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Baucau Cement Project

Environmental Impact Statement - Cement Plant, Jetty, Conveyor Belt and Associated Infrastructure

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PROJECT 301012-02135 - BAUCAU CEMENT PROJECT

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Appendices

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Appendix 7 Social Impact Assessment

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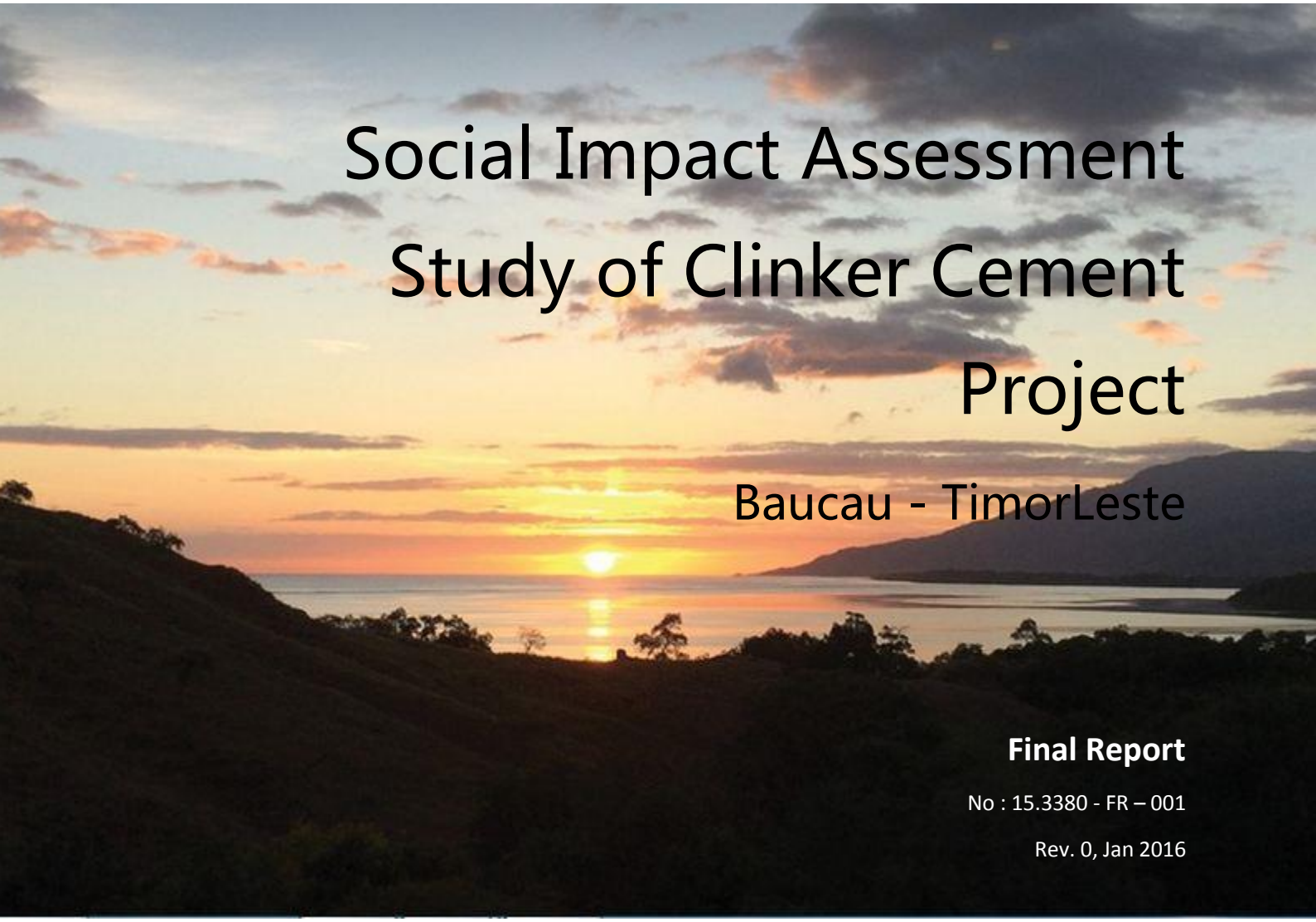

Social Impact Assessment Study of Clinker Cement Project

Baucau - TimorLeste

Final Report

No : 15.3380 - FR – 001

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Prepared by:

PT. **BITA** BINA SEMESTA

CONTENTS

EXECUTIVE SUMMARY

The clinker cement factory plan is located in Suco Tirilolo, Baucau Subdistrict and Suco Vemasse, Vemasse Subdistrict; both sucos are located within the Baucau District.

This project would have to acquire land for the mine and plant sites, a jetty, and a hauling road in Aldeia Osso-Ua, Suco Tirilolo, as well as for a clay area in the Aldeia Wailacama, Suco Vemasse.

