services. The rural community Amaru is located in a district of the Cusco Region in southern Peru. A village, where the local WM is handled by the residents with no technical, financial or institutional support provided by any of the responsible local authorities and a place where the touristic activity has started about ten years ago.

In general, Peru has an inadequate Waste Management system (Ministerio del Ambiente (MINAM) 2017, p 24). On one hand, it is not surprising that there is an absence of studies about waste awareness and attitudes matters at a national level. On the other, it should be a reason to awake interest among the public and educational research institutions and responsible government institutions.

Despite exhaustive research online and in-person, the researcher was not able to find studies, or any information about the opinions, perceptions, practices, beliefs, intentions or practices on waste handling, of people who live in touristic rural areas neither from Cusco nor from Amaru. The limited information found was specialized only in the local Waste Management system from its urban areas (Gobierno Municipal de Cusco 2015, p 179).

Concerning the international scientific literature developed so far in the topic. There were found only few publications, most of them studies focused on environmental attitudes and awareness of people living in urban areas: Brito & Pasquali 2006, Choon, Tan & Chong 2017, Jatau 2013. Other investigations were conducted to support Waste Management Programs or strategies: Desa, Kadir & Yusooff 2012. Some publications focussed on the influence that attitudes towards WM can have in the health of the residents: Eneji et al. 2017, others were concentrated on the education and raise of awareness and knowledge: Festus, Dr. & Ogoegbunam 2012, p 6, Grodzińska-Jurczak 2003.

This is the first investigation addressing awareness, attitudes, and practices towards WM focusing of residents living in rural communities in the Andes of Peru. And although currently there is little importance given to the topic from part of the governmental institutions, the results are expected to be of great value for the support of future strategies and creation of policies on WM in rural areas throughout the Andes. Especially in places with characteristics similar to the once of the presented case study. Additionaly, the findings can also stimulate the research in topics such as environmental awareness and attitudes investigations at both national and international level. Obtained data, particularly the variables which entail residents' awareness and attitudes towards sanitary topics, could also be further utilized by the local health institutions. Furthermore, the results that will be compiled are relevant to the community board. They could use it to To reinforce the residents' knowledge on waste. Similarly, Non Governmental organisations (NGOs) dedicated to strengthen environmental education could use the results to develop guidelines to design educational strategies. Moreover, tourism institutions, organizations and associations who work with a sustainable rural tourism approach can use the results to develop within their tourism training a complementary proper disposal waste guideline.

Finally, this study indirectly hopes to raise the quality of life of Amaru's residents. They urgently need an improvement in the situation of the local waste management, which can be reached, enhancing their awareness, attitudes, and practices towards proper waste handling. If the situation is not improved, especially people with less financial resources, who only have the natural resources to their sustenance will keep being threatened by high pollution, loss of ecosystems, and degradation of soils (Banco Mundial Peru 2007, p 13).

1.2 Research questions

To achieve the aim of this thesis research questions were formulated. They should also be considered as the objectives of this investigation and were divided into three categories: attitudes, awareness and practices. The answer to each of the following questions can be found in chapter 5.

Attitudes (A)

How do Amaru's residents perceive waste pollution?

What do residents think about people who litter and who do they think are the polluters?

Who in the view of the residents is responsible for most of the waste generated in the community?

How does the presence of tourism in the community impact the attitudes of the residents towards adequate waste handling?

What is the role of the communal administration in shaping the general awareness and practices of the residents regarding waste management?

Awareness (AW)

How aware are the residents of the effects of improper waste disposal on soil, water, air?

What is the knowledge of the residents regarding waste recycling techniques?

How aware are the residents of the effects of improper waste disposal on their health?

What are the reasons residents think tourist like or dislike a littered landscape?

Practices (P)

What are the Waste Management practices developed by the residents and the community board according to the sequence of WM?

It is expected that the findings of the study will help understand and give insights into the intentions, beliefs, behavior, customs as well as waste handling motives of Amarus' residents. With this knowledge, government authorities, the community itself, NGOs, travel agencies and various entities involved in tourism could organize effective awareness-raising campaigns or activities to promote a more responsible domestic waste disposal. As well as strengthen favorable waste practices for example minimization at the source, recycling or reuse, etc.

The methodology employed to achieve the above-listed objectives was qualitative. Further, it had a mixed character since two research tools were applied to conduct the research namely the observation and interviews. The author conducted the study by herself from December 2018 to Februar 2019 in three different locations. The city of Cusco, the district of Pisac and the community of Amaru all situated in Peru. The observation method was carry out mainly obtain baseline information about the local situation of the current waste handing practices, the communal facilities, the government organization and the context in which tourism operates. The interviews, on the other hand, were executed to directly obtain information to accurately answer the research objectives and therefore meet the main aim of the whole research. The next chapter 2. paves the way towards the achievement of the study's objectives. Because the conceptual framework first had the function of allowing the researcher to decide what kind of methodology was necessary to apply to achieve the main study objective. Secondly it served as a guide to developing the observation and the interview guideline. Finally, it also assisted as a basis to correctly interpret the results.

2 Conceptual Framework

This chapter will start by giving a brief overview of the situation of rural tourism in Peru 2.1. The following section 2.2 will explain what is understood under the term of rural community in Peru and it also will give details about its location, economy and the social structure of the village. Chapter 2.2.1 provides a glimpse into the current tourism situation in the community.

2.1 Rural tourism in Peru

The (Ministerio de Comercio Interior y Turismo (Mincetur) 2015) defines rural tourism as “all kind of tourist activity that takes place in rural areas in a planned and sustainable manner, which is based on the participation of local population for the benefit of the community with rural culture being a key component of the product.”1. Mincetur emphasizes that the tourism in the communities should be seen as a complementary economic activity and recommend that members of tourism associations or entrepreneurs not to neglect other areas of their economic activities such as agriculture or farming (Flores 2018). According to Montesinos 2018 this type of tourism uses the natural cultural resources of the destination while preserving the heritage, generating economic benefits and preserving the territory. Rural tourism creates opportunities for social and economic inclusion of rural communities through the development of touristic products and services. The running of the projects is coordinated through tourism associations. In 2015 the number of projects throughout Peru reached 76 (Ministerio de Comercio Interior y Turismo (Mincetur) 2015).

The development of rural tourism projects in Peru has been supported by the government. Its institutions promote it by targeting markets that search for authentic experiences. In fact, most of the tourists visiting Peru are rather seeking to participate in experiences and activities than in sightseeing trips. For the consumers the best way to experience authenticity is by participating in the day by day of people living in rural communities (Carnaffan 2014, p 243).

There are different opinions about the impacts of tourism in the communities. On the one hand, Zoomers 2008, p 979 states that most of the villages do not have enough attractivity to be considered a desired destination and therefore tourism does not create a significant income source for its residents. The reasons for this could be either because of their remote locations, the absence of archaeological sites or because they do not have enough capacity to host considerable amount of tourists. The author states that the additional income generated reach only a few inhabitants, for example sellers of food and textiles. On the other hand, Carnaffan 2014, 242 suggests the community associations make efforts within their members and outside to reach a more even share of the economic benefits from tourism. For instance, they designate the visitants in a way that every family will get the

[1] Literally translated

same amount of clients. Outside the associations they try to involve other members of the community, offering work or giving donations to community founds. Finally, one argument that would support the opinion of Zoomers would be, that in Cusco, although there has been an increase in the region's GDP in the last decade, the poverty rate has remained the lowest in Peru (Herrera, 2013 cited in Carnaffan 2014, 242).

2.2 The community Amaru

As previously stated, the case study presented in this investigation is a Peruvian peasant community. The following quote extracted from the current Peruvian constitution provides an official description of the term: *"Peasant and Native Communities have legal existence and are juridical persons. They are autonomous in their organization, in the communal work and in the use and free disposition of their lands, as well as in the economic and administrative aspects, within the framework established by law."*[2] (Ministerio de Justicia y Derechos Humanos 2016, p 82). Similarly the families living in those communities are usually linked by ancestral, social, economic and cultural ties (Instituto Nacional de Estadística e Informática (INEI) 2012, p 249). Their legal status allows the establishment of formal possession of the lands with the capacity for forest use or protection (Ministerio de Cultura del Peru (MICUL) n.d., p 27).

Amaru, which means sneak in Quechua[3] is one of the twelve communities that belong to the district of Pisac – Cusco (Programa de desarrollo regional Cusco 2013, p 200). It is located eight kilometers away from the capital of the district at 3359 meters above sea level (Instituto Nacional de Estadísticas e informática (INEI) 2018). Fig. 1 shows the exactly location of the community. The community has a population of around 769 inhabitants (Directiva de la Comunidad Campesina Amaru 2019), where most of its inhabitants are Quechua native speakers. Spanish is also practiced but not all have a good command on it. In year 1965 it was officially recognized as a native community by the Ministry of Labor and Indigenous Affairs (Programa de desarrollo regional Cusco 2013, p 200). According to the Census of year 2007[4] the rate of extreme poverty in the district of Pisac was estimated at 32.7 percent. A figure that is relatively high compared to the country's extreme poverty index 13,7 percent. Here extremely poor people are people who have a per capita expenditure below the cost of the basic food basket. (Instituto Nacional de Estadística e Informática (INEI) 2007)

[2] Literally translated by the author
[3] Native Peruvian language
[4] Despite an ardous research, it was no possible to find current data of the poverty levels of the community Amaru

Figure 1: Geographical location of Amaru

Source: Google maps, 2019

The economy of the community is based mainly on agriculture and livestock activities. Furthermore tourism activity is presented as an additional income. The inhabitants of Amaru are mostly farmers and the work in the crop fields is carried out by all members of the family. Among the products they grow are potatoes, beans, quinoa, mashwa, tarwi[5], wheat, cebada, oca[6], and corn.

During the field investigation, it was observed that Amaru's society is participative, inclusive, and solidary. They have a self-governmental model, where its high level of organization stands out. The community leaders are elected every two years through local elections. The villagers chose the communal president together with the communal board. The attributions and obligations of these local authorities change when the communal members consider it, which shows their administrative autonomy (Peña Jumpa 2013, p 196). The community board meets with the residents once a month in

[5] Pearl lupin
[6] Yam

the community plenums. In which democratic decisions linked to distribution and protection of water, maintenance of roads and water streams, and assistance to the assemblies are taken. The families or one representative of them have the responsibility to assist and actively participate in those meetings. Another social characteristic is that all members of the families receive responsibilities from a very early age. Therefore, it is usual to observe small independent children with obligations such work in the plots or the household work, there is also a cooperation of the whole family harvesting time.

In conversation with the comuneros, it was noticed that they continue exercising traditional beliefs and rites. The Andean worldview is still present, not only in special occasions, but also in their daily lives. The residents venerate animals and apus[7]. In fact, some of the surrounding mountains embody male and female characters of authority, entities to which they show respect. For them, the mountains demand harmony between human, nature and animals. According to Centro de Salud Quello Quello 2015, p 6 they have this cosmovision of establishing an almost pantheistic nexus between the land and the man since immemorial time. This respect and wisdom for nature are reflected in the rotating planting system. They work in the tuber's communal plots according to agriculture calendar, where they take care of the regeneration capacity of the soil (Programa de desarrollo regional Cusco 2013, p 201).

2.3 Rural tourism in Amaru

While the previous chapter provided an economic and social perspective of the community, this section will specialize in the particularities of tourism in the community. The rural tourism offered in the community Amaru is experiential tourism, aimed at a specific public that is looking for an experience of closeness with nature and its inhabitants. The visitors of rural communities want to have a closer look into the culture and the customs of the locals, which is why they usually search for interaction (PromPeru 2008, p 13).

In the community, the families that offer touristic services are organized in associations. Most of these associations were created hand in hand with private institutions. Those organizations provide the microenterprises with support in key issues for its opening, training, financing and consulting. The entrepreneurs are trained in areas such as: gastronomy, customer service, marketing, tax system, strengthening of the organization, local guides, tourism product design, quality, constitution of a company, etc. In theory the system of work from the tourism associations tries to avoid that the incomes remain in the hands of a minority. However, to be part of any of the associations, it is necessary to pay the organization a considerable amount, which prevents the equal participation of all residents.

[7] Mountain in Quechua

In addition, in Amaru there are at least five tourist associations, the number of members fluctuates between ten and twenty. Approximately 22 families have conditioned their homes to receive visitors (La Tierra de Los Yachaqs n.d.). Hence, the housing conditions, hygienic services and the rooms have significantly improved. Each of the tourism associations works independently from each other, consequently, the profits are only distributed among their partners. Some of the tourism associations are for instance, “La Tierra de Yaqchas”, “Apurunawuana” and the “Comite de mujeres”. Although not all villagers have the opportunity to be part of a tourism association, many of them increase their income with activities linked to tourism. For example through the sale of their waved textiles. In this case the production and the sale are made mostly by women, who are organized in associations of weavers. The whole community has a capacity to host 50 tourists at the same time (La Tierra de Los Yachaqs n.d.).

Amaru has many assets that make it an attractive location to attract tourists. It has, for instance, a privileged view from where the high Andean landscape can be observed. It is located very close to lakes such as Quinsaqocha, Mataraqocha or Chaullaqqocha. From the highest part of the community, it is possible to observe the Inca fortress of Pisac, which is part of the archaeological circuit of Cusco. Among its cultural manifestations, the most outstanding is the cultural legacy inherited from their ancestors from pre-Inca, Inca and Spanish cultures. This cultural amalgam is manifested in their clothing, weaving techniques and their gastronomy (Programa de desarrollo regional Cusco 2013, p 201). Another appealing feature is the architecture of their houses since they is still do it in an artsanal way. The products that they offer are the following: home staying, trekking, demonstration of the elaboration’s process of textils, teaching of weaving techniques, elaboration of huatia and pachamanca[8]. Appendix 1 contains picture from the tourist products offered in the community. The next chapter will examinate another key topic in this investigation, namely Solid Waste Management (SWM).

2.4 Solid waste management

This section will start offering explanations of terms, elements and components of SWM. After chapter 2.3.1 will explore the components of an enhanced version of SWM namely, the Integrated Solid Waste Management (ISWM). Then chapter 2.3.2 will examinates the dangers that may arise by incorrect practices or absence of SWM. Chapter 2.2.3 will present the particularities of SWM in Rural areas. The final chapter 2.3.4 will show current waste generation and composition waste rates in the district of Pisac.

According to Birhanu & Berisa 2015, p 155 the term solid waste involves all wastes originated from human and animal activities, this comprises the heterogeneous loads of garbage produced in the

[8] Traditional dishes prepared in a oven built in the earth

cities as well as the homogenous heap consisting of various materials like food wastes, packaging material, construction wastes, medical wastes, and dangerous wastes.

As the focus of this study is the waste generated in one specific area, there will be a focus on the municipal solid waste (MSW). Strange 2002, p 2 defines MSW as the waste generated from private households and which are usually collected by the municipality or on its behalf. MSW contains a share of commercial and non-hazardous industrial waste. In general, the material included are, household wastes which are collected for recycling and composting or discarded in waste sites, as well as hazardous, bulky and wastes obtained from household's street cleaning, refuse of parks and garden trash.

One categorization from MSW is made considering the nature of solid waste components. On this basis, solid waste can be classified into organic or inorganic, combustible or noncombustible, and putrescible or non-putrescible (Birhanu & Berisa 2015, p 155). More frequently, in the municipalities, waste is classified into organic and inorganic. Table 1 presents the waste typology used in this study:

Table 1: Types of waste and their sources

Types	Sources
Organic	Food scraps, yard (leaves, grass, brush) waste, wood, process residues
Paper	Paper scraps, cardboard, newspapers, magazines, bags, boxes, wrapping paper, telephone books, shredded paper, paper beverage cups. Strictly speaking, paper is organic, but unless it is contaminated by food residue, paper is not classified as organic
Plastic	Bottles, packaging, containers, bags, lids, cups
Glass	Bottles, broken glassware, light bulbs, colored glass
Metal	Cans, foil, tins, non-hazardous aerosol cans, appliances (white goods), railings, bicycles
Other	Tiles, leather, rubber, multi-laminates, e-waste, appliances, ash, other inert materials

Source: Hoornweg & Bhada-Tata 2012, p 16

Solid waste management is composed of collection, transportation, processing, and recycling or discard of the waste, which is mostly generated by human activities, to suppress its negative impact on human health and society (Chandra Moharana 2012, p 32). The main objectives of WM are as follows (Oreoyomi 1998, p 2 cited in Festus, Dr. & Ogoegbunam 2012, p 255):

- To eliminate health risks of the community by removing all the physical, biological, and chemical waste that is potentially harmful to human and its habitat.
- To prevent pollution and long-term devastation of nature and the environment in general. This objective is reached for instance by discouraging people to dump the waste arbitrarily in their surroundings which not only destroys the closest environment but even further places land and river.
- To offer job opportunities to people that in other situations would not have the chance to work.

- Additional source raw materials to industries from waste. This is achieved by recycling materials of monetary value.

Elements of a waste management System

Chandrappa & Das 2012, pp 32–33 have defined the elements of WM. After them these elements and its proper interrelations are critically important to ensure a smooth running of a WM strategy. As can be seen in Fig. 2 these elements are complex and interrelated. First, policy, law and planning are considered the key elements because without them there would be not clarity between the stakeholder about their respective functions and responsibilities. The experience on WM gained in the last years serves to recognize that with non-existence of law people tend to dispose the waste indiscriminately. Secondly, the presence of laws is not enough then they cannot act themselves, but rather WM requires an adequate implementation of waste handling. In this phase training play an important role since it is necessary to reinforce the strategy and its management. In addition to this, it is crucial to raise awareness in the waste generators, to achieve a switch in their behavior, which has been done for instance through publicity in mass media such as internet, radio and newspaper. Similarly, it is important that new policies have regard to the independent means from local people who's life are hardly depended on solid waste. This could be made for example making efforts to involve them and avoiding this way to bring new people for managing. A major decision in a world, where about the one to two percent of urban population depends on solid waste for livelihood. Finally, safety and emergency preparation should be not be ignored, to avoid harm or death of WM collaborators and residents.

Figure 2: Elements of a waste management system

- Source: Based on Chandrappa & Das 2012, p 34

Key components of solid waste management

SWM encompasses a set of stages, where private subjects, industries and public organizations are involved. Fig. 3 shows the sequence of steps in SWM:

Figure 3: Components of solid waste management

Source: Adapted from Harvey, Baghri & Reed 2002, p 110

- **Generation:** It refers to the production of a certain amount of materials in a determined period of time. Solid waste is generated by production units or households, in accord with its socio-economic level, consumption patterns, food habits, geographical location and climate, which contributes to production different amounts, and composition of solid waste. Generators are considered natural or legal persons. (Defensoría del Pueblo del Peru 2007, p 32) In this moment the owner does not find any more use for the item and does not need it anymore, therefore he/she is willing to dispose it (Harvey, Baghri & Reed 2002, p 110).
- **Storag**e: It consists of the action of temporarily retaining the solid waste until it is collected for its subsequent transport to treatment points or the final disposal location. In this intermediate phase, the user stores the solid waste inside their homes or businesses. (Defensoría del Pueblo del Peru 2007, p 33) Storage may not be necessary in cases when on-site disposal system exists. (Harvey, Baghri & Reed 2002, p 110)
- **Collection:** It consists of taking the solid waste from its storage place to subsequently deposit it in collection vehicle and then transfer it to the treatment or final disposal site (Defensoría del Pueblo del Peru 2007, p 37). This stage demands precise planning to prevent overcharging of storage facilities and requires an exact and cautious estimation of the collection intervals and volumes of the collected waste. (Harvey, Baghri & Reed 2002, p 110).
- **Transportation**: After the collection stage, the collected waste must be transferred to a treatment plant or the site for its final disposal. The transfer can be done directly or through a transfer facility, an infrastructure in which smaller vehicles empty the waste into larger vehicles, which will carry the load to a treatment plant or the final disposal site. (Defensoría del Pueblo del Peru 2007, p 38) Depending on the local availability and the amount of solid waste to be transported, the three

following ways of transport can be employed: Human, animal-powered and motorized. For instance, tricycle, donkey-drawn trolley and dump trucks (Harvey, Baghri & Reed 2002, pp 110–111).

- **Disposal:** It is the final management option and the last stage in the cycle of solid waste. This final disposal should be made in an adequate way, for this it should take place in specially conditioned places for this purpose, which comply with certain characteristics and technical requirements. (Defensoría del Pueblo del Peru 2007, p 39).The disposal methods range from landfilling, composting, incineration and resource recovery (Harvey, Baghri & Reed 2002, p 111). For most of the Peruvian municipalities the most advisable alternative technologically and economically is the use of sanitary landfills. However, in practice, most of them only have open dumps. The dumps are improper accumulation of solid waste on roads or public spaces either in urban or in rural areas. In all cases dumps lack sanitary measures, they represent hence undoubtedly a risk for the environment and the health of the populations. Finally, dumps lack sanitary authorization. (Defensoría del Pueblo del Peru 2007, p 39)

Variables to gauge waste

According to the California Department of Resources Recycling and Recovery 2019 **solid waste generation rate** refers to the quantity of waste created by residences or businesses over a given period of time. In this rate are included all materials disposed, no matter whether they are were later recycled or discarded in a landfill. In a review of global solid Waste Management the authors Hoornweg & Bhada-Tata 2012, p 8 consider that the rate of waste generation is definitely affected by economic development, the level of industrialization, people customs, and local climate. Birhanu & Berisa 2015, p 155 affirm that the rate of solid waste produced in a certain area is also determined by factors such as demographic development, seasonal changes, geographic situation and citizens' attitudes towards waste. Additionally, Hoornweg & Bhada-Tata 2012, p 8 suggest that the quantity of solid waste generated has increased together with the economic prosperity and the rate of urbanization. Therefore, a rise in living standards and consumption results in a growth of the amount of waste generated. That probably explains the fact that rural residents produce half of waste than their urban counterparts (Hoornweg & Bhada-Tata 2012, p 8), or that the waste generation rate of developing countries is considerably lower than in developed countries (Birhanu & Berisa 2015, p 155). Nevertheless, developing countries presents a higher amount of waste generated, due to greater levels of population growth, which present a perfect example of the impact of population size on waste generation rate (Birhanu & Berisa 2015, p 155).

On the other hand **waste composition** indicates the amount of different material types in a specific waste stream (Birhanu & Berisa 2015, p 155). Similar to the waste generation rate, waste composition

is highly variable since it depends on a range of factors (Strange 2002, p 4), (Birhanu & Berisa 2015, p 155). According to Gidarkos, Havas and Ntzamilis 2005 cited in Birhanu & Berisa 2015, p 155 following factors are the most prevalent:

- Level of economic development: In places with higher income is usual that the produce of inorganic materials is higher than organic (Hoornweg & Bhada-Tata 2012, p 17).
- Demography: Refers to the population density, for instance in tourist places, the density is higher and therefore the waste composition is higher as well (Strange 2002, p 4).
- Location: The location of an area, its wealth of natural resources and the presence of a variety of regions as well as the socio-cultural factors have also a great influence in the variation of waste.

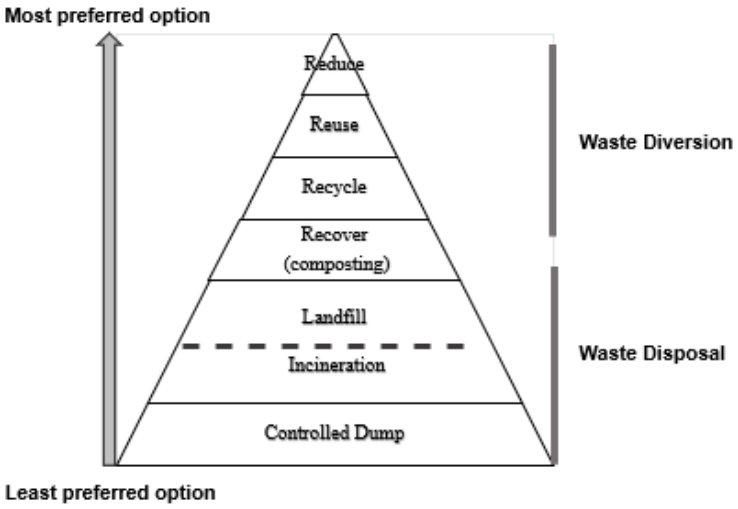
In addition to those factors, household's waste composition also reflects the existence of waste minimization initiatives, for instance home composting (Strange 2002, p 4).

2.4.1 Integrated solid waste management

After many years of carrying out WM in an irregularly and relatively uncontrolled way, the implementation of a new sustainable WM approach emerged (Strange 2002, p 34). For Chandrappa & Das 2012, p 17 Integrated Solid Waste management (ISWM) is a WM approach, which effectively takes into account the environment and the peoples' health (Chandrappa & Das 2012, pp 17–18). Additionally, its planning does not disregard factors such as the use of appropriate technology, work conditions and the implementation of a "social license" between the community and the WM competences, who frequently are the local authorities (Hoornweg & Bhada-Tata 2012, p 25). In order to consolidate an ISWM whether immediately or over it is essential to exert motivation and execution of actions in order to enable new environmental behavior and attitudes. Here is where participation and awareness arguments should act as instruments to minimize the waste problematic, so it is important to achieve interest and involvement from all social stakeholders (Brito & Pasquali 2006).

According to Hoornweg & Bhada-Tata 2012, p 25 ISWM is based on the hierarchy of WM. As shown in Fig. 4 the most preferred WM option is situated on the top, and as the level decrease so does the preference. From this graph can be also seen that the WM options can be divided into two phases. The one where waste is diverted through systems such as reduce, reuse, recycle (also known as the 3Rs) and recover techniques. In the second phase located in the bottom of the pyramid, the disposal options incineration and landfill can be found, both are considered as the least desired waste techniques.

Figure 4: Hierarchy of waste management



Source: Adapted from Hoornweg & Bhada-Tata 2012, p 27

Every level or management option from the waste hierarchy will be explained bellow:

a) Waste reduction: This option includes actions such as prevention, minimization and reuse. All of them attempt to reduce the amount of waste at the source point. The effort occurs when products are redesigned or by a shift in patterns of production and consumption. By reducing the quantity of generated waste the greenhouse emission can simultaneously be achieved. (Hoornweg & Bhada-Tata 2012, p 28)

Prevention is basically how WM begins, it describes the prevention of waste even before it is produced. Since what is not fabricated does not have to be discarded. Waste prevention is essentially the improving of manufacturing manners and it influences the consumers so that they demand environmentally friendly products and less packaging. Many countries in Europe are organizing awareness-raising campaigns to encourage citizens to seek products that leave behind less waste, which could create a more resource efficient market (European Comission 2010, p 15). Further, minimization implies a reduction in the generation of waste, which can be reached for example by improving manufacturing processes as well changing consumption patterns and habits in households (Defensoría del Pueblo del Peru 2007, p 34).

b) Waste reuse: Consists in the reiterated use of articles and its components for the same objective as for what they were created. This takes place for example when products or materials like clothes and furniture that would have ended in the disposal site, are reused. The practice of this management

technique holds social, economic and certainly environmental benefits. Because through it local employment can be created and at the same time created products can be available to consumers who normally could not afford them. (European Comission 2010, p 15)

c) Recycling: Is the activity of recovering solid waste in order to return it as a raw product into the productive cycle (Barrios Napuri et al. 2009, p 89). Among the most important benefits of recycling are the reduction of the quantity of waste that otherwise would end in landfill sites. Recycling is also decreasing the amount of material required from nature. In addition, this option helps saving energy. This is perfectly visible for example in the case of recycling aluminum cans when it saves 95 percent of energy required for the whole production process of a new can from the raw material (European Comission 2010, p 11).

d) Recover: Compost is the result of a process of degradation of botanical and putrescible waste, bacteria, fungi, insects, animals and air are responsible for this transformation. It can be said that compost is a residue that arises from biological decomposition processes, where organic materials rot and compost form carbon dioxide and water. Compost can be used as a fertilizer to help the growing process. (Strange 2002, p 17)

e) Landfill: Sanitary landfilling is a process of refuse's treatment, this WM option is considered in the ISWM as the least desirable option. Strange 2002, p 28 defines landfill as waste areas, where refuse is spread and compacted. Usually, the waste is buried and then covered with a layer of material mostly soil. This contributes to avoid pests, rubbish, smells, and diminishes risks of fire. Furthermore, a modern landfill is created to contain refuse and its decomposition substances until they reach a certain stage in which they are stable and limp enough to present no more any risk to the health of the inhabitants and to the environment. An improper managed landfill could lead to great risks immense disadvantages such as liberation into the air of methane, a potent greenhouse gas which is 25 times more toxic for the environment than carbon dioxide, this gas can be produced in the landfill heap and provoke explosions. The landfill facilities should have chimneys for the capture of gases, drains for the collection of leachates, drains of run-off for capture of the rains, protection fences, appropriate access roads, among others (Defensoría del Pueblo del Peru 2007, p 39). Finally, it is important to mention that in developing countries there is commonly a lack of adequate landfilling, where they usually upgrade from open-dumping, controlled dumping, controlled landfilling to sanitary landfilling (Hoornweg & Bhada-Tata 2012, p 29)

f) Incineration: The incineration process refers to the burn of waste, after the extraction from bulky elements. In contrast with the past when incineration was used mainly to process waste, nowadays incineration plants are conceived also to recover energy and create steam, hot water or electricity (Strange 2002, p 25).

To conclude this section it should be stated, that to implement the above WM techniques depends on factors such as the composition of waste, the local management system and the current possibilities for waste trade of the location (Strange 2002, p 7). Finally, one of the greatest barriers for implementing sustainable WM options is the high cots that it represents and the difficulty to agree on who should bear them (Strange 2002, p 2).

2.4.2 Problems from inadequate waste management

Inadequate management of waste causes a great deal of problems in short- as well as long-term. Especially in low income countries waste is managed in an unsustainable manner. Indeed, in these countries more than 90 percent of the produced waste is disposed in illegal dumps or openly burned (The World Bank 2019). This together with the poor status of sanitation is often the cause of severe pollution problems (Kajokare Karija, Shihua & Lukaw 2013, p 98). Nevertheless, it is important to clarify that the waste impacts that waste could have either on the environment or on the health of people depends in greater part from the waste composition and the disposal waste practices (Triassi et al. 2015, p 1217). The negative consequences of WM are divided into: open dumps, backyard burning, contribution to climate change and effects on people's moral:

a) Open dumping

Barrios Napuri et al. 2009, p 87 in the *"Guía de orientación en saneamiento básico para alcaldías de municipios rurales y pequeñas comunidades"* state that, in rural areas of Peru, people usually dispose the waste either in their backyard or in their fields. In cases where people live in densely populated areas, they tend to throw it into certain accumulation points, which become garbage dumps. The dumps with domestic waste become infected sites, which attract rodent infestations, help to the proliferation of bugs and cause odors nuisance.

As reported above decomposing organic waste attracts animals, parasites and flies. Flies that have been in contact with feces may play an important role in the disease spread, especially fecal-oral diseases. Rodents are carriers of diseases like leptospirosis and salmonella, they may also attract snakes to the waste heaps. Another potential carrier of a number of viral diseases are mosquitos. For instance, in standing water sources the Aedes mosquito lay its eggs, which are responsible for infecting humans with dengue and yellow fever. The availability of these potential places for mosquito to breed may also attract the mosquito Anopheles, a malaria vector and the Culex, who breed in stagnant water loaded with organic content and is responsible for transmitting microfilariases (Harvey, Baghri & Reed 2002, p 105). In an investigation carried out in the south of Italy which focused on occurrence and severity of health effects related to illegal waste disposal Triassi et al. 2015, p

1232, the authors reached the conclusion of a possible long-term role of waste on liver and lung cancer mortality. The short-term role waste related health effect were congenital malformations.

In other study on the impact of improper SWM practices and sanitation status on water quality and public health conducted in Juba, South Sudan it was demonstrated that open dumping and lack of basic sanitation was causing the contamination of the river Nile with high fecal coliform concentrations. As a consequence its contaminated water cause as water-borne diseases like typhoid, diarrhea, dysentery, hepatitis A and occasionally cholera. (Kajokare Karija, Shihua & Lukaw 2013, p 98) In a similar study carried out in Rawalpindi, Pakistan Ejaz et al. 2010, p 382 it was reported that especially in rainy seasons open dumped sites were responsible for streaming leachate to water sources.

As stated above toxic leachate is created by the mix of organic and inorganic substances when both react chemically. Leachate generated from organic waste is not toxic, but if it is contaminated with non-bio degradable waste it can be. Mixed leachate contains high amount of toxic substances, great levels of nitrates and sulphates, creating a perfect environment for the proliferation of germs. In addition, leachate might be loaded with heavy metals such as lead, mercury and arsenic. The emitted toxic substances contaminate the soil and the water sources, and they make their way to the human through animals and plants that are later consumed by people. (Goverment of Kerala 2015, p 10)

a) Backyard burning

In rural areas inadequate disposal practices like backyard burning are usual. This practice produces toxic substances such as dioxins, and the environmental conditions of these areas may facilitate the spread of these emissions on food crops and grazing lands (Goverment of Kerala 2015, p 6).

Dioxins modify the essential growth and development of cells so great that it can have influence in the development of human body (Goverment of Kerala 2015, p 4). In fact, it was demonstrated, in distinct levels and through different exposure means, that it generate a wide range of carcinogenic and non-carcinogenic health impacts (Rushton 2003, p 191). Ash is another toxic element produced by backyard burning, this substance may contain lead, mercury, chromium and arsenic (Goverment of Kerala 2015, p 6). Sulphur dioxide and particulate matter are also present in the contaminated air. Investigations have showed that particularly in sensitive age groups such as children and elderly or persons who already suffer from asthma or cardiovascular diseases, it may have impacts on morbidity and mortality (Rushton 2003, pp 190–191).

b) Waste and Climate Change

The emissions release linked to SWM represent a major global concern because this so called “post-consumer waste” account approximately for five percent of the total greenhouse (GHG) emissions. But waste itself also creates greenhouse emissions. Paper illustrates this perfectly well, when the

majority of the emissions created occur in its production and much less when it is processed as SWM. For this reason to encourage the public to minimize waste through SMW can have a direct effect on GHG minimization. (Hoornweg & Bhada-Tata 2012, p 29)

c) Moral effect of inadequate waste disposal on population

Ultimately, staying in an unhealthful and messy environment my have as a consequence that people feel demoralized and have no motivation to improve life conditions. Additionally, to be surrounded by waste can attract even more waste and may cause unhygienic behaviors (Harvey, Baghri & Reed 2002, p 105). Nevertheless, in nearly all studies about the impact of WM focus was posed on the arising health effects, leaving aside the socio-economic effects (Rushton 2003, p 195).

2.4.3 Solid waste management in rural areas

This subchapter will focus on the particularities of the Solid Waste Management in rural areas in low income countries. Mihai 2017, vii points out that in rural areas of developing and transitions countries Solid Waste Management represents a great challenge due to the deficiency or even the nonexistence of proper WM facilities and services. Some of the reasons for this propensity are the low technical capabilities of small municipalities, lack of adequate infrastructure, and the unaffordable prices of landfilling or adequate combustion of solid waste. (Buenrostro, Márquez & Ojeda 2014, p 3098)

The final disposal of solid waste definitely adopts special features in small and rural areas, the factors which lead to this particularity are following:

- Lack of appropriate technology to achieve a proper waste disposal as well as lack of know how from responsible authorities to deal with possible problems that arise from inadequate final disposal. (Barrios Napuri et al. 2009, p 87)
- In locations situated in cities WM is normally financed through governmental taxes, in rural areas, on the contrary, the locations do not usually have enough funding or do not have this income, which makes it impossible to incur the expenses of treating wastes (Mihai & Taherzadeh 2017, p 3).
- Due to the reason that people living in rural areas do not have cleaning services provided by the municipality or the government, they develop a higher sense of responsibility and engagement for WM than people living in urban areas, where people usually have the waste treatment service provided (Mihai & Taherzadeh 2017, p 3).
- The collection and treatment of waste in rural areas turn to be difficult and expensive because the sites are normally scarcely distributed (Mihai & Taherzadeh 2017, p 3).
- The rudimentary infrastructure of waste facilities and services. For instance, for the waste transport between communities animal-driven carts, tricycles, and tractor-trailers are usually

used. And it is very common that the collected waste is discarded into open dumps or on river banks (Mihai & Taherzadeh 2017, p 6).