Socio-Cultural Baseline

The Wailacama region was historically situated within Suco Ostico's customary territory. During the Indonesian occupation, the Aldeia was administratively moved into Suco Vemasse. However, this change in administrative status did not change Wailacama's customary status with respect to its original region. The population of the Wailacama Aldeia was 15 households at the time of the administrative move, which has grown to 27 households at present. These households are regarded as the 'native residents' of their customary territory since their baptismal surnames mark them as custodians of the customary area. This baptismal surname identity (as the custodians of the local customary area) plays a very important part in defining their social, economic, and political rights and responsibilities as residents of the customary territory.

Apart from these 'native' households, there are also 44 'immigrant' households that live with their woman-receiving lineages. As women-givers, they have the right to demand a livelihood from the respective woman-receiving lineage; but, as 'non-native' groups in the Ostico customary area, they have no rights of possession over the resources in the customary area (suco), except for the resources granted to them by their women-receiving lineages. These households have no right in decisions about various issues in the Aldeia or Suco where they live.

The Ostico settlers in Wailacama used to rely on rice cultivation in their original habitations. Now, the lack of water resources has prompted them to move to non-farming sectors.

In the Wailacama aldeia, the heads of the 16 migrant households from Ostico work as either drivers (10) or merchants (6). Others who still have some kin relationship to the women receiver of the Wailacama natives (44 households) work as firewood collectors in Ostico forests.

Unlike the clay extraction site, the mine and plant sites and the jetty are located in Aldeia Osso-ua, suco Tirilolo. Suco Trilolo generally consists of two principal regions: an 'urban' area made up of two Aldeia, and the 'rural' Caisido area with 4 Aldeia (Parlemento, Caisido, Lialaileso, and Osso-ua).

Although the 'rural' areas are no more than 4 to 7 km away from Baucau City, they have experienced a profound physical, socio-economic, and political isolation throughout the Portuguese era, the Indonesian occupation, and all the way into the independence period. The last 5 years saw the establishment of a dirt road leading from the main road to the Aldeia Osso-Ua along with the construction of public facilities such as clean water distribution networks, electricity grids, and health and educational facilities. The prolonged isolation, the lack of attention from external authorities, and the adverse soil and weather situation have led the Caisido communities to construct their social and cultural organizations in a distinctly 'rural' or 'parochial' manner, as described by Appdurai : '…. *place imprudence through the interaction of social relation, expression of identity and the practice of Culture*'.

With reference to these facts, the analysis of the social and economic impacts from the plans to build a clinker cement factory in the Caisido region would be based upon the results of ethnographic research.

The analysis of social impacts is focused upon the Caisido community since this area would see the largest extent of land acquisition, population resettlement, and road construction activities that may

lead to the growth of local transportation enterprises, increased noise levels, and the concentration of industrial activities. In this way, the impacts and their characteristics – extent and magnitude, direct or indirect, accumulation, reversible or irreversible, manageable or unmanageable – would be related to and affected by the characteristics of the Caisido community.

The population of nearby sucos would inevitably react to the project's impacts, especially the creation of employment opportunities outside the traditional sector. Therefore, the impact analysis would include potential impacts to the population of other sucos within the same subdistrict.

Suco Tirilolo is one of the three oldest sucos in the Baucau Subdistrict. The Tirilolo residents were originally immigrants from the Waiweko region. Their ethnic identity is generally displayed through the baptismal surnames of Da Costa, Belo dan Flores. Most residents identify with these baptismal surnames as their tribal identity. However, it would be more anthropologically accurate to view these baptismal names as signifiers of customary territorial identity. The use of certain baptismal names (Da Costa and Belo) as identities for the entire population of the Caisido territorial community originated with the names of the leaders of the traditional elites acknowledged by the Portuguese colonial administration. Anthropologically speaking, these surnames were intended to flatten out the traditional social hierarchy and organisation that prevailed among the local population at the time. This constructed identity has lasted into the modern age through its use to signify the residential identity of the population of local sucos.

From the anthropological viewpoint, the use of the same baptismal surnames (or only a few surnames) for the entire population of a suco has both positive and negative consequences. On the plus side, all individual residents have the same status in terms of resource possession and political rights, and 'foreign' parties (not bearing the same surname) can be strictly limited in their ability to exploit the resources within the customary territory. This territorial demarcation can be seen as way to manage the environmental carrying capacity through customary means.

On the negative side, individuals and households are rendered unable to develop their livelihoods outside their customary territories. This limitation is one of the factors that have shaped the Caisido residents' subsistence situation in establishing their livelihoods for the sake of mutual survival.

Another negative consequence is the lack of a leadership structure that can represent the entire population. Most present residents in Caisido are third-generation settlers who can no longer identify the direct descendants of the first Belo immigrants in the region. Leadership usually falls upon the oldest male member in the household who can trace descents to a recognisable ancestor (lineage). The lineage group identifies with a particular customary/traditional ritual house (*rumah adat*). The identity centred upon the customary house makes up the basic structure of Caisido's traditional community.

Customary houses are usually built together in a centralised location in each Aldeia. However, ceremonies are performed separately in each customary house by the corresponding lineage. The lack of joint ceremonies held by multiple lineages in one customary house indicates that there are no traditional figures seen as the most prominent elder among all lineages.

A number of customary houses in Osso-ua stand apart from the main cluster of customary houses in the hamlet. The local residents offer no explanation for this separation. It is possible that these segregated customary houses originally belonged to the families of lepers. Osso-ua was historically designated as a leper colony for the entirety of Timor Leste in 1945. However, curative services were only provided by the Church from 1988 onwards. Administrative records in Suco Tirilolo show that there are only 2 remaining leprosy patients in the area.

No sites or artifacts of historical significance have been discovered at the mine and plant sites or the future jetty, with the exception of some graves and customary houses. Customary houses are used to affirm and symbolize the identity of lineage groups, while graves are meant not only as body

disposal sites but also '....to remove the souls of the dead from the living world and fit them firmly into the sacrewd word of the afterlife, and to serve the living members of the lineage. These living members benefit from the tie they form to the sacred world (through the intermediation of the spirits of the dead) and the ability to find closure that allows them to return to the normal rhythm of day-to-day life'.

The population of Suco Tirilolo is 6441, approximately 2% of the Baucau Subdistrict's total population (37613). Its population growth rate over the last five years is 18%, while the growth rates among other sucos in the subdistrict vary from 0.3% to 28%. The total population of the Caisido region (the Project Site) is 2387 or 38% of the Suco Tirilolo population (6441).

There are 532 households with Osso-ua having 123 households or 23% of the total in Caisido. The average size of households is 5 people.

The total number of men and women of productive age in the Caisido region is 1225. The number of productive-age males in the Caisido region is 613, or approximately 18% of the total number of productive-age males in Suco Tirilolo (3364).

The population of the Baucau Subdistrict is 37613, spread among 7523 households. This means that the average household has approximately 5 people in it. Number of male productive age is 8811 or 23% of total Baucau Subdistrict population.

Most heads of households and their wives work for their families' livelihoods, but relatively few other members of the family are gainfully employed.

According to the family card records, 34 – 56% of the heads of households in the 'urban' areas (Tirilolo) work in the traditional (agricultural) sector, while the remaining 44 – 66% work in non-agricultural sectors. There are 17 – 20 occupations listed, with schoolteachers, private sector employees, police officers, merchants, drivers, and public servants being the most prominent. Most wives tend to be stay-at-home housewives (38 – 81%), but a number work in the traditional farming sector (3 – 45%), and even in non-traditional sectors (17 – 18%). There are 9 – 11 kinds of occupations open to such women, the most prominent being schoolteachers, public servants, and public functionaries.

Among the children, 8 – 10% of boys and 2 – 6% of girls are employed. Most (92-98%) are still at school. The most common occupation, both for working age for boys and girls, is that of private sector employees. There are 6 – 9 other occupations found among these children.

In rural (Caisido) communities, 69 – 95% are heads of households and 70 – 95% are wives working in the traditional (agricultural) sector. The rest work in non-agricultural sectors. There are 2 – 11 kinds of occupations recorded among the heads of households with the most important being drivers, private sector employees, merchants, brick makers, and public servants. Meanwhile, the most common occupation among the women is as merchants/traders. There are 1 – 2 other occupations such as teachers and public servants.

Their children, consisting of 14 – 38 working age and 15 – 40 girls, also work mostly in the traditional (agricultural) sector. Not many kinds of occupations outside the traditional sector have been successfully developed whether for boys or for girls (2 – 6 types in each case), some of the most important being merchants, drivers (for boys), public servants, teachers, and NGOs.

The tabulation of the data from Tirilolo shows that employment opportunities in urban areas are more diverse than those in rural areas. In rural regions, traditional (agricultural) occupations still dominate, both for wives and their children. The most common employment opportunities are as public functionaries, merchants, private sector employees, teachers, and public servants. This picture is likely to hold for other sucos in the Baucau and Vemasse Subdistricts.

The Caisido region has a number of vulnerable groups including disabled people, widows, and infants; they number 540 people or 22% of the total Caisido population. These vulnerable groups (except the infants) are eligible for a government allowance of 30/month/person. This amount is enough to buy three 25-kg sacks of rice.

The remaining vulnerable group – the 370 infants (15% of the total population) in Caisido – are likely potential to be affected by project activities. The local medical clinic's record of visits and health complaints show the following data:

From the opening of the clinic (2011) to the present (first three months of 2015), nearly the entire Caisido population has visited the clinic; the total number of visits is 108% – 144% of the Caisido population. The proportion of people with actual diseases or medical complaints is 56% - 98% of all visitors.