Another characteristic from rural areas is its vulnerability created mainly through the lack of monitoring and ineffective implementation of laws (Mihai & Taherzadeh 2017, p 7).

For all the foregoing reasons it can be said that pollution activities in rural areas tend to become uncontrollable (Mihai & Taherzadeh 2017, p 6). The following chapter provides an illustration of the generation and composition of garbage in the capital of the district to which the case study Amaru belongs.

2.4.4 Composition and generation of waste in Pisac

This section will deliver information about the current waste generation rate and waste composition of Pisac. The Pisac municipality so far has not carried out any waste characterization and quantification in the rural areas of its jurisdiction. That is why it was decided to refer to the results of this study, in order to provide an approximate reference of the waste streams in the district. Nevertheless, this data should be treated cautiously, since the data submitted belongs to a city, where the consuming habits and therefore the type and amount of waste generated, might differ from the rates in a village like Amaru.

The waste monitoring conducted in the year 2016 shed light on the waste generation per capita. The results of the study registered an amount of 0.49 kilograms of waste per day per household. In terms of the rate of the total waste generation in the district, it was 1.74 ton per day. In the same report the waste composition was also looked at. The organic fraction was the highest, it was 51 percent of the total amount. The second highest percentage was the sanitary waste, followed by plastic bags, which made up six percent and the last significant amount was made by the inert waste with five percent in total. The amount of the other types of inorganic waste lies between one and three percent. Table 2 sumarized the physic composition of the solid waste in Pisac. (Municipalidad de Pisac 2016, p 123)

Table 2: Waste's composition in Pisac

Material	Percentage %
Organic Matter	50.9
Wood	2.21
Paper	2.15
Cardboard	1.07
Glass	3.01
PET plastic	2.26
Hard Plastic	3.01
Plastic bags	6.32
Tetrapak	0.61
Expanded polystyrene	1.1
Metal	2.84
Fabrics, textiles	1.74
Rubber, leather	1.13
Batteries	0.49
Remains of medicines, bulbs	0.29
Sanitary Waste	15.09
Inert Waste	5.14
Others	0.64
Total	**100,00**

Source: Own elaboration based on Municipalidad de Pisac 2016, p 123

2.5 Attitudes towards solid waste management

Although there have been many attempts to explain attitudes, this chapter will only focus on the definitions that link attitudes with behavior. It will start with a general definition and will end inquiring in detail about people's attitudes towards WM.

Nandini N. 2013, p 91 defines attitude as "a hypothetical construct that represents an individual's like or dislike for an item. Attitudes are positive, negative or neutral views of an 'Attitude Object'. People can also be 'Ambivalent Towards' a target, meaning that they simultaneously possess a positive and a negative bias towards the attitude in question." In the case of the environmental attitude of a person, the "object" can be understood as some characteristics of the environment or an issue linked to it (Buenrostro, Márquez & Ojeda 2014, p 3098). Guevara Martinez & Guevara Fiore 2015 consider that although attitudes and behavior are two different matters, they are closely linked to each other since both are part of a common process. Indeed, the relationship between attitudes and behavior is bi-directional. On the one hand, attitudes can be considered as behavioral predispositions and on the other hand behaviors can be regarded as potential generators of attitudes. (Guevara Martinez & Guevara Fiore 2015)

In order to gain an expanded view of how this relationship operates, a brief explanation of the Theory of Planned Behavior (TPB) will be presented. This theory assumes that human beings are rational (with certain exceptions) and systematically use the information they have available to make decisions (Brito & Pasquali 2006, p 340). According to Ajzen 2012, p 438 what a person does, "its behavior", is conditioned by the intention to perform the behavior. The intention is the extent of probability in which a person acts in a particular way. The intention can be predicted by the attitudes towards a behavior, subjective norm and perceived behavioral behavior.

Negative or positive attitudes towards the behavior: Arise from the subject's beliefs in the consequences of its behavior. Every belief automatically relates a certain behavior with an outcome and to each outcome a certain subjective value is assigned. In this theory it is assumed that an evaluation of the behavioral beliefs and outcomes takes place, when those both factors are mixed, they create negative or positive attitudes from the subject towards that behavior. (Ajzen 2012, p 441)

- **Subjective norm:** Is based as well on people's beliefs in this case the so-called normative beliefs, which make us think other people wish us to act in a particular way. Those beliefs are different in people. In the model it is assumed that normative beliefs, especially social referents, mingle to create a perceived social pressure. In other words, *subjective norm* refers to the perceived social pressure or the importance that is given to the expectations that the subject perceives that other people have of them for performing or not performing a behavior. A subject will act, considering the consequences of its actions, and will prefer the positives over the negatives. (Ajzen 2012, p 443)
- **Perceived behavioral control:** Is based on the persons' beliefs of the resources and obstacles that can facilitate or hinder a behavior.

To sum it up, beliefs lead to the formation of attitudes and values, the social environment leads to subjective norms, and both create the purpose of intention that in the end determines the behavior towards a particular object. (Brito & Pasquali 2006, p 340).

Few studies have been published on attitudes towards waste handling. One of them is the work of Eneji et al. 2017, p 244, who carried out an investigation on "Attitudes towards Waste Management and Disposal Methods and the Health Status of Cross River State, Nigeria" the research findings showed that the residents of the studied city had an unfavorable attitude toward WM and disposal. According to the authors these negative attitudes seem to have a powerful influence on the way how the citizens dispose waste since people in Cross River State dispose their waste mainly in open dump yards. This investigation also showed that that behavior had clearly negative consequences on the resident's health. Another factor that can be influenced by positive attitudes towards WM is the waste generation rate. This rate can be influenced in the manner in which people use and handle

waste, as well as the degree of concern for waste reduction and minimization that they possess (Birhanu & Berisa 2015, p 155).

Finally, Hasan 2004, p 484 suggests in his study about public awareness and participation, that "*there is a clear difference between the attitude of an informed and environmental aware person and that of an uninformed and environmentally illiterate individual".* According to him an environmentally conscious person, for example, tends to keep out hazardous waste items such as batteries from the waste stream in order to later deposit it in a proper designed facility. The previous study confirms the relationship that exists between attitudes and awareness. At this point, it is needed to review next chapter, where awareness will be explained in detail.

2.6 Awareness of solid waste management

Awareness is generally understood as "knowledge that something exists, or understanding of a situation or subject at the present time based on information or experience" (Cambridge Dictionary 2019). In this investigation the focus will be upon WM awareness, which is indisputably linked to environmental awareness. Therefore this section will present various definitions of it. This chapter will also explore its elements, the possible way how to raise WM awareness and the reasons why the improvements of WM awareness could not be achieved.

Harju-Autti 2013, p 545 defines environmental awareness as a "state of being aware, having knowledge about, and being conscious of the external surroundings in which people live and work, and which tend to influence people's development and behavior. A high level of environmental awareness enables conscious choices to act in an environmentally friendly way." Another definition is provided by Schwartz 1977 cited in Han, Yu & Kim 2018, p 1123 for him environmental awareness is "one's conscious/awareness level of negative consequences for one's valued objects (e.g., natural environment, other people, animals, habitats, and plants) when not engaging in pro-environmental behaviors." From his definition can be deduced that, if people are conscious and know that their actions can have a profound negative impact or effects on the environment, then they may compromise on environmentally friendly activities. The elements of environmental awareness are presented by Harju-Autti 2013, p 545 in his comparison and analysis of the environmental awareness of people living in different cities in India. He considers that ecological awareness is made up of three elements namely: motivation, knowledge, and skills. For the author, the motivation of an environmentally aware person is mainly based, next to its values and attitudes also on its concern about environmental issues. Hence, a motivated person will understand the importance of his participation and responsibilities. Knowledge refers to having information about environmentally relevant issues and to under-

stand its causes and consequences. The last component are the skills, which are the personal abilities to take action in various environmental topics such as waste reduction, clean energy and means of transport, etc.

To raise awareness on adequate recycling and achieve household participation, it is advisable to apply different appropriate communication techniques. The message can be sent through communication channels, like television, radio networks and newspapers (Omran et al. 2009, p 283). Furthermore, the strategies could be conducted by announcing it on the radio and the television or enlightenment and clean up campaigns (Festus, Dr. & Ogoegbunam 2012, p 256). Raising awareness about WM is crucial to resolve the issues linked to waste pollution (Festus, Dr. & Ogoegbunam 2012, p 257). Further, the benefits of a higher awareness about WM include:

- Residents and government authorities competent for Waste management may be influenced with positive attitudes, abilities, values and concern to the environment (Festus, Dr. & Ogoegbunam 2012, p 257).
- Households aware and conscious about the impact of improper waste disposal on their health may have a healthier life. They will be able to protect themselves from diseases like diarrhea, cholera, hepatitis and cholera (Jatau 2013, p 121).
- People with an acceptable knowledge of the negative effects of poor WM may follow good waste management practices, which can lead to the enhacenment of their personal hygienic habits (Jatau 2013, p 121).
- Conscious people, who are aware of the consequences of illegal dumping, may refuse to dump their discards on inadequate areas such as roadways, streets and public places (Ezechi et al. 2017, p 234).

Stakeholders are encouraged to participate in waste management activities such as segregation, minimization, reuse, composting and recycling of solid wastes(Festus, Dr. & Ogoegbunam 2012, p 257).

There are multiple challenging issues to consider when raising awareness about the SWM. However, the obstacles depend strongly on the society and the residents involved. Some of them are: (Climate and Clean Air Coalition (CCAC) 2013):

- Scarcity of founds and capacity.
- Deeply rooted customs and practices, beliefs, and behavioral norms. For example, if the waste generators do not believe on the monetary value of waste, they will tend to not separate waste. In the same way they may not take advantage of the economic opportunities related with waste management

- No or limited capacity from technical and financial resources to reach the public
- Little to none legal support
- No interest or lack of time from the stakeholders

Although awareness-raising owns a significant role in the success of any waste management strategy, it does not ensure that people will act environmentally-friendly (Nalan et al. 2011, p 339).

2.7 Tourism and waste generation

Tourism has undoubtedly a strong relationship with the environment since environment is considered a main component of tourism (Holden 2003, p 23). A clear illustration of this statement can be appreciated in one study of “Quality perception of a destination”, this study focuses on the opinion of tourists about a certain tourism destination. The results revealed that tourists place a great value on the physical and cultural characteristics of the environment of a destination. In fact, they prefer to be surrounded by a clean and quite environment, to have a healthy climate and relaxed atmosphere, as much as enjoying an exquisite typical cuisine. (Holden 2003, pp 34–35)

However, it may sound contradictory, but tourism can also be the reason for a touristic place to lose its charm and therefore induce a loss of its visitors. There is a wide range of reason for this to happen. For example, Cooper et al. 2000 cited in Dileep 2007, p 381 indicates that in order to allow tourism to emerge, or during the course of its development, the environment is modified to serve it, which can produce possible environmental negative impacts (Dileep 2007, p 381). Despite of it, topics such as the connection between tourism growth and MSW generation has not been sufficiently researched, which is a disconcerting aspect. Since in many regions this sector is one of the most important WM generators (Arbulú, Lozano & Rey-Maquieira 2015, p 629). This is the case of the Kilimanjaro Park in Tanzania where tourism, already since its establishment, has caused a wide range of environmental problems. The increase of the solid and liquid waste generation for example is posing great challenges regarding its collection and disposal (Kaseva & Moirana 2010, p 695).

Greco, Cenciarelli & Allegrini 2018, p 62 carried out a research between 68 Italian municipalities. The investigation examined the effects of tourism activity on the solid waste collection costs. The findings showed that the collection costs of different types of waste were clearly higher by the number of tourists staying overnight and their expenditures. Additionally, the waste generation rate per capita was influenced by the number of visitors, the quality of tourism and the specialization degree in tourism. (Greco, Cenciarelli & Allegrini 2018, p 67)

Finally, to prevent and minimize adverse effects of tourism on the local waste management performance the competent authorities should recognize the immense challenge that an increase of visitors poses to the WM capacities. They should also take actions or adjust its WM strategy to be able to control it and avoid dangerous situations for the tourists, inhabitants and the environment.

3 Methodology

The purpose of this chapter is to describe the research approach, the methods, and the research design applied in the whole investigation process. In subchapter 3.1 a summary of the investigation's process. This chapter will emphasize the last phase of the investigation process. In the following subchapter 3.2, the data collection methods will be addressed, where both applied methods (interview and observation) will be explained in detail. The sampling method used to develop the sample for the interviews will be described in subchapter 3.3. The last subchapter will provide insights about the investigation process.

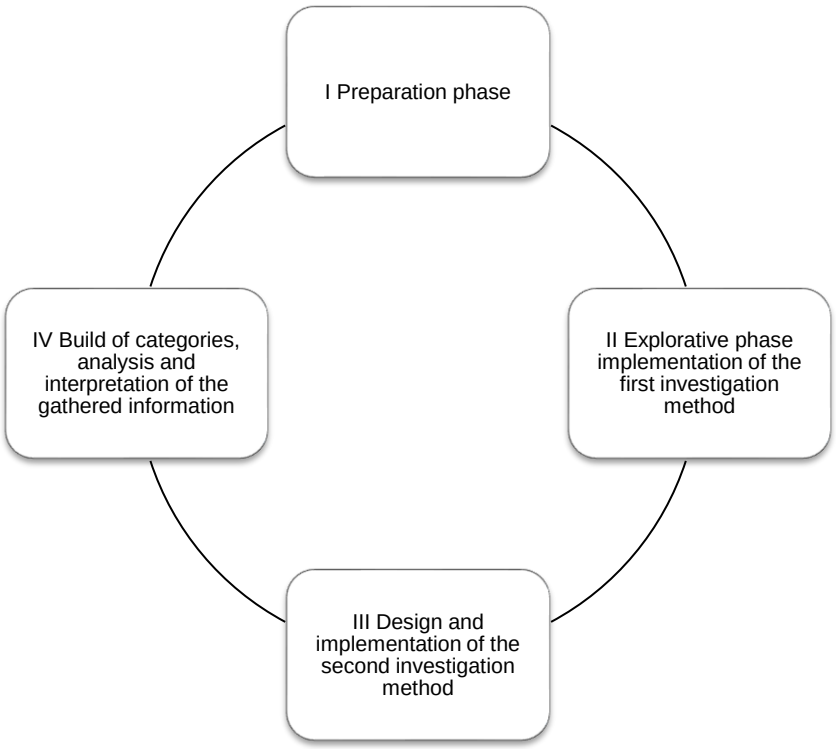
This investigation was developed with a qualitative focus, an alternative that best meets the objectives and conditions of this study. The qualitative method allows the researcher to have an authentic view of the study object (Mayer 2013, p 25). Since qualitative research aims that the respondents are interviewed in their every day, natural sitting, they take place partially in the field, for instance, in ethnographic interviews (Misoch 2015). Both qualitative methods applied in this study were executed in a trusting environment of the respondents allowing the researcher to communicate with them, discovering with it their real-life situations. Likewise, the qualitative approach is based on the construction of theories, on the contrary to the quantitative method, which mainly checks theories. The qualitative research process will not necessarily be planned or follow a linear form (Döring, Bortz & Pöschl 2016, p 67). As an illustration, in this study, some research questions were developed at the beginning and others were set up during the research process.

Another reason to chose this method was the fact that just little was found on scientific literature about the topic of investigation. Johnson and Christensen 2008 cited in Msezane & Mudau 2014, p 368 claim that qualitative research is used when there is no much known about a topic or phenomenon and when the investigator wishes to find out more about it. Furthermore, it was determined to work with a case study, to be able to describe a case, which will be the subject of analysis (Uwe 2004, p 147). The subject of this analysis is a small rural village, where the touristic activity has been slowly developing the last years. The village has its local SWM system, a community-driven system. The particular features of the Community Amaru made it the most suitable candidate to meet the research questions of the research. Finally, the qualitative method was applied to gain a certain kind of information that probably would have been lost with the use of a quantitative and standardized method (Mayer 2013, p 25).

3.1 Investigation stages

The research process was divided into four phases, which took place consecutively. For a visual representation of the investigation's stages, the reader is referred to Fig. 5.

Figure 5: Research stages



Source: Own elaboration

I Preparation phase

In this stage, an intensive review of various secondary sources of data books, scientific articles, statistics, reports, strategies, related to waste management, waste disposal, attitudes, and awareness took place.These lectures allowed the development of the project design. Likewise, the planning of the research travel was also included in this phase. The following aspects were considered: travel budget, extend of research period and set up of links with scientific contacts at the local level in the studying area. After the arrival in the study area, the researcher started to seek for a suitable case study. Parallel to this, in an attempt to gain access to official documents such as waste strategic management plans, documentation of waste education programs as well as to inquire about the possibility of a partnership and authorization to carry out the investigation, local governmental institutions were contacted. The final step of this stage was the design of the observation guide, followed by the beginning of the interview's design.

II Explorative phase implementation of the first investigation method

In this second stage, an examination of the study area took place, which was followed by first contact attempts with the studied community. The observation method was applied with the support of an observation guide and a photo camera to enable a photographic register.

III Design and implementation of the second investigation method

The step had the objective to obtain in-depth information about the study object. It began with the completion of the interview guideline design facilitated thanks to the inside information acquired during the explorative phase. The interviews were channeled to a sample of selected inhabitants of the studied area and to the president of the community.

IV Build of categories, analysis, and interpretation of the gathered information

The last stage of the investigation process started with the transcription of the 23 interviews and the drafting of the observation protocol. The subsequent step was to add the interview transcription files to the MAXQDA program. After this, it was possible to read the transcripts and directly note possible unusual answers that may require further attention (Kuckartz 2008, p 33). After that, variables from the first section of the interview guideline "*Socioeconomic data from the respondent*" were separately added to MAQXDA to link them to categories and codes. This approach had the objective to use the variables as criteria to select any desired subgroup further in the evaluation. The next step was to design a mindmap, which was created to establish categories and establish possible relations between categories and questions (see II Appendix 2). The mind map helped to build categories and groups of variables. At the same time, each specific variable contains one to three questions from the interview guide. I Appendix 3 contains a table, which links codes, variables, and the questions of the interview guideline. The variables and the categories were included in the MAXQDA program as codes. Fig. 6 presents a list of all generated codes.

Figure 6: List of MAXQDA codes

Source: Own elaboration

In total, were created around 25 provisional codes under the categories of attitudes, awareness, practices, and others. Each of the codes was colored: attitudes-yellow, awareness-red, practices-green (see I Appendix 4). The results were created with the support of a code matrix, an excel table that contents all answers divided by code and respondent. The use of this table was efficient and enabled the researcher to have all the answers classified by code at a glance. In this phase, the researcher adopted the strategy to create “case summaries” or interview profiles from each respondent (see Appendix 5). In the summaries, the interview’s information of the respondents was summarized, characterized, and translated to English (Kuckartz 2008, p 33). This summary also helped the researcher to develop an understanding for each person, and gain insights about their motives and their attitudes. This information helped to understand and clarify the reasons that each respondent had to give an unexpected answer. Finally, to understand and interpret the declarations was also necessary to draw on the observations and to the opinions of the communal President.

3.2 Data collection method

How it was already mentioned, within this investigation two scientific methods were applied, the observation and the interview. Whereas the observation supported not only the interview design but also the whole research delivering necessary background data, the interview was allowed having access to the interviewees’ intern “world.”

3.3 Observation

This section starts defining the participant observation method that was applied in the explorative stage of this research. Guest, Namey & Mitchell 2013, p 75 affirm that "*Participant observation is in some ways both the most natural and the most challenging of qualitative data collection methods. It connects the researcher to the most basic of human experiences, discovering through immersion and participation the hows and whys of human behavior in a particular context*." According to the authors even though everyone has taken part in observation situations, most of the time it does not happen within a scientific frame. A scientific observation requires data to be systematized and organized following an intrinsic fluid process.

The researcher accomplishes its role by, for instance, taking notes and pictures, also asking questions created to reveal the meaning disguising the behaviors. Put differently participant observation involves being integrated into a situation and context of a social setting while recording what is observing (Iacono, Brown & Holtham 2009, p 39).

In this particular investigation, the main reason to chose this method was the lack of elementary information not only about the situation of the local disposal waste handling but also documentation about aspects that determinate the quality and the way of life of the respondents. Since it can allow the researcher to get a realistic overall picture of the context in which the respondents live. To gain this information helped the researcher to obtain a rich insight into the studied object (Iacono, Brown & Holtham 2009, p 40). Furthermore, the observation phase was necessary to interact with the population and to comprehend them and be able to interpret their answers. Meyers 1999, cited in Iacono, Brown & Holtham 2009, p 40 states that researchers immerse themselves in the context of the studied group with the objective to understand the reasons why the respondents act in a certain way. A list of the observation objectives of this investigation is presented below:

- To gain a broad view of the social, natural, and economic environment in which the Community Amaru, the study object, is situated.
- To gauge information about the living conditions of the respondents. Because to be aware of the current situation may aid the researcher to interpret in a more assertive way the results of the investigation.
- To document the waste handling practices of the inhabitants of the community to later in the investigation either complete or compare it with the information gathered through the interviews. As well to set a baseline of the current waste management situation.

- To examine the current situation of both community dump yards. Since to have details about facts about the proximity to households, crop fields or water sources, can help to interpret how it can impact the life of the residents and therefore affect its attitudes and practices on waste handling.
- To gather information about the tourism activity in the area. Since the amount and the type of tourists may have an influence on the waste generation and littering.
- To find out about the hierarchy and the relations of their communal organization, considering that it can have a significant influence in the way how the residents of the community deal with the waste issue and it can also have an impact on the attitudes and awareness of the residents towards topics such as littering, waste separation or minimizing.

The observation guide explored six dimensions which are listed below. To obtain more detailed data, please refer to the Appendix 6,7 where the observation guide with its respective protocol can be found:

- *Socioeconomic characteristics:* this section attempt to describe the socio-economic conditions of the population. Here aspects such as religion, geographic location, economic activities, costumes that the researcher observed on the fieldwork are documented.
- *Infrastructure:* this dimension deals with terms such as housing, water, electricity, internet, accessibility, and sanitation.
- *Characteristics of tourism in the community*: this variable served to collect information such as the profile of tourists that visit Amaru, number of visitors, the touristic product, as well as the internal tourism organization. Also, to identify external entities involved in the running of the tourism activity.
- *Health services and diseases related to improper waste handling*: efforts were made here to inquire about reoccurring health problems as a consequence of bad habits in the disposal of waste.
- *Communal organization:* this part examines the composition of the communal board, the exiting relation between their members and the population.
- *Existing waste management practices:* last variable deals with characteristics of the local waste management. The structure design was inspired by the components of solid waste management. More details on this are given in Section 2.3.

The information obtained within the community was gathered through direct observation, photographic and video documentation, as well as through casual conversations with locals, community leaders, taxi drivers, small traders, local tourism guides, women from weaving, tourism cooperatives. Besides, key players at a communal and district level such community board members, personal of the local medical center, members of the department of environment of the Pisac municipality were

also consulted. Similarly, the author conducted regularly field visits to households, crop fields, the communal hall, the illegal waste dumps, and the local medical center. Table 3 shows both types of data that were applied in this stage of the research. The graphic also names and compares the challenges and constraints that both types represent for the researcher and its investigation.

Table 3: Data collection methods in the participant observation

Data type	Description	Pros and Cons
Observations notes/ audio/video	•The baseline for participant observation, notes, and recordings • Written/transcribed/digital record of what the researcher saw, heard or felt during the observation period	• Very open to emergent data, little/no instrument bias • Can be difficult to capture in some venues, time-consuming to analyze, subject to the bias of the researcher regarding what to note or record
Casual conversations/ Informal interviews	• Notes or recordings of actual conversations	• Captures data in the vernacular and context • May not be relevant to research objectives, can be hard to accurately record in some settings • May be highly idiosyncratic and difficult to analyze

Source: Own elaboration based on Guest, Namey & Mitchell 2013, p 93

The observation took place mainly in Amaru, from the second half of January to the second week of February. In total, there were three visits undertaken in periods of four to five days (15.01.2019 – 19.01.2019, 25.01.2019-29.01.2019, 05.02.2019-09.02.2019). As many Amarus's inhabitants work in the markets during the day in the city of Pisac, some informal conversations with them were carried out there.

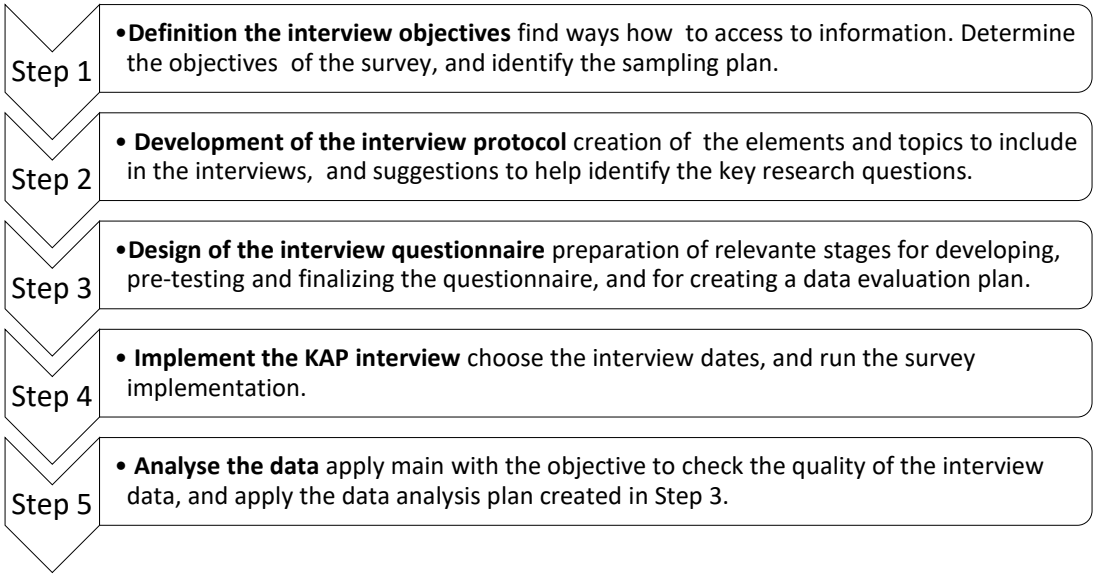
3.4 Interviews

The second qualitative method chosen was the interview. This data collection method allows the gathering of research-relevant data through a process of oral communication. An interview guide can be utilized to have a common thread by collecting qualitative verbal data. Some of the functions that the interview guide fulfills are as follow: it serves to create framing and focus, help to build a list of the all relevant topics that need to be addressed in the interview, allow to establish better comparability of data and it also enables to structure the entire communication process. The degree of structure of the guide can vary depending on factors such as the research question, the chosen interview method, or the experience of the researcher. Even though these types of interview guidelines specify

the relevant topics and issues, an order of the topics or answer options is not required. Furthermore, the interview is thematically based on the guide, and all its relevant topics need to be addressed to ensure the comparability of the data. (Misoch 2015)

The principles of the semi-structured interview fit better to the requirements of this investigation that is the reason why it was applied. The interview's design was directed by the knowledge, attitudes, and practices (KAP) guide. The KAP guide was initially developed to collect information about knowledges and beliefs of people about a particular topic. This method supported the researcher in the setting of the first steps of the interview design. During the evolution of the design, it was tried to follow all KAP steps. However, in some stages of the process, the process of designing the interview did not follow a linear order. Fig. 7 presents an adaptation from the five KAP steps (World Health Organization 2008, 4-6):

Figure 7: Knowledge, Attitudes & Practices guide



Source: Adapted from World Health Organization 2008, 4-6

In total 23 inhabitants and the communal president from the Community Amaru were interviewed. The questionary was divided into eight parts. The first part consists of questions inquiring about socio-economic information. The second part consists of data about the attitudes, perceptions, and awareness about waste and littering in general. The third section inquires about practices and awareness about disposal, recycling, and composting of domestic waste. Next section, deal with the attitudes and awareness about the prevention and minimization of waste. The fifth section includes information about attitude and awareness towards the local dump yards and its consequences. The six part comprises data about the satisfaction and responsibility of waste produced at a communal level. The seventh part consists of questions inquiring the waste education strategies, carried out in the com-

munity. The last part includes questions to inquire if the respondents are aware of tourists' preferences in the natural environment. Similarly, the content of the interview guide is guided by the objectives of this investigation. For better visualization and to establish a relation between the aim of investigation, the variables, and the results, the variables will be accompanied by a code. Code A will be used for attitudes, AW for awareness, and P for practices. Appendixes 8,9 contain an Spanish and English version of the interview guideline respectevely. In the English version the questions are colored, the one inquiring for attitudes are yellow, for awareness are red and practices are green respectively. Table 4 summarizes the variables and its objectives.

Table 4: List of variables & objectives

Variables	Objectives
Attitudes	
Meaning of waste (A1)	Establishing a baseline on the current state of the Amaru residents understanding of waste.
Littering (A3)	Find out how the residents feel about the community being polluted by garbage as well as the attitudes they adopt towards subjects who litter in public places.
Final waste disposal (A2)	Recognize the attitudes of the residents towards the dump yards.
Prevention of waste (A4, A13)	Recognize the attitudes of the residents towards the prevention of waste during the acquisition of groceries. Identify "comuneros" knowledge about natural cleaning products that can replace the regular ones to minimize packages and therefore, plastic.
Responsibility (A5, A6)	Identify who the persons or institutions are that are responsible for the waste generated in the community according to the comuneros. Determinate the opinion from the residents to their role in achieving a litter free community.
Participation in Waste Management activities (A7, A8)	Find out the attitude and interest of the residents to gain more information about topics such as composting and recycling. Recognize how the attitude of the "comuneros" is towards the implementation of educational strategies on waste education and their motivation to participate.
Influence of tourism in waste pollution (A10)	Identify how the residents think of the impact tourism has on waste and pollution.
Influence of the communal organization in waste management (A9)	Recognize the influence of the communal organization towards the importance that the community board gives to the waste issue in the communal reunions.
Satisfaction with the community board's job on the managing of waste (A11)	Determine possible recommendations from the residents to the community board to better manage the waste at a local level.
Influence of the community board in practices and beliefs (A12)	Identify the role of the communal organization and its possible impact in a change of the residents' behavior concerning waste issues.
Awareness	
Presence of waste litter (AW1, AW2, AW3)	Identify the awareness of the Amaru residents towards the existence of waste littering in the surroundings of the community in the present and its evolution during the last years and how it can affect the visit of tourists.

Consequences of improper waste disposal for the environment (AW6	Identify if residents of the community Amaru are aware and to which degree about the issues that an inadequate waste disposal has on the pollution of the water, air, and soil.
Knowledge about waste management techniques & Toxicity of hazardous materials.(AW4, AW5, AW8)	Establish the presence and degree of knowledge that the respondents have about waste management techniques, their process, and the importance of applying them.
Consequences of improper waste disposal for health (AW7, AW8, AW9)	Identify how is residents of the community Amaru are aware and in which degree about the issues that the improper disposal of waste produced in inadequate waste disposal as a cause for diseases.
Tourists and waste (AW3)	Identify the perception of the respondents of the way how tourists' value or dislike a clean or polluted natural environment.
Practices	
Waste Management situation (P1, P2, P3)	Document the current situation of the communal waste management strategy as well as the condition of the dump yards used by the community members. Generation rate, storage, minimization of waste, segregation and reuse, collection, transfer and transport, treatment, incineration, composting, final disposal (dump yard).

Source: Own elaboration

The interviews were carried out during the last week of February. Initially, the time frame to carry them out was set up to one week, but it was extended due to logistical difficulties to ten days (25.02.2019-07.03.2019). The interview implementation started approximately two weeks after the observation period. Those days in between were used to enhance and adapt some questions. The author herself conducted them and also was responsible for arranging all permits to make it possible. For instance, the researcher had to request formal authorization from the Pisac's municipality and the community board from Amaru.

In total were interviewed 23 adult persons from 22 selected households from the community Amaru and the president of the community. More details about the size and frame of the target group will be given below in section 3.5. To interview more than one person has the objective to use the other interview texts as an orientation framework and to be able to compare them with each other. Because if the researcher would have interviewed just one person, then the potential risk would have been to run or interpret this only interview exclusively with the information background of the researcher common knowledge or its own experiences about the topic (Arnd-Michael 2017, p 9).

The only interview which was not compared with others was the one carried out with one community leader, namely the communal president. His opinion as a key player and his insider knowledge was valuable for the research (Guest, Namey & Mitchell 2013, p 91). The intention interviewing him was to gain more deeply information about waste-related issues like littering and problems, which were previously identified during the observation. In addition, the president also gave some recommendations on how he thinks some current disposal problems can be solved or improve. The interview guide of the communal president can be found in Annex 10.

Other factors that were considered while planning and implementation of the interview guideline were interview time and the language. It was decided to set a maximum of 30 min for each interview. This may have reduced the “burden” of the respondent to the minimum (United Nations 2010, p 24). This situation is called a burden because the fact of being interviewed implies being intensively immersed in an emotional situation. (Misoch 2015). Moreover, the interviews were developed and conducted in plain language, given the fact that most of the respondents are not Spanish native speakers. Furthermore, the first four interviews were considered pilots. After this test phase, some questions, which seemed difficult to understand by the respondents were changed, and others were eliminated. All interviews were recorded, and transcribed, to later in the research take them as a basis to carry out data interpretation (Mayer 2013, p 25). For the evaluation of the interviews, the program MAXQDA was used. This program allowed the transcription, categorization, and interpretation. This aspect will be in more detail in Section 3.

At this point it is considered worthy to name some of the disadvantages of this research method. The first weakness of this scientific method is the requirement for cognitive efforts of the respondents and high probability of misinterpretation from the interviewer. Bias can arise, for instance through the possibility of influence from researcher to the behaviors of the respondents and or the other way around through the effect of the respondents on the beliefs of the investigator (Darke, Shanks & Braodbent 1998 cited in Iacono, Brown & Holtham 2009, p 41). Further, open answers generally require a prolonged time to analyze, which results in higher costs and time-consuming post-interview processes (United Nations 2010, p 125). Next section will provide a series of biases that arose during and before the interviews.

Correction and potential biases

During the implementation of the interviews some mistakes were made, their causes range from the interviewer inexperience to the lack of available time from both sides. A list of the main and most common identified mistakes and a set of possible solutions or recommendation for future research are presented below:

- First, despite having formulated the questions in plain language, some terms were not recognized by the interviewees. This communicative interference could have been due to the fact that some of the interviewees did not have a formal education that could allow them to understand some terms, which for other people with an average education level, would have been more facile to understand. Another reason could have been that the interviewees did not understand the question because they were formulated in Spanish and not in her mother tongue, Quechua. The last assumption to explain the interference is that the researcher talks in a very fast tempo. A solution to this barrier could be reached by explaining the terms in simple concepts during the

interview, translating them into Quechua, another option would consist of organizing in advance a short workshop with a group of residents to learn how they refer to the topic and formulate the questions of the interviews with this information.