Patients came from all age groups. Among children under 1 year old who visited in 2011 – 2015, 9%-13% had actual medical complaints; so did 16% - 26% of the visitors aged 1 – 4 years, 4% - 19% of visitors aged 5 – 14, and 54 – 67% of visitors aged 15 years and above. This seems to indicate an increasing incidence of disease as people age. The number of medical complaints from infants under 1 year old is relatively low. As children enter the 1-4 years age bracket, the number of medical complaints begins to increase. The next age bracket (5 – 14 years) sees further reduction. In the final age bracket (15 years and over), the predominant complaints are those of old age; the large number of anemia, rheumatism, bronchitis, and gratitis cases hints that the local people's physical condition tend to deteriorate as they enter advanced age.

The most common types of diseases among all age groups are the big three (Upper Respiratory Tract Infections/URI//*ISPA*), other skin diseases, and other diseases not classified in the table before. There is an increased incidence of diarhea among children 1 – 4 years old. This may be due to difficulties with the weaning process. Similarly, the prevalence of URI can be attributed to the dry and dusty environment. Another observation is the prevalence of diseases and disorders associated with dehydration due to the limited supply of clean water.

Data from the 2010 census gives a general breakdown of education levels among people aged 5 and up, but it does not give a clear picture of the level of education for every single family members.

Data from family card records in Suco Tirilolo is used to develop a better picture of the educational status within local families. The degree of education found in this suco is deemed fairly representative of other sucos in Baucau sub district.

Recent data for the two *aldeia* in Tirilolo's urban segment (Baucau sub district) shows that 6% - 9% of the heads of local households had junior highschool education, compared to 11% - 14% of housewives. 27% - 31% of the heads of households had senior highschool education, and so did 37% - 39% of their wives; 11% - 15% of the heads of households and 11% - 16% of wives had college diplomas or university edcucation. Among the younger segments of the population, 10% - 23% of boys and 12% - 16% of girls had junior highschool education; 19% - 24% of boys and 22% of girls had senior highschool education; and 9% - 12% of boys and 8% - 10% of girls had college/university-level education.

Meanwhile, the general picture of education in the four inland (Caisido) *aldeia* of Tirilolo is: 10% - 20% of boys and 12% - 21% of girls had junior highschool education; 5% - 17% of boys and 12% - 25% of girls had senior highschool education; and 13% - 31% of boys and 13% - 24% of girls had bachelors' degrees.

Therefore, the level education throughout the family (father/head of household, mother, son, and daughter), both in urban areas (Lutumutu and Betulale *Aldeia*) and in rural ones (Caisido: Caisido, Parlemento, Lialaileso, and Osso-Ua) has seen a considerable improvement.

Caisido residents recognize 4 types of land utilization patterns, namely forests, rice fields, gardens/orchards, and bush. The forests in the Osso-ua hamlet are mostly secondary forests and are regarded as government land. The local residents harvest wood from these forests for firewood and construction materials. Some rice fields are found in the Osso-ua hamlet, mostly dry fields that depend on rain for watering the crop. The rice field plots are generally quite small except for those on the clay extraction site in the Wailacama, Ostico, and Vemasse hamlets. The scarcity of water and labor means that these rice fields are not cultivated in a particularly intensive or extensive manner.

The bush in Caisido largely functions as reserve or fallow horticultural lands. Garden/orchard plots throughout the bush are cultivated under a three- to four-year crop rotation system. These plots are demarcated with piled stone fences; however, it is even more important for individual owners to remember and keep track of the boundaries of their plots.

Virtually the entire Caisido region outside the forests is in the possession of local community members. People from outside the aldeia or suco are not allowed to own or possess land outside the territories of their “tribe” (baptismal surname group). The alienation of land ownership rights through the sale of the land would deprive the seller of his/her social, economic, and political rights within the aldeia or suco. Distribution of ownership and possession rights is conducted through inheritance mechanisms. Only male family members have the right to inherit; the women do not. Although the inheritance proceedings distribute the family’s lands, the oldest male member in the household remains responsible for the overall management of the inherited lands. Every hamlet resident knows the limits and boundaries of their neighbour’s land possession rights. In this way, local landowners mark their identity as “native” residents of the hamlet, but this native resident status lacks official corroboration in the form of title deeds or ownership certificates for customary houses.

The main source of livelihood for Caisido households is the traditional agricultural and horticultural sector. Traditional fisheries remain relatively undeveloped beyond a few residents’ activities in catching fish with simple methods and tools. Animal husbandry functions as a system for the accumulation of surplus, providing residents with a form of savings that allows them to fulfill their cash income needs as well as the demands of traditional ceremonies such as weddings and circumcision.

The extent of individual possession over horticultural lands is calculated according to the number and extent of boundary fences built. The size of each individual fenced plot is tailored to each household’s estimated subsistence needs and production optimisation strategies for the development of the household economy. There are three available strategies for the optimisation of horticultural productivity. The first divides a single plot of land into several sections, each of which would be planted with a particular kind of cash or subsistence crop. The second model, particularly preferred by households with large amounts of land, relies on the availability of multiple different plots of fenced-out land. Each plot is planted with one type of subsistence and cash crop. The third model has a single plot of land planted with various kinds of both cash and subsistence crops interspersed among each other (rather than separated into distinct sub-plots).

An important factor in the development of these three strategies is the influence of traditional norms and personal adherence to Protestant ethics. Traditional customs discourage individuals from showing off any excess fortune they may have. On the other hand, religious ethics call for the individual to try and work as hard as their capabilities would allow (and as their needs dictate). Even when the individual is motivated by the Protestant ethic, traditional norms prevent them from displaying the prosperity they have thereby gained.

Case studies reveal that households that rely on horticultural resources still face considerable uncertainty in the fulfillment of their subsistence needs. The households that are better-off or more certain in the fulfillment of their subsistence needs are generally the ones that possess sources of

income outside the traditional sector. It is very difficult to find out the exact number of both well-off and at-risk households since the marketing of garden/orchard produce is done on a haphazard basis whenever the need for cash arises. Monthly social security allowances from the government have helped people who are struggling to fulfill their subsistence needs, such as vulnerable groups and former independence fighters.

The social organization structure in the Caisido community recognises both formal and informal authorities. Formal authority is held by (on a descending scale) the District Administrator, the Subdistrict Administrator, the Chefe Suco, and finally the Chefe Aldeia. The District and Subdistrict Administrators are appointed by the central government as its local representatives while the Chefe Suco and Chefe Aldeia are elected by the local residents. Although the Chefes are elected by the people, their mandate does not confer the power to make binding decisions about rights of ownership and possession over the resources of the Suco community. Meanwhile, the highest political authority (with the power to make decisions in the public interest) lies in the District Administrator's hands.

Informal political authority is wielded by local churches with their baptismal institutions and the corresponding civil register powers. This informal authority accommodates the interest of both the flock and the formal government. The church's social and political authority mostly manifests in the conduct of daily social life among the villagers (such as in thanksgiving and life-cycle ceremonies).

Other forms of social organization that play a major part in the mutual survival process are territorial groupings, customary ritual house-based groupings, and marriage bonds.

Baptismal surname groups are an important form of territorial social organization in the Baucau region. Identification with a particular baptismal surname (Belo in Caisido) guarantees an individual's rights to obtain a livelihood within the corresponding Suco. Individuals with baptismal surnames that are not identified with the local customary/traditional territory are generally not allowed to reside and work in a different baptismal surname grouping's territory. Exceptions are made through intermarriage, particularly as a member of a woman-giving lineage, but even then the migrant's rights are limited by the customary rights of the woman-receiving lineage. Immigrants of this type do not have a right in decisions about their village of residence or even about their own individual interests. Their individual interests are subsumed and represented by the *lia nain* of the woman-receiving lineage. Although the immigrant becomes a member of the customary house in his new locale, his original group identity remains and limits his rights and responsibilities relative to other villagers who are regarded as native residents.

Another form of social organization that underpins the social structure of Caisido is lineage groups (consisting of individuals who claim descent from the same ancestor). The members of such a group band together in an extended customary household. The customary ritual house (*rumah adat*) provides a physical symbol for the unity of the members' kinship-based identity. Customary/traditional name identities were introduced to allow a finer distinction between members of the same hamlet community who share the same baptismal surname. The customary house also hosts important life-cycle ceremonies for its group members, especially marriage and mourning/funerary rituals.

One more form of social organization that contributes to group survival is the bond between woman-giving and woman-receiving groups. This bond extends well beyond the individual relationship between husband and wife, and involves entire lineages on both sides. The woman-giving lineage has the stronger right to demand social and economic aid since it also bears great responsibility in taking care of deceased members from the woman-receiving lineage. The involvement of the woman-giving lineage is crucial in helping the soul of the deceased settle down in the afterlife and providing comfort for the bereaved family members.

Women play an important part in group survival within the entire social organization framework. However, their position within their own lineage groups is essentially that of second-class citizens (subordinate of of her lineage). Women are the most economically important asset for acquiring guarantees of aid from receiving lineages. The woman is a key figure in the effort to provide *belis* (dowry from the men's side) when any of her male relatives are about to get married. In funerary rituals, the woman also holds a principal role in making sure that her husband's family would provide the funeral shroud.

Paradoxically, women remain somewhat marginalized within their own lineages since they do not have inheritance rights to their ancestral land resources. The only way they have to guarantee their livelihood if their husbands left or passed away would be to rely upon the generosity of their children and/or their brothers (due to the strength of brother-sister bonds)..

It can generally be concluded that, as stated by Appdurai, social organizations form or are formed within a space where the community has to develop a complex of institutions (culture) in order to manage the needs of mutual survival. Changes to any single element in any single institution have the potential of causing further significant social and/or cultural changes.