- For some interviewed persons it was difficult to express their thoughts and opinions, as a consequence, they did not fully express their opinions in detail or they needed long time to formulate a spontaneous answer. The reasons for what they might not be able or not wish to express themselves could have been, for instance, the lack of trust towards the interviewer, the lack of communicative abilities, shame to express themselves for fear that their answers are incorrect or for fear of possible reprisals by other members of the community. Although the researcher tried to establish a framework of confidence with the interviewees by visiting them beforehand or by making repeat visits to the community gatherings. Probably, the time or the frequency of the visits was not enough for some respondents to take confidence. This issue could have been perhaps overcome with a longer stay in the studied area. On the other hand, the interviewer tried always to show empathy with the interviewees, being open and showing understanding, and maintain a neutral attitude so that the respondents feel relaxed and confident. However; this attitude did not always work. Because the researcher had the impression that some interviewees felt that the answers had to be correct and did not answer honestly or answer with the feeling they were in a test. Next extract show it:

  "I: El medio ambiente qué exactamente. ¿Qué parte del medio ambiente contamina, la tierra, el aire o el agua?
  B11: Aire pues (I: El aire)
  B11: Sí, yo pienso el aire pues. ¿no? ¿eso estaría bien?" (B11, 80-82)

  In this case, the recommendation is to clarify, before the interview begins, that there is no correct or false answer. The last possible cause of interference in this section, fear of reprisals probably did not happen, as the interviewer assured at the beginning a ano guarantee of anonymity.

- Another error was having left some answers in superficiality. This mistake occurred because of two reasons. On the one hand, the interviewer in an attempt to strictly follow the sequence of the interview guideline did not leave much time to the respondents to reply and rapidly posed the next question. And on the other because the guideline contained too many questions.

  "I: Y ¿tú crees que tu comportamiento o lo que sabes de la basura ha cambiado gracias a las asambleas?
  B13: Un poco sí (I: Sí ha cambiado) Sí un poco.
  I: A ver ¿puedes darme un ejemplo de lo que tú puedes hacer para que tú para que la comunidad esté más limpia?" (B13, 123-125)

  In this case the researcher could have asked examples of why the respondent though there has been a change in his behavior following a community gathering, but instead of doing that, the interviewer asked for examples of other topics. Arnd-Michael 2017, pp 16–17 suggests that the use of an interview guideline should not be confused with a standardization of the survey situa-

tion; it should, therefore, be used in a flexible way, to avoid for example narrowing down unexpected topics. In this case, it would have been more accurate to try to gain more information about the topics in question. Another solution to reduce the number of questions would have been to develop a short complimentary survey to replace close questions. In addition, this survey would have been useful to establish relation between variables in a faster, systematic and easier way.

- The next mistake was the unintentional use of suggestive questions. The next example clearly illustrates an interview situation in which the way how the question was posed had an influence on the answer of the respondent:

> *"I: Haber me cuentas un poquito de lo que sientes cuando ves basura. ¿No sientes nada o de repente tienes una sensación en el estómago de incomodidad?*
> *B1: Mmm (…) Cuando tenemos basura, nos sentimos mal, estamos siempre incómodos al ver esa basura. (…) Nos sentimos mal.*
> *I: ¿Se siente mal? (B1: Sí)" (B1, 28-30)*

In this case the researcher would have had to wait a bit more for the answer or propose an alternative more impartial or a list of mix alternatives with the aim that the respondent could have a big pool of sensations to choose, an alternative would be for example:

> *Te voy a nombrar sensaciones y sientes una de ellas cuando ves o te encuentras cerca de basura me dices cual de ellas vienen a ti: indiferencia, asco, alegría, júbilo, pena, rabia, dolor, gusto.*

Referring to the last recommendation, in certain cases providing alternatives for the answer did not solve the issue. As it can be seen in the next example where the respondent picked the first alternative of the list and automatically adopted as his/her own opinion:

> *"I: A ver (…) Con respecto a la basura que se genera aquí en la comunidad (…) ¿Quién crees que es responsable? Cada uno es responsable.*
> *B4: Cada uno es responsable por la basura.*
> *I: la comunidad o la municipalidad.*
> *B4: La comunidad misma porque no llevamos de acá en los carros de coyobamba baja*
> *I: la municipalidad entonces te refieres.*
> *B4: La municipalidad nos lleva las basuras que hemos juntado todo, sí." (B4, 120-125)*

- For the respondents, it was difficult to express their opinions, instated they described facts. This occured especially in two questions. In one inquiring about what their opinion of waste in general and in other questiong asking about their opinion about the dump pit. As it can be seen in the next example:

> *"I: Muy bien vamos a hablar un poco sobre los desechos sólidos. ¿Qué considera usted basura? ¿Qué objetos que cosas?*
> *B8: (…) basura nosotros guardamos aquí en mi casa en un tacho luego llevamos al acá la frente hay un hueco grande hay basura."*

To avoid that kind of situation, the researcher decided to overcome the abstract nature of those questions giving an example of concrete situation. Next example illustrates it:

> *"I: ¿Y cuando estás **cerca al botadero** y **ves toda esa basura sientes algo**?*
> *B8: Sí, siento algo medio como se llama como se llama un poco triste me siento*
> *I: ah te sientes triste (B8: sí) ¿Por qué?*
> *B8: aquí no hay mucha ayuda (I: porque no hay ayuda)." (B8, 153-156)*

Here instead of asking what you feel when you see waste? the question was complete with the situation of being near to the dump yard what do you feel when you are near the dump yard?

- There was one question, about the use of chemical fertilizers, the reason this why this question was chosen, was because the researcher assumed that the respondents use them. It would have meant the presence of hazardous waste in the waste stream of the community and therefore an issue that would have been necessary to inquire. However, as no one used them this question and its replies did not add much to the research.

Further, it is considered important to clarify that the answers in which was noted a bias, were not considered for the interpretation of the interviews. Finally, for the last question where two pictures were shown, it should have been used in the section of awareness about the consequences of waste pollution. To put them at the end was too repetitive.

3.5 Sample frame and size

In all empiric studies, the generation of a sample is decisive to ensure the quality of the gained data, and to guarantee the validity of the interpretations derived from it (Misoch 2015). In this research, it would have been impossible to inquire about all the elements of the survey universe. They would have been around 700 persons, that is the reason why it was necessary to work with a sample (Flick 1999, p.57 and Merkens 1997, P. 100 cited in Mayer 2013, p 38); the design of this sample frame and its size was defined before the data collection started as (Flick, Kadorff & Steinke 2004, p 181) recommend.

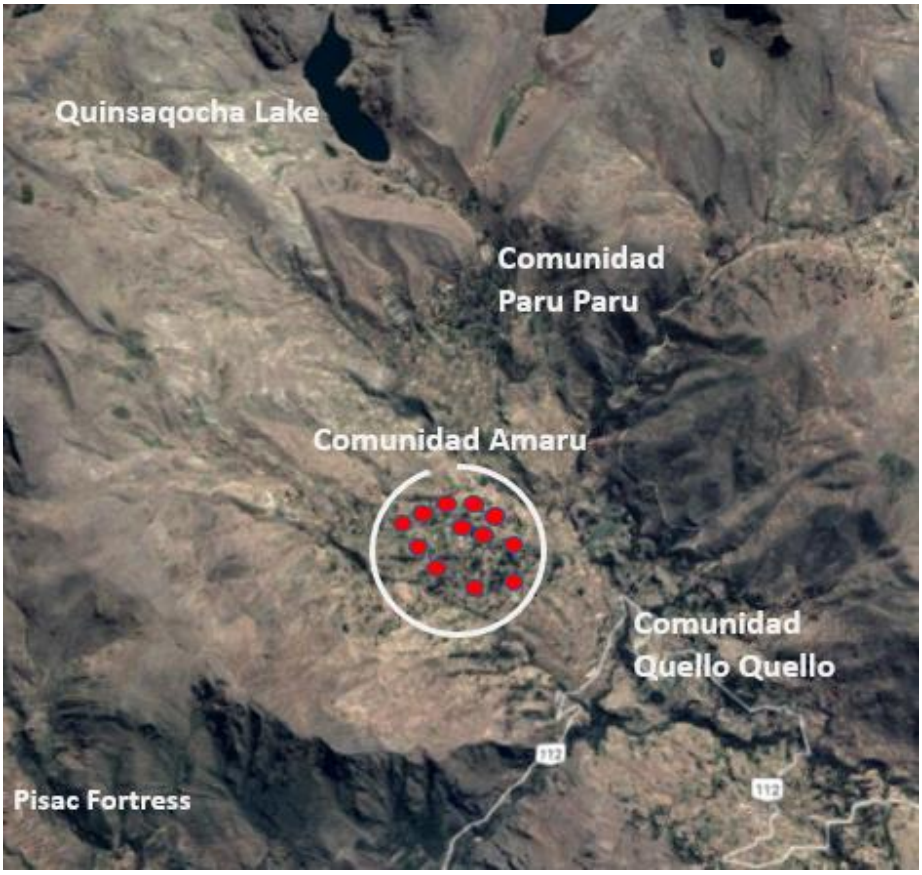
The type of sample applied was quota sampling, which allowed the researcher to select a sample in a systematic and deliberate way. This method chooses the sampling according to the distribution of specific features within the target group. Like that, the researcher can make an upfront selection of the respondents and then interview them (Misoch 2015). The criteria for the sampling applied to this research cover demographic, geographical, and social features. Additionally, another criterion was built from the differentiation between people who undertake work related to tourism and people who do not. This feature will allow, later in the evaluation of the interview, to compare both groups and recognize if there is any influence of rural tourism on the attitudes and practices of people who work within it. In total it was planned to interview 21 persons. It was decided to interview one member from each household to avoid duplication of information (United Nations 2010, p 43). However, two more interviews were conducted, as they were no planned the explanation in this section will not count them. The sampling was built according to the following sampling criteria:

- House location (sector)
- Age
- Sex
- Tourism-related job

The explanation of how the researcher arrived at those group divisions is given below. First, to accurately identify the population, it was necessary to consult the communal census. According to it, the total population of Amaru in the year 2018 was 769 inhabitants, and the total number of households was 210 (Directiva de la Comunidad Campesina Amaru 2019). By recommendation of the environmental department of Pisac, this quota was set to ten percent.

Likewise, these 21 households needed to be dispersed throughout all sectors of the community to reach families living in areas with difficult access. For that, it was tried to find a map of the sectors, but the search was unsuccessful. That is why the researcher was forced to create a list with all sectors, which was possible only with the support of the communal president and some residents. In total there were identified 41 sectors. From which at least 30 percent a complete list can be found in Appendix 11. It was decided to cover at least 30 percent of them. Hence, 12 sectors were intervened. The map shown below in Fig. 8 shows the 12 sectors intervened in the investigation. The sectors were Pampacancha, Qenqo Q'ata, Q'atawasi, Nusqopata, Llajarpata, Ichllopata, Rukello, Kantuscancha, Kapullajata, Aserjapata and Pampawasi.

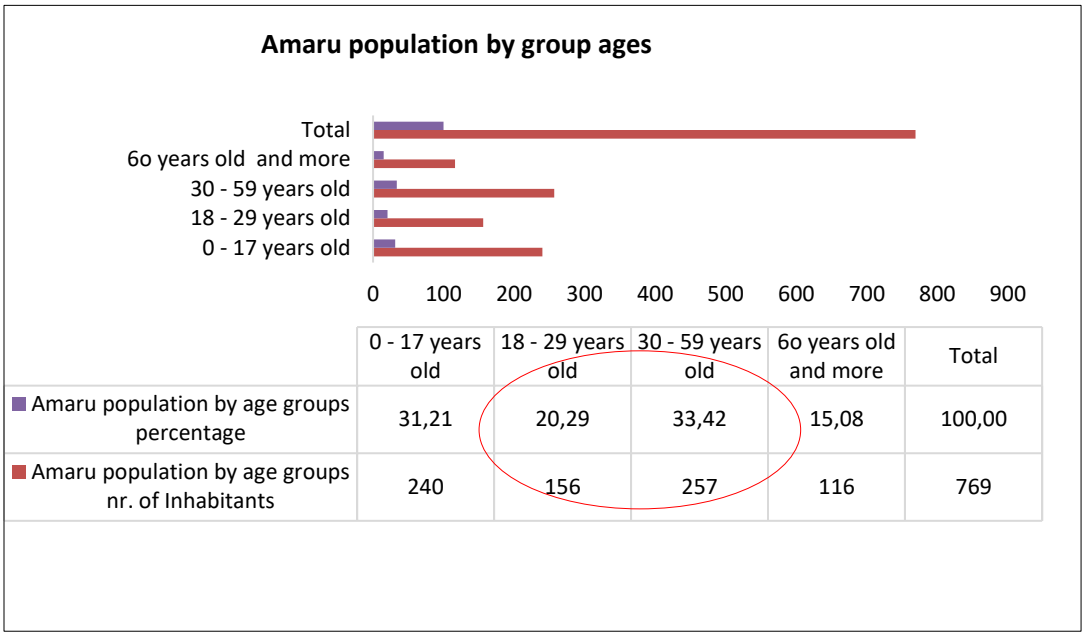
Figure 8: Map of intervened sectors



Source: Adapted from google maps, 2019 b

The next criterion applied, was the age of the respondents. Fig. 9 shows Amaru's population divided into age groups and its respective percentages. The target group of this research was people from 18 to 59 years old. They make up 57 percent of the total inhabitants of the community or 413 persons. Within these two age groups, a subdivision was applied. Resulting in three sub-groups, as it can be seen in Fig. 10 The subgroups are the *"young"*, *"adults"* and *"the mature adults"*. The "*young"* are composed of respondents from 18 to 30 years old, the "*adult*" constitute from people from 31 to 45 years old and the *"mature adult"* make up from respondents from 46 to 60 years old. They all make a total of 21 respondents and have 33.3 percent, 38.0 percent, and 28.7 percent respectively.

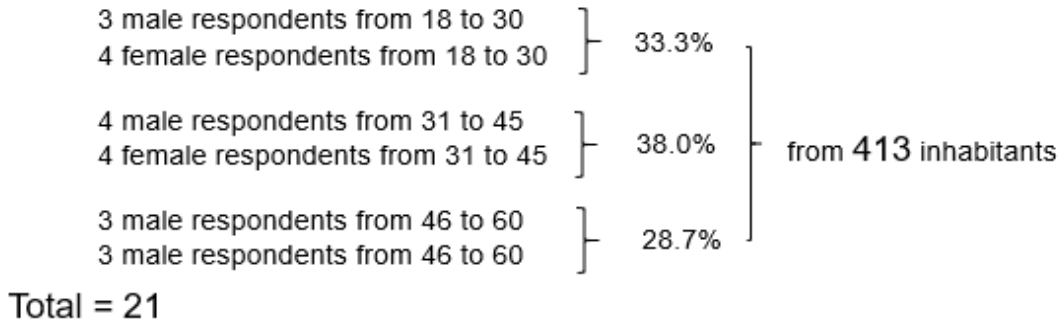
Figure 9: Amaru population divided by age groups



	0 - 17 years old	18 - 29 years old	30 - 59 years old	6o years old and more	Total
Amaru population by age groups percentage	31,21	20,29	33,42	15,08	100,00
Amaru population by age groups nr. of Inhabitants	240	156	257	116	769

Source: Own elaboration based on information provided by the Directiva de la Comunidad Campesina Amaru 2019

Figure 10: Sampling divided by age groups



Source: Own elaboration

Another characteristic taken into account was the sex of the population. In Amaru the female population is slightly bigger than the male one. Table 5 illustrates this information and also provides its percentage. The sample of this research has the same proportion as the sample universe, which make up 11 females and 10 men respondents.

Table 5: Amaru population divided by gender

Sexo	Nr. of inhabitans	% Percentage
Male	332	48.0
Female	359	52.0
Total	**[9]691**	**100**

Source: Own elaboration based on Instituto Nacional de Estadísticas e informática (INEI) 2018

The last motive, to choose the adequate interview partner, was the involvement of the respondent in the tourism activity. In total were interviewed half respondents who work or are employed in tourism and half who do not. Appendix 12 presents a detailed list of all intervieews and their profiles. Finally, one part of the population was ignored in the sampling, underage and elderly persons. The main reasons for leaving out the underage inhabitants off the research sample were that they neither assist to the communal gathering nor run tourism ventures. As well as to work with them would have meant to develop another interview guide, one more suitable for young people and to ask for the necessary permissions. Elderly persons were not taken into account because most of the people in this age are not be able to speak Spanish, the language in which the interviews were carried out. In addition, it should be also mentioned, that meeting the necessary criteria lead to significant difficulties. For instance; It was hard to find the most appropriate persons to interview within the community. Especially young people were hard to reach since they are usually working or studying during the week in bigger cities.

[9] There is a difference of 78 in the amount of inhabitants between the INEI and community's census. This research take mainly in account the data from the Community's census.

3.6 Evolution of the research idea

The research idea at the beginning of the investigation was to develop a strategy on waste education for a small rural village situated in the Sacred Valley[10] (Cuzco). The planned approach would have contained a series of pedagogical activities to apply to reach an environmentally friendly, effective and responsible manner of waste disposal. This program would have had activities such as workshops, training, and informative meetings. The main aim would have been to train and raise awareness of the local population on topics such as waste separation, minimization, consequences of littering on the environment and the health of the persons, etc. After invetigated for a certain time, it became clear, that a precondition to developing a successful strategy, was first to have a more comprehensive and in-depth knowledge of the ideas, opinions, preconceptions, environmental values and current practices of the people living in the studied area. However, there were no preliminary studies found, that would have served as a baseline for the realization of the strategy. The investigator had to make a decision either to fill the research gap and carry out the planned investigation or fill the research gap, leaving the first choice.

After a profound evaluation, the decision of creating the strategy was reconsidered due to the high probability of not having enough time and financial resources Not only because the timeframe allowed to submit the thesis would have been too short of completing it, but also because the researcher would have needed to stay in the studied area much longer than already planned to arrange and coordinate the educational activities. It was decided then to focus the research on the second choice, namely to inquire on the attitudes, awareness, and practices of the inhabitants of the rural area.

Once this decision was made, it was necessary to elect the village in which the research will be conducted. This decision was possible thanks to the support of a Peruvian university professor, who acted in this case as a *"gatekeeper*" (Misoch 2015). He offered the researcher the possibility to establish contact with local travel agencies and operators. So is how the rural tourism association "*La tierra de los Yachaqs*" was contacted. After email contact with its director, a meeting at the offices of the Association in Cusco - Peru was set up. The director committed herself to supporting the investigation and invited the researcher to a tourism networking event organized by the Ministry of Foreign Trade and Tourism (Mincetur) and the Red of Rural Tourism of Cusco. The participants of this event were in its majority local rural tourism entrepreneurs from the Cusco Region. (II Appendix 3) holds a summary of the conference. To attend the event was essential to come in contact with entrepreneurs from the Sacred Valley and obtain information about the planned study. As a result of this meeting, two communities were considered to work with, the community Hanac Chuquibamba and the community Amaru. Since both communities were under the jurisdiction of two different municipalities from

[10] Valley were the distric of Pisac is situated

the districts of Lamay and Pisac, respectively, the data gathering turned out to be tedious and complicated. Mainly because both municipalities were undergoing at the time a change of authorities. That circumstance led to considerable delays in data delivery, particularly in the district of Lamay. In Appendix 13, 14 can be found the authorization of the Municipalities of Lamay and Pisac respectively.

While waiting for the information from the municipalities, a visit to both communities took place. Both visits were conducted to gain a general view of the situation of their local SWM systems. To decide later on based on this information, if the situation truly represented a severe issue for the community. After visiting these two communities and having a closer look at the situation of their waste management systems, the researcher decided to concentrate just in one community, namely the Community Amaru. The litter-free situation of the community Hanac Chuquibamba was the main reason to ignore it in this research.

The chose of one was necessary, because work with the two of them would have meant to have to deal with two different municipalities. And even though they are ruled by the provincial *"Plan Integral de gestion ambiental de residuos sólidos de Calca,"* they still have their own local plan of Waste Management, which would represent for this investigation to operate in two different contexts.

The community Amaru is under the jurisdiction of the municipality of Pisac. The review of the district plans and reports of Waste Management revealed that the department of environment had totally ignored rural areas, since all efforts regarding waste management and waste education, were placed mostly in Pisac, the district capital. However, the new municipal management is setting up a new strategy that will take into account all 12 peasant communities under its jurisdiction. The department was particularly cooperative and assisted the researcher with advice to carry out the field research.

To be able to carry out the field research, the investigator also had to ask for permission at the Community board and get the authorization of all its members through consensus. The first contact with members of the community was achieved attending their monthly meeting. It was noticeable that some inhabitants mistrusted the researcher. A situation that can be understood as the community is currently facing social issues, which threat the communal land and resources, such as the privatization of the water by the government and the presence of mining companies in pursuit of new sites to acquire. Despite obvious difficulties many members of the community are facing today the researcher was able to obtain acceptation and trust from most of the inhabitants of Amaru. Finally, the community board and the municipality of Pisac express their interest to obtain the results of the study. Finally, it is highly probable that Pisac's municipality uses the findings of this thesis to support the development of its new Waste Management strategy plan.

4 Results and interpretation

The purpose of this chapter is to summarize and interpretate the data collected through the interviews and during the observation. The chapters structure follow the same chronological way, as the objectives of the interviews set in chapter 3.4. The interpreation and explanation will be complement with findings from other authors to allow a comparation and therefore search for similarities or differences.The chapter has been divided in four subchapters. Chapter 4.1 briefly explain the socio and economic features of the participants. Subchapter 4.2 reports the results from the interviews related to the participant's attitudes. In chapter 4.3 the outcomes of their awareness will be examined. The habits and practices of the community will be presented in subchapter 4.4. By reporting the results, it was decided to support some statements with quotes extracted from the MAXQDA file. For a better understanding of this chapter it is recommended to have a look into the observation protoco (Se section (VI Waste Management practices).

4.1 Socioeconomic characteristics of households

This section intends to statistically cover the investigated target group. Information about sex, place of residence, occupation, age, education level and tourism employment status will be given. As it can be seen from Tab 6 the total of respondents was 23, which makes two more respondents than planned. One of them is older than 60 and originally did not belong to the sampling. The second person was the husband and interpreter of interview B2A, who ended up giving his own declarations. Even though they were not originally planned, their declarations were considered of greater value for the investigation and therefore included in the research. In total there were11 woman and 12 men interviewed. The variable education attainments possess a mixed group of interviewees. The first outcome was that four out of five people without formal education are female. Furthermore, all people who had a higher education level than secondary school were below the age of 25. Regarding the variable of employment in tourism, half of the interviewed people worked in tourism.

Table 6: Profile of the respondents

Age			%
	46 and above	10	43,5
	31 - 45	6	26,1
	18 - 30	7	30,4
	Total	**23**	**100**
Sex			
	Female	11	52,2
	Male	12	47,8
	Total	**23**	**100,0**
Educational Attainment			
	Higher education	3	13,0
	Secondary	4	17,4
	Secondary incomplete	5	21,7
	Primary	3	13,0
	Primary incomplete	3	13,0
	No formal education	5	21,7
	Total	**23**	**100**
Employment in tourism			
	Yes	11	52,2
	No	12	47,8
	Total	**23**	**100**

Source: Interviews

4.2 Attitudes towards solid waste management from Amaru residents

4.2.1 Feelings and sensations towards waste (A1)

The objective of this variable was to explore the feelings and sensations that polluted places and waste awaked in the respondents. As attitudes and feelings are linked (Nandini N. 2013, p 91).

In the first attempt, the participants were asked about their feelings. It turned difficult for them to openly talk about their feelings, they gave instead, examples about the consequences of littering in nature. In the second try, the participants were asked about the sensations that the dump yard awakes in them. The results showed that in general respondents relate negative feelings when referring to the dump yard. The most common feelings were sadness and anger:

> *"B8: Si, siento algo medio como se llama como se llama un poco triste me siento*
> *I: ah! te sientes triste (B8: sí) ¿Por qué?*
> *B8: aquí no hay mucha ayuda (…)" (B8, 154-157)*

Participant B8 also mentioned the reason for her sadness. She feels that they have been forgotten by the competent authorities such as the municipality. This statement might be explained with the fact that the Pisac municipality has been wriggling out from it is responsibilities for solving any issue related to the disposal of waste in the community. The participants were also asked what are the feelings they have, when they get close to the dump yard, half of the participants expressed that they could perceive the bad smell emanating from it, especially in summer or when the sun shines.

Participant B7 reported having feelings of discomfort towards the dump yard. This person lives near to the dump yard, which could explain its negative attitude towards it. He is directly affected by the harmful effects from the dump yard:

> "*B7: A veces (I: ¿Qué le provoca?) cuando viene viento se trae los perros viene del frente eso es todo lo que llevan es en bolsa en saquito eso me molesta entonces con eso y cuando solea o lleva el viento viene entonces esos son contaminación también pues si está pudriéndose. (…)." (B7, 63)*

To sum up, sadness and anger were the most recurrent feelings that the participants experienced, when they were close to improper waste disposal heaps. Concerning the sensations they perceived, many of them reported that their sense of smell was negatively stimulated since they experimented a very unpleasant odor when being near to a waste heap. Moreover, the participants expressed negative feelings when talking about inadequate handling of waste. It seems that for them, it was difficult to express their intern experiences since the feelings mentioned were limited to only three. Some gave details of the negative consequences of illegal dumping and littering for nature instead of talking about their own feelings. These findings could be explained by the fact that in the Andean culture not only human can have feelings, talk or have values, but also deities, who are also seen as a person (Ministerio del Ambiente del Peru (MINAM) n.d, p 15). Finally, the fact that for them the only sensation that was mentioned was the bad smell could be explained with the theory of Marinof et al. 2001, p 19, who stated that the sanitary culture of the comuneros is perceived with their own parameters. Dirtiness is mainly associated with "concrete" elements like dust, corpora incommodity and bad smells.

4.2.2 Understanding for waste (A1)

The goal of this variable was to establish a baseline about the mindsets that the respondents have for waste. People's mindset influences the decision to discard any object that their unconscious mind understands as a waste (Chandrappa & Das 2012, p 41). To have a good knowledge of them can serve to successfully communicate with respondents about SWM issues. In addition, this section presents gathered information about perceptions from the comuneros on the value of waste. The importance of addressing this topic lies in the fact that if people do not believe in the value that some waste materials have, high probably they may have difficulties to recycle.

To the first interviewees the question what means waste for you? was possed, but it seemed to be hard for the intervieews to answer. Probably, because it was too abstract, to overcome this barrier, this question had to be slightly modified to which materials you consider as waste?

The findings showed that for all respondents, the term waste is equivalent to plastic:

> *"B10: Lo que es en basura puede ser descartables. Descartables que son cosas plásticas. Eso es lo que serían pues basuras." (B10, 7)*

Some of the interviewed comuneros[11] expressed that waste for them is everything that they store and after take to the dump pit because those objects are no longer useful.

Based on their previous answer, it could be assumed that for the participants non-organic waste has no monetary value. However, it was interesting to observe the results. To the question do you think waste can have a monetary value? many of the participants answered first that waste could not have any value, because it is unloaded it in the dump yard. Nevertheless, after they think a bit about it, the majority of them declared that waste does have a monetary value. Some of them added that the value appears only if they would recycle it and in other places, not in their village. B18 was the only respondent who mentioned that if they would practice the separation of the plastic bottles, they would have much less volume of waste in the dump yard site.

> "*B18: No sé tal vez al otro lado cómo pero no sé cómo dicen pueden no tal vez podemos vender como dice el descartables, plásticos y poco tendríamos la basura en nuestro botadero." (B18, 128)*

A small number of respondents reported to store the plastic bottles to bring it later to Pisac to sell it. It can be assumed that they handle the containers carefully since, those bottles are for the Pisac Market, where they are reused and if they are not clean, they lose their value.

.

> *"B8: Yo pienso vende señorita descartable de gaseosa*
> *I: las botellas (B8: las botellas exacto) ¿Y tú separas las botellas? ¿y las vendes?*
> *B8: (…) si recién estoy pensando para vender*
> *I: ¿Y dónde podrías venderlas? (B8: En Pisac)" (B8, 65-68)*

Summing up, most of the respondents consider plastic as waste. Pretty often, the participants used the term waste as synonymous with plastic. Besides, some other comuneros called waste all materials that they deposit in the dump pit site. The reason why only plastic was considered for them waste is probably because in their society, plastic is not treated and they normally do not see it as a resource. Disposable plastic bottles, packing, and plastic bags are viewed rather as a problem. Finally, in their answers, they do not refer to the organic remains as waste, and have a positive attitude towards that. Probably because they use food scraps, vegetable peelings, and straw to feed their animals or as a natural fertilizer. They gain a benefit of the organic remains and therefore, it is also

[11] Member of an indigenous community

seen as a resource. On the contrary to the negative opinions that they have for plastics, which are materials that are "*dirty","smelly" and "useless."* In addition they believe that waste, especially disposal plastic bottles, can have a monetary value. Some of them were aware that in the community, they do not have the facilities to treat the recycled bottles correctly, but in general, they know there is a way to do it. Some of the respondents even negotiate with plastic bottles having a direct monetary benefit. The answer of the majority of the comuneros, no matter their sex, age, or educational level, reveal that they are familiar with the fact that recycling of plastic can generate income. The explanation of why the participants first answer that waste can not have any monetary value could be that they imagined with the term "waste" plastic bottles mixed with other materials in the dump yard. Finally, the statement of one participant who relates recycling and selling plastic bottles with a reduction in the amount of waste in the dump pit site could that for some of them the value of selling the plastic is not only monetary but also a way to ensure that the dump pit's capacity is not exceeded.

4.2.3 Opinions regarding the dump pit (A2)

This variable inquires the beliefs and attitudes of the respondents towards the dump pit since all families deposit their inorganic waste in the illegal communal dumpsite.

Nearly all respondents opined that they have a cleaner community since the community board opened the first dump yard. When there was no dump yard approximately eight years ago, the residents used varied non-environmental friendly methods. Some of them used to dig a hole in the surroundings of their property and stored the waste there until they burned it or dumped it directly to the river. For some participants, the negative side of the dumpsite was first that, it poses a considerable risk for the wellbeing of the children who live and play near to it. Second, the wind blows the plastic bags away so spread them in the fields. Third, some dogs come from other communities and scatter the waste, taking it out to the near roads and the fields. Fourth, it serves as breeding for flies, and it represents an odor nuisance. Participant B12, a university student, also remarked the informality nature of the site. However, in his declaration, he did not give any further detail of why the dumpsite does not follow the rules of a landfilling site. Another student, respondent B9, declared his disagreement with the dump yard because people discard the waste without recycling it before. An explanation to his statement and his unfounded emphasis on recycling could be that in his school he is probably taught about recycling and he is just repeating it in his declaration because he believes it is "correct." The comunero's attitudes towards the dump yard are mixed. On the one hand, the favorable attitudes towards it are mainly based on the fact that without it, the final waste disposal would represent a more substantial problem for the inhabitants and the natural environment. The negative opinions are mostly rooted in a direct impact on their quality of life. It seems that the residents are likely to be more in favor of the dump pit's existence, probably because they see that it is more difficult to

control the waste issues when they are spread in different places throughout the village. Finally, it was noted that respondents with a higher educational level, mostly young people, had more precise terms to express their beliefs on the topic. However, when they had to sustain their arguments, it was noted that they were superficial and not that rich in detail as the declaration of the older ones with a lower formal education level.

4.2.4 Opinions about polluters (A3)

In this section, the comuneros were asked to identify and give their opinion about people who litter in the community.

According to the respondents, people pollute because of the following reasons. In the case of children, they probably are not taught at home or school about environmental values. Talking about adults, they are not well informed about the consequences that litter has. A small number of participants declared that neither children nor adults understand that they are acting incorrectly. Overall, the results indicated that a significant number of comuneros think that school students and adults pollute, being the children the major polluters in the community because. Children acquire sweets, cookies, and chips from the community shops, and directly drop the packaging throughout the community paths. The results obtained suggest that there are two groups of people within the participants. The first group, which would say something if they see someone polluting, and the other who just observe it and do not say anything. Participants in both groups expressed to be bothered when other people pollute and to be dissatisfied with that kind of harmful customs. According to the comuneros from the first group, polluters will react in different ways; some ignore them; others listen to them and pick up the waste, others get annoyed and even discuss refusing to pick the garbage up. The second group of participants, which are the minority, declared to not openly reprove that the “polluters” to avoid discussions. In the second group, there were two persons, who admitted to litter and therefore they would not saying nothing to the polluters. Participants B6 and B18 expressed that they litter only when they carry out work in the crop fields. Since they take plastic bottles with them, and they do not consider it convenient to take the bottles with them every time they go back home. However, both participants reported collecting the bottles after a while. Both participants declared that everybody leaves the bottles in the fields. Their testimonies clarify the presence of some half-full big plastic bottles sighted in the crop fields.

Summing up, participants believed that adults and children pollute. Children are considered the biggest polluters in the community. Regarding the reasons why both generations pollute, the participants opined that the younger generation is not instilled with environmental values neither in their homes nor in their schools. Although the participants were not directly asked if they pollute with waste. The

negative attitudes of almost all of them towards waste contamination and the relatively good local waste situation, allowed the researcher to assume that littering is not a very common practice and it is not accepted in the Amaru society. Most of the comuneros feel the responsibility to express their incommodity against this kind of negative behavior. These results contradict the findings of Bruce, 2007 cited in Eneji et al. 2017, p 243 who reported that in Nigeria people had a negative attitude towards waste handling and therefore they do not consider necessary to reprimand polluting neighbors. But these results need to be interpreted with caution, as the participants who scold the polluters, also declared that the polluters were mainly children. Probably, it is easier for them to confront children than adults. Despite the open rejection of waste pollution in society, two participants declared that they pollute and that other adults do it as well. Both participants have same educational level, primary incomplete. Maybe this could explain their disinteres pretending to be a strictly environmentalist person, what could be the case of other groups of residents, particularly the one with a higher education level. Finally, if children are truly the big polluters, it is difficult to understand why they adopt these non-environment-friendly attitudes if most of the interviewed adults seem to be very sensitized on avoiding litter and probably share their values in their homes.

4.2.5 Responsibility of waste generated in the community (A5, A6)

This variable was created to allow the intervieews to express their views about the responsibility of the waste produced in the whole community. The participants had to choose between four alternatives: their duty, the community's responsibility, municipality's responsibility, or others responsibility. The aim of this variable is to reveal if the respondents see themselves as responsible. Several studies have shown that the sense of environmental responsibility, awareness, and knowledge of individuals directly affects the grade of consistency between the attitudes and environmental actions of people (Desa, Kadir & Yusooff 2012, p 48). Another further objective in this section was to explore the reasons why participants think one of the suggested options must solve the emerged inconvenience arising from the waste issue.

The results suggest that most of the people in Amaru felt that fundamentally, it is the responsibility of every comunero to tackle the waste issue in the community. This result could be explained with the fact that in the Amaru's society, waste seems to be a social issue. A problem which is solely solved by them and without any outside help. It looks like they are aware that their actions and positive waste handling practices help to enhance the overall waste situation. Some of them declared that their responsibility for the generated waste begins buying products because they decide what they want to take to the community. Two persons additionally expressed their desire to have the support of the municipality. They wish the municipality could send at least the collector trucks to pick up the garbage

as they do in the capital district and other few communities. Participant B10 recognize the guiding role of the community board.

> *"I: (…) ¿Quiénes crees que son responsables por la basura que se genera por la comunidad? ¿Cada uno, la municipalidad o la comunidad?*
> *B10: (…) cada uno es y guiar la comunidad, pero después es pues cada uno (I: cada uno) sí, cada uno (I: cada uno es responsable)."*

Another smaller group of residents believe that the community board is the one responsible for the waste handling in the community. This position could be explained with the efforts made by the community leaders arranging the local waste management system through internal laws, agreements and building facilities such as the excavation of the two dumpsites of the community:

> *"B6: Ese botadero es responsable, la directiva comunal, ellos dicen llaman a su parlante señores lleven basura al botadero y todos llevan.*
> *B6: La comunidad organiza eso no es la municipalidad nada. Y ese hueco la comunidad lo echo fondo no más." (B6, 179-180)*

None of the comuneros manifested that only the municipality authorities are responsible for the waste. This position is probably due to the lack of support from the local authorities. Since they had never committed to help them in the managing of waste, the majority of comuneros does not demand anything from the official authorities.

On the other hand, respondent B20 was convinced that the responsibility should be possed in the three of them. According to him the mission of the municipality is to stay informed and train the community members in topics such as reuse and recycling. This participant is a member of a tourism association that could be the reason why the participant seems to be familiar with the term *"capacitación"* and even demand it from the municipal authorities as the tourism associations are regularly having training from various tourism institutions:

> *"B20: yo pienso que serían los tres. Porque cada familia siempre compra en bolsas y tienen que saber reutilizar o llevarlo al botadero sino hacen las familias de la municipalidad tendrían que capacitarnos a los comuneros para que podamos reutilizar o reciclar las basuras, eso seria." (B20, 68-69)*

Two participants also expressed their discontent with the community grocery shops, because they are indirectly responsible for the waste pollution, but they do not assume their responsibility.

In brief, the majority of the respondents think that it is their own responsibility to ensure a litter free community. A smaller group declared that the community board must have the duty to look after the waste handling. Any participant believe that the municipality should be responsible for waste management in the community. An explanation for these results could be that since the respondents are actively participating in positive waste management activities, for example, the communal clean-ups, waste segregation and transport of waste to the designated place. They feel responsible because they take the waste problem as their own issue, they invest their time and try to solve it throughout all the phases of their local SWM. Regarding the reason that impulses them to take own actions to

reach correct waste handling, this may be rooted in their culture. The indigenous values that they have connect them with their crop fields and territory, both are spaces for their survival and development. They constitute at the same time a substantial ground of their culture (Ministerio de Cultura del Peru (MICUL) n.d., p 27). Finally, the results showed a relatively high number of persons who assume and accept responsibility to participate in waste handling activities.

4.2.6 Role of the residents on having a clean community (A5)

"*Can you give me an example of what you can do to have a cleaner community?"* this question was possed to the participants in an attempt to inquire about the position they adopt on achieving a litter free community. This question also had the intention to make the participants reflect on the relevance of their actions.

For the first group of participants, what they can do is "maintain" the community clean. This declaration is guided by the logic that if people do not pollute, then they won't need to clean after. Respondent B1 also stressed the need to keep it clean because if they do not do it, anyone will be responsible for it:

> *"B1: Mmm (…) Si pues, así puedes mantener la limpieza y la basura si no piensas recoger o si no piensas hacer limpieza basta porque la basura nunca se va a desaparecer si nosotros no hacemos quien lo va a hacer." (B1, 81)*

Others talked about their commitment to preventing waste through minimization actions. The point of view of participant B2B summarizes two ways of avoiding unnecessary waste. The first action that he takes is to replace the plastic bags, one of the most common waste issues in the community, with fabric bags. The other example he gave was to reduce the consumption of industrial and therefore, packaged products. He even gave alternatives to the sweet's products and its packagings:

> *"B2B: A ver en mi caso (I: personal) ya no comprar plástico (I: ya no comprar, perfecto), ya no comprar en plasticos llevar atadora o un bolso (I: bolso y el segundo ejemplo).*
> *B2B: un ejemplo ya no comprar eso de las tiendas tanto y hay veces lo que más trae basura eso, ya no comprar todo lo que es dulce hacer los productos para (I: producir por ti mismo), lo que botan también puede ser con lata de leche todo mermelada de oca (I: mermelada de oca) de tauco (I: sauco), de aguaymanto, todas esas cosas, pues todo eso se puede hacer en la comunidad." (B2B, 105-106*)

Other participants mentioned that all members of the community have an active role in keeping the community clean because they participate in the communal clean-ups and at the same time have the obligation to keep the surroundings of their houses clean. A mandate imposed by the community board is regularly monitored by the community board leaders or the members of the Juntas Administradoras de Agua y Saneamiento (JASS).[12]

[12] More information about the internal communal board can be found in the observation protocol

"I: (...) A ver ¿Me podría dar dos ejemplos de lo que usted hace para que su comunidad esté más limpia? ¿Personalmente qué haría?
B11: Haría con plástico pues aquí limpiamos todo este pues limpieza (I: Limpiaría todo) Sí.
I: Ok. ¿Qué más? (risas) ¿Para que esté más limpia para que se mantenga también limpia de repente?
B11: Organizamos pues limpiar limpios caminos y todos (I: Hacer limpieza) Hacer limpieza casas.
I: Limpieza general (B11: General) OK perfecto." B11, 153-157)

One participant also declared that a way to help to improve the waste situation is discussing the waste issues they are facing and possible solutions with his paisanos[13] in the community plenums. Participant B12 wanted for example, adopt an educator role in his community. He even manifested the idea to become the president of the community in the future to achieve awareness-raising in the community. Participant B9 expressed that people in the community should learn more about recycling.

To sum up, the examples given by the respondets varied. However, all of them assume an active role in reaching a litter-free community. The mentioned roles were maintaining a clean community, minimization of waste, participation in the community cleanups, education of neighbors, participation in the decision-making processes in topics relating to waste handling and exchange of opinions with other comuneros in the plenums. With relation to the declaration of respondent B1 who stated that if they do not clean the community noone else will do it. This answer could be evidence that they do not count with extern entities such as the local municipality as an institution who can solve any waste issue. Furthermore, the declaration of participant B2B was surprising, especially his minimization practices and the idea of producing their own food products to replace the industrialized one. His knowledge about alternatives of consumption could be explained with the fact that the respondent is an expert of native's vegetables conservation. Finally, it is interesting to see that the answers of two students were characterized by the willingness to help the community and to educate them on waste relating topics like recycling or separation of waste. The declarations of participant B9 during the whole interview implies that he thinks that he knows more about recycling and segregation than the other comuneros. This can be refused as the other comuneros seem more engaged and have more precise knowledge than him.From what can be deduced that in Amaru, the educational level has low influence in the knowledge related to waste handling topics.

4.2.7 Waste prevention during household purchases (A4)

There is a clear relationship between consumption and waste generation Pagadala 2015 cited in (Olukoju 2018, p 100). Precisely because of the existence of this relationship is was decided to ask the participants if they think on the waste that they could produce while doing the household shopping. The first aim of this question was to reveal if they consciously chose the products, in other

[13] Expression used to express that someone come from the same place

words, find out if they are aware that those acquired disposal items, plastic bags, nylon bags, packaging will sooner or later end up in the communal dump yard. A further objective was to inquire about their declarative purchasing habits and to know if they still use natural clean and hygienic products.

The results showed that the majority of comuneros are informed about some ways of waste minimization and they can clearly explain that their buy decisions can influence that amount of disposing of waste generated. The most well-known strategy to prevent waste, particularly small plastic bags, was to avoid them when buying. Almost every person reported that practice no matters their educational level, sex, or their link to tourism. It seems like it in the Amaru society to take unnecessary plastic bags is misconduct, who do not practice it, or at least express they do it, can be judged for non-compliance since this is part of the many communal waste-related agreements.

> *"B2B: A veces algunos están practicando ya no comprar bolsa. Mejor ya no traer en bolsa compramos asi sin nada de plástico estamos quitando basura del pueblo.*
> *I: ¿Y de donde viene esa idea de que tienen que comprarse bolsa o de que tienen que comprar cosas con menos empaque?*
> *B2B: En la asamblea dicen cuándo vamos a comprar plástico mejor prevenir y ya no vamos botar el plástico(…)." (B2B, 50-52*)

Some of them declare to avoid them when buying vegetables or fruits and take them just when they buy products like sugar or rice. However, during the observation phase, it was noticed that they do still bring to the community a large quantity of plastic bags, which could be a hint of an inconsisty between their declarations and the reality. This results could be similar to the obtained by Grodzińska-Jurczak 2003, p 10 in Poland, where the participants were aware of pro-environmental practices of waste management, but this knowledge was not always putting in practice. After the author, their declarations showed their wishes rather than their actual behavior. Participant B7 reported to avoid waste and save money at the same time, especially plastic bags buying groceries in bulk, preventing with it buying food supplies in the community shops and avoiding small plastic bags. This participant works as a path sweeper near the archeological site "Macchu Picchu" probably his declarations and attitudes are influenced by his job. This *"solution"* perhaps it is not the most appropriate for all comuneros, because it implies to have saved a decent amount of money and have the meanings to transport up to the community. Another strategy of waste prevention, named by two participants was to avoid industrialized products. One pointed out that the advantage of this is the lower price of natural products. The second participants also mentioned that they produce more waste, but did not talk precisely what kind of waste or name any kind of packing.

With regard to the use of natural cleaning and hygienic products, the results showed that the majority of the respondents were aware of the existence of it, but only a few families declared to use it. Table 7 shows a list of the natural products that were named during the interviews.

Table 7: Alternative cleaning and hygienic products

	Natural products[14]
Hygienic products	Romero, llantín, muña, marcho, and ttancar
Cleaning products	Broad beans, quinoa, yaulli, ash and gigantón

Source: Interviews

Most of the participants, who do not use the natural alternatives as cleaning products share the same argument, synthetic detergent and shampoos are much more practical and easy-to-use. The declaration of participant B7 gives reason to believe that they are aware of the waste generated, but prefer their comfort:

> *"B7: shampo compras ya metes a tu cabeza a tu cuerpo todo, pero plástico (I: plástico) (…)." (B7, 52)*

Two of the respondents with a big difference in age and educational level declared that they do not think about the waste they will produce by shopping. They do not relate buying decisions to an influence of the amount of waste going to the dump pit:

> *"I: (…) cuando ¿Usted hace las compras en su casa piensa en la cantida de basura que eso puede producir? (…)*
> *B3: No, piensa solo compras comes botas (I: así no más, okay perfecto)." (B3, 91-92)*

Their neutral attitude towards it could represent an ambiguity pro-environmental profile or proof that some people in the community ignore the relation between consumer and waste generation.

To conclude, the attitudes of the respondents towards waste minimization are positive. The vast majority showed their familiarity with the concept of prevention. Their purchasing statements point to good prevention habits; the most well-known strategy was to avoid plastic bags. Other prevention strategies were avoiding industrialized products and buying groceries in bulk. Those preferences be a signal of environmental awareness Gabriela Luna Lara, 2003 p 201. Regarding natural products, they are aware that they exist. However, they do not use them. The main reason for this is their unpractical nature of it. Finally, it seems that age and the education level of the respondents do not correlate with positive attitudes avoiding waste at shopping.

[14] The majority of the plants are native and their names have no translation to English

4.2.8 Personal motivations to learn about waste handling (A7, A8)

The participants were asked if they would like to learn more about topics related to waste handling and participate, for example, in waste education programs. They had to name some reasons that impulsed them to participate. These last two questions were formulated with the objective of recognizing the attitudes and intentions of the comuneros to the implementation of educational strategies.

The results indicated that almost all participants have a positive and open attitude on participating in waste education programs, particularly training. Some reasons that motivate the respondents to participate in educational programs on waste handling named during are shown below:

"To have a healthy life", "To have clean air" (B7)
"To learn how to sell recycled materials" (B4)
"To learn more about diseases caused by waste" (B21)
"To learn about recycling" (B10)
"To learn more about how to take care of the environment" (B19)
"To be proud of the community", "To be an example for other communities" (B7)
"To be more informed about waste handling" (B12)
"To have a cleaner household and community" (B8)

The most reiterated motive was to learn about recycling. It seems like many of the community's members were aware that they have been improving the waste situation in the community. Indeed, the displayed enthusiasm to learn more about waste segregation gives rise to the thought that they want to keep improving.

Next motive, which prompt people to want to know more about waste disposal techniques were for example that with this knowledge they think that could have a cleaner community with clean air that can allow them to achieve a healthy life. This declaration could be an indication that some participants seem to understand the repercussions that improper waste handling could have to their health. Furthermore, another motivation was the wish to live in a pollution-free community which also is a reason for the comuneros to feel proud of their community. This statement could imply that the respondents place particular value on living in a clean and healthy environment also that they identify themselves with the community and recognize the leading example that they are providing to the surrounding communities. Participant B15 was very interested to learn more about waste handling, because the dirt produce by it can attract vectors such as flies, which can transmit diseases. This declaration could be explained by the fact that this person is more concerned about sicknesses transmitted by the improper disposal of waste because she has a child. She has probably participated in one of the sanitary awareness-raising campaigns offered by the local medical center and provided especially to mothers with minor children.

"B15: Claro, si me gustaría ver la basura más que todo me capacitaría y más que más enfermedades siempre vienen de la suciedad. (I: de la suciedad) Claro es que algunos no sabemos limpiar bien. Entonces se viene los moscos así es la más con contaminación y más por nuestra salud (…)" (B15, 122)

The motivation of some students was mainly based on the wish to share the acquired knowledge with other comuneros. Two of these participants also claimed that their motive was *"to stop climate change".* However, they did not deliver any further information, or specific example to establish a causal connection between litter pollution and climate change. This motive is aimed to solve a global problem, from which they did not have much idea how. It could be assumed that both participants are not that close or are not aware of the local environmental problems caused by improper waste disposal.

To conclude, all respondents showed a favorable attitude towards the implementation of waste education programs. The motives expressed were based mainly on local environmental, sanitary, and social aspects. Their positive attitudes and the availability to invest their time to acquire more knowledge and skills on the waste topic, even though their rural lives are always busy, could be a sign that the interviewees want to keep improving the waste situation in the community and that they want to live in a litter-free community. Next to it, the results implied that they are conscious that the acquisition of knowledge and skills on waste proper waste handling is closely linked to the achievement of a cleaner and healthier community. Finally, some declarations were interesting, because they showed that the acquisition of knowledge and skills are aimed not only to benefit individuals but also the whole community, which can be a hint to believe that they are a caring society.

4.2.9 Waste pollution influence by tourism (A10)

In Subchapter 2.6, it was discussed about the influence that tourism activity could have on the waste management of a tourist destination. This variable will talk about this relationship but with a focus on the perception that locals have about the impact of tourism activity on local waste pollution.

The findings showed that in Amaru, the influence of tourism has been direct and indirect. The area in which tourism activity has had a direct impact is politic. More than half of comuneros talked about a "before and after tourism," when they referred to the evolution of the waste littering in the community. They necessarily needed to stress the role of the local tourism associations and their members, who have had, since they started, a lot of influence in the development of rules relating to waste management. Their role had been mainly to be proponents of local laws, the last word, naturally, was taken by the whole community in the plenums. Two significant norms proposed by tourism associations were approved, the first was the prohibition against raising dogs and pigs, who were considered big polluter represented a nuisance and were a danger for the tourists. The other rule was to take the non-organic waste bag to the plenum, to allow the community board to control who is separating waste and taking it to the dump yard. The second area in which tourism seems to have had an indirect impact is on the respondent's concern on littering. The influence of the tourists in the environmental

values of the comuneros may be explained with the positive perception of tourists that the participants have, which is the opposite to the perceptions that they have of their neighbors. They declared, for example, that the ones who litter are the locals and no the tourists. Following, phrases that illustrate this are presented:

Tourists…

"never litter" (B2)
"care for the environment" (B16)
"are very respectful" (B15)
"know how to take care of the environment" (B20)
"are well informed about pollution" (B21)
"most of them know how to correctly separate waste" (B22)
"pick up the waste in the paths" (B20)
"live in a clean environment" (B15)

In addition, many respondents stressed that the visit of the tourists was one of the reasons why they keep the community clean. Some of them even see tourists like a guest that is visiting their house the community. Likewise, overall the perception of the respondents from the tourists is positive because, for them, tourists value the environment, which is reflected in their environmentally friendly behavior while visiting the community. However, there were two respondents who expressed that tourists also may litter.

Respondent B1 working in the tourism sector declared that having a clean community attracts more tourist. That is the reason why she thinks that the community board by convincing people to keep the community clean, indirectly helps people working with tourism. Respondent B5 was totally convinced that tourism is an income source for the community. A source, which can be in risk if people do not protect the environment. That is the reason why people should take care of the environment:

> *B5:] están entrando de otros países, no es cierto, en el camino deben cuidar todo. Tienen que cuidar todo entonces van a venir turismo y con eso plata, hay restaurantes, hay plata, no es cierto, eso es porque que hay que cuidar (risas) todo pero algunos no comprenden.\B5: 65 - 65 (0)*

To sum up, the influence of tourism was mainly recognized in two aspects. It has influenced the creation of waste-related norms, which have supported a significant shift in people's practices on waste handling. Moreover, tourist activity and particularly the environmental friendly behavior of tourists may have also influenced the concern that people have for a litter-free environment. This assumption is supported by the positive perception that the residents have of tourists regarding their environmental practices and the fact that many of them recognize a before and after tourism of the waste management situation. As mentioned above the communal tourism associations were one of the promoters to create some waste handling norms. It can be assumed that they were probably influenced at the same time from the environmental values and ideas that tourism programs or institutions, who support the development of cultural and rural areas in the Andes, transmitted them. In addtion, to understand the positive beliefs that the comuneros have from the tourists, it is necessary

to mention that tourism in the community owns an excellent reputation. This might be due to the idea that some comuneros have that tourism could play an essential role in increasing their income and therefore cover some living costs (Knight et al. 2017, p 351). Furthermore, this positive attitude could also be related to the low negative impact that the locals perceived from tourism since the number of visitors is relatively small, and they act respectfully with the environment and the local culture. Moreover, it seems like the few tourists visiting the community are keenly observed by the comuneros, who usually work in the fields or serve them in the touristic facilities. The declarations of the locals give rise to the thought that those observed tourists represent a model to follow because they have good waste practices and therefore protect the environment. Regarding the two respondents, who declared that tourists also litter, there are reasons to suggest that they did not refer to the tourists in Amaru, but the tourist that they see in their jobs. The first reason is that they both worked in places characterized by the influx of mass tourism. Probably, they have witnessed those tourists littering elsewhere. Second, no other comunero share this opinion.

It seems like in the community, especially for people working in the tourism sector, there is a general belief that tourism is equal to the obtention of extra income. This can imply that for some of them the idea behind having proper waste management practices and ecological values is implied the intention of obtaining a financial benefit.

Finally, the vast majority of comuneros acknowledge tourism's contribution to the improvement of the waste management situation of Amaru. Nevertheless, they do not seem to perceive that the touristic activity is also a waste generator because they do not directly litter but generate indirectly solid waste. For example, the families that offer home-stays need to adapt the products they consume to best accommodate and meet the traveler's expectations, which includes acquiring cleaning products for the bathroom, some extra industrialized ingredients for the meals, decoration items, etc. They also take to the community disposable plastic waste, because they will always consume water in bottles, just a small part of them purify the water.

4.2.10 Influence of the communal organization (A9)

The community Amaru is characterized by having a particular governing model, namely self-government, which is based on collective participation. This variable will talk about how this form of government has influenced the communal organization in solving waste-related issues.

There will be an emphasis on the role of the community board as it is the body that regulates the rules of the local administration.

According to the declarations of the participants, the community board plays a great role in the overall managing of the waste in the community. However, waste topics are not the primary subject of discussed in the plenums. It is a latent topic because, thanks to previous agreements, people know

already what they need to do with their waste. The community board, together with the residents, have created their own form to overcome various communal issues among them the waste problem. The interaction between the community board and the residents includes following kinds of local involvement, awareness-raising on correct waste handling, public consultation, platforms of exchange and monitoring of agreement's adoption (Birhanu & Berisa 2015, pp 166–167).

The first aspect in which the community board influences the local waste management is in the **awareness-raising labor**. The respondents declared to have heard and received recommendations about following topics during the plenums:

> *"separation at the source, preventions of waste, composting, avoid littering in the crop fields, the houses or river banks, characteristics of the plastic, effect of the plastic in the environment, correct waste storing, proper waste collecting, cleanliness in the households, waste pollution and climate change"*

Most of the respondents stated that they would follow the advice of the community board. They feel inspired and motivated to do what the community board recommend:

> *"B2B: En la asamblea dicen cuándo vamos a comprar plástico mejor prevenir y ya no vamos botar el plástico. La gente misma decía, nosotros mismo decíamos, cuando vamos a traer plásticos ya vamos a botar. Y así la comunidad, mejor prevenir y ya una bolsa nomás y ya no comprar bolsa." (B2B, 51)*

Public consultation generally takes place in the monthly plenums. The gathering provides an opportunity for the community leaders, members of the community board, to consult people on issues that concern the whole community, which also includes waste issues. These discussions have helped, for instance, setting up internal laws such as the prohibition of dogs and pigs, planning of the dates in which they will meet to perform the community clean-ups, delegating of tasks between the comuneros, for example, to designate groups and distribute them into the areas that need to be cleaned.

The plenums organized by the community board are **platforms of exchange**, a place which allow a community dialogue. A dialogue in which every comunero has the right to express its opinion, wish, complain, advice etc. For example, the whole community expresses their wishes that the community leaders should maintain closer contact with the municipality in order to share the community's demands.

The last form of community involvement in which the community board influence is **the monitoring of the agreement's fulfillment**. The community board members perform from time to time inspection visits to check on if the comuneros maintain the surroundings of their households clean, if they are segregating waste or if they are saving drinking water. In addition, the board from time to time rewards or to tell off members of the community who do not fulfill the waste disposal or litter agreements.

Summing up, the communal governing model in Amaru and its authority body "the community board" has a significant influence on the managing of waste in the community. The results indicated that its

organization involved at least four forms of community participation. The community board, through its informative talks, exercises, influence over the beliefs and practices on waste management of the residents. The communal leaders consult for the agreement of the residents in the decision-making of waste management norms. In addition, the communal plenums serve as a place where all members are open to the dialog. The last tool of waste management's influence is the monitoring of actions, which helps the community board to control the compliance of rules set. It seems that for the respondents, the primary role that the community board has adopted is educational and informative. Based on the declaration, it can be said that the discussions on waste handling and environmental topics have a considerable influence on the mindset of the comuneros. Furthermore, the respondents seem to respect the local waste agreements and are open to exchange. This positive, open attitude and good reception of the awareness-raising efforts from the community leaders arise probably from the profound confidence of the community to the community board. An extract of the interview of the communal president shows the way how the community board governs. Here their character of democratic governance and organiser become apparent too. This attitude of the president might explain the trust placed on them.

> *B23: (…) eso por eso vamos a organizarnos para limpiar (…) En esta asamblea del 28 vamos a informar de ese campo, un día vamos a fijar con todos los participantes o con los asambleísta que día podemos limpiar eso. Porque tampoco los directivos somos tan autoritarios o tan no podemos obligar a la masa, la masa es máxima autoridad ellos deben decir la fecha y día para limpiar eso.*

Finally, considering that community board acts with any help of external support either from the local authorities nor from private organizations, its voluntary labor should be acknowledged and supported.

4.2.11 Satisfaction with the community board managing waste (A11)

This variable is devoted to find out how is the overall approval of the waste handling measures taken by the community board. The respondents also gave some recommendation to improve local waste handling.

The results showed that most of the respondents are satisfied with the work carried out by the community board. Just a few respondents express their dissatisfaction. The dissatisfied respondents belong to the young and young adult group, all of them are students, and half women and half man.

The respondents named some measures that the community board should address to achieve an improvement of the local waste managing. Those were the following:

- A commonly expressed demand was the implementation of training on topics such as recycling, reuse, segregation and ways and commerce of waste, especially plastics.

- Other interviewees indicated that the community board should be harder with people who do not respect the local laws of waste handling. For them, the penalty should be monetary.
- Some others wanted the local leaders to be more active in their work with the municipality to engage in negotiations like sending the waste collector to the community.

In conclusion, most of the participants have a positive attitude on the work that the community board is making to solve the waste issues. An explanation for the dissatisfaction of one group could be that their expectations of good management are too demanding. Or probably, because they think that the farmers who do not have formal education are not able to successfully conduct waste management. Finally, probably the respondents who demand the implementation of training, are aware that they lack of knowledge in some topics of waste handling.

4.2.12 Influence of the community board on residents practices and beliefs (A12)

Householders were asked to identify if they consider that the monthly community plenums influence the change of their waste practices. They could also provide an example that could underpin their actions. The objective of this question is to recognize if the comuneros have noticed a change in their behavior and if they relate this shift to the recommendation of the community leaders.
All respondents expressed a significant effect that the advice from the community leaders had in their actions. The more recurrent aspects in which they felt the community board exert more influence with their measures of non-formal education and their norms were, waste burning, littering, prevention of plastic consumption prevention of dogs raising and to respect for disposal norms. Most of intervieews obey the law and respect the waste disposal norms even if they are not obliged to pay a fine if they do not act according to it. Many of the intervieews expressed to no longer burn waste, which was confirmed in the field visits. The declaration of Respondent B13 indicate that some people in the community do not burn for compliance and respect for the law imposed by the community board, which prohibited to burn waste:

> *"I: ¿Y ahora tú quemas? ¿Quemas basura en tu casa? ¿Por qué no quemas?*
> *B13: Porque la comunidad que están prohibiendo que quemes esa basura." (B13: 65-66)*

Respondent B14 reported to have contaminated before, but he has changed this habit. Nowadays, together with the community board, he collects the waste and deposits it in the dump pit. His declaration could indicate that the reason why some people litter is because they have a lack of knowledge about waste pollution:

> *"B14: Ya antes (...) cómo no sabíamos qué era contaminar las basuras normalmente si nosotros no botamos botábamos normal y ahora poco a poco hemos aprendido nosotros también estamos recolectando y como te digo juntamente todos los directivos estamos juntando basura lo llevamos al botadero." (B14, 133-137)*

Participant B19 manifested its trust on the advice of the communal leaders:

> *"I: Tú has cambiado tu comportamiento. ¿Les haces caso? (B19: Sí) por qué les haces caso a ver cuéntame. B19: Les dije nos dice para nuestro bien para que no enfermamos para que en nuestro pueblo para que esté limpio. Para que no esté contaminado." (B19, 56-57)*

Participant B10 declared that the fact that other members of the community work hard to keep community clean motivated him to change.

To conclude this section, it is clear that the respondents are aware that their waste disposal habits, attitudes, and knowledge have changed thanks to the recommendation and advice of the community board. It can be said that the community board acts as a trigger for a positive shift of environmental practices and beliefs. The acceptation and shift in their waste habits are probably rooted in the approval or disapproval attitudes from respected and well-known people within the community (Marinof et al. 2001, p 19). Those persons could be the community board members, the communal president, or the community health promoter. Another explanation for the adoption of the norms and change of habits could be found in the way how they interact in society. In the Andean cultures, a way to be respected means to have prestige *"…Prestige of a person (reputación) arises with his being sincere, cooperative, helping others, being a good worker on his plot and on the land of others, not being an egoist, being good with everybody, sharing what he has (…) that is how to earn prestige in the community"* (Zoomers 2008, p 977). Probably, when they meet their communal obligations for the well being of the community they want in reality also be a respected and reliable person in the community. The positive attitude from the comuneros to the recommendations of the community board can lay in Andean society principles like the Ayni[15], which is based on acts of reciprocity among the comuneros (Knight et al. 2017, p 351). This practice of this precept probably bonds them together and strengthen their solidarity, especially when they feel that they are living aside without any welfare support from the municipality or government (Knight et al. 2017, p 351). A further assumption is that the respondents have seen the positives impacts and advantages of their actions in the natural environment and want to advance further on their way toward a cleaner community. Finally, not only the community board and its norms influence and motivate the habits and beliefs of the respondents but also comuneros who show favorable attitudes towards good waste practices.

[15] Andean precept stands for mutual support

4.3 Awareness of solid waste management from Amaru residents

4.3.1 Presence of waste pollution in the community (AW1, AW2)

With this variable the comuneros awareness towards the existence of waste pollution and its evolution in the past years is to be examined.

The majority of the respondents declared to have seen litter throughout the community. Some of them even indicated critical littered areas, which are the communal water streams, the area near to the municipal stadium, and the community paths. These declarations were confirmed by the researcher through field visits. Regarding the evolution of the waste situation, there were diverse views about it. One group of respondents, mostly the group that was composed of younger respondents believed that now there is less waste pollution than a few years ago. According to them, currently there still some waste pollution, but it is better than before and under control thanks to the presence of the dump pit.The other group consisted of a majority of respondents who were above the age of 40. This group compared the present situation to the time when there was not as much disposal products. At that time, there was much less waste pollution for them. They believe that the considerable problem started with the introduction of plastic. They mentioned, for instance, that at that time they would cover the vegetables, the fresh adobe bricks or wood with wool banquets. Now they use large plastic covers, which represents litter source. However, many of them also mentioned that the waste situation has improved compared to a few years ago, and that is particularly so because of the dump yard.Participant B7 had a note of nostalgia for the past and also disconformity with the fact that there is currently no other alternative for plastic.

> *"B7: Ahora. Hace 20 años estábamos bien ahora viene pan viene en plástico todo en plástico por eso hay basura okay." (B7, 54)*

Respondent B3 mentioned a reason why now there is less waste pollution than before:

> *"B3: Hace 5 años había más.*
> *I: ¿Y por qué cree que hace 5 años había más y ahora no mucho?*
> *B3: Porque antes no valorar el ambiente." (B3, 20-23)*

The results showed that all comuneros are aware that the current waste pollution situation is not perfect. The opinions of the respondents were divided into two groups, and both groups agree that the waste situation is better than a few years. However, their perception of the past was different. This was due to the scope of time. The respondents referred to when comparing the present situation of waste pollution. The group with the younger respondents compared the present waste pollution with a smaller period of time whereas the group that consisted of older respondents used a broader period. It seems that both groups of respondents are aware that there have been developments in the waste situation the view however has to do with their age. This leads to older people valuing the times when there was no plastic pollution and the younger ones appreciating the present, as they

have only a critical time to compare.It can be assumed that both groups perceived a positive development, which happened thanks to measurements taken by the community board such as the creation of the dump yard and the raise of the environmental values. Finally, the declaration of respondent B3 was surprising since her Spanish was limited, but she was able to state an opinion of appreciation for the environment. Her statement gives the impression that it might be inspired by a different source other than her own experiences. It can be assumed that she caught the term when attending training at the tourism association.

4.3.2 Effects of waste pollution for the environment (AW6)

This variable is to determinate the individual's knowledge of the consequences of improper waste disposal on the elements of the natural environment. The participants were asked how the soil, water, and air can be affected by inappropriate disposal practices such as waste burning and littering. The results will be divided into three aspects. The effects they perceive: in the soil, water, and air.

The majority of respondents were aware that the soil could get polluted by waste. For them, the most common harmful material is plastic. One respondent even called it "poison". Half of the respondents linked the reduction of crop production and the reduction in quality of the harvest with the presence of plastic in the fields. Few respondents related the loss of nutrients of the land to the burning of waste.The most perceived negative impact was the decrease in fertility and crop output. A small group of respondents reported having seen a decline in the number earthworms and frogs:

> *"B16: Afecta a la tierra por ejemplo en la parte donde bota mucha basura ya no da o sea los productos como siempre normal sino que es bajo, no crece, no crece bien o a veces el fruto no da como siempre es poquito así. Así entonces la tierra misma no seguro trae algunas cosas no sé qué pero afecta. Yo siento que afecta." (B16,108)*

With respect to air pollution, a small number of respondents declared that bad smells are the main reason for air pollution. According to them, the air can get polluted either by burning waste or when the plastic is exposed to the sunshine because it releases gases. A group of respondents related burn waste burning and the emissions of gases to climate change, global warming and the depletion of the ozone layer. Some of them even ensure that they have perceived the changes of their local climate. They did not give any other detail about the cause of the toxicity, but they stress their dissent towards waste burning.

The participants also spoke about some adverse effects of improper disposal practices on the water. They mentioned contamination of the groundwater from the dump yard, which could happen due to the filtration of toxic substances, which usually occur when it is raining. Another small group of respondents mentioned that the water polluted with harmful substances could also damage the crop fields during the irrigation. Few participants declared that disposing of waste in the watercourses or water streams, can block them and cause an overfloat. Another group talked about the relationship

between water contamination and absence of life; for them, it can cause the death of fishes. They also declared that the contaminated water is unfit for human consumption and that they could recognize contaminated water by a change in its characteristics such as the smell and the color.

> *"B12: Uno sería lo que bajan así por los riachuelos se amontonan se amontonan y se amontonan y así como atascamiento sale los ríos lo otro sería es que a los pececitos y algunos por ahí es más lo mata (I: lo mata). "B12, 55)*

Summing up, the results showed that all participants are aware of the harmful effects of inadequate waste disposal on nature. They consider plastic as a toxic material and can establish relations between littering and waste burning with the decrease of fertility, and de reduction of animal species. The contamination of the air is also known under the residents; they consider that the cause for this is the waste burning and that global warming is a consequence of it. The concepts they have about the contamination of water referred to problems that affect the crop fields through the irrigation, human health, and the groundwater through irrigation and also named the overfloat possibility caused by streams blocked with waste. It seems like their ideas and concepts about the adverse effects of improper practices of waste disposal are in large proportion explain by their experience. Probably, for them, the elements of nature are polluted when it is evident because they can perceive it with their senses. The statements revealed a lack of information of the cause and the effects of specific processes, for example, the presence of harmful substances in the air contaminated during open waste burning.These results are similar to those of Grodzińska-Jurczak 2003, p. 12 in her study called *"The relation between education, knowledge and action for better waste management in Poland,"* where the participants knew about the negative effect of some disposal methods, but their knowledge was superficial and inaccurate. The way of description and complexity of their answers did not differ much. People with higher education levels did not have better or more complex knowledge. These results conflict with the findings of (Grodzińska-Jurczak 2003, p 12), where the knowledge of the participants with higher education correlates with a complete understanding associated with waste. Finally, it is surprising to discover that despite the lack of formal environmental education in the area, the respondents possess a considerable level of information about the possible negative impacts of inadequate disposal methods in the nature and global environmental problems such as the global warming and its relation with improper waste disposal methods.

4.4.3 Knowledge about characteristics of waste materials (AW4)

The results presented in this section report the respondent's knowledge in one area. Namely, features of different waste materials. It is necessary to acknowledge what kind of information people have in this matter because this data could sharpen the method in which people are being reached in possible waste education training programs. For instance, if respondents are found to found little

awareness of the dangers of some hazardous waste. Then those weaknesses and gaps of information can be cover, including these topics in the waste educational programs, what could avoid, for example, the incorrect disposal of toxic waste.

Most respondents showed awareness of the characteristics of plastic materials. The most repeated answer was *"plastic will never disappear"* or *"plastic won't vanish".* Other surprising statements were *"plastic bottles explode", "plastic bottles release toxic gases" and "plastic bottles stink."*

> *"B5: plástico revienta cuando solea, revientan parecen bomba. Entonces revientan este pasto también para que coma animales. Muy apestoso (I: apesta)." (B5, 15)*

With respect to the organic waste, they declared that it disappears easily. However, as already mentioned before the most of the comuneros do not consider organic remainings as waste.

In an attempt to find out resident's awareness of toxic waste such as batteries and pesticide containers, the respondents were first asked if they use those items. The results showed that only a small group still uses batteries. Some years ago when they did not have electric energy they would use batteries for flashlights or radio. Nowadays, they have replaced the flashlights by their cell-phones. When inquiring about the toxicity of the batteries with the few who still use it, it was revealed that a small group of persons think that batteries pollute the environment. However, they were not able to make out specific details about the negative effects of it neither on the environment nor on people's health:

> *"B5: harto había pila, esa pila estas contaminando todo muy la tierra. Otra ves que yo compraba esa pila, en mi casa [inaudible] 20 años (I: ya no compras) no [inaudible] (I: no crece cuando hay pilas).*
> *B5: mira pues está botando en el suelo en la pampa no hay producto está contaminando (I: el suelo pierde la productividad) ese poquito lo ha malogrado parece veneno (I: veneno)." (B5, 67-68)*

Concerning the pesticides, the initial intention to ask them about their knowledge on the topic was overthrown because they all use any kind of chemical pesticide, fertilizers and fungicides.