Social Impacts Assessment

The two project activities that can lead to significant primary potential negative impacts are :

- Land acquisition
- Relocation of people, graves, and customary/traditional ritual houses

Another activity that can potentially cause not only significant primary and secondary negative impacts but also significant primary positive impacts is :

- Employment opportunities

These potential impacts are expected to remain within manageable bounds. Compared to the situation in the project's absence, the advent of the project in the Caisido region in particular -- and in the Baucau subdistrict in general -- would result in the creation of potential social and economic benefits to the residents of the surrounding areas. The project would be stimulate the growth of new employment opportunities and business opportunities outside the stagnant traditional sector.

Land Acquisition

The potential significant primary impact of land acquisition largely takes the form of the degradation of the local subsistence situation. This degradation stems from the local residents' weak bargaining position over the legal status of land possession and ownership, the small amount of land owned by each individual landowner, and the inability to utilize the compensation money in productive pursuits.

The degradation of the subsistence situation is attributed to the fact that land ownership status is usually assessed according to whether the land is being actively cultivated or not at the moment, which means that fallow fields in the bush may end up being assessed as public lands with no private ownership rights attached. This considerably reduces the amount of land attributed to each landowner for compensation purposes -- and weakens local landowners' bargaining position in the determination of the appropriate value, system, and form of compensation for their land. In the end, land acquisition under the abovementioned criteria would reduce the amount of replacement land that the former landowners would be able to buy with the compensation funds. Another complicating factor is that the sale and purchase of land in Caisido rarely takes place openly since the sale of lands would deprive the seller of their status as a native resident of the local village, which in turn means that they stand to lose their social, economic, and political rights rights in the village community.

Land acquisition through the payment of cash compensation to people who have only had experience with subsistence living also carries the risk of trapping these people in a consumptive behavior pattern, and it wouldn't be easy to prevent or mitigate this risk in the face of merchants' efforts to take advantage of the situation by offering incentives and inducements for more consumption.

Unlike the Caisido case, land acquisition in the Wailacama area is not expected to greatly affect the local landowners' social and economic situation since they are no longer so exclusively dependent upon the traditional sector for their livelihoods.

The potential secondary negative impacts from land acquisition in this hamlet are disputes over the administrative predicament of the lands to be acquired and disagreements over the desired land acquisition model or system. The land needed for the clay extraction site is administratively located within Suco Vemasse, but from the traditional/customary viewpoint it still belongs to Suco Ostico. This situation can lead to a conflict of interest over the expected benefits; these benefits can take the form of administrative fees or royalties paid to the village, or specific allocations out of the economic opportunities expected to arise from the project such as employment opportunities and CSR programmes.

These potential secondary negative impacts are expected to be somewhat simpler to manage than the primary negative impacts upon the Caisido community.

Relocation of People, Graves, and Customary Houses

The number of residential sites, graves, and customary houses that would have to be relocated is relatively small (between 5 and 15 in total), but the management of the move can be quite complicated and it might affect not only the social and economic condition of the households undergoing the move but also shape the project's image and viability in the future.

Population relocation is also inextricably linked to the chosen amount and system of compensation payments, the acknowledgement of fallow plots as privately owned land, the search for and establishment of a resettlement site that remains within the bounds of the same customary/traditional territorial unit, the restoration of the resettled households' economic livelihoods, and the revitalization of the areas surrounding the resettlement site to prevent the growth of social envy and discontent among neighbouring settlements. The management of this impact demands a long-term approach since the project needs to ensure the restoration of the resettled households' ability to sustain an independent social and economic livelihood.

The acknowledgement of customary rights over reserve/fallow fields is very important to the management of population resettlement, the choice of resettlement site, the restoration of household economies, and the resettled people's quality of life due to the guarantee that the resettled households would not be removed from their traditional/customary territory. This acknowledgement would also help in the negotiation of a suitable form of compensation, which should preferably not be made in cash; possible alternatives are the construction of new houses and social facilities for the resettled populations, along with the guarantee that each household would receive an allocation of permanent employment opportunity in the project environment. The relocation of gravesites and customary ritual houses raises certain psychological issues related to the resettlement project. Graves are not seen as mere disposal sites for the bodies of the deceased, but also as places for the maintenance of a spiritual connection between the spirits of the dead and the living family members. Maintaining this connection provides closure and reassurance to the living family members who need to move on and resume their daily lives.

Meanwhile, customary ritual houses serve to symbolize the identity of lineage groups in contradistinction to other lineages within the same territorial (baptismal surname) group. As with graves, customary houses are sites for mediation with ancestral spirits, and also a gathering place

for the entire lineage as a social, economic, and political unit led by the oldest male member (*lia nain*). The presence of customary ritual houses affirms the lineage members' identity as "native" residents. This affirmation guarantees their rights and obligations as members of the hamlet community. As such, the relocation of family sites (*i.e.* graves and customary houses) requires consultation with both customary stakeholders and all male heads of households within the relevant lineage.

Employment Opportunities

Employment opportunities present a potentially significant primary positive impact to the household economic situation of local workers; however, it may also lead to a significant secondary negative impact through conflicts over the limited amount of opportunities available and the mass layoff of workers upon the conclusion of construction activities.