To sum this aspect up, the respondents were able to talk about the characteristics of waste, especially of plastics, some of them also name some characteristics of organic waste. It was also discovered that only a small number of the comuneros still use batteries and all of them use chemical fertilizers. Only some of them possess extensive knowledge about the toxicity of batteries. Likewise, all of them declared to dispose them in the dump yard.The opinions about the plastic features were just partly correct. It was also noted that many of the declarations were: very identical even the way how they narrate it. Those shared beliefs give rise to the thought that they have heard the information from the same source. Probably the respondents automatically have adopted similar concepts during the communal plenums, where the community leaders give talks about waste-related topics. This situation could indicate that the respondents do well in appropriating the information provided by their community leaders. However, if those persons spread misleading or partially correct data or information not supported by accurate knowledge, it can be counterproductive. With respect to their belief

about the explosion of plastic bottles, they probably referred to the possible explosions that the accumulation of methane gas might create when all kind of waste materials are mixed in the dump yard. Finally, the fact that the respondent's knowledge focusses on the plastic could be explained by the point, that this is the material that amounts for the biggest share of disposal problem. That is why they informed themselves or have been informed by the community board about it.

4.4.4 Knowledge about waste handling techniques (AW4)

Recycling has been gaining importance in rural areas such as Amaru, where the location does not have adequate final disposal facilities and the pressure to reduce the amount of waste is much higher than in other areas. This section will identify the presence and degree of knowledge about recycling and its process.

The findings showed that the majority of the people, who replayed this question, are aware of recycling, but they do not precisely know what it means. Some respondents defined recycling as reuse, upcycling, and separation. The participants referred here mainly to plastic, especially plastic bottles. Just one person mentioned paper as a recyclable material. However, the same person contradictory reported to burn it. Moreover, the most common example, to describe the recycling process was to say that the transformation of plastic bottles into blankets:

> *"B12:(…) reciclar no reciclar es tienes por ejemplo traes una botella de te compres una botella de agua. Después no les votes a así como por ahí para que esta tirado lo traes y lo guardas por ejemplo yo le guardo mis botellitas que tengo en medio saco. Y eso le llevó a ahí por donde vende no sé cosa colchones, no sé qué cosas hay. Y ellos ya \|lo convierte en a frazadas a los que sea." (B12, 88)*

Concerning other recyclable materials such as glass, metals, and textiles. Just one person, Respondent B21 mentioned the possibility to recycle glass:

> *I: y tú sabes que es lo que de repente hacen luego con estos materiales ¿Cómo es el proceso de reciclaje?*
> *B21: (…). En cambio los vidrios lo llevaran y lo harán de nuevo en mi caso yo pienso así, que debe ser así. Pero en sí no sé cómo lo harán donde lo llevarán yo pienso que lo llevan así (…).*" (B21: 93-94)

Two respondents, B10 and B14, reported having recycled metals and glasses with the help of the scrap dealers.

To sum up this section, it can be said that the notions of recycling from the residents are very superficial and incomplete. However, it seems like they know about the sense and the purpose of recycling, which is to reduce the amount of waste dumped in the dump yard. It is understandable why they do not grasp the concept. In the first place, they live in a society where they do not practice it. Therefore, there are no facilities and no information available. There have not been any type of recycling campaign or something similar. Furthermore, not even the participants who enjoy a higher level of formal education were able to give a complete description of the meaning of recycling. Although many persons expressed that they did not know what recycling meant, some of them still showed awareness about some of the recycling process stages. Others even recycle, but it seems like they were not

aware that what they were doing was recycling. The same situation happened in Kerala, and Indian city, where people did not know the concept of recycling and that what they practice is recycling. (Government of Kerala 2015, p 67). There was just only one person who was informed about the possibility of glass recycling an explanation for her level of awareness might be the fact that she had lived in the capital of Peru, where recycling practices are wider spread. There she could have heard about it or practiced recycling herself. Finally, the declarations about the use of recycled plastic to create blankets were almost identical. It seems that they have heard that information from the same source, probably in the community plenums.

4.4.5 Improper waste handling as a cause for diseases (AW7)

Improper waste disposal methods such as waste dumping and littering can aggravate the reproduction of pests, which could act as vectors of plagues and epidemics (Olukoju 2018, p 100). This situation can lead to a notable increase in the spreading risk of health problems and a very unpleasant living environment (Harvey, Baghri & Reed 2002, p 105). This section is going to have a look at the knowledge that the participants have on health issues, symptoms, and transmission induced by inadequate waste disposal methods.

The first question posed was *do you* think *that bad waste handling practices can cause diseases?* depending on what they replayed, follow up questions were made, for example: *Which kind of diseases do you know? How are they transmitted? Do you know the symptoms*?

The results indicate that all of the participants were pretty sure that improper waste handling could cause sicknesses. However, many of them expressed not to have precise knowledge about it, which was the reason why only a few respondents answered the follow-up questions.

> *"I: Y para nosotros los humanos ¿Causa enfermedades? (B6: Claro)*
> *B6: Cuando vas apesta pues pero no sabemos nosotros mismo que enfermedad esta dando. No sabemos." (B6, 109 - 110)*

The more frequently symptoms mentioned were diarrhea, stomachache, headache, asthma, fungus infections, respiratory infections, acne, and allergies. In general, most of the participants could not clarify their causes. Some of them recognized flies as transmitters for diarrhea infections. Following declaration made by a minority, who were able to give at list a bit more detail about causes or way of transmission of diseases related to waste contamination:

> *"I: Y para nosotros los humanos ¿Causa enfermedades? (B6: Claro) ¿Qué tipo de enfermedades tiene maso menos conocimiento?*
> *B6: Cuando vas apesta pues pero no sabemos nosotros mismo que enfermedad esta dando. No sabemos." (B6, 109 - 110)*

Participant B21 recognized mosquitos as transmitters of dengue. This person also gave details of the symptoms and the way how and where they breed. Participant B22 expressed that humans can

acquire infections through the consumption of meat from contaminated animals. Respondent B7 believes that the consumption of infected water causes gastrointestinal issues such as stomachache, lack of appetite and acidity. Respondent B1 recognized that improper waste practices and the resulting dirtiness and contaminated water could induce diarrhea and vomits. However, the same person admitted to have attributed those diseases or symptoms to a cold. This perception of sicknesses in the Andes can be explained by the findings of Marinof et al. 2001, p 24, who stated that *"in the communities usually the causes of diseases are attributed to events such as prolonged exposure to natural phenomena such as wind, sun or cold"* (Marinof et al. 2001, p 24).

In conclusion, all participants declared to be aware of the negative consequences that inadequate disposal practices can have on their health. However, most of them possessed incomplete, inaccurate, and even false information. They show a reduced level of knowledge on the relations between SWM and diseases. They did not name specific sicknesses, but they described the symptoms of gastrointestinal, respiratory, and dermatologic conditions. Most of the respondents did not have a clear idea of the transmission ways. In fact, they only mentioned two vectors that spread infections, the flies, and the mosquitos. They left aside other vectors like rats and cockroaches. It is probable that some of the symptoms referred to diseases such as salmonella, typhoid, dysentery, hepatitis A. In additon, only a few respondents were able to give correct answers about the way of transmission, vectors, and symptoms.

This result could be explained by the fact that in communities in the Andes scientific knowledge of diseasses and the transmission ways are not widespread (Marinof et al. 2001, p 18). Finally, it is evident that they need reinforcements in the knowledge of causes, and the consequences of possible diseases acquired through inadequate waste disposal. The enhancement of this knowledge may encourage them to keep implementing positive waste handling practices and at the same time, promote personal hygiene (Jatau 2013, p 121). Finally, to successfully address the lack of knowledge in the community it is especially necessary to understand how the Amaru's society perceives health, taking into account local cultural factors (Ministerio de Cultura del Peru (MICUL) n.d., p 26).

4.4.6 Places that tourists prefer to visit (AW3)

This section is about what kind of natural environment tourists prefer to visit from the perspective of the respondents. The comuneros were shown two similar images from green landscapes. The difference between both pictures shown, was that one of them was heavily polluted with waste, while the other was free of litter. They had to choose one of both images and explain the reasons why they think tourists would prefer to visit that place or why not. The purpose of this question was to inquire if they are aware that tourism and garbage usually do not go hand in hand.

As expected, all respondents chose the free litter image, as a place where they think tourists would prefer to visit. Respondent B20 justified her responds by declaring that she had witnessed how tourists collect waste while they visit the community. Respondent B19 expressed that tourists feel joyful when they breathe pure air because it is beautiful. To explain the reason why tourists do not like polluted places. Some respondents stated that tourists are not used to seeing such pollution since they probably do not have waste pollution where they come from. And precisely that is the reason why they need to keep the community clean and their households because they know tourists are coming. Respondent B15 stated that she was trained in gastronomy, where she learned that when cooking for tourists, it is necessary to keep cleanliness. Following, Table 8 summarizes the reasons what they think tourists like and what they do not.

Table 8: Tourist preferences and dislikes

Tourists like…	Tourists do not like …
to wander.	to walk in a contaminated and dirty community.
the nature, landscape, green landscapes, a clean landscape, clean and pure air, the natural environment, mountains trees and plants.	any type of waste especially plastics and glasses.
beautiful landscapes.	ugly and contaminated environments.
cleanliness and orderliness.	dirt and mess.
natural environment.	bad smells.
to walk through nature and visiting.	polluted rivers.

Source: Interviews

An explanation of why tourists do not like polluted places was given by the participant B14 who expressed that tourists can get easily sick when they walk in filthy nature or when they get in contact with contaminated water because they are very fragile. This person also thinks that in their countries, they probably do not have such a dirty environment. This respondent used to work in supporting trekking groups in the mountains. It is possible that he has seen tourists getting sick.

> *"B14: (…) El río está muy sucio por eso no pueden ir porque los turismos están más (...) frágiles con sus cuerpos hasta que se pueden enfermar.*
> *I: Que se enferman rápido ¿Por qué otra razón?*
> *B14: Otras razones porque en sus países también tal vez no estarían viviendo de esta manera por eso."(B14, 177-181)*

Interviewee B16 expressed that in her conversations with tourists, they have expressed their sadness seeing litter in public places within the community. They do not understand why people litter in such a place. Sometimes they even advised her how to handle the waste. She thinks that they are sad because they come from a place where they do not have the pure air of Amaru. This statement coincides with what Zoomers 2008, p 979, where the author suggest that tourists wish perfect blue sky, sunshine, impressive landscape. Participant B16 also expressed to be sorry for the tourists:

"B16: A ellos les gusta caminar, imagínate que vean basura y ellos se ponen triste. Hay amigos que me vienen a comprar y me dicen porque lo botan hasta ellos mismo dicen hay que llevarlo esto hay que hacerlo esto. Entonces me da pena a veces como vengo yo a distraerme ellos salen de un lugar donde no hay ese aire que se vive acá, que se respira acá, que vean ellos esas bolsas, basuras o sea se ponen tristes ellos también." (B16, 132)

It was observed that the declaration "*to clean their houses or the community, because tourists are visiting"* was given not only from the respondents who have tourist enterprises or work in the tourism branch but also from participants who do not. This might suggest that tourist visits act as a drive to motivate their currently declarative cleaning practices.

From the results, it can be stated that all comuneros are aware that tourists prefer to visit a natural environment free from pollution. No matter if they work with tourists or not. In general, there is a clear tendency in the answers of the respondents to build antinomies. They link what they think tourists prefer with positive concepts like cleanliness or joyfulness. On the contrary that what tourists dislike, is associated with negative thoughts such as ugly landscapes, sadness, etc. It seems like all of them are concerned about what tourists think about the community. It can be assumed that people consider that they need to be very careful with tourists because they can easily get sick or sad. Their declarations imply that the respondents are very considerate, empathic and compliant with tourists. The reasons for the welcoming attitude to tourist might be explained by the assumption that tourist, who visit Amaru act in a very ecological respectful way or because the comuneros in their subconsciously consider them a source of revenue, that need to take care of. The declaration of one person suggests that she probably thinks that if tourists clean the garbage uncollected thrown along the paths, it is because they do not feel comfortable with it. It seems like her perception is based on the experiences she had observing tourist's ecological behavior. Finally, it looks like some comuneros do not like to disappoint the *"poor"* tourists who come to the community yearning for something they do not usually have and find a littered place instead of the perfection they were searching for.

4.4 Practices on waste management from Amaru residents (P1, P2, P3)

In the Amaru community, SWM is run entirely by the community itself. This chapter will briefly explain the most relevant practices and systems that Amarus' residents are using. These practices were developed, over the past years, in their own way and with their own resources. The information that will be offered in this chapter was gathered through observation and the interviews. The structure of this chapter will follow the stages of the components of ISWM presented in subchapter 2.3.1. This subchapter, unlike subchapter 4.2 and 4.3, will not provide the objectives of every variable, but it will focus more on the description and interpretation of every component of the Waste Management system. A Photographic documentation can be found in Appednix 15. Fig. 11 shows the Amaru's sequence of integrated solid waste management.

Figure 11: Components of Amaru's domestic Waste Management

Source: Own elaboration based on Harvey, Baghri & Reed 2002, p 110

i. Waste generation & storage

In Amaru waste storage of inorganic waste takes place mostly in spaces within households. The inorganic waste is stored in sacks, which are usually placed in the backyard of the houses, in order to avoid that animals such as dogs or sheep, spread the waste around. In authorized visits in some households, the use of plastic buckets for the storage of organic waste was observed. The size of the bucket usually depended on the number of family members. Typically, the organic waste bin is stored in the kitchen, and many families have even two buckets. Depending on the kind of animals they have, they can feed them with leftovers. People who do not own animals will store the organic waste directly in the crop fields and wait until it rots, to use it as compost. It was surprising to learn that in the whole community there are only two garbage bins both seemed to belong to the Pisac municipality. After asking around, it was confirmed that they wereplaced there about ten years ago and were abandoned shortly afterwards. Nowadays both bins are used privately. So the emptying of the garbage bins is carried out by the families of the houses in where they are located.

ii. Waste segregation

Separation at the source and recycling at household level becomes very important in rural areas because it can palliate the quantity of waste uncontrolled dispose (Mihai & Taherzadeh 2017). The results showed that in Amaru 22 from 23 households segregated waste. The exception was Respondent B20. Her declaration was surprising because she showed a high level of awareness of the consequences of improper waste disposal and also expressed her willingness to punish people with a fine who did not segregate waste. She justifies the inconsistency in her declarations with laziness:

> *B21: (…) pero las demás basuras lo mezclo todo. Me incluyo que no space to sabiendo todas esas cosas por así por ocioso todas esas cositas no lo separo (…)." (B21, 103)*

This result is similar to the one obtained by Omran et al. 2009, p 289 where the author found out that even if people had a high level of awareness of recycling, this was not reflected in the participation of the respondents in recycling actions. Furthermore households make a distinction between organic and inorganic. As mentionedbefore, organic waste consisting of food wastes are used to feed

animals. This is how vegetables and fruit skins are used to feed guinea pigs, sheep, or chickens. And the leftovers of cooked food are used to feed the pigs. Other organic waste residues such as plant wastes are segregated and mixed with the compostable waste. When the comuneros do not possess animals to feed or have space to produce compost, they donate it to their neighbors. They also deposit the inorganic waste consisting of packaging, plastic bags, diapers, disposable plastic bottles, cans, old textiles, paper, etc. at the dump yard. They recycle glass bottles, electrical appliances in poor conditions or other items, by selling it to the scrap dealers, who are part of the informal garbage trade and visit the community from time time.

Overall the results showed that from all respondents, just one household did not separate waste. The rest of the respondents segregated at least organic and inorganic waste. Likewise, the findings also showed that even if the respondents were not aware of the meaning of recycling, they practiced it, by recycling glass, bottles, and metals. It seems like the comuneros have good habits of segregation. All respondents were familiar with the difference between organic and inorganic, and they know well that disposing organic waste in the dump yard is not well accepted by society. That is probably one of the reasons why disposing organic waste in the dump yard is the last alternative. The other explanation for their excellent waste disposal habits could be that they have a strong pro-environmental commitment (Strange 2002, p 45). Because even if segregation does not really fit in their busy rural life and the circumstances of segregation are unfavorable (The distance to the dump yard is on average approximately 2km away from the households.), they make an effort and are still practicing it.

iii. Waste collection

As earlier described, in Amaru there is no waste collection service offered by the Pisac municipality. The collection route of the collector truck serves only the district capital of Pisac and only two out of the twelve communities that it should. For this reason, the inhabitants of Amaru have organized themselves independently of the municipality. The waste generated in households is taken to the dump yard by them. For waste accumulated in public places, they have created a clean-up system. The clean-up system consists of the community meeting voluntarily about four times a year or when it is necessary, as part of their monthly community plenums and performing a communal clean-up. Most of the interviewees expressed that they are participating in it. Respondent, B21 mentioned that sometimes, not all comuneros could participate in the clean-ups because they have other responsibilities. This situation could happen, for example, when families have small children, the mother needs to look after them and the father needs to look after their animals or be in the field. The researcher had the opportunity to witness one clean-up day. In those days some families will gather in one house, where women who couldn't attend the communal clean-ups, were given the responsibility of preparing the meals. In this way they would also contribute.

To sum up, in Amaru, the waste collection service is not present. However, the community has found two ways to collect waste from public places. Either they keep the surroundings of their houses clean or they participate in the communal clean-ups. The findings showed that many of them participate in such as clean-ups despite the institutional abandonment in waste management aspects. The efforts of the comuneros, particularly through their participation in the community clean-ups, could indicate that: First its commitment to keep their community clean. Second, their high capacity of organization and third their high collaboration capacity. All this might lead to the creation and enhancement of their pro-environmental values.

iv. Waste treatment

In the community, the only waste treatment that exists until this day is composting. This is indeed, very positive for the local waste management system, considering that more than half of the waste produced from the residues is organic (Municipalidad de Pisac, 2016). This treatment technique, among other beneficial aspects, indirectly saves space and reduces pressure in the dump yard. Additionally, it makes farmers save money that they would spend acquiring chemical fertilizers. Although their agricultural land has been suffering from erosion and their livestock has been massively reduced over the last years (Zoomers 2008, p 976), the results showed that nearly all respondents use only organic waste as fertilizer. The two most common techniques used among them are food waste and animal manure compost. The ways to compost food and crop residues differ in every family. Generally, they apply systems which do not take much time to prepare. Below the main used techniques are described:

- Placing the organic kitchen waste on their backyard or crop fields and pile it up and mix it from time to time.
- Placing the organic residues in shallow holes in their gardens and wait until it becomes humus.
- Using a bin or a box for it.

To compost livestock manure (sheep, cows, horses, guinea pic, rabbits, etc.), they do not mix it with another kind of organic waste.

In brief, the majority of the comuneros apply two compost systems using food waste and animal manure. With food and crop residues, they apply the pile, sheet, and bin compost techniques. Furthermore, what was noted during the interviews is that for the respondents, it is essential to use a quick and simple method. This position is understandable since probably they do not want to complicate their busy rural life. It seems like the respondents are well aware of the advantages to transform the organic waste in compost, which they have been practicing since always, and it looks like they want to keep practicing it.

v. Final disposal

During the field research, it was noted that the most common final waste disposal technique was the dump yard. It was also observed that few people burn their waste. That is the reason why it was decided to inquire about this disposal method. This section will first devote to report the burning waste practices of the Amaru's population and after it will concisely explain the situation of the active "Pampacancha" dump pit.

The respondents were asked if they burn waste. The results obtained have shown that the majority declared not to burn waste. The other group who admitted to practicing it, clarified to burn "once in a while" burning only straw or crop residues. They clearly stressed not having burnt plastic. Some of the reasons they gave not to burn waste are the following: "it stinks" (most repeated argument), "it's bad for the environment" or "because it is prohibited by the community board". However, it was observed that the comuneros burn papers, cartons in their wood-burning stoves, which is used to replace or complement wood since they do not have access to forest areas' purposes, which is very common in the highland (Mihai & Taherzadeh 2017).

Summing up, generally people in Amaru declare not to burn inorganic waste. The few people that admitted doing it, mentioned that they only practice it when necessary, this was confirmed in the field research. They also showed a negative attitude towards it, explaining the reasons why they do not practice it. The most repeated argument was the bad smell of plastic waste. Their stand against waste burning and the positive practice could suggest an instilled responsibility for the environment and respect and obedience for what is stipulated and recommended in the community plenums regarding burning waste. Finally, they seem not to be aware that burning certain papers and cartons could be dangerous for their health and the environment, which occurs because when they burn colorful paper mix with plastic or newspaper, it can release harmful chemicals like dioxins and gases while combusting (European Comission 2010, p 10).

In the community, there are currently two dump yards, which are located in the sectors of Pampacancha and Nosqopata, respectively. By decision taken in the communal plenum, people are recommended to take the waste generated to the Pampallacta dump yard. Since Nosqopata has been closed. In the following paragraph some details from the Pampallacta dump yard will be given: First, both dump yards have been created independently from the municipality. The community itself have made the excavations to create the dump yard of Pampallacta. According to conversations with key informants, there is currently no sanitary control that is the reason why it is an illegal dumpsite. Likewise, no treatment, any compaction process, or vector control or rainwater drain-off take place. In other words, there are no controls to avoid contamination, the dump yard lacks measures of sanitary

adequacy set by the Peruvian environmental legislation and therefore represent a great environmental risk to the health and safety for the inhabitants. The social, ecological and health conflicts are obvious. For instance, families that have crops relatively close to the dump yards; people who have livestock in the surrounding areas are clearly affected.

5 Discussion

5.1 Answering the research questions

The main objective of this subchapter is to answer the research questions that were posed in chapter 1.3. To formulate the last version of the research questions was a process that started at the beginning of the research and ended after the implementation of the observation and interview methods. The responses that will be presented in this chapter were inspired by the output given in section 4.

5.2 Attitudes (A)

For the respondents, waste is material that ends up in the dump yard. Given the fact that plastic is the most common matter disposed of there, they also consider waste mainly items like plastic bags, disposable plastic bottles, and packaging. Inadequate disposed waste in the dumpsites, garbage dumped in river banks and rubbish littered throughout the village paths, evokes negative feelings and emotions in Amarus residents. They relate them to feelings of sadness and anger. The feelings depend on the values, beliefs and impact that waste has on the lives of each respondent. Further, the respondents own a negative perception of plastic, which is confirmed in the expressions they use to refer to plastic: smelly, dirty and useless. Organic waste, on the other hand, provides them with flexible benefits using them for animal feed and as fertilizers and is not linked to negative perceptions. The negative environmental attitude towards waste pollution is a hint to believe in their predisposition to act in an ecological friendly way (Guevara Martinez & Guevara Fiore 2015). The participants are aware of the consequences that litter have in their emotional well-being, and knowing that they could feel uncomfortable with this situation, it can be assumed that they tend to not litter and therefore they compromise on environmental-friendly actions (Schwartz 1977 cited in Han, Yu & Kim 2018). Surprising is that despite expressed negative attitudes of the respondents towards plastic, most of them are well informed about the possibility of obtaining a monetary and environmental benefit. For them plastic, especially plastic bottles can be treated and sold, which indirectly could save space in the dump yard. An excellent advantage for low-income families who can have an extra income through it and at the same time for the whole community because it reduces the amount of garbage deposited in the dump yard and directly positively influence in the impacts of the dump yard on the surrounding areas and living beings. The consciousness of this information probably induces a modification of their attitudes and actions (Desa, Kadir & Yusooff 2012, p 48).

The most widely final disposal technique applied in Amaru is dumping the waste into an excavation site built entirely by the members of the village. The beliefs that people have about these dump yard are diverse. They have clearly identified the advantages and disadvantages of the dump yard, and most of them are grateful that it exists because before the waste pollution situation was even more precarious than the current and did not exist any form to control the amount and type of waste generated, the place or the way in which it was final disposed. In absence of the dumpsite people used to dispose their waste wherever they wanted, the most common practice was to burn all types of waste in their backyards causing annoyance and pollution of the air and dirt contamination in their houses. The respondents think that nowadays, although the presence of the dump yard represent hazards in aspects like the rising of plastic waste pollution in the surroundings, the latent accident risk for small children to fall into the excavation, the odor nuisance and the reproduction of plages. It has a more beneficial impact on their quality of life, which was solely built by the members of the community Amaru. The residents are conscious of the negative consequences of illegal dumping. This fact can have an influence in the positive attitudes of the participants to the dump yard and it at the same could indicate that they could avoid dumping their waste in improper places.

In Amaru's society polluting is not accepted and as a result residents have negative attitudes for unfavorable waste practices. They consider that the biggest polluters in the village are children and youths in scholar age. For them an important proof for this is that the school paths are more polluted with garbage than other places in the village. But they also think that adults are not free from responsibility. In fact, some declarations give a clue about temporary waste pollution by some adults. This mainly happens during the time in which the farmers work in the fields and they take liquids with them in plastic bottles, they will leave it there in their fields and pick it up later. Relating to the attitude that they adopt towards people who contaminate the community with waste, most of the respondents show concern and rejection for any act of contamination. However, not all respondents speak out when they see other people polluting. One of the main reasons to adopt this position is that they try to avoid conflicts with their neighbors. One assumption to explain the high amount of people that scold polluters could be that as the main polluters are children or youths, it is probably manageable for them to confront them.

According to the opinion of the majority of the respondents the responsibility of the waste generated in the village is from every person living there, in which each comunero should perform to achieve an improvement in the local waste situation. Other small groups of participants believe that the community board and the community leaders are accountable to ensure and promote a clean and litter-free village. It is evident that the role of the municipality in the handling is not recognized by the comuneros since any of them confer responsibility to the municipality. This perception is justified because the Pisac's municipality does not view them in any of its past Waste Management strategies,

nor do they receive any support financial nor technical and overall they do not enjoy the slightest waste service. In Amaru the waste issue seems to be understood as a social problem, which needs to be solved with the support of all the members because no external aid exists. One of the reasons for the high level of self responsibility from the villagers could lay in their active voluntary participation in pro-environmental activities such as communal-clean-ups, waste minimization, participation in decision-making of waste handling rules, cleanliness maintenance, and waste segregation. Another reason is that they feel more connected with their land, in which their indigenous values help them consider it not only the place where they develop their lives but also are an essential part of their culture. Furthermore, the high sense of responsibility could indicate that they not only have good attitude towards environmental friendly actions but also they act consequently with them (Desa, Kadir & Yusooff 2012, p 48). One good example of this action is the attitudes of the villagers towards waste prevention measures, most of them understand the existing relationship between consumption and waste generation. They also show skills to prevent waste especially with plastic bags. It is worthy to name that according to Ajzen 2012, p 443 attitudes could determine behaviors conditioned by intentions and intentions at the same time can be predicted by access to villagers beliefs. Their beliefs, for example minimizing waste could have been influenced by the internal norms existing in the community, which may possess a social pressure. This pressure and the negative consequences which could follow if they act in an unfriendly environmental way may cause that they adopt pro-environmental behaviors.

The tourism activity definitely has in view of the residents a significant influence on the situation of waste handling. Tourism has been intervening since it was introduced in the community around ten years ago and has directly influenced what is exerted by local tourism associations. They have powered and proposed communal norms designed to regulate and enhance the waste situation in Amaru. One of those norms is the creation of an environmental law, which prohibits the raising of dogs and limited the possession of pigs to prevent pollution with excrement, odor nuisance and representation of a danger for the visitors. Indirectly it seems like the environmental behavior of the visitors has an influence on the concerning villagers towards waste littering. To support that supposition is the fact that some villagers claim to keep the community clean because they want to welcome the visitors in a clean community. This calls into question if the villagers want to have a clean community to improve their quality of life or do they only want to satisfy the visitors. In view of the foregoing, the perception that the residents have of tourists with respect to their environmental preferences, actions, behavior, environmental education, waste handle practices are very positive with almost no exception. Although there is no way to know if their environmental values were pro-environmental before the introduction of tourism in the community. The statements ensuring that a few years ago the waste situation was much worse through the representation of the local tourism associations than now could be

sustentation for this assumption. However, as already mentioned the creation of the dump yard also exerted an important weight on it. To conclude this paragraph, another reason that could induce the residents pro-environmental behavior is the belief that the presence of tourism is closely linked to financial benefits and as they have learnt through observation that tourists like to visit not polluted places, so they keep the village litter-free to not lose their monetary source.

The self-government model of Amaru and its strongly communal organization have an enormous influence on the improvement of the local Waste Management situation. They have developed systems that allow residents to participate and be actively involved in the process of improving the waste issues. The community board has the task to consult the residents in any decision taken or the setting or amendment of norms related to waste management, for example setting of clean-up days. Further, the monthly communal plenums are a space that permits the dialogue and exchange of the whole village. People have the opportunity to express their complaints, advice or wishes with their fellow-villagers. Additionally, the communal leaders monitor and try to ensure that every member of the community meets its obligations. The last form of influence is the most recognized by the respondents. Indeed, the respondents believe that the community board exerts a notable role in the villager's awareness-raising, shift of negative waste handling practices and motivation for growth on waste relevant topics. This educational-informative function takes place generally in the communal plenums, where the villagers receive informative talks and recommendations on topics like source separation, waste minimization, composting, effects of the plastic in the environment, correct waste storing, waste pollution and climate change, etc. The suggestions of the community are well received by the residents, as they obey the waste-related rules, follow the recommendations and trust what is shared. This open attitude of acceptance towards the advice provided and the waste handling measures by the communal board might be based on the profound confidence of the community to stand by them. In fact, most of the respondents are satisfied with the work carried out by the community board and recognize a positive shift in their behavior. For example, residents who use to pollute due to lack of knowledge about its consequences, but after having attended the plenums and receive the advice, do not practice it anymore. The previous implies that the community board acts as a catalyst for a positive shift of environmental practices and beliefs. Similarly, the respondents' motivation to enhance their knowledge and skills about waste-related themes is high. Some of their declarations imply a great value living in a litter-free community, and some of them even feel proud from their waste situation in the village because they think it can be an example to the surrounding villages. It seems like some of them are willing to learn more about waste to make a benefit not only to them but also the community as a whole. This could be a suggestion of the solidarity present in the community. In conclusion, Desa, Kadir & Yusooff 2012, p 48 explain some of the reasons why the community board has a significant influence on the change of attitudes of the residents, even

though people are constantly changing, adapting, modifying and renouncing attitudes. To achieve a change in people's attitudes, it is necessary to take into account some factors. First of all, for people to accept a change in their attitudes, they need to accept it. The acceptance will depend on who is offering the knowledge, the way in which it is presented, how the educator is perceived and the credibility of the person responsible to communicate. The change of environmental attitudes and even behavior in Amaru has evolved in large part due to the actions of the community board, the high grade of participation and community cohesion. In this particular case study a change of attitudes ensured an improvement of environmental behavior.

Finally, there is no correlation between the level of education of the people and their pro-environmental attitudes. This statement contradicts the findings of Jatau 2013, p 126. The author in her study called "*Knowledge, Attitudes and Practices Associated with Waste Management in Jos South Metropolis, Plateau State*" proved that the level of education from the respondents had evidently influenced the knowledge they had of waste management and therefore it has led to better practices. In Amaru people who declare to be actively participatory in the community plenums and reunions tend to have more extensive knowledge from correct waste handling. In the study named before, the author discovered that the variables age had no notable impact on attitudes related to waste management Jatau 2013, p 126. These results also differ from the findings of this investigation. In Amaru people over thirty years old tend to have a greater positive attitude towards waste management than younger people. Probably because the older residents take responsibility for their families in front of the community board and because they are more involved in communal clean practices

5.3 Awareness (AW)

In Amaru people are conscious of the waste pollution that exists and about the consequences it has for their wellbeing and the natural environment. Indeed they acknowledge critically polluted areas throughout the village, like the community paths, places by the bank of the river, etc. and are not proud of it. However, they also consider that the situation has notably improved in the last years. One of the main reasons for this shift is the creation of the communal dumpsite, the rise of pro-environmental practices such as keeping clean the surroundings of their houses and the acquisition of knowledge about the consequences of littering. An illustration for this is the fact that nowadays, Amaru's residents have an agreement to use a designated final disposal site mainly to deposit their inorganic waste. Other types of improper waste disposal techniques like waste burning, and waste dumping in the river are strictly prohibited by the community board and rejected by all respondents. It seems like the respondents understand the importance of their correct waste disposal habits because they usually respect the norms and meet their obligations. Although, the respondents admitted that there are polluted areas within the community. They are just a few, and it can be said that if the village is compared with others they are definitely well placed. Plastic waste is a material relatively

new for them, a material which was introduced in a swiftly and continuous mode. The fact that they were not environmentally friendly in themes as littering was probably because nobody explained to them about the harms that it could have for the soil, the water and their health if it not treated correctly.

With regard to the awareness of negative consequences and causes of inadequate waste disposal the older respondents admit that the introduction of plastic and its unreasonable use had a huge influence on the overall situation of the waste pollution in the community. This statement implies first that they are aware that people are using plastic excessively and that this is a harmful habit. Respondents have an acceptable awareness about some properties of plastic, most of the knowledge is linked to the negative impacts that it can have if dispose inadequately, to its toxicity when it is exposed to the sunlight and to its long-life feature. Second that they are conscious that this use has a direct impact on their local Waste Management. Coming back to the plastic, the majority of the respondents recognize plastic as one of the main causes of soil contamination. They are aware that the soil goes through a transformation process when is exposed to plastic. The vast majority have an extremely negative attitude towards plastic and its consequences for the earth they relate conditions like erosion, infertility, bad quality of the harvest outputs and even decrease in the number of animals such frogs and earthworms to the presence of plastic items like disposal plastic bottles, plastic bags, and sweets packaging. Although the presence of plastic has a negative impact on the fields, the effects could also be caused by other factors such as climate change, contamination of the water through the indiscriminate use in the nearby crop fields of chemical fertilizers, fungicides, insecticides, and herbicides. Some assure it is one of the reasons for global warming, while others state that it is toxic because of its bad smell. However, they were not able to justify their declarations or give more details or talk about other consequences, like the contamination of the soil due to the ash. This allows to assume that their knowledge on this topic is superficial and incomplete. The level of knowledge that they have about the negative impacts of waste dumping in the water can be considered decent. They connect the contamination of groundwater with the filtration of toxic substances such as heavy metals, because toxic elements are transported to the crop fields and other parts of the community through the water streams that cross or are situated near to the dump yards. Another cause of water contamination with waste for the respondents is dumping waste in the river banks or the water streams, which at the same time can cause over floating. The consequences of such actions are that for example the water is unfit for human consumption and it can cause death to humans and animals. The difference in the level of awareness between soil, air, and water is caused probably because they do not perceive equally the effects of pollution. It can be assumed that a reason that their level of knowledge is lower in the consequence of air pollution is that the respondents cannot comprehend them. Whereas the contamination of soil or water is evident when it is contaminated

because it can be observed by change in color or consistency. Due to the way in which the participants reported the previous information, mostly narrating in the form of a story, can be a hint that they have obtained it in great part through their own experience and during the communal plenums.

In reference to the respondent's consciousness about disease and their relationship with inadequate waste disposal, absolutely all respondents agree with the assertion that bad disposal habits are one way to contract diseases. Nevertheless, only a very few are able to describe symptoms, recognize contagious sources, name concrete diseases, establish clear relations between improper waste practices and sickness or describe ways to diminish the risk to contract such diseases. In fact, only few respondents can recognize, causes of sicknesses or transmissions. However, they are aware that mosquitos and flies can transmit diseases. Some of them recognize that humans can get infected through the consumption of contaminated meat or polluted water. In fact, many of them relate symptoms such as diarrhea, stomachache, headache, fungus infections, respiratory infections, acne, and allergies. In some cases, when people have symptoms such as diarrhea, or headache they think it was caused by their exposition to the cold. This outcome coincides with the one of Marinof et al. 2001, p 24 who suggest that in Andean communities the cause of sickness is usually linked to natural phenomena. Furthermore, dengue was the only concrete disease averagely named and explained. The explanation about the difference in the outcomes could be explained by the fact that the respondents who enjoy more detailed information, causes, transmission and symptoms especially about infectious gastrointestinal diseases are women with small children, who normally are target from sanitary training from the medical center. It can be said that their awareness-raising work is creating positive results. Overall the knowledge that they have about disease is either non-existing or very limited and fragmented. These results confirm the statement of (Marinof et al. 2001, p 18), who suggest that in communities of the Peruvian Andes there is little scientific knowledge of diseases and ways of transmission.

Recycling is a well-known term in Amaru, almost everyone has heard about it. Even though they admit not exactly know what it is, they do have reasonable information, which is mostly founded on the local and concrete waste issues. For them the term recycling is closely linked to reuse, waste separation and upcycling, which indeed are techniques very close to recycling, but the main difference being that they do not go through a transportation process. Their declarations give evidence to believe that they are conscious about the purpose and the advantages of the implementation of recycling in their village. One of the purposes is to save space in the dump yard, which indirectly leads to having a litter-free community. At the same time they are conscious that they would need to implement a series of measures to make it possible, for example building special installations in order to correctly store it or find sales channels. In fact, the majority of the participants consider that plastic, especially plastic bottles can be recycled and that they could get a monetary benefit from it. Further,

only few persons are aware that it is also possible to recycle other materials such as glass, paper, aluminum, batteries, and metal. That affirmation is surprising because some of them practice recycling with the help of the scrap dealers, without being aware of it. Regarding the recycling process, plastic is the only inorganic material that they know can be recycled. Some of them have ideas about the process in which the plastic bottles go through to be transformed into blankets or other plastic items, people who spend time in Cuzco – city the closest big city. Most likely it was there where they saw informal collectors or recycling facilities. Moreover, most of the respondents are interested and motivated to learn more, not only about recycling but also about other waste handling techniques. Their motives are characterized by responsibility on the local environment, like to have a community with clean air; sanitary reasons to learn more about causes of disease and social aspects like to be an example in good waste handling to the neighboring villages. It seems like this topic is relevant for the respondents, they consider this technique as correct and value the idea of plastic as a resource, which can be transformed and not only represent an inconvenience as how it has been to date.

Some of the respondents' statements linked to knowledge were pretty similar as if they had learned it from the same source. It can be assumed that they have acquired it from the monthly plenums organized by the community board, which is on the one hand a very good signal and indication of the effectiveness of the informal environmental education labor. On the other hand, the case of spreading of misinformation can be detrimental especially if the information is related to topics linked to the health of the respondents. For instance, spreading the word that burning tetra packs in their ovens don't cause any harm to their health.

Absolutely all respondents think that tourists like litter-free landscapes. Their opinions were based mainly on their personal experience with tourists. Further, there is a tendency to build antinomies from the beliefs they have about tourists and environment. For them tourists like beautiful, clean, joyful and pure landscapes, while disliking ugly, filthy, and sad landscapes. They recognize the admiration and joyfulness tourists feel when visiting the landscape of the community, which probably makes them think the tourists do not have the same nature where they come from. Respondents also constantly witness tourists picking up garbage spread throughout the paths, while they visit the village. This is probably the reason why they suppose that tourists live in a litter free place. Some respondents who work in the tourism sector believe that tourists are fragile and can easily get sick, as to why they can not walk through dirty and filthy places. The opinion of the respondents who work in tourism and therefore have closer contact with tourists could have been influenced by the training they recieved from tourism organizations or employers. They may have observed some sick tourists, who tend to get gastrointestinal illness due to the water quality or altitude. Moreover, it seems that participants pose great value on the well-being, opinions, judgments, and comfort of tourists. For example, they want tourists to feel welcome, and as they know tourists like a clean environment, they

keep clean the surroundings of their houses to please them. Important here is to note that the visit of the tourists is one of the main reasons to encourage the villagers to keep performing good waste practices.

Here arises a question, do they act environmentally friendly only because they want to please the tourists? Their declarations and actions have shown that the respondents have other reasons to care for the environment, of course tourism is one important one but their environmental compromise, conviction, and values go far beyond the merely satisfaction of tourists. It probably has more with the pride they have of having a litter-free community, they want to show off the fruit of their efforts, not only to the tourists but also to other outsiders. Moreover, there might be an economic interest behind that attitude since tourists are an extra income source for them. In general, there was no difference between the beliefs of people who work in tourism and people who do not.

5.4 Practices (P)

The community does the best they can with the WM system to ensure the best environmental practices without professional know-how, financial or technological support from the responsible governmental institutions. The habits of the villagers can be better understood when the three factors of its elements, the stakeholders and its structure become known. The first element is the setting of internal laws, with which the residents can have clear parameters to act correctly and can learn about their responsibilities and active role. Second, the training of the villagers given precise instructions of correct waste handling. The rise of awareness and education on behavior shifts are also elements in which the community board holds a lot of sway. The last element is conformed by the stakeholders, in the WM of the village there are three; the community board, the residents and occasionally the scrap dealers. The community leaders, in conjunction with the residents are in charge of creating laws, planning, control measures, financing and establish contact with district authorities. The residents, on the other hand, are responsible for the effective implementation of waste handling practices. Even though their WM system has few elements that permit a slight control of the waste streams, those elements are nor that complex as in the cities (Chandrappa & Das 2012, pp 32–33). The residents' habits will be explained classifying them into the structure of WM in Amaru:

The waste generated in the community is mainly domestic. The majority of the villagers store their waste either in their kitchen or in their backyard. Inorganic waste and compostable organic waste are put outside the house, mostly in their yard or their fields if they are close to their homes. The organic waste, primarily leftovers, are placed in the kitchen in plastic buckets. As mentioned, the community practices waste segregation. They demonstrate it with good practices of waste separation. The vast majority of the respondents segregate organic from inorganic waste. In addition, a minority separate within the inorganic waste, the most common recycled inorganic material is plastic followed by glass

and metal. The organic waste is used either to feed their animals or to prepare compost. Only one respondent mixed it with the inorganic waste, to later dump it into the communal refuse pit.

Furthermore, the lack of waste collection service has indirectly boosted the community's organization to solve this inconvenience. This exhibition of good attitudes and commitment towards a cleaner village consists of three activities: regularly communal clean-ups, consistent cleaning of their houses and correct disposal of inorganic waste in specific refuse site. Moreover, the only treatment they carry out is composting. The materials applied are food scraps, animal manure, and crop residues. They have developed three different compost techniques, which they use depending on the available amount of organic waste, space and time. Those are the pile-up, the direct compost and the open bin technique. For the final disposal, the majority of the residents resort to the open dump technique. Since they do not have other alternatives, in some occasions they also burn organic waste as straw or crop rests. Although in general they have a very negative attitude towards inorganic waste burning.

The challenging circumstances that Amarus' residents have to face solving their waste issues are not an obstacle to adopt positive waste handling practices. In so doing, they show the presence of pro-environmental values in their society. Furthermore, their practices are interrelated and congruent with their attitudes and awareness towards WM. Likewise, there is a connection between their good waste habits to other ecological practices, for example most practice composting, because it is the only form to obtain fertilizer since they do not use any kind of chemical fertilizer. Finally, their particular situation makes them more conscious about the generation of waste. In the cities usually people think waste disappears after it is collected.

5.5 Strengths and limitations of the study

This section will highlight the strengths and limitations that arose during the whole research, considering that the interviews' limitations method were already discussed in chapter 3.2.

Strengths

First of all, this study represents the first approach to understand the wastes' perceptions of an Andean rural community influenced by tourism. It is also the first investigation that analyzes the relationship between a self-government driven village and the attitudes towards waste of its residents. Second, the interaction from the researcher with the residents might have made some respondents reflect about waste disposal habits on which they do not usually think. Third, although the research is not fully representative, the application of mixed criteria to achieve a varied research sample was ensured. The sampling was covered by many particularities of the whole participant's universe and embraced different groups of respondents. This might have reinforced the validity of the results. Finally, even though the researcher does not belong to the resident's culture, her closeness to the

Peruvian culture, the language might have positively influenced the trust of the respondents. It could have also enabled a better understanding between her and the participants.

Limitations

A critic of the thesis should first point to the lack of scientific data to support the particularity of SWM in rural areas in Peru as well as the context in which the community is located. The research started without any detail of their SWM system. That led to difficulties in developing an understanding of the framework of the research. For instance, at the beginning of the investigation, it was assumed that people in the rural areas could have the similar attitudes on waste handling as people in the cities because that was the only closest information available. This lack of information, which was partly overcome with the preparation of the observation protocol caused the investment of valuable time to find out information that was related to the objective of the study but was not the objective itself. All papers reviewed about awareness and attitudes were developed in very different circumstances to the one from Amaru. Firstly, because all of them with no exception were conducted in an urban area, areas covered by waste services at least with the waste collection service. Besides any of them had the model of intern government adopted in the community Amaru, which unquestionably has affinity towards the SWM system and the beliefs of the residents towards it. Furthermore, this shortage of information caused difficulties by the setting of very detailed research questions, and at the same time was probably the cause which brought the generality of some variables, for example the variable of waste practices. However, the intention of this variable was descriptive and aimed mostly to serve the understanding of the attitudes and awareness categories. Another possible critique towards this investigation is the little information held by the researcher in the culture of the interviewed individuals and therefore the lack of an intercultural focus. This might have caused a negative influence on the effectiveness of the qualitative method and could affect the methodology as well (United Nations 2010, p 24). This lack of local knowledge in the local wisdom, people's relation to nature, their language and the way how they perceive health problems might have also influenced the quality of the results. To overcome that difficulty it would have been better to resort to an expert while developing the interview guideline, although in this case it was not manageable due to the lack of time. Likewise, the oral information that was given by the comuneros was irregular, especially regarding the name of sectors of the community or the exact number of years in which any norm was imposed or about the creation of the dump yard were irregular. Their perception of the time seems to be different from the occidental one. This is the reason why questions and answers that implicated certain timeline ("long time ago", "few years ago", "recently") were very indefinite and the results thus very inaccurate. Another difficulty was logistical part, particularly when planning the visits to the households since most of the time the respondents were not at home during the day. In some cases, they would go to work in the fields, in other cases, especially women, were busy during the morning preparing the

lunch or attending there children. In other cases, especially young people, who work or study out from the community, would also come back home after 6 pm or on weekends. To overcome these issues the researcher developed strategics to reach them. For example, the researcher visited the households early morning or late afternoon, eventually on weekends, or she would go to the fields to encounter the participants trying to make appointments. Similarly, since only a case study was considered, there is no way to compare the results and gain a broader perspective about the awareness and attitudes of the respondents. Here arises the question if the results of this study if the results of the study can be acquired by the generalization of the gained information. It is certainly true that most of the communities are similar but this case is highly specific.Finally, the vast majority of the declarations provided by the individuals did not pass for an accuracy control, which leaves the suspicion that probably some respondents have claimed to perform pro-environmental practices, and not have told the whole truth.

5.6 Areas for further work

This chapter will now conclude some suggestions for further research areas that have been highlighted throughout this thesis.

The first area of further research would be to analyze the resident's knowledge and perception of diseases caused by improper SWM handling. This suggestion is based on the fragmental level of awareness that was shown during the interviews. It is recommendable to work with a quantitative approach and use extensive surveys to reach more villagers. This could be the most suitable form to give the intervieewa alternatives and focus on diseases that could have the symptoms that were already mentioned by the respondents such as typhoid, diarrhea, dysentery, or hepatitis A. Secondly, it was clear that the respondents perceive the effects of the waste pollution from a different view than people in the cities. A study on their perception of nature should be made, but taking great attention to their ways of understanding. To be able to rightly communicate and motivate the participants. And so a relationship between the formal or scientific knowledge and their traditional one. Thirdly, the governmental authorities should prepare an assessment of the environmental impact caused by the dump pits. Although this topic is not directly connected with the main themes of this thesis, they need to be scientifically evaluated. To accurately know about the effects that it has in the water, air, and soil and according to it take measures to reduce negatives impacts on the health of the villagers. The results of such a study could also help legitimate an upgrading request of the dump pits being turned into landfills by the government. Finally, as indicated before the Pisac's municipality has so far not carried out an analysis of the waste composition of the waste generated in its rural areas. It was probably because the areas have been ignored by any district WM measure and therefore the data were not needed. However, it would be valuable to undertake a waste characterization analysis in

the area. The data of the waste streams can be used for example in the first steps of the implementation of any waste program like recycling, to forecast waste generation rates or to calculate the lifetime of the dump pits, etc.

6 Recommendations

The following recommendations were made after a deep analysis of the issues emerged while evaluating the results. They are directed to the four stakeholders: the community board, the residents, the municipality and NGOs. Despite the absence of the governmental and municipality institutions, it was considered necessary to address them because they could excert a great influence on the situation improvement of community's SWM.

The first suggestion for the community board is to designate a group of persons responsible to organize talks on the dissemination of the ill effects of poor waste management. The community promoter in charge of informing and promoting changes of habits should be well known and respected person in the community (Marinof et al. 2001, p 28).Those persons could have the responsibility of contacting and coordinating the medical staff of the medical center as well as encouraging the members of the community to attend the training or talks. Second, given the fact, that many children consume packaged products acquired from the shops in the community. The community board should present a new norm targeting the shop owners to compromise in the awareness-raising of their customers, so they could take a number of measures to communicate the adverse impacts that littering has. Third, continuing with the children, the community board should try to contact with NGOs like "Sweet child Peru" or "Amistad sagrada" who are currently running cleaning campaigns with children in scholar age in Pisac and surroundings. The NGOs together with the community could organize, for example, a clean-up day exclusively for children. Fourth, in order to prevent waste contamination in the paths. The community board together with the residents could create billboards to put it along the paths and the rivers, especially in the more polluted areas. The message should be in Quechua and it should be an image to allow the illiterate to understand it. Some of them can contain messages of the positive characteristics of the flora or fauna, so the people passing by realize that those creatures can be endangered if they litter. Finally, the community board could grant public recognition for villagers who maintain cleanliness in their homes. They could do the evaluations during the control visits they regularly make. They should also name and congratulate in public families that are practicing good habits and reprimand the families the others that are not. This exercise is extremely important in a society where prestige is valued.

As previously stated, during the fieldwork it was noted that all along the water streams there were plastic containers of bleach and packaging of detergent. The comuneros should ensure to take the packaging of cleaning products with them when they do the wash in the river banks, to avoid an

accidental consumption of them by grazing animals. Likewise, they should compromise using less chemical cleaning products and if possible search and for natural alternatives. This mainly due to the reason that liquid waste from their households ends in the water streams, which they use to irrigate their fields. Another suggestion for the comuneros is to constantly incentive/motivate their children not to litter by sharing all information they possess about the consequences of littering in a creative and interesting way. For instance, the comuneros can walk with them to the school and pick up the waste which is spread throughout the paths. The last recommendation is to try not to leave plastic bottles in the crop fields since the wind or the children can move them to other fields or water sources. A recommendation could be collect them in a sack and keep it in a safe place until they are ready to be transported to the dump pit.

Even though the municipality currently does not support the community in any SWM affair, it was considered relevant to offer the recommendations since they could be catalysts for change. Firstly, the existing of the dump pit is environmentally erroneous and socially disallowed. Hence, the dumpsite should be upgraded to a landfill that accounts with at least meets environmental legal requirements. In the short term they should build fences to keep small children and animals save. Secondly, in conversations with the community president, he expressed a desire to assign two people to do the public clean-up and become clean-up promoters. His suggestion was to choose two people from the community who need financial support. To enable the hiring of them, he asked for the economic support of the municipality. Lastly, another desire of many respondents was that the municipal garbage truck reaches the community at least once a week. With that service, the community could close the dump pit. However, since the district of Pisac does not have a sanitary landfill either, sending the collector truck to transfer the garbage to another dump pit, would only change the location of the problem.

The last group who can have a positive influence on the resident's awareness towards SWM are NGOs. In case they want to develop a waste educational program to reinforce the existing WM attitudes or awareness. Any training program should be adapted to the participant’s culture, knowledge, and educational level (Ministerio del Ambiente del Peru (MINAM) n.d, p 13). For which it is essential to have the support of community leaders and professionals with knowledge and experience in the culture of the participants. Finally, in the accomplishment of communal programs, paternalistic and assistentialist attitudes should be avoided. Mainly because they supplant the own efforts of the communities and therefore generate passive attitudes in their members. Instead, they should promote empowerment processes for each of the participants. In this way, communities are encouraged to carry out their projects, initiatives, and programs autonomously. (Montes & Díaz 2011, p 9)

7 Conclusions

The aim of this study was to reveal details about the current attitudes, awareness, and habits pertaining to various issues in SWM of households in Amaru. Amaru a rural community characterized by the lack of governmental waste services and where tourism has been present for approximately one decade.

From the research that has been undertaken is possible to conclude that the respondents indicated negative attitudes towards waste pollution and the risks and consequences that it involves. In the Amaru society polluting is a rejected behavior. In fact, the great majority manifested it disconformity with polluters, who are in its majority children and youth in scholar ages. As a consequence they showed a favorable attitude to any kind of SWM method aims to keep their community litter-free. Indeed, all respondents acknowledged their responsibility to achieve that objective. They ignore the role of the municipality on this matter. Even though their WM is far from perfect, it has been helping to diminish the negative effects that bad waste handling practices used to generate in public places, households, the air, the crop fields, the water sources, and the residents' health. This good performance of the local WM in the community is largely swayed by the communal government. Thanks to the communal board, the villagers are well trained in waste segregation, are aware of effects of improper waste handling, have changed non-favorable waste practices, and have developed interest to improve the waste situation of the community. Another factor that has led to the progress of their attitude and values towards WM, mainly to prevent pollution of public places, is tourism. This study discovered that the influence of tourism has occurred in two ways. On the one hand, the intern tourism organizations have promoted the approval of internal laws that intend to provide a favorable environment for the tourist as well as guarantee the improvement of the overall littering condition. On the other hand, the environmental friendly behavior of the tourists has influenced on the resident's concerning and ecologic behavior and therefore have promoted positive attitudes towards SWM handling.

In addtion, the study has showed that the villagers have good awareness and possess an acceptable knowledge about the negative consequences that improper waste handling can have on the soil, air, and water. The level of awareness they have slightly differs depending on the topic. Being the contamination of soil and water the two topics where they established complex relations. Moreover, the comuneros are conscious that plastic represents a big challenge for their SWM system and the natural environment.They are concerned about the soil infertility caused mainly by the presence of plastic in the crop fields. The residents are partially informed that bad final disposal practices as waste burning can have an adverse effect in the air. Further, they can relate to the pollution of the groundwater in the dump pit area and the resulting pollution of crop fields. Likewise, recycling is not applied

in the community, therefore the residents do not have sufficient understanding regarding it. However, they showed motivation to learn more about it and also to practice it. The area in which the residents showed more deficits in their knowledge was in the relation that diseases have with negative waste disposal techniques. Most respondents can not describe symptoms, recognize contagious sources, name concrete diseases, establish clear relations between improper waste practices and sicknesses or describe ways to diminish the risk to contract it.

Although it is true that the inhabitants of the community show to have incomplete knowledge.on the impacts of improper waste handling, their practices show congruence with their positive attitudes towards proper domestic waste disposal methods and level of awareness. The households have good waste handling habits, they practice waste segregation and composting. To ensure a litter-free community they participate in regularly clean-ups and deposit the inorganic waste only in the official designated communal dumpsite. The particularities of their intern organization, especially their high governance level was certainly a contributing factor to the relative successful adoption of good SWM practices. One can clearly recognize the influence on the residents' practices of the dump pit creation. Moreover, tourism might not bring to all of the inhabitants of Amaru a considerable income source. However, tourism has proved to be an influence on the environmental values of the locals.

This case study can be considered as a best practice example in Peru. Since the limited literature available about attitudes and awareness of Peruvians towards SWM take for granted that the Peruvian society has negative attitudes and low level of attitudes towards SWM. Is this context where no considerable importance is granted neither to SWM implementation nor to the investigation of people's, mindsets linked to, it is where this paper becomes relevant. This thesis helps, therefore, to complement the necessary research in following areas: firstly, this research can be used to track the residents' trends on waste and attitudes awareness topics. Secondly, this valuable information could serve as tool for the successful development of waste education guides and training based on the specific resident's knowledge, beliefs, and motivations. Thirdly, it could serve as a best practice example that municipalities, authorities, or communities could use as a model to implement rural waste handling programs.

Although, Amaru has shown the responsibility, commitment, conviction, concerns, and environmental values of their residents by challenging the waste issues with their own designed SWM system, it should be not forgotten that the government and its representant the Pisac's municipality should assume its responsibilities as one of the main stakeholders in reducing the impacts that waste has on their quality of lives, their health, and the natural environment. Only with their politic intervention and the creation of a support structure like the upgrading of waste facilities, the introduction of incentives, or the assistance with impulse programs to reinforce good SWM habits. The waste handling

solutions that have been reached in the community can be improved. Finally, a system that ignores the rights of native people by not ensuring the compliance of environmental laws in their lands can not expect that Amaru's residents who have insufficient economic resources, a more rural complex life, and who do not enjoy a waste disposal system, engage and fight alone against environmental effects caused by a precarious SWM.

8 Personal reflection

The topic was selected due to a personal interest raised few years ago during a short visit to the Cusco region. It was then that I began to question the relationship between tourism and the generation of waste. My concern about this situation was focused in Cusco because it is one of the most famous touristic destinations in Peru, and therefore, I thought that efforts created there could have a more significant impact. My first intention was to find a way in which tourism could positively influence the generation of waste. I also wanted to concentrate on the side of the locals, because for me it could bring more longlasting positive consequences.

I started the research in Germany and had partial ideas of the region and the most waste relevant topics. That is why I started this research with a different objective since all limited information I could gather from Germany were not sufficient to develop a realistic thesis theme, which of course became more clear once I arrived in Cusco. I started with a very ambitious and unreal plan, which was reflected in my first exposé. However, the feedback of Hor, Prof. Mrs. Häusler helped focus my ideas and objectives.

I also thought that to set the studied area could have been faster but it turned to be a long and grueling process, which was due to my inexperience and the lack of reliable contacts. I'm aware that this search was part of a process. However, if I would have the opportunity to do it again I would go directly to the studied site and ask by myself for any valuable contact to accelerate the search. I spent in total more than a month there but I had the feeling I needed more time staying in the community to better understand the respondents and therefore be able to deliver a more accurate interpretation of the results.

The large number of interviews demanded a relatively high investment of time. Even though I knew it would be a massive work to process all the amount of information of 23 interviews I decided to carry them out. The main reason that led me to take that decision was a requirement from the Pisac's municipality authorities to utilize the results of my thesis in the development of their future environmental strategies. I chose that option because I wanted it to be used as an instrument that could help their local Waste Management situation and consequently could allow the improvement in the quality of lives of people living in the 12 rural communities located in Pisac. What I think now, is that the large amount of the interviews had a negative influence on outcomes and the quality of the interviews

themselves. And even though it allowed me to have a broad look into the perceptions and motives of more persons. It was probably in a more superficial way.

During the redaction time I wrongly concentrated too much in the conceptual part of the thesis. Although I am sure they served me well to create a framework to understand my topic and to be able to create a better interpretation of the results, now I realize I spent too much time trying to look up for more detail that was not necessary.

My stay in Cusco was not always uncomplicated, because even though I'm Peruvian it was not easy for me to adapt to the way of life and the weather in the Andes. However, I consider that my time in the community has enriched my life, opened up my understanding of nature, simplicity, solidarity, social commitment, and communal organization. It also has brought me closer to the social, environmental and economic injustices, which in some moments were demotivating. But also gave me motives to keep researching and, if possible, continue with the second part of this study, which is the creation of an environmental waste education guideline. The one that I was not able to develop due to the limited time and financial resources.

Finally, I am aware that my study is not perfect, but I also need to take into account that this is the first large scientific study I carried out. That is also why I can say that I am proud of the work I have done, same as I deeply hope the results of my investigation will be put into good use.

Appendix 1
Photographic documentation of the community Amaru

Comuneros

Home-stay accomodation

Guinea pig farm

Woman dyeing wool

Community plenum

Source: Apaza, L., 2019

Appendix 2
Rural tourism in Amaru

Group of tourists

Preparation of pachamanca

Comunera in the kitchen's restaurant

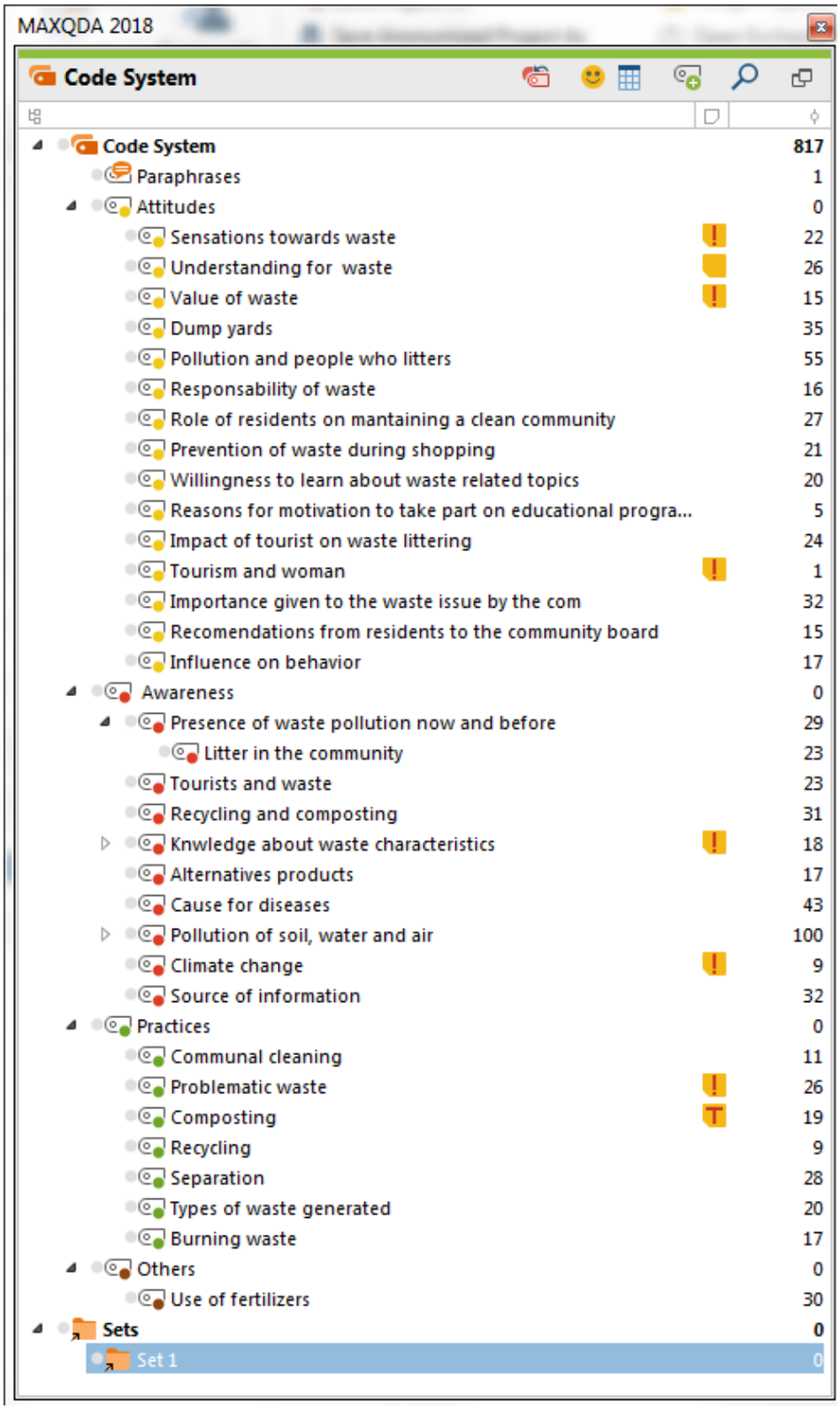
Demonstration of natural wool

Source: Ccana, H, 2019

Appendix 3
Linking variables, codes and questions

	Codes	Group of variables	Specific variables	Nr. of question	Questions
Attitudes	A1	Meaning of waste	Understanding the waste	(7)	What objects or materials are waste for you?
				(14)	Does waste can have value for you? For example, that it can create a monetary benefit
	A2	Final waste disposal	Dump yards	(8)	How do you feel about the waste in the dump yard?
				(35)	What is your opinion about the dump yards of the community?
	A3	Littering	Pollutions and people who does it	(13)	Why do you think they adopt that behavior?
				(12)	What do you think when you see people littering?
				(10)	How do you feel when you see waste on the roads, paths or next to the river?
	A4	Prevention of waste	Prevention during shopping	(32)	When you go shopping to the market for example, do you think before buying in the waste that can be produced by the products that you acquire?
				(33)	What do you ask yourself? Can you give me one example?
	A5	Responsibility	Responsability of waste	(43)	Who do you think is responsible for the waste created in the community?
	A6		Role of residents in maintining a clean community	(42)	Can you give me an example of what you personally can do to create a cleaner community?
	A7	Participation in Waste Managemnet activities	Willingness to learn about waste related topics	(31)	Would you like to learn a biit more about topics such as recycling and composting?
	A8		Reasons for motivation to take part on educational programs	(46)	Which specific topic that was disscuss during our interview would you like to learn more about?
				(47)	Can you name a reason why would you like to participate in such activities?
	A10	Influence of tourism in waste pollution	Impact of tourist on waste littering	(48)	Do you consider that tourist litter the community?
	A9	The role of the community board on waste management	Importance of the waste issue at the community board	(37)	Do you think that in the community monthly meetings the topic waste received an adequate attention?
				(38)	Which topics related to waste or garbage do they speak about?
	A11		Recomendations from residents to the community board	(40)	How satisfied are you with the way waste is handle in the community?
				(41)	How do you think, it can be improved?
	A12		Influence on behavior	(39)	Do you think communal reunions have an influence on your behaviors towards waste?
Awaraness	AW1	Presence of waste litter	Presence of waste pollution now and before	(15)	When do you think there was more waste in the community, now or in the past?
	AW2		Litter in the community	(9)	Have you noticed if the community is littered with waste like in the paths or the river banks?
	AW3		Tourists and waste	(49)	Can you point out to which of these two pictures a tourist would prefer to visit? (fotos)
	AW4	Knowledge about waste management techniques	Recycling and composting	(25)	Do you know what does recycling mean?
				(27)	What happens with the materials after there are recycled?
				(30)	Do you know what the process of composting is?
	AW5		Alternative products	(34)	Do you know alternatives for cleaning and body care products that are natural?
				(44)	Have you been informed about the different type of waste, the effects of incorrect disposed waste, recycling, or ways how to minimize it?
	AW6		Source of information	(45)	Who in your community organizes workshops concerning waste and littering?
	AW7	Consequences of improper waste disposal	Cause for diseases	(17)	In your opinion can an incorrectly disposed waste be a cause for diseases?
				(18)	What kind of diaseases?
				(19)	Have you ever been infected with a disease closely linked to improper waste dispopsal?
	AW8		Pollution of soil, water and air	(16)	What happens with the nature, the "Pachamama", the water and the air which are littered with different kinds of waste?
				(36)	Do you know what happen with the soil, the water and the fields around the dump yard?
	AW9		Toxicity of hazardous waste	(20)	What do you do with used batteries/batteries from phones?
				(22)	Can you name reasons why you burn waste?
Practices	P1	Source separation	Recycling	(26)	Which materials have you recycled
	P2		Separation	(23)	Do you separate waste at home?
				(24)	Who does it and how?
	P3	Waste generation	Types of waste	(11)	Which kind waste types or materials do you often see on the paths or river banks?
	P4	Waste disposal	Waste burning	(12)	Do you burn waste?

Appendix 4
List of the MAQDA codes



Appendix 5
Example of a "case summary"

B1 Concerned and well informed tourism entrepreneur

- Primary school.
- 45 years old.
- Farmer, weaver, mother.
- For her organic residues does not represent waste, because they serve as feed for her farmed animals.
- She is worried about disposable plastic waste, which represents the biggest pollution source in the community.
- She has many contacts with tourist and tourism agencies, and she has in her house facilities to host tourists.
- Took part of many workshops about waste handling offered by tourism-related institutions.
- She thinks there is fewer waste littering in the community than in the city (Pisac), because of the communal dump yard.
- For her the "big waste polluter" in the community, at least in public spaces are the school age childrens.
- For her the polluters do not value the natural environment.
- What she knows about recycled plastic bottles is about the covers made from it.
- She prevented waste in the way that she does not bring (to the community) much plastic bags and disposal items, particularly bottles.
- She thinks that the community dont know the true value of waste may have.
- Participate in the community cleanups.
- Knows about the highly pollutant power found in cleaning products, and its effects for the weater and the soil and animals (earthworms and toads).
- She is concern about the pollution of the soil and its influence in the quality or features of the crops.
- She believes that the local population litter and not the tourist.
- She relates syntoms such as diarrhea, vomits with incorrect waste handling and contaminated water.
- She isnt sure if she got sick beacuse of the gripe or the dirt caused by incorrect waste handling.
- She thinks that the each person in the community should maintain it clean, because anybody else will take that role.
- She doesnt use any chemical fertilizer. Instaed she uses guano made from the manure of her sheeps.
- For her the vegetables treated with chemical fertilizers looks better but are polluted, are very weak to plagues and become dependent.
- Doesnt use batteries anymore, but she used to dispose them in the dump yard.
- She is aware that the batteries cointain dangerous substances.
- She doesnt know about natural cleaning products.
- She knows a little about the compost technique, humus with earthworms. Before there were some training for this topic.
- She is willing to participate in trainings about composting.
- She replay about the question about her thoughts of the dump yard with facts.
- She knows that the soil is being polluted with the presence of the dump yard. However she doesn't know eaxctly how. She thinks it is because of the standing water in the dump yard facility.
- For her the topics talked about in the reunions are maintaining clean and organization of the comuneros.

Say something when other polluts: yes
Satisfied with the community board: Yes, because she works with tourism and she think it help her business.
Change of behavior: -
Dispose of batteries: Dump yard
Waste separation: Yes, organic and inorganic
Waste burning: -
Fertiliser: nature, guano
Responsability: each person

Appendix 6
Observation guide Spanish

Observation Guide
Date:
Place: Amaru Community
Observations:
Guía de observación:

I. Características demográficas

¿Cuál es la cantidad de personas empadronadas y familias?
¿Qué tipo de religión tiene presencia en la comunidad? ¿Cuántos templos existen? ¿El pastor o sacerdote viven en la comunidad o con qué frecuencia la asisten?
A grandes rasgos ¿Cuál es la condición socioeconómica de los miembros de la comunidad?
¿Existen grupos dentro de la comunidad que se diferencian (por motivos religiosos, situación socio económica, actividad económica, etc.)?

II. El turismo en amaru

III. Infraestructura

¿Con que material están construidas la mayoría de las casas? ¿Cuál es el tipo de vivienda predominante?
¿Cuentan con servicios de agua, luz y/o Internet? ¿De dónde proviene el agua? ¿A dónde desembocan los desechos líquidos? ¿hay alguna fuente de tratamiento?
¿La comunidad posee servicio de agua potable? ¿De dónde la obtienen?
¿Cómo es el acceso a la comunidad?
Hay escuelas en la comunidad
Hay centros de salud

IV. Problemas De Salud Relacionadas A La Mala Disposición De La Basura

¿Con cuales servicios de salud cuentan la comunidad? ¿Si no lo poseen donde reciben atención médica?
¿Cuáles son las enfermedades más frecuentes en la comunidad?
¿Qué controles sanitarios se han realizado últimamente las instituciones gubernamentales encargadas de la salud?
¿Qué tipo de enfermedades son reconocidos en el centro de salud y cuáles son sus causas, vías de transmisión, síntomas y efectos?
¿Cómo se trata de evitarlas?