Additionally, the employment opportunities would mostly be made available to men, which may cause a significant negative secondary impact upon gender dynamics and women's bargaining position.

The availability of employment opportunities for 1000 workers during the construction phase would absorb about 11% of the productive workforce in the Baucau and Vemasse Subdistricts. Later on, during the operational phase, the project would require 700 workers and thus absorb around 8% of the productive workforce in the Baucau and Vemasse Subdistricts.

Amidst the dearth of employment and economic opportunities outside the traditional farming sector, these jobs – especially the ones in the operational phase, with the promise of long-term employment and a number of desirable perks – may lead to a negative secondary impact in the form of tensions and jealousies or even open conflict between individuals and sucos over the limited number of available jobs.

Even the positive social and economic impacts can lead to a negative secondary impact, especially during the lay-off of construction workers. Workers who have grown used to a steady cash income would then face potential difficulties in re-adapting to a life without cash after the termination of their employment. Whatever cash incomes they may derive from the traditional sector would seem quite small and highly uncertain compared to their construction wages

The introduction of a cash wage system into a subsistence economy (that has hitherto been rather unfamiliar with it) can have both expected and unexpected consequences that demand the project's involvement in managing social and economic development in the local area.

The overwhelmingly male composition of the workforce absorbed into the project may weaken women's position in the household economy. The traditional economic structure has relied so far on a cooperative effort between husband and wife; the availability of employment opportunities outside the traditional sector for male members of the household would change this by making the household economy structure more dependent upon the men's income. This shift would change the cooperative relationship pattern between husband and wife in the development of the household economy. This potential dependence should be counterbalanced with the reinforcement of women's role in the traditional farming sector. These efforts would take the form of the empowerment of a regional economy based on local resources with women as the principal actors.

All of these potential impactscan be managed with the prevention and mitigation measures outlined in the Table below. The Table also lays out the monitoring scheme needed to supervise those management efforts.

A more detailed description of mitigation and monitoring efforts is presented in the full report.

Table 1 Summary of Proposed Impact Mitigation Measures

Potential Impact	Proposed Mitigation Measures
Land acquisition: • Loss of subsistence resources • Loss of bargaining power over land status, value, and compensation system	Intense negotiation with landowner, chefe aldeia, chefe suco, and *lia nain*
Population displacement/resettlement Relocation of ancestral cultural sites: graves and customary ritual houses (*rumah adat*)	Comprehensive resettlement program
Recruitment of workers and distribution of employment opportunities	Establishment of a labor recruitment institution
Loss of women's bargaining power Dependence upon cash income in household economic subsistence systems Transformation of traditional agriculture and the promotion of regional development	Composition of an agricultural development and market integration plan Establishment of a regional development board Empowerment of women's role in agricultural and horticultural production

Table 2 Monitoring Parameters and Schedules

Potential Impact	Mitigation	Parameter to be monitored	Monitoring schedule
Loss of subsistence resources	Integrate part of resettlement plan	The number of landowners and the size of plots outside the affected area	Once after the direct identification of affected households
Loss of bargaining position over the status and value of land and the compensation system	Intensive negotiation with landowners	• Trends in complaints and requests from the landowners • Negotiation deadlocks • The effectiveness of an independent third party's involvement in negotiation	Once within three months after negotiation
Dissatifaction/ conflict over the relocation of gravesites and customary/ traditional ritual houses	Integral part of the resettlement plan	• Trends in the numbers and intensity of rites of integration (where the body is incorporated in the world of ancestral ghosts, giving it a sacred status in the cosmos)	Duration of the adjustment period (1-3 years after relocation)
Resettlement	Comprehensive resettlement plan	• The performance and effectiveness of the resettlement plan and the implementation of	Every 3-6 months during the 3-year adjustment process

Potential Impact	Mitigation	Parameter to be monitored	Monitoring schedule
		resettlement schedules • Trends in the effectiveness of household economic restoration • Trends in the number of disease and malnutrition cases • Trends in rites/ceremonies of integration (see explanation above) • Integration with neighboring people (host communities)	
Potential conflict over worker recruitment and the distribution of employment opportunities	Establishment of a labor recruitment institution	• Trends in the effectiveness of the labor management institution • Trends in the number of complaints and conflict incidents • The development of recruitment schedules • Transparency and fairness in worker registration and recruitment criteria	Every three months since the establishment of worker accommodations in the first year; then every 6 months for the duration of construction and operational activities
The loss of women's bargaining power Dependence of the household economy upon cash income Transformation of traditional agricultural practices	The creation of an agricultural development and market integration plan	• Establishment of a regional economic development board • Trends in the development of agricultural market plans • Trends in the empowerment of women's role in the agricultural sector • Trends in the improvements made by agricultural extension workers	Every years for the 5-year plan; or upon every review of the programs

1. INTRODUCTION

1.1. Brief Project Description

TL Cement LDA, a privately-owned company, proposes to construct a Greenfield cement manufacturing project in Baucau Municipality, Timor-Leste. The project will produce approximately 1.65 million tons per annum (Mtpa) of Portland cement clinker.