V. Organización comunal

¿Cómo está conformado el consejo comunal de la comunidad?
¿Qué tipo de organizaciones existen en la comunidad?
¿Quiénes son los líderes "oficiales" y/o los informales?
¿Qué organizaciones o instituciones están presentes en la zona y su tiempo de creación?
¿Se reconoce continuidad en el trabajo que realizan las instituciones del estado?
¿Han recibido alguna ayuda o apoyo de parte de la alcaldía en la gestión de residuos sólidos?
¿Cuál es la relación de la comunidad con esta institución?
¿Cómo funciona la participación ciudadana?

VI. Practicas existentes de gestión de la basura

a) Generación

¿Tiene el nivel socioeconómico tiene influencia en la basura producida?
¿Qué otros factores afectan lq producción de basura a nivel doméstico?

b) Almacenamiento

¿Hay puntos de acumulación? ¿Cuáles son?
¿Dónde se almacena temporalmente la basura en los hogares, en depósitos de plásticos, costales, latas, bolsas de plástico?
¿En qué parte de la casa se almacena?

c) Minimización de los residuos sólidos

¿Producción utilización de productos fácilmente reaprovecharles?

¿Cómo funciona la segregación en la fuente: papel, cartón vidrio, metales plásticos, residuos orgánicos?
¿Uso de materiales menos tóxicos?

d) Segregación y reaprovechamiento

¿Cómo funciona la separación y reutilización de desperdicios en los hogares?

e) Compostaje

¿Qué elementos se descomponen?
¿En qué nivel ha sido implementado? A nivel comunal, o municipal o domicilio
¿Se observa uso de fertilizantes?
¿Cómo funciona el reuso?
¿Cómo funciona la reducción?

f) Recolección

g) Transferencia y transporte

¿Cómo son transportados los residuos recolectados a la planta de tratamiento, o al lugar de disposición final?
¿Poseen servicio de recolección de basura? ¿Con que frecuencia realizan la recolección?

g) Tratamiento

¿Se incinera la basura?
¿Elaboran técnicas de compostaje?

h) Disposición final

¿Como se transporta la basura a esos lugares? ¿Qué tan seguido?
¿Qué tanto afecta las propiedades privadas, a los cultivos al ganado, contamina el agua?
¿Hay fuentes de agua cerca al botadero, están contaminadas?
¿Hay olores?
¿Qué tan cerca están de la zona residencial?
¿Hay tratamiento de absorción, control de olor, control de vectores, drain-off de agua de lluvia, cerca?
¿Hay protección para niños o animales domésticos?
¿Hay presencia de criaderos de animales, criados con condiciones de insalubridad?
¿Como es fiscalizado, quiénes son los supervisores ambientales?
¿Hay contaminación del río por el drenaje de los residuos sólidos por las vías del alcantarillado?
¿Hay basura en las orillas de los ríos?
¿Hay basura en los espacios abiertos?

Source: (Marinof, et al. 2001, p 125-126)

Appendix 7
Observation Protocol

Date: 15.01.2019 –19.01.2019, 25.01.2019-29.01.2019, 05.02.2019-09.02.2019
Place: Amaru Community
Observations: Observation took place in time periods form four days. In this time the researcher rented a room in the house of a family offering "home-staying". The father of the family was member of the community board.

Objetivos→
- Identificación de las principales características sociodemográficas y de infraestructura
- Identificación del tipo y funcionamiento de organización comunal
- Examinar el desarrollo de la actividad turística local
- Levantamiento de la línea base de la situación local de gestión de los residuos sólidos

Guía de observación:

VII. Características sociodemográficas

Ubicación

La comunidad Amaru, es una comunidad campesina, ubicada a aproximadamente 20km de la capital del distrito de Pisac.

Religión
Hay **cuatro** iglesias, adventista israelita, iglesia evangélica peruana y católica, cada religión tiene un templo. Los sacerdotes viven de vez en cuando.

Economía en Amaru:
La economía de la comunidad se basa principalmente en actividades de agricultura y ganadería, el turismo se encuentra presente como ingreso adicional.
Los habitantes de Amaru son en su mayoría agricultores, el trabajo en los campos de cultivo lo realizan todos los miembros en la familia cuando es necesario. Entre los productos que siembran se encuentran la papa, las habas, la quinua, la mashwa, el tarwi, trigo, cebada, oca y maíz. Gracias a un acuerdo comunal la mayoría de ellos no utiliza fertilizantes químicos. Además todos practican la agricultura tradicional. Ellos utilizan por ejemplo la *chaquitaclla*, instrumento utilizado para arar los suelos de cultivo con ayuda del pie, o la *yunta* instrumento agrícola para labrar la tierra con ayuda de bueyes.
Asímismo, Amaru es reconocida por la gran variedad de papas que crece en sus tierras. Para la conservación de dichos tubérculos utilizan la técnica de la deshidratación de la papa en épocas de heladas dando como resultado al chuño o la moraya.
Cabe mencionar que la comunidad forma parte de "El parque de la papa". Un proyecto creado por siete comunidades aledañas a Amaru en conjunto con la ONG Andes. El objetivo de este proyecto es básicamente conservar la agrobiodiversidad, en concreto, la biodiversidad de la papa. Las ONGs también apoyan a los socios a desarrollar emprendimientos de turismo en torno a la papa. Pese a que los miembros de este proyecto son solo una minoría, la mayoría de los habitantes de las siete comunidades pueden formar parte de las directivas que representan a cada comunidad. Lo que se puede rescatar de este proyecto es que donan un porcentaje de sus ingresos a las comunidades.

Agrupaciones con diferencias religiosas o socioeconómicas dentro de la comunidad Como se mencionó, en Pisac conviven tres religiones, cada una con un cierto número de fieles. Las misas o reuniones pastorales se llevan a cabo los sábados por las mañanas. Durante la observación no se notó ninguna discordia entre ellos. Existen, como en toda sociedad, una diferencia en estratos socioeconómicos. Generalmente las familias que se dedican enteramente a la agricultura son las que tienen menos ingresos económicos, a diferencia de las que diversifican sus ingresos mediante trabajos en Pisac o Cusco, servicio de taxi, venta de tejidos etc.

La sociedad en Amaru

Durante la investigación de campo se observó que la sociedad Amaru la sociedad Amaru es una sociedad participativa, inclusiva. Como característica comunal resalta su alto nivel de organización. Todos los miembros de la familia desde edades muy tempranas reciben responsabilidades. Es usual observar a mujeres y niños con mucha independencia formando parte del trabajo en las parcelas o en el hogar.

Por otro lado, todos los miembros de la comunidad eligen, por medio de elecciones locales, cada dos años a su directivo o alcalde comunal, constituyéndose la junta directiva. La cual se reúne una vez al mes en las asambleas mensuales. En ellas se toman decisiones democráticas, los temas que se abordaron en las asambleas en las que el investigador asistió se centraron sobre todo en temas como repartición y protección del agua, mantenimiento de los caminos y los canales, asistencia a las asambleas y multas, etc. La fecha de las asambleas coincide con las faenas[16], en ellas se realizan trabajos voluntarios comunales, como por ejemplo la construcción de la nueva sala municipal local, liberación de los canales que recorren la comunidad, limpieza de caminos, etc. En ellas participan, mínimo un miembro por familia y la asistencia es controlada por los directivos.

En conversación con los comuneros, se observó que siguen ejerciendo creencias y ritos de sus antepasados. No cabe duda de que la cosmovisión andina sigue presente en su vida diaria y en ocasiones especiales como la siembra. Parte de los ritos prehispánicos es la veneración a los Apus[17] y los animales, algunas de las montañas colindantes encarnan personajes masculinos y femeninos de autoridad, entes que denotan respeto y que, según ellos, les exigen que haya una armonía entre el humano, la naturaleza y los animales. Este respeto y sabiduría se refleja en su sistema de siembra de ~~los~~ tubérculos en las parcelas comunitarias bajo el sistema rotativo *(muyuy*), en el que de acuerdo a un calendario agropecuario se cuida y se da la tierra la capacidad de regenerarse. Una cualidad comunitaria de la comunidad Amaru en el área agrícola consiste en la repartición de parcelas entre todos los habitantes de la comunidad. La participación en la cosecha de la papa le permitió a la investigadora observar que los comuneros siguen manteniendo el culto a la Pachamama[18], este rito o ceremonia del pago de la tierra.

Por otro lado, en las seis semanas que la investigadora permaneció en la comunidad, no se notó presencia de población joven durante los días laborables. Esto es, según pobladores, debido a que los jóvenes se movilizan a las ciudades más cercanas a estudiar o trabajar. Por último, cabe resaltar que la mayoría de los comuneros que tuvieron contacto con el investigador ostentan el quechua como lengua materna, el español está también presente y la mayoría de ellos son bilingües, sobre todo los varones.

VIII. El turismo en Amaru

El turismo rural ofrecido en Amaru es un turismo vivencial, dirigido a un público específico que va en busca una experiencia de cercanía con la naturaleza y sus pobladores. El perfil de turista, valorado por la comunidad debido a las dificultades que presenta la ruta de acceso, se caracteriza por el interés de conocer, el arte y la variedad gastronómica, la cual radica en la diversidad de los tubérculos.

Por lo general, las familias que ofrecen sus servicios turísticos se organizan en agrupaciones o asociaciones. Dichas asociaciones fueron creadas de la mano con instituciones en su mayoría privadas, las cuales brindan apoyo en temas fundamentales para la apertura, y el manejo de microempresas turísticas, por ejemplo, MINCETUR o la fundación española Codespa entre otros. Por medio de capacitaciones y visitas de profesionales, los “emprendedores” son capacitados en áreas como: gastronomía, servicio al cliente, marketing, sistema de impuestos, fortalecimiento de la organización, guías locales, diseño de producto turístico, calidad, constitución de una empresa, etc.

[16] Trabajo voluntario realizado por los comuneros para el beneficio de toda la comunidad
[17] Montaña en quechua
[18] Madre tierra

Este sistema de trabajo en asociaciones trata de evitar que los ingresos queden en manos de una minoría. Sin embargo, para ser parte o socio de alguna de las asociaciones es necesario el pago de un bono de entrada, lo que impide que algunas familias puedan participar. Además, por lo que se pudo observar en el trabajo de campo sólo en Amaru hay por lo menos 10 asociaciones turísticas, muchos de ellos han acondicionado sus viviendas para recibir visitantes. Las viviendas acondicionadas se caracterizan por tener gran capacidad para recibir grupos de hasta 20 personas, la mayoría goza de un amplio comedor y patio. La institución estatal encargada de brindar la autorización de funcionamiento a los hospedajes en casas particulares es la DIRCETUR (Dirección Regional de Comercio Exterior y Turismo) local.
Durante el tiempo que se realizó el trabajo de campo, alrededor de tres semanas, se una cantidad baja de visitantes. Los cuales solo acudían a la comunidad para realizar su visita durante el día. Es una cantidad sumamente baja, y demuestra que hay más oferta que demanda. Aunque los meses de enero y febrero se consideran temporadas bajas debido a las precipitaciones, se espera más afluencia de visitantes.
Lo que se puede rescatar del acondicionamiento de las viviendas es que gracias a ello las condiciones de vivienda, como los servicios higiénicos, las duchas y habitaciones han mejorado significativamente para aquellas familias dueñas de los hospedajes.
Cada uno de ellos trabaja de manera independiente y las ganancias solo se reparten entre sus socios. En su mayoría de ellos tienen contacto con distintas operadoras de turismo, las cuales contratan sus servicios. No se observó que haya venta de paquetes directas al consumidor final. La investigadora pudo tomar un contacto más estrecho con la asociación “La tierra de los Yaqchas”. Esta asociación trabaja, además de Amaru con otras seis comunidades, todas ellas situadas en el Valle Sagrado de los incas. Según la directora de la asociación, ellos basan su iniciativa en la revalorización del patrimonio natural y cultural, eso quiere decir que los productos y servicios turísticos ofrecidos explotan un valor inherente. No se pudo confirmar la cantidad exacta de asociaciones vinculadas al turismo local. Sin embargo, la siguiente lista intenta documentar la información recabada en el trabajo de campo:

- La tierra de los Yaqchas (26 familias asociadas)
- El parque de la papa
- Apurunawuana
- Comité de mujeres

Si bien es cierto, no todos los pobladores tienen la oportunidad de ser parte de una asociación de turismo. Muchos de ellos incrementan sus ingresos con actividades ligadas al turismo. Es así, por ejemplo, que la mayoría de las familias realizan tejidos en su tiempo libre, por lo general está actividad se realiza por las tardes. Tanto la producción del tejido como la venta son realizados en su mayoría por mujeres, quiénes están organizadas, mediante una asociación de tejedores. Los miembros son tejedoras distribuidas en cuatro comunidades campesinas pertenecientes al distrito de Pisac. Mediante un sistema de turnos, cada miembro recibe un turno para vender sus tejidos en el mercado de Pisac, un mercado artesanal muy famoso y conocido tanto por el turismo nacional como el internacional. De igual manera, parte del turismo es el consumo de productos nativos. Familias dedicadas al turismo adquieren productos locales dando como resultado la valorización de su patrimonio gastronómico y un ingreso monetario extra para los agricultores. A su vez, se presentan trabajos ocasionales para hombres, los que prestan sus servicios para la construcción o acondicionamiento de instalaciones turísticas.
Por último, no hay información detallada sobre el número de visitantes a la comunidad, debido a que no existe un archivo oficial.

<u>Ofertas atractivas para el turismo:</u>

- Lo que destaca en la comunidad a nivel natural es la pureza de su aire, la diversidad de su fauna en especial, la diversidad de aves. Su relativa cercanía a diversas lagunas como la Kinsaqocha, la Mataraqocha o la Chaullaqqocha. Se puede afirmar que Amaru tiene una ubicación privilegiada desde la cual se puede observar el paisaje aledaño alto andino, los sembríos y en algunos casos los riachuelos de forma panorámica. Desde la parte más alta

de la comunidad, se puede avistar la fortaleza de Pisac, un centro inca que forma parte del circuito arqueológico de Cusco.

- Entre sus manifestaciones culturales, se encuentra, sin lugar a duda, el legado cultural heredado de sus antepasados tanto de las culturas prehispánicas, así como de las culturas, preincas e incas. Esta amalgama cultural se manifiesta en su indumentaria, las técnicas de tejido en telar y su gastronomía.
- Debido a como se ha venido suscitando el desenvolvimiento social y económico en comunidades rurales como la estudiada en esta investigación. Amaru, en parte por su lejanía de las capitales del distrito y provincia y su difícil acceso, Menos accesible hace algunas décadas, mantiene, sin embargo, sus características tradicionales, lo que se refleja por ejemplo en la indumentaria típica, que sus habitantes llevan en la vida diaria.
- La construcción y el material de las viviendas se sigue llevando a cabo de forma artesanal. Sus diseños van en armonía con el paisaje y con las demás las demás viviendas.

Los productos que ofrecen son entre otros:

- Homestaying
- Paseo por los campos de cultivo
- Demostración del proceso completo de la elaboración de los tejidos incluyendo, la esquila de lana de llamas y ovejas, enseñanza de la técnica del tejido en el telar y coloración de lanas
- Elaboración de productos naturales como pomadas y productos de aseo personal.
- Elaboración de platos típicos como la huatia[19] y la pachamanca[20]

Gracias a que se está fomentando la preservación de plantas nativas, dentro del marco turístico, algunas asociaciones ofrecen caminatas guiadas para hacer reconocimiento de ellas. Asímismo, en una demostración de tejidos a visitantes los comuneros expresaron el orgullo por sus conocimientos. Eso ayuda en muchos casos a levantar la autoestima de los pobladores, sobre todo de las mujeres, que han expresado en conversaciones informales, la importancia que tienen las actividades turísticas y lo que conlleva a que puedan alzar su voz y con eso sentirse empoderadas. Muchas mujeres en algunos casos netamente quechua hablantes ven en el turismo un camino que les permite la participación y la capacidad para tomar decisiones.

IX. Infraestructura

Viviendas

La mayoría de las viviendas están construidas con material de adobe, hay una relativa armonía entre ellas, tienen por lo general tienen techo de paja o de teja. La mayoría cuentan con el servicio de luz eléctrica. No obstante, el 10% de los pobladores no cuentan con estos servicios al vivir en zonas más alejadas.

Abastecimiento de agua, electricidad, internet y telefonía

Por lo que se observó, casi todos los pobladores cuentan con el servicio de agua potable. El agua que llega a las viviendas llega de los reservorios en los que el agua emana del manantial Pichiwana. De acuerdo a conversaciones con pobladores. Ellos abonan anualmente la suma de diez soles[21] al presidente del agua de la comunidad. Los trabajos que se realizan con este monto son entre otros, arreglos de las tuberías y cercado. No se pudo constatar si todas familias tenían fluido eléctrico. Por otro lado, la telefonía fija no ha llegado a la comunidad. Sin embargo, la cobertura deja mucho que desear. Ya que solamente la señal de algunas redes de telefonía móvil si llegan a la zona.

Desemboque de los desechos líquidos

[19] Platillo tradicional compuesto de papas cocidas en un horno hecho en la tierra. Generalmente los comuneros la consumen cuando se van a cosechar las papas a lugares alejados.

[20] Platillo tradicional constituido primordialmente de carne de animales menores y plantas aromáticas locales. Es elaborado en un horno en la tierra.

[21] Moneda peruana

Los desechos líquidos de los lavaderos y duchas desembocan en los canales o son utilizados para regar sembríos y por consiguiente contaminan esas fuentes de agua. Por ejemplo, con los productos que utilizan para su aseo personal y de limpieza. Se observó un uso exagerado de detergentes y de lejía. En los paseos regulares que se realizaron por la comunidad, se pudo también advertir que algunos comuneros, realizan el lavado de sus prendas de vestir directamente en los riachuelos, se notó además frascos vacíos de lejía esparcidos a las orillas de este. No se realiza ningún tipo de tratamiento al agua.
Con respecto al servicio de desagüe, en el año 2016, el Ministerio de Vivienda, Construcción y Saneamiento a través del Programa Nacional de Saneamiento Rural (PNSR) construyó gratuitamente instalaciones sanitarias con ducha y lavadero. (Año, como funcionan los inodoros, dónde terminan los desechos líquidos?)
Acceso a la comunidad

Amaru está ubicada en una zona periférica. No existe transporte público regular que llegue hasta la comunidad, la carretera no es asfaltada y dificultosa en épocas de lluvias.

Centros educativos

En la comunidad no hay centros educativos, salvo en los centros poblados vecinos. Por ejemplo, el más cercano (a dos kilómetros aproximadamente) es el centro educativo “Amauta” que brinda educación en los niveles primaria y secundaria. Otras dos escuelas para el nivel primaria se encuentran en Sacaca y Paru Paru.

X. Situación de los servicios de salud y enfermedades relacionas al mal manejo de basura

Servicios de salud presentes en la comunidad

El centro de salud de Quello Quello es el que lleva en su jurisdicción a Amaru y dos comunidades más. Se ubica a aproximadamente un kilometro de distancia. En caso de que el paciente presente un cuadro grave problema es derivado a Pisac.

Problemas de salud relacionadas a la mala disposición de la basuraSegún el equipo del centro médico las enfermedades más recurrentes entre los pobladores de las tres comunidades incluidas Amaru, son conjuntivitis, enfermedades respiratorias y diarreas provocadas por parásitos o virus. Esta última relacionada con el mal manejo de desechos domésticos. Para evitar que dichas enfermedades proliferen, se dan charlas por ejemplo de lavada de manos Las visitas domiciliarias se aprovechan también para brindar información al ciudadano sobre las enfermedades transmisibles y no transmisibles producto de la falta de higiene.

XI. Organización comunal

El consejo comunal
El consejo directivo está conformado por el presidente, secretario, tesorero, fiscal y los vocales. Todos los miembros sin excepción son de sexo masculino y su trabajo es Ad honorem y según uno de los directivos su recompensa es el agradecimiento de la comunidad. El actual presidente es el sr. Fausto Hancco elegido democráticamente para realizar una gestión de un lapso de 2 años. Las últimas elecciones se llevaron a cabo el mes de diciembre del 2018.
Paralelo al consejo directivo, existen en la comunidad comités que cumplen distintas funciones con el principal objetivo de de servicio a la comunidad:

- Consejo directivo de la JAAS (Junta Administradoras del Agua y Saneamiento)
- Comité del vaso de leche
- Junta vecinal: Este grupo está conformado por diez personas que coordinan sus servicios con el presidente comunal y la policía nacional del Perú. Este comité de seguridad tiene como objetivo velar por la tranquilidad de los comuneros, protección contra robos, protección contra el maltrato familiar, etc.
- Por el momento no hay comité del medio ambiente. Sin embargo, la JAAS cumple~~n~~ el rol y es la responsable del área medioambiental. en temas medioambientales.

XII. Practicas existentes de gestión de la basura

a) Generación

b) Almacenamiento

Durante el tiempo de investigación, se observó la presencia de solamente dos tachos de basura en toda la comunidad. Los tachos datan del año 2007 y son utilizados de manera privada. Por lo que el vaciado es efectuado por las familias de las casas en los que se encuentran. A diferencia de en la capital del distrito Pisac, no hay servicio de barrido de vías públicas. Para la limpieza de los lugares públicos, orilla de los ríos, de las carreteras, pasajes y riachuelos, la comunidad se reúne voluntariamente aproximadamente dos veces al año, en el marco de las faenas, y realizan una limpieza comunal. Igualmente, por decisión tomada en asamblea general de la comunidad, los vecinos están obligados a llevar los desperdicios generados durante el mes a la asamblea general. Muy probablemente para que los miembros de la directiva tengan un cierto control y conocimiento del accionar de los comuneros. Si ellos arrojan los desperdicios al lugar indicado para ello en este caso el Botadero de ".Papacancha". Con esto se intenta evitar que los pobladores sigan prácticas inadecuadas de disposición de la basura como arrojar los desperdicios en lugares no indicados a lo largo de la comunidad o quemar la basura en sus patios.

En visitas autorizadas a algunos hogares, se pudo observar la utilización de depósitos de plástico para el almacenamiento de los desechos orgánicos. El tamaño dependía de la cantidad de miembros de la familia. En otras palabras, en la mayoría de los casos, existe una separación en la fuente con una distinción entre orgánicos e inorgánicos. Generalmente, los orgánicos se destinan a la alimentación de animales y los inorgánicos son almacenados en costales o bolsas de plásticos.

Por lo general el tacho de desechos orgánicos se almacena en la cocina, algunos tienen inclusive dos depósitos, esto dependiendo si hay una diferencia de animales que alimentar con los desechos orgánicos. Los sacos por lo general se ubicaban en el patio, posiblemente porque animales, como los perros o las ovejas, no le dan mucha importancia a la basura seca y por lo consiguiente no buscan comida ahí.

<u>Puntos de acumulación de basura en la comunidad</u>

Durante los recorridos de la investigadora por la comunidad se identificaron algunos puntos críticos. En general, estos lugares tienen desechos esparcidos, no se encontraron concentraciones grandes de desechos.

- En los caminos vecinales, sobre todo los que se encuentran cerca a los botaderos.
- En las sendas que llevan al centro educativo Amauta.
- En las orillas de los ríos, donde sobre todo se pudo observar restos de plásticos azules. El material que utilizan los comuneros para cubrir y proteger de la lluvia lo cosechado o distintos objetos.
- En las visitas a los campos de cultivo y en la colaboración en la cosecha se pudo percibir restos de residuos, como lapiceros de plástico, cañitas, palitos de chupete, y empaques de golosinas. Esto sobre todo en los cultivos cercanos a carreteras o viviendas. Lo que se observó más a menudo en los cultivos alejados fueron botellas de plásticos con líquidos, probablemente éstas fueron transportadas por los agricultores.

c) Minimización de los residuos sólidos

En hogares vulnerables, es decir, con menos recursos monetarios se puede señalar que se presenta una incidencia más alta de reuso de todo tipo de materiales. El material que es más reutilizado son las botellas de plásticos. Esto por su valor monetario ya que en el distrito de Pisac hay demanda de ciertas botellas por parte de las tiendas que venden Chicha de Jora[22]. Otro tipo de minimización es realizado por los llamados cacharreros y sus visitas esporádicas a la comunidad. Los cacharreros forman parte del comercio de basura informal. Su trabajo consiste en adquirir artículos que se pueden reusar o reciclar como botellas de vidrio, artefactos eléctricos en mal estado o cualquier otro enser que tenga un valor en el mercado de los

[22] Bebida macerada hecha generalmente de maíz macerado

desechos. Los comuneros se alimentan en gran parte de los productos producidos en sus campos de cultivo. No obstante, para diversificar su alimentación y adquirir productos de primera necesidad asisten al mercado dominical que se realiza en la plaza de Pisac. Además, se observó que las mujeres llevan, por lo general una manta en la que transportan los productos adquiridos.

d) Segregación y reaprovechamiento

Segregación

En las veces que se realizó la visita de campo a lo largo de la comunidad o a los botaderos informales. No se notó la presencia de segregadores informales. No obstante, tras conversación con vecinos se pudo confirmar que ciertos segregadores acuden regularmente a los botadero y que no cuentan con ningún tipo de protección al ingresar al espacio y arriesgan por lo tanto su salud e integridad. Los segregadores separan y almacenan los materiales para luego comercializarlos.

Separación en la fuente

Como se mencionó antes, se observó el hábito de segregar los desechos orgánicos de los inorgánicos. Algunas familias utilizan estos desechos para la alimentación de animales menores. Así es como cáscaras de verduras y de frutas sirven para la alimentación de cuyes, ovejas, o gallinas. Y las sobras de alimentos cocidos sirven para alimentar a los cerdos. Se observó también, que en casos en los que los comuneros no poseen animales, ni espacio en el que producir compost, ellos lo donan a comuneros como alimento para los suyos. De esta manera el desecho en el botadero se convierte en la última alternativa de disposición.

e) Recolección

La municipalidad distrital de Pisac es la responsable por la gestión de los residuos sólidos en su jurisdicción. Por lo tanto, son responsables de la recolección y el transporte, entre otros servicios vinculados a los desechos domiciliarios en todas las comunidades que conforman el distrito. Sin embargo, la ruta de recolección solamente se realiza en la capital del distrito y dos comunidades de las doce que debería. En Amaru este servicio no está presente, por ello los pobladores se organizan independientemente de la municipalidad.

f) Transferencia y transporte

El transporte de los residuos domésticos secos al botadero se realiza de tres maneras: a pie, utilizando ayuda animales de carga o automóviles. Periódicamente, cada familia, ya sea los días de las asambleas o cuando lo consideren necesario transportan dichos desechos a pie, puesto que el botadero activo se encuentra a aproximadamente a 1 km de la plaza central de la comunidad. Algunas veces las familias que poseen movilidad propia llevan los desechos secos con su automóvil. Y la minoría utiliza a animales como el burro para el transporte de cargas pesadas. Lo que es posible porque hay un camino de trocha que llega hasta la quebrada en la que se encuentra el botadero. Otro aspecto que se observó es que aparte del compost producido por algunas familias. No existe ningún tipo de tratamiento de la basura. Por lo que en esta fase no hay distinción de ningún tipo entre los desechos arrojados al botadero.

g) Tratamiento

No existe por el momento forma de tratamiento distinta al compostaje.

h) Incineración

Pese a información a nivel de la comunidad sobre la peligrosidad de la quema de la basura esta práctica se sigue ejerciendo, pero en una baja incidencia. Lo que, si se observó más a menudo fue que los comuneros queman los papeles, cartones y envases tetrapak en sus cocinas a leña.

i) Elaboración de compostaje

La mayoría de las familias que preparan compost lo hacen empíricamente. Ellos colocan los desechos orgánicos entre ellos cascaras de frutas y verduras, restos de comidas y sobras de forraje en una esquina de sus campos de cultivo o en sus patios. No se observó ninguna construcción especial que cerque o rodee el cúmulo. Por otro lado las familias que crían animales menores como cuyes y gallinas utilizan los excrementos de estos para preparar el compost. Colocando los excrementos al momento de la siembra de productos como el maíz, trigo, papa y la alverja.

j) Disposición final

En la comunidad actualmente existen dos botaderos el que se encuentra en Pampacancha y el de Nosqopata. No obstante, la comunidad, por decisión colectiva solo hace uso del botadero de Pampacancha.

El botadero Pampacancha

- ***Caracterización general del sitio:*** Está ubicado en los límites del centro poblado en un acantilado. El área es propiedad de la comunidad. Se notó que se encuentra actualmente en funcionamiento. El tiempo que lleva operando es de aproximadamente 5 años. Por otro lado los usuarios que utilizan el botadero son en su gran mayoría los comuneros de Amaru 769 Personas. El suelo aledaño aproximadamente a menos de 100 m es utilizado para cultivos y pastoreo. Las casas más cercanas de ubican aproximadamente a 200m.

- *Presencia y distancia de agua superficiales:* Un riachuelo bordea la fosa del botadero, la corriente va en dirección al centro poblado.
- ***Impactos ambientales:***

  Tipo de contaminación del suelo: Dado que los elementos orgánicos se mezclan con los orgánicos, posiblemente haya presencia de metales pesados como los lixiviados. Dado que se visitó la zona en época de lluvias se pudo observar la acumulación de agua en el fondo de la fosa.

  Tipo de residuos: El botadero es básicamente utilizado para desechar basura doméstica. Ya que la mayoría de las familias comuneras tienen el hábito de separar los desechos orgánicos de lo inorgánico, se observó una baja presencia de desechos orgánicos. Entre los inorgánicos se observaron, empaques, bolsas de todo tipo,

  Agua: Se pudo observar presencia de desechos de todo tipo en el riachuelo, desde pilas hasta juguetes de plástico. Asímismo, en su trayecto se observaron también a aves y animales menores consumiendo esta agua.

  Aire: Aunque por lo observado se puede confirmar que no se realiza la incineración de basura al aire libre, los gases producidos por la mezcla de las sustancias contenidas en los materiales inorgánicos e inorgánicos liberan gases tóxicos como el metano.

  Flora y Fauna: Definitivamente los animales y la vegetación se ven afectados. Si bien es cierto los animales menores se encuentran un poco alejados del botadero, se pueden ver afectados por desechos llevados por el viento hacia los campos en los que pastean, ellos pueden confundir los desechos, en especial plástico, y consumirlos. Por último, llamó la atención la cantidad de aves que pululan alrededor del botadero. No se observaron roedores, pero si hay presencia de moscas y mosquitos.

El botadero en Nusqupata

- ***Caracterización general del sitio:*** Se encuentra en un tipo de mini valle, ubicado prácticamente en medio de la comunidad junto una vía de trocha. En este caso el área es propiedad de la comunidad. Y según información de los directivos de la comunidad, se encuentra inactivo, puesto que ha superado su capacidad de almacenamiento. Este tiradero se encuentra en medio de plantaciones y el suelo aledaño aproximadamente a menos de 100 m es utilizado para cultivos y pastoreo. También, se observaron asentamientos ubicados aproximadamente a 100m.
- ***Caracterización geofísica:***

  Presencia y distancia de agua superficiales: Un riachuelo transcurre a pocos metros del valle.
- ***Impactos ambientales:***

  Lo impactos ambientales son muy parecidos en ambos botaderos a excepción de los efectos en el agua y la flora y fauna, donde en el tiradero ñosqopata hay sin duda un impacto más agudo.

  Agua: Hay una fuente de agua superficial, un riachuelo que pasa perpendicularmente al tiradero. La corriente lleva consigo distintos desechos que en gran parte son arrastrados por el viento.

Flora y Fauna: Se observó ganado muy cerca a la zona del botadero. Tanto la flora en y alrededor del botadero, se ve sumamente afectada. Se puede observar, por ejemplo, que ~~los~~ algunos árboles crecen en medio del cúmulo de basura.

Cabe resaltar que en ninguno de los dos existe un cálculo de la cantidad de desechos que ingresan al botadero mensualmente. Tampoco existe separación de los residuos, ni proceso de compactación, no hay control de vectores ni drain-off de agua de lluvia. En resumen, no existen controles para evitar contaminación, el tiradero carece de medidas de adecuación sanitaria fijadas por la legislación medioambiental peruana y por ello representa riesgos ambientales a la salud y la seguridad de los pobladores.
La comunidad fue la que, independientemente de la municipalidad, se organizó e hizo las excavaciones para crear el botadero de Pampacancha. Según conversaciones con informantes claves, las gestiones anteriores se han desentendido por completo de la gestión de residuos en la zona. Por ello no existe ningún tipo de fiscalización por parte de supervisores sanitarios enviados por la municipalidad. El conflicto social, medioambiental y de salubridad es obvio, las familias que tienen cultivos relativamente cerca de ellos se ven claramente perjudicados tanto los comuneros que crían ganado en las zonas aledañas, los cuales son criados en condiciones de insalubridad, como lo que son propietarios de tierras de cultivo. Así también, debido a que ninguno de los dos botaderos cuenta con cerca, presenta un riesgo para los niños. Y si la relativa distancia del actual botadero disminuía la preocupación de sus efectos negativos, la construcción de una nueva loza deportiva . Ya que este centro deportivo se encuentra a menos de 50 metros de distancia del botadero Pampallacta. Sin duda, una situación preocupante si se toma en cuenta el aumento de visitantes a esta zona de riesgo.

Appendix 8
Semi-structured interview guideline - residents - Spanish

First phase: Advanced information

- **Saludo**: Muchas gracias mi nombre es Leysi Apaza estudiante de Turismo sustentable.
- **El propósito de la entrevista**: Evaluar el grado de conocimientos, actitudes y sensibilidad de los pobladores de Amaru hacía la basura.
- **Autorización:** ¿Está de acuerdo en que grabe la entrevista y en firmar posteriormente una declaración de participación en la investigación?
-

Second phase: Interview guide

I. Sociodemographic date from the respondent

Vivienda	1. ¿En qué zona de Amaru vives?		
Ocupación	2. ¿A qué te dedicas?		
Edad	3. a) 18 - 29 years old	b) y 30	c) Más de 30
Educación	4. ¿Cuál es el nivel de educación máximo que alcanzaste?		
	a) Primaria	b) Secundaria	C) Superior
Relación con turismo	5. ¿Eres miembro de alguna asociación vinculada al turismo?		
	Si		No
	6. ¿Cuál?		Siguiente pregunta

II. Attitudes, perceptions and awareness about waste and littering in general

Opinions and perceptions from waste	
7. ¿Qué materiales son para ti basura?	
8. ¿Qué sientes te encuentras cerca del botadero de la comunidad y ves y hueles la basura?	
9. ¿Has observado si hay basura dispuesta inadecuadamente por la comunidad?	
Yes	No
10. ¿Cuéntame qué sientes cuando caminas por los caminitos de la comunidad, por las orillas de los ríos y ves basura tirada?	Siguiente pregunta
11. ¿Cuáles son los objetos que ves tirado mas frecuentemente?	
Attitudes and opinion towards littering	
12. ¿Puedes decirme que sientes cuando ves a personas tirando la basura en lugares no adecuados para ello?	
13. ¿Por qué crees que los comuneros hacen eso?	
Value of the waste	
14. ¿Crees que la basura tiene un valor? Por ejemplo, que puede comprarse y venderse genarndo un beneficio monetario.	
Awareness of the evolution of the waste quantity	
15. ¿Piensas que ahora hay más basura en la comunidad que antes?	
Awareness of the environmental pollution created through littering	
16. ¿Qué piensas que pasa con la naturaleza, la pacha mama, que están llenos de basura?	
Awareness of waste as cause of diseases	
17. ¿En tu opinión, la basura manejada incorrectamente puede causar enfermedades?	
Si	No
18. ¿Qué tipo de enfermedades?	Siguiente pregunta
19. ¿Te has contagiado, alguna vez por una de esas enfermedades?	
Awareness about the toxicity of certain types of waste and burning waste	

20. ¿Qué haces con las pilas o baterias de celular usadas?	
21. ¿Quemas basura?	
Si	No
22. ¿Puedes nombrarme los motivos por los que lo haces?	23. ¿Puedes nombrarme los motivos por lo que no lo haces?

III. Practices, attitudes and awareness about disposal, recycling and composting of domestic waste

Practices and opinions on source separation	
24. ¿Separan la basura en tu casa?	
Si	No
25. ¿Quién lo hace y cómo?	¿Por qué no?
Awareness and practices of recycling	
26. ¿Sabes que es reciclaje?	
Yes	No
27. ¿Qué materiales has reciclado?	Next question
28. ¿Qué ocurre las cosas que son recicladas?	
Practices and awareness on natural fertilizers	
29. ¿Utilizas fertilizantes?	
Si	No
30. ¿Qué tipo de fertilizantes?	
31. ¿Sabes como es el proceso del compostaje?	
32. ¿Te gustará aprender un poco más sobre el proceso?	

IV. Attitudes and awareness about the prevention and minimization of waste

Practices regarding smart shopping	
33. Cuando haces compras, en el mercado por ejemplo, piensas en la basura que puedan producir tus compras?	
Si	No
34. ¿Qué te preguntas exactamente, podrías darme ejemplos?	
Alternative clean and personal care products	
35. ¿Conoces o utilizas alternativas a productos de aseo o limpieza que sean naturales?	

V. Attitude and awareness towards the local dump yards and its consequences

Attitudes towards the dump yards
36. ¿Qué opinas sobre los botaderos de la comunidad?
Awareness about the pollution caused by the dump yards
37. ¿Sabes lo que pasa con el suelo, el agua y las chacras alrededor del botadero?

VI. Satisfaction and responsibility about the waste at a communal level

Attitude in relation to the function of the community directive
38. ¿A tu parecer es el tema basura un tema presente en las reuniones de la comunidad?

39. Si	No
40. ¿Qué temas tratan?	Siguiente pregunta
41. ¿Sientes que has cambiado tu comportamiento gracias a eso?	
42. ¿Estás satisfecho con la manera en la que se maneja la basura en tu comunidad?	
43. ¿Cómo piensas que podría mejorar?	
Responsibility of the communal waste	
44. ¿Me das un ejemplo de lo que haces o puedes hacer para tener una comunidad más limpia y libre de contaminación por basura?	
45. ¿Quiénes crees que son responsables por la basura creada en la comunidad?	

a) Cada uno	b) La municipalidad	c) El consejo directivo	d) Otros

VII. Waste education

Existence of waste education strategies	
46. ¿Ha recibido información en las que expliquen de los tipos de basura, los efectos de la basura mal manejada, reciclaje, formas de minimizarla, etc.?	
Si	No
47. ¿Quién las dictó?	Siguiente pregunta
Attitude towards strategies of waste education	
48. ¿De qué tema en específico de los que hablamos en la entrevista te gustaría aprender un poco más	
49. ¿Qué razonas o motivos te impulsaría a participar en ese tipo de actividades?	

VIII. Tourists and waste

Attitudes towards littering by tourists
50. ¿Consideras que los turistas contaminan la comunidad?
Awareness of tourist's preferences
51. ¿Puedes señalar a cuál de las dos lugares crees que preferíria ir un turista?

Appendix 9
Semi-structured interview guideline - residents - English

I. Sociodemographic data from the respondent

Homing	1. In which sector of Amaru do you live?		
Ocuppation	2. What do you do for living?		
Age	3.		
Education	4. ¿Which is the education level that you have reached?		
	a) Primary	b) Secundary	C) Superior
Tourism relation	5. Are you an active member of any tourism association?		
	Yes		No
	6. Which one?		Next question

II. Attitudes, perceptions and awareness about waste and littering in general

Opinions and attitudes towards waste	
7. What objects or materials are waste for you?	
8. How do you feel about the waste in the dump yard?	
9. Have you noticed if the community is littered with waste like in the paths or the river banks?	
Yes	No
10. How do you feel when you see waste on the roads, paths or next to the river?	Next question
11. Which kind materials do you often see?	
Attitudes and opinion towards littering	
12. What do you think when you see people littering?	
13. What do you think they adopt that behavior?	
Value of the waste	
14. Does waste can have value for you? For example, that it can create a monetary benefit	
Awareness of the evolution of the waste quantity	
15. When do you think there was more waste in the community, now or in the past?	
Awareness of the environmental pollution created through littering	
16. What do you think happen with the nature, the “Pachamama”, the water and the air which are littered with different kind of waste?	
Awareness of waste as cause of diseases	
17. In your opinion waste disposed in an incorrect manner, can cause diseases?	
Yes	No
18. What kind of diaseases?	Next question
19. ¿Te has contagiado, alguna vez por una de esas enfermedades? Si o no	
Awareness about the toxicity of certain types of waste and burning waste	
20. What do you do with used batteries/batteries from phones?	
21. Do you burn waste?	
Yes	No
22. Can you name reasons why you burn waste	Can you name reasons why you don’t burn waste?

III. **Practices and awareness about disposal, recycling and composting of domestic waste**

Practices and opinions on source separation	
23. Do you separate waste at home?	
Yes	No
24. Who does it and how?	Why not?
Awareness and practices of recycling	
25. Do you know what does recycling mean?	
Yes	No
26. Which materials have you recycled?	Next question
27. What happen with the materials after there are recycled?	
Practices and awareness on natural fertilizers and composting	
28. Do you use fertilizers?	
Yes	No
29. What kind of fertilizers?	Next question
30. Do you know how the process of composting is?	
31. Would you like to learn a bit more about topics such recycling and comsposting?	

IV. Attitudes and awareness about the prevention and minimization of waste

Practices regarding smart shopping	
32. When you go shopping to the market for example, do you think before buying in the waste that can be produced by the products that you acquire?	
Yes	No
33. What do you ask yourself? Can you give me one example	Next question
Alternative clean and personal care products	
34. Do you know alternatives for cleaning and body care products that are natural?	

V. Attitude and awareness towards the local dump yards and its consequences

Attitudes towards the dump yards
35. What is your opinion about the dump yards of the community?
Awareness about the pollution caused by the dump yards
36. Do you know what happen with the soil, the water and the fields around the dump yard?

VI. Satisfaction and responsibility about the waste at a communal level

Attitude in relation to the function of the community directive	
37. Do you think, that in the community monthly meetings the topic waste is treated enough?	
Yes	No
38. Which topics related to waste or garbage do they speak about?	Next question
39. Do you think the communal reunions have/had and influence in your behavior?	

40. How satisfy are you with the way waste is handle in the community?			
41. How do you think, it can be improved?			
Responsibility of the communal waste			
42. Can you give me an example in what you can do to have a cleaner community and free from waste littering?			
43. Who do you think is responsible for the waste created in the community?			
a) Every one	b) The municipality	c) The community	d) Other

VII. Waste education

Existence of waste education strategies	
44. Have you been informed about the different type of waste, the effects of incorrect disposed waste, recycling, or ways how to minimize it?	
Yes	No
45. Who offered them?	Next question
Attitude towards strategies of waste education	
46. From which specific topic that we have talked in the interview, would you like to learn a bit more?	
47. Can you name a reason why would you like to participate in such as activities?	

VIII. Tourists and waste

Attitudes towards littering by tourists
48. Do you consider that tourist litter the community?
Awareness of tourist's preferences
49. Can you point to which of the to places a tourist would prefer to visit?

Appendix 10
Semi-structured interview guideline – communal president

Date:
Interviewed: President of the Amaru community – Fausto Jancco Mora
Objectives:

- Obtain information about the organization of the community in waste management.
- Recognize critical dates and places for an inadequate disposal of waste.

Presentación

- Podría describirnos su cargo y el tiempo lleva como presidente de la comunidad.

Gestión de la basura en Comunidades rurales
¿Cómo se organiza la comunidad para la gestión de basura?
¿Han designado a algún comité del medio ambiente?
Si→¿Desde cuándo? ¿Cuáles son sus obligaciones?
No→ ¿Por qué?
He observado que los plásticos que se utilizan para cubrir objetos como adobe o sembríos, terminan muchas veces en los cauces de los ríos ¿Conversan sobre esto en las reuniones de la comunidad?
¿Hay alguna sanción para los miembros de la comunidad que arrojen desperdicios?
¿Existe un trabajo en conjunto con la municipalidad?
Si→¿Cómo se podría reforzar?
No→¿Por qué cree que usted que no ha sucedido?
¿Quiénes toman las decisiones en la comunidad relacionadas a la gestión de la basura (multas, disposición, recolección de basura) y sus problemas? ¿Cómo sucede?

Puntos y fechas criticas
¿En qué época del año o en qué actividad específica hay un aumento de desechos en la comunidad?
¿Ha podido identificar zonas en las que se acumula basura?
Se observó que en la zona alta de la Comunidad, sobre todo a los alrededores del centro comunal que está muy cochino y hay basura, inclusive más que en otras zonas. ¿Por qué cree usted que sea así?
En mi recorrido por la comunidad sólo vi un tacho de basura. ¿Quiénes son los responsables de que hayan tachos de basura?
Educación ambiental
¿Se han organizado en la comunidad vez charlas de sensibilización o capacitación con la relación a los residuos? ¿Por quién? ¿La municipalidad, ONGs, ¿la asociación de turismo?
¿Cuáles cree que puedan ser los beneficios de éste tipo de acciones en el manejo de basura en la comunidad?
Desafíos (Aplicación de leyes, aumentar la conciencia ambiental de la población)
¿En su opinión como se podrían ustedes solucionar a corto y a largo plazo los problemas actuales relacionados con el manejo de la basura en la comunidad?
¿En su opinión que podría hacer la municipalidad para mejorar la situación de la basura en la comunidad?

Appendix 11
List of communal sectors in Amaru

1. Achupallayoq
2. Ancatiana
3. Awanagoypata
4. Chapapampa
5. Chacuchallo
6. Chejlajocha
7. Cheqtarumiyoc
8. Chorojata
9. Chulluqopata
10. Cochapampa
11. Cruzmocco
12. Cuyopujro
13. Q'atawasi
14. Hatunwasipampa
15. Qenqo Q'ata
16. Ichllopata
17. Inkasamana
18. Erapata
19. Irugallakasa
20. Kantuscancha
21. Kerapata
22. Kunturtiana
23. Kurpaymoko
24. Llanamallopampa
25. Llarjapata
26. Machuwasipata
27. Ñuqchupata
28. Pampacancha
29. Pampawasi
30. Paru Paru Mamasamana
31. Patapatalloq
32. Riruwajana
33. Rosaschalloq
34. Rukello
35. Runahuana
36. Suituccocha
37. T'ancarpata
38. T'iccak'asa
39. Tinderraja
40. Viscachapampa
41. Wuaillapata

Appendix 12
Profile of interviewees

Respondent code	Location	Occupation	Age	Education attainment	Tourism related job	Gender
B1	Pampacancha	artisan	45	without formal education	Yes	Female
B2A	Ichllopata	artisan	58	without formal education	Yes	Female
B2B	Ichllopata	Farmer	47	secondary school incomplete	Yes	Male
B3	Pampacancha	artisan	57	without formal education	Yes	Female
B4	Kapullajata	farmer	68	without formal education	No	Male
B5	Ñuqchupata	sweeper	58	secondary school	Yes	Male
B6	Aserjapata	farmer	48	primary school	Yes	Male
B7	Nuqchupata	farmer	47	secondary school incomplete	No	Male
B8	Pampawasi	micro entrepreneur	35	primary school	Yes	Female
B9	Pampawasi	student	18	secondary school incomplete	No	Male
B10	Kantuscancha	bricklayer	32	secondary school incomplete	No	Male
B11	Kantuscancha	homemaker	42	without formal education	No	Female
B12	Qenqo Q'ata	student	20	superior education incomplete	Yes	Male
B13	Cochapampa	homemaker	29	primary school	Yes	Female
B14	Pampawasi	farmer	30	primary school	No	Male
B15	Chullucopata	homemaker	27	secondary school	No	Female
B16	Q'atawasi	homemaker	30	secondary school	No	Female
B17	Ñuschupata	homemaker	25	secondary school incomplete	No	Female
B18	Chacuchallo	farmer	31	primary school	No	Male
B19	Rukello	farmer	20	primary school	No	Female
B20	Qenqo Q'ata	student	23	superior education	Yes	Female
B21	Llarjapata	farmer	31	secondary school	No	Female
B22	Pampacancha	student	25	superior education incomplete	Yes	Male

Appendix 13
Authorization for cooperation in the research from the Municipality of Lamay - Cusco

MUNICIPALIDAD DISTRITAL DE LAMAY

Sub Gerencia de Medio Ambiente y Servicios Públicos

INFORME N° 019- 2018-A.T.M./C.F.P.Q

A ***: LEYSI APAZA VAZQUES***
Solicitante

DE ***: CARLOS FELIMON PEÑA QUISPE***
Responsable AREA TECNICA MUNICIPAL

ASUNTO ***: INFORME DE ENTREGA DE DOCUMENTOS A LO SOLICITADO DE RRSS***

FECHA ***: Lamay, 12 de Diciembre del 2018.***

Previo un cordial y afectuoso saludo, la presente es para comunicar que desde la Oficina del AREA TECNICA MUNICIPAL (ATM). Se realiza la entrega de documentos solicitado por la Sr Leysi APAZA VAZQUES con solicitud de fecha lunes 03 de diciembre del 2018 en la cual pide documentos para realización de tesis de investigación con tema es educación sanitaria en residuos sólidos con un contexto turístico en al cual se facilita los documentos pertinentes al solicitante como:

- Copia Plan operativo del manejo de residuos sólidos del 2018
- Fichas de reporte de manejo de residuos sólidos a nivel distrital del II trimestre correspondiente al 2018
- Copia del proyecto de "MEJORAMIENTO DE SERVICIO DE LIMPIEZA PUBLICA EN EL PROCESO DE ALMACENAMIENTO BARRIDO, RECOLECCIÓN Y TRANSPORTE DE RESIDUOS SOLIDOS EN EL DISTRITO" del cronograma de actividades en ejecución y continuidad.

Es todo en cuanto informo para su conocimiento y sin otra particularidad aprovecho la Oportunidad para hacerle llegar Muestra de las más distinguidas Consideraciones

ATENTAMENTE

MUNICIPALIDAD DISTRITAL DE LAMAY

Carlos F. Peña Quispe

RESPONSABLE AREA

Appendix 14
Authorization for cooperation in the research from the Municipality of Pisac – Cusco

GESTION 2019-2022

MUNICIPALIDAD DISTRITAL DE PISAC

GERENCIA MUNICIPAL

ACREDITACION

En la ciudad de Pisac en la fecha 07 de febrero del año 2019 mi representada, a petición expresa de la interesada acredita a la ciudadana Peruana Residente en Alemania Doña LEYSI DEL PILAR APAZA VASQUEZ, ante las Comunidades Campesinas ubicadas en el ámbito del distrito de Pisac como estudiante del Programa MAESTRIA EN TURISMO de la UNIVERSIDAD DE DESARROLLO SUSTENTABLE HNE EBERSWALDE del país de Alemania. Para desarrollar estudio de investigación en materia de Educación Ambiental en Residuos Sólidos para manejo sustentable del Turismo en el Distrito de Pisac.

Por lo que, invoco se sirvan dar las facilidades del caso por el lapso de un mes, para el cumplimiento de su objetivo académico.

Pisac, 07 de febrero de 2019

Appendix 15
Photographic documentation of SWM in Amaru

Plastic covering bricks

Dump pit of Pampacancha

Abandoned Municipal bin

Inorganic plastic separation

Burning of branches

Source: Apaza L., 2019

References

Abdul-Waha, SA 2008, 'A Preliminary Investigation into the Environmental Awareness of the Omani Public and their Willingness to Protect the Environment', *American Journal of Environmental Sciences (American Journal of Environmental Sciences)*, vol. 4, no. 1, pp. 39–49.

Ajzen, I 2012, 'The Theory of Planned Behavior' in *Handbook of Theories of Social Psychology: Volume 1,* eds P van Lange, A Kruglanski & E Higgins, SAGE Publications Ltd, 1 Oliver's Yard, 55 City Road, London EC1Y 1SP United Kingdom, pp. 438–459.

Arbulú, I, Lozano, J & Rey-Maquieira, J 2015, 'Tourism and solid waste generation in Europe: A panel data assessment of the Environmental Kuznets Curve', *Waste management (New York, N.Y.)*, vol. 46, pp. 628–636.

Arnd-Michael, N (ed.) 2017, *Interview und dokumentarische Methode,* VS Verlag für Sozialwissenschaften, Wiesbaden.

Banco Mundial Peru 2007, *Análisis Ambiental del Perú*. *Retos para un desarrollo sostenible*. Resumen Ejecutivo, Unidad de Desarrollo Sostenible región América y el Caribe, Banco Internacional de Reconstrucción y Fomento. Available from: https://sinia.minam.gob.pe/documentos/analisis-ambiental-peru-retos-un-desarrollo-sostenible [30 March 2019].

Barrios Napuri, C, Torres Ruiz, R, Lampoglia, TC & Agüero Pittman, R 2009, *Guía de orientación en saneamiento básico para alcaldías municipios rurales y pequeñas comunidades,* Asociación Servicios Educativos Rurales. Available from: http://www.bvsde.paho.org/bvsacg/guialcalde/0gral/078_guia_alcaldes_sb/guia_alcaldes_2009.pdf [08 January 2019].

Birhanu, Y & Berisa, G 2015, 'Assessment of Solid Waste Management Practices and the Role of Public Participation in Jigjiga Town, Somali Regional State, Ethiopia', *International Journal of Environmental Protection and Policy*, vol. 3, no. 5, p. 153 [25 April 2019].

Brito, E & Pasquali, C 2006, 'Comportamientos y actitudes asociados a la disposición de la basura en áreas urbanas no planificadas', *Interciencia*, vol. 31, no. 5, pp. 338–344. Available from: http://www.redalyc.org/pdf/339/33911605.pdf [25 October 2018].

Buenrostro, O, Márquez, L & Ojeda, S 2014, 'Environmental perception of solid waste Management in the Municipalities of Pátzcuaro, Mexico', *Environmental Engineering and Management Journal*, no. 12, pp. 3097–3103. Available from: 272505619_Environmental_perception_of_solid_waste_management_in_the_municipalities_of_PAtzcuaro_region_Mexico [22 April 2019].

California Department of Resources Recycling and Recovery 2019, *Estimated Solid Waste Generation Rates*. Available from: https://www2.calrecycle.ca.gov/WasteCharacterization/General/Rates [05 May 2019].

Cambridge Dictionary 2019, *Awareness*, Cambridge University Press. Available from: https://dictionary.cambridge.org/dictionary/english/awareness [09 May 2019].

Carnaffan, J 2014, 'Rural Tourism as a tool of Regional Development. A Multi-Scalar Analysis of Responsible, Home Stay Tourism in Rural Peru' in *Rural tourism. An international perspective,* ed K Dashper, Cambridge Scholars Publishing, Newcastle upon Tyne, pp. 229–249.

Centro de Salud Quello Quello 2015, *Actual situación del centro de salud Quello Quello - 2014*.

Chandra Moharana, P 2012, 'Rural Solid Waste Management: Issues and Action'. Kurukshetra, May. Available from: https://www.researchgate.net/publication/265413674_Rural_Solid_Waste_Management_Issues_and_Action [14 January 2019].

Chandrappa, R & Das, DB 2012, *Solid Waste Management,* Springer Berlin Heidelberg, Berlin, Heidelberg.

Choon, S-W, Tan, S-H & Chong, L-L 2017, 'The perception of households about solid waste management issues in Malaysia', *Environment, Development and Sustainability*, vol. 19, no. 5, pp. 1685–1700.

Climate and Clean Air Coalition (CCAC) 2013, *Raising Awareness about Solid Waste Management*. *CCAC Waste Initiative*, Climate and Clean Air Coalition. Available from: https://www.waste.ccacoalition.org/document/raising-awareness-about-solid-waste-management-ccac-waste-initiative [04 May 2019].

Conant, J & Fadem, P 2011, *Guia comunitaria para la salud ambiental,* Hesperian.

Defensoria del Pueblo 2007, *Pongamos la basura en su lugar. Propuestas para la gestión de los residuos sólidos municipales*. Available from: http://sinia.minam.gob.pe/documentos/informe-defensorial-no-125-pongamos-basura-lugar-propuestas-gestion [08 October 2018].

Desa, A, Kadir, NB'yA & Yusooff, F 2012, 'Waste Education and Awareness Strategy: Towards Solid Waste Management (SWM) Program at UKM', *Procedia - Social and Behavioral Sciences*, vol. 59, pp. 47–50.

Dileep, MR 2007, 'Tourism and Waste Management: A Review of Implementation of "Zero Waste" at Kovalam', *Asia Pacific Journal of Tourism Research*, vol. 12, no. 4, pp. 377–392.

Directiva de la Comunidad Campesina Amaru 2019, *Registro de comuneros año 2018*. Reunion, Amaru-Cusco.

Döring, N, Bortz, J & Pöschl, S 2016, *Forschungsmethoden und Evaluation in den Sozial- und Humanwissenschaften,* Springer, Berlin.

Ejaz, N, Akhtar, N, Nisar, H & Naeem, UA 2010, 'Environmental impacts of improper solid waste management in developing countries: a case study of Rawalpindi City'. *The Sustainable World,* ed CA Brebbia, WIT PressSouthampton, UK, pp. 379–387.

Eneji, C-VO, Eneji, JEO, Ngoka, VN & Abang, M 2017, 'Attitudes towards Waste Management and Disposal Methods and the Health Status of Cross River State, Nigeria', *SCIREA Journal of Agriculture*, no. 1, pp. 231–247.

European Comission 2010, *Being wise with waste*. *The EU's approach to waste management,* Publications Office of the European Union, Luxembourg. Available from: http://ec.europa.eu/environment/waste/pdf/WASTE%20BROCHURE.pdf.

Ezechi, EH, Nwabuko, CG, Enyinnaya, OC & Babington, CJ 2017, 'Municipal solid waste management in Aba, Nigeria: Challenges and prospects', *Environmental Engineering Research*, vol. 22, no. 3, pp. 231–236.

Festus, MO, Dr. & Ogoegbunam, OB 2012, 'Imperatives of Environmental Education and Awareness creation to Solid Waste Management in Nigeria'. Educational Sciences, vol. 3. Available from: http://www.savap.org.pk/journals/ARInt./Vol.3(2)/2012(3.2-32).pdf [31 January 2019].

Flick, U, Kadorff, E von & Steinke, I (eds.) 2004, *A Companion to Qualitative Research,* Sage Publications, Hamburg.

Flores, F 2018, *Reunión Turismo Rural Comunitario Cusco,* Cusco.

Gabriela Luna Lara, *Factores involucrados en el manejo de la basura doméstica por parte del ciudano,* Barcelona. Available from: https://www.tdx.cat/bitstream/handle/10803/2668/GLL_TESIS.PDF?sequence=1&isAllowed=y [07 August 2018].

Gobierno Municipal de Cusco 2015, *Plan de Desarrollo Urbano del Cusco 2013 – 2023,* Cusco. Available from: https://www.cusco.gob.pe/?s=sub-componente-residuos-y-energia. [29 October 2018].

Goverment of Kerala 2015, *Waste?,* Suchitwa Mission.

Greco, G, Cenciarelli, VG & Allegrini, M 2018, 'Tourism's impacts on the costs of municipal solid waste collection: Evidence from Italy', *Journal of Cleaner Production*, vol. 177, pp. 62–68.

Grodzińska-Jurczak, M 2003, 'The relation between education, knowledge and action for better waste management in Poland', *Waste management & research : the journal of the International Solid Wastes and Public Cleansing Association, ISWA*, vol. 21, no. 1, pp. 2–18 [05 November 2018].

Guest, G, Namey, EE & Mitchell, ML 2013, *Collecting qualitative data*. *A field manual for applied research,* Sage Publications, Thousand Oaks. Available from: https://www.sagepub.com/sites/default/files/upm-binaries/48454_ch_3.pdf [14 April 2019].

Guevara Martinez, J & Guevara Fiore, S 2015, 'De la cultura de la basura a la cultura de los residuos:. comunicación estratégica para el cambio de actitudes ciudadanas', *Cuadernos de H Ideas*, vol. 9, no. 9. Available from: http://sedici.unlp.edu.ar/bitstream/handle/10915/50976/Documento_completo.pdf?sequence=1 [20 October 2018].

Han, H, Yu, J & Kim, W 2018, 'Youth travelers and waste reduction behaviors while traveling to tourist destinations', *Journal of Travel & Tourism Marketing*, vol. 35, no. 9, pp. 1119–1131.

Harju-Autti, P 2013, 'Measuring Environmental Awareness in Nineteen States in India', *Universal Journal of Environmental Research and Technology*, no. 5, pp. 544–554. Available from: http://www.environmentaljournal.org/3-5/ujert-3-5-3.pdf [05 May 2019].

Harvey, P, Baghri, S & Reed, B 2002, *Emergency sanitation*. *Assessment and programme design,* WEDC, Loughborough. Available from: http://ec.europa.eu/echo/files/evaluation/watsan2005/annex_files/WEDC/es/ES07CD.pdf [05 May 2019].

Hasan, SH 2004, 'Public Awareness Is Key to Successful Waste Management', *Journal of Environmental Science and Health*, A39, no. 39, pp. 483–492. Available from: https://www.tandfonline.com/doi/full/10.1081/ESE-120027539?needAccess=true.

Holden, A 2003, *Environment and tourism,* Routledge, London, New York.

Hoornweg, D & Bhada-Tata, P (eds.) 2012, *What a Waste*. *A global Review of Solid Waste Management,* The World Bank, Washington.

Iacono, J, Brown, A & Holtham, C 2009, 'Research Methods - a Case Example of Participant Observation'. Electronic Journal of Business Research Methods, vol. 7, no. 1, pp. 39–46.

Instituto Nacional de Estadística e Informática (INEI) 2007, *Censos Nacionales 2007 XI de Población y VI de vivienda*. *Sistema de consulta de principales indicadores de pobreza*. Mapas, Instituto Nacional de Estadística e Informática (INEI). Available from: http://censos.inei.gob.pe/Censos2007/Pobreza/ [27 May 2019].

Instituto Nacional de Estadística e Informática (INEI) 2012, *IV Censo Nacional Agropecuario*.

Instituto Nacional de Estadísticas e informática (INEI) 2018, *Directorio Nacional de Centros Poblados 2017*. *Censos Nacionales 2017:*. XII de Poblacion, VII de Vivienda y III de Comunidades Indígenas. Available from: https://www.inei.gob.pe/media/MenuRecursivo/publicaciones_digitales/Est/Lib1541/index.htm [20 December 2018].

Jatau, AA 2013, 'Knowledge, Attitudes and Practices Associated with Waste Management in Jos South Metropolis, Plateau State', *Mediterranean Journal of Social Sciences*, vol. 4, no. 5, pp. 119–127. Available from: https://pdfs.semanticscholar.org/f678/41d451f4f6c433a10b8379a961b69cdbcf57.pdf [11 August 2018].

Kajokare Karija, M, Shihua, QI & Lukaw, YS 2013, 'The Impact of Poor Municipal Solid Waste Management Practices and Sanitation Status on Water Quality and Public Health in Cities of the Least Developed Countries: the Case of Juba, South Sudan', *International Journal of Applied Science and Technology*, vol. 3, no. 4. Available from: http://www.ijastnet.com/journals/Vol_3_No_4_April_2013/11.pdf [05 May 2019].

Kaseva, ME & Moirana, JL 2010, 'Problems of solid waste management on Mount Kilimanjaro: a challenge to tourism', *Waste management & research : the journal of the International Solid Wastes and Public Cleansing Association, ISWA*, vol. 28, no. 8, pp. 695–704.

Kaza, S, Yao, l, Bhada-Tata, P & Van Woerden, F 2018, *What a waste 2.0*. *A global snapshot of solid waste management to 2050,* World Bank Group, Washington DC. Available from: https://openknowledge.worldbank.org/handle/10986/30317 [25 May 2019].

Knight, DW, Cottrell, SP, Pickering, K, Bohren, L & Bright, A 2017, 'Tourism-based development in Cusco, Peru: comparing national discourses with local realities', *Journal of Sustainable Tourism*, vol. 25, no. 3, pp. 344–361.

Kuckartz, U 2008, *Qualitative Evaluation*. *Der Einstieg in die Praxis,* VS, Verl. für Sozialwiss, Wiesbaden.

La Tierra de Los Yachaqs n.d., *Develando el Textil Andino*. *Turismo vivencial - Valle Sagrado de los Incas*. Available from: https://www.yachaqs.com/turismo-rural-comunitario/develando-el-textil-andino/.

Marinof, N, Pesantes, MA, Samanez Carrillo, C & Centurión, C 2001, *Metodologías Participativas en Educación Sanitaria*. *Una adaptación de SARAR PHAST para comunidades rurales andinas del Peru,* 2001. Available from: https://www.minsalud.gov.co/sites/rid/Lists/BibliotecaDigital/RIDE/INEC/IETS/guia-del-orientador-metodologias-participativas-en-educacion-sanitaria-(sarar-1).pdf [09 January 2019].

Mayer, HO 2013, *Interview und schriftliche Befragung*. *Grundlagen und Methoden empirischer Sozialforschung,* Oldenbourg, München.

Mihai, F-C (ed.) 2017, *Solid Waste Management in Rural Areas,* InTech. Available from: https://www.researchgate.net/publication/319668416_Solid_Waste_Management_in_Rural_Areas [14 January 2019].

Mihai, F-CJ & Taherzadeh, M 2017, 'Introductory Chapter: Rural Waste Management Issues at Global Level' in *Solid Waste Management in Rural Areas,* ed F-C Mihai, InTech, pp. 1–10. Available from: https://www.researchgate.net/publication/319668416_Solid_Waste_Management_in_Rural_Areas [05 November 2018].

Ministerio de Comercio Interior y Turismo (Mincetur) 2015, *Turismo rural comunitario*. Available from: https://www.mincetur.gob.pe/producto-turistico/turismo-rural-comunitario/.

Ministerio de Cultura del Peru (MICUL) n.d., 'Propuesta de estrategía de conocimientos tradicionales de los pueblos indigenas en el Peru'.

Ministerio de Justicia y Derechos Humanos 2016, *Constitución Política del Perú*, vol. 4, pp. 1–189. Available from: http://spij.minjus.gob.pe/content/publicaciones_oficiales/img/Constitucion-Politica-2016.pdf [25 August 2019].

Ministerio del Ambiente (MINAM) 2017, *Plan Nacional de Gestión de Residuos sólidos 2016 - 2024*, Ministerio del Ambiente del Peru (MINAM). Available from: https://sinia.minam.gob.pe/documentos/plan-nacional-gestion-integral-residuos-solidos-2016-2024 [30 March 2019].

Ministerio del Ambiente del Peru (MINAM) n.d, *Programa de Formación de líderes (as) comunitarios (as) en cambio climático*. *Plan de capacitación. Microcuencas: Mollebamba - Apurimac - Huacrahuacho - Cusco*.

Misoch, S 2015, *Qualitative interviews,* De Gruyter, Berlin. Available from: https://beluga.sub.uni-hamburg.de/vufind/ [05 November 2018].

Montesinos, P 2018, *La tierra de los Yachaqs,* Cusco.

Msezane, SB & Mudau, AV 2014, 'Reconnoitering the Stimulus of Environmental Education in Reducing Improper Solid Waste Disposal: A Case of St Marcia School in the Mkhondo Village in Mpumalanga in South Africa', *Journal of Human Ecology*, vol. 48, no. 3, pp. 367–374 [05 November 2018].

Municipalidad de Pisac 2016, *Plan de manejo de residuos sólidos Pisac - 2016,* Pisac - Calca.

Nalan, DY, Hasan, Y, Metin, D & Süleyman, T 2011, 'Effects of personal characteristics on environmental awareness; a questionnaire survey with university campus people in a developing country, Turkey. campus people in a developing country, Turkey'. Full Length Research Paper, *Scientific Research and Essays*, vol. 6, no. 2, pp. 332–340 [05 January 2019].

Nandini N., KM 2013, 'Community attitude, perception and willingness towards solid waste management in Bangalore city, Karnataka, India'. International Journal of environmental sciences, vol. 4, no. 1, pp. 87–95 [09 February 2019].

Olukoju, A 2018, '"Filthy rich" and "dirt poor:" social and cultural dimensions of solid waste management (SWM) in Lagos', *Social Dynamics*, vol. 44, no. 1, pp. 88–106.

Omran, A, Mahmood, A, Abdu Aziz, H & Robinson, GM 2009, 'Investigating Households Attitude Toward Recycling of Solid Waste in Malaysia: A Case Study', *Int. J. Environ. Res.* Available from: https://beluga.sub.uni-hamburg.de/vufind/Search/Results?lookfor=all+&submitForm=Suchen&library= [05 November 2018].

Peña Jumpa, A 2013, 'Las Comunidades Campesinas y Nativas en la constitución Política del Perú: Un Análisis Exegético del Artículo 89° de la Constitución', *Derecho y Sociedad, Asociación Civil*, vol. 40, pp. 195–206. Available from: http://revistas.pucp.edu.pe/index.php/derechoysociedad/article/view/12800.

Programa de desarrollo regional Cusco 2013, *Evaluación Social*. *Valle Sagrado de los Incas*. Programa de desarrollo regional Cusco, World Bank, Cusco. Available from: http://documents.worldbank.org/curated/en/313411468294087062/pdf/IPP6480V10IPP0000PUBLIC00Box379811B.pdf.

PromPeru 2008, *Publicación del Perfil del Turista Rural Comunitario,* PromPeru, Lima.

Rushton, L 2003, 'Health hazards and waste management', *British medical bulletin*, vol. 68, pp. 183–197. Available from: https://academic.oup.com/bmb/article/68/1/183/421368 [05 May 2019].

Strange, K 2002, 'Overview of Waste Management Options: Their Efficacy and Acceptability' in *Environmental and health impact of solid waste management activities,* eds RE Hester & RM Harrison, Royal Society of Chemistry, Cambridge, pp. 1–51.

The World Bank 2019a, *Solid Waste Management*. Available from: http://www.worldbank.org/en/topic/urbandevelopment/brief/solid-waste-management [23 April 2019].

The World Bank 2019b, *Understanding Poverty*. *Urban development*, The World Bank Group. Available from: https://www.worldbank.org/en/topic/urbandevelopment [25 May 2019].

Triassi, M, Alfano, R, Illario, M, Nardone, A, Caporale, O & Montuori, P 2015, 'Environmental pollution from illegal waste disposal and health effects: a review on the "triangle of death"', *International journal of environmental research and public health*, vol. 12, no. 2, pp. 1216–1236. Available from: https://www.mdpi.com/1660-4601/12/2/1216/htm [05 May 2019].

United Nations 2010, 'Manual para encuestas de victimization'. Oficina de las Naciones Unidas contra la Droga y el Delito Comisión Económica de las Naciones Unidas para Europa. Available from: http://www.unodc.org/documents/data-and-analysis/Crime-statistics/Manual_Victimization_surveys_2009_spanish.pdf [30 January 2019].

Uwe, F 2004, 'Design and Process in Qualitative Research' in *A Companion to Qualitative Research,* eds U Flick, E von Kadorff & I Steinke, Sage Publications, Hamburg, pp. 146–152.

World Health Organization 2008, *Advocacy, communication and social mobilization for TB control:*. *Advocacy, communication and social mobilization for TB control,* World Health Organization. Available from: https://apps.who.int/iris/bitstream/handle/10665/43790/9789241596176_eng.pdf;sequence=1.

Zoomers, A 2008, 'Global Travelling Along the Inca Route: Is International Tourism Beneficial for Local Development?', *European Planning Studies*, vol. 16, no. 7, pp. 971–983.

Declaration of Authorship

I declare that the work presented here is, to the best of my knowledge and belief, original and the result of my own investigations, except as acknowledged, and has not been submitted, either in part or whole, for a degree at this or any other University.

Leysi Del Pilar Apaza Vásquez

Eberswalde, 02.09.2019