Clinker refers to small lumps (3.0-25.0 mm diameter), produced by heating limestone and other materials such as clay and sand in a cement kiln. Clinker, if stored in dry conditions, can be kept for several months without appreciable loss of quality. Because of this, it can easily be handled by ordinary mineral handling equipment, clinker is traded internationally in large quantities. Clinker is then ground to a fine powder, along with gypsum and other substances to produce useable cement.

The proposed project will provide cement for both domestic use and international sale. A feasibility study is currently being undertaken to demonstrate the commercial viability of the project.

The proposed project represents a significant investment of approximately $350 million and the largest industrial project undertaken in Timor-Leste to date. It is anticipated to create 1000 jobs at the peak of the construction. It will then continue to have 700 permanent employees during operation. The project aims to develop local capacity and will develop a training center.

The spin off benefit would be indirect employment to local community members, through the multiplier effect due to downstream socio-economic benefits and consequent improvement in the living conditions of local population in the project area.

A. Cement Clinker Plant

The plant includes clinkerisation and cement grinding facilities with a rated capacity of 5,000 tons per day (tpd) of clinker and 100 tons per hour (tph) of cement. The plant also includes a waste heat recovery (WHR) power plant.

Up to 60% of 0.53 Mtpa of cement will be sold in the local markets and balance 40% will be shipped to Australia in 8,000 Deadweight-Ton (DWT) ships. Balance clinker of 1.15 Mtpa will be shipped in vessels of 40,000 DWT ships to Australia.

The project involves developing a green field plant including, but not limited, to the engineering, design, manufacturing and supply of new equipment for cement plant, a waste heat recovery based power plant, a captive thermal power plant of approx. 30 MW and Port (Double wharf jetties) about 1.5-2 Km from the plant site.

B. Thermal Power Plant Bottom and Fly Ash Utilization

The waste from the thermal power plant will be fly ash and bottom ash. The total ash will be utilised in the cement grinding for producing PPC based on the coal data and ash in the coal the fly/bottom ash generation will be approximately 50 t/day i.e approx 16500 t/annum. This will produce around 66000 t/a of PPC based on 25% ash in PPC. All ash from the thermal power plant will be transported pneumatically to the cement grinding section.

C. Mines and Raw Materials

The raw and fuel material requirements for the proposed plant are to be met from different sources as given in Table below.

Table 1.1 Raw Materials

No.	Material	Source	Source Locality	Remarks
1.	Limestone	Local	SucoTirilolo, Triloca, Bucoli , Baucau Municipality	Primary raw material. Transported from mine site to crusher by trucks.
2.	Clay	Local	Suco Wailacama, Baucau administrative post in Baucau municipality	A corrective material. Transported from quarry to plant by road.
3.	Iron Ore	Import	Australia	A corrective material. Transported to Timor-Leste by ship or barge, offloaded at jetty, and transported to plant by belt and Pipe conveyor.
4.	Gypsum	Import	Australia or other	A corrective material. Transported to Timor-Leste by ship or barge, off loaded at jetty, and transported to plant by belt and pipe conveyor.
5.	Coal	Import	Australia/ Indonesia	Fuel source and corrective material. Transported to Timor-Leste by ship or barge, offloaded at jetty, and transported to plant by belt and Pipe conveyor.

D. Limestone Deposit

The limestone deposit is accessible from Baucau by a tar road. The mine is located about 1 km from the main road and Bucoli village. The mining area is located around 0.5 km from the coastline where a jetty is proposed to be constructed. The limestone concession area (I-1) which shall meet the initial limestone requirement of the plant covers an area of 576 ha. The deposit area is generally undulating and hilly. As observation result, the limestone bearing area is covered by thick or scattered trees, thorny bushes and tall grass.

E. Clay Deposit

Clay is found to occur close to the plant site in Suco Wailacama in Baucau administrative post, less than 10 km west of the plant site. Clay shall be used as corrective to compensate for silica and alumina deficiency in the raw mix. Clay is proposed to be transported to the plant site by trucks.

F. Jetty

A dedicated jetty is proposed at a distance of 2 km from the plant site. Inbound material, (e.g., coal, gypsum, iron ore) and outbound clinker shall be transported between the plant and the jetty by a 0.5 km long conveyor belt ±1.5 km Pipe Conveyor (fully enclosed). The maximum load during unloading is estimated as 1000 tons per hour and during loading is estimated as 1000 tons per hour.

G. Utilities

a. Power

Power will be supplied by captive thermal power plant of approximately 30 mega-watts (MW) capacity and Waste Heat Recovery power plant.

Power for initial phase of plant operation when cement grinding is commissioned will be from grid power. Tapping from the nearby grid line of 20 KV will be tapped and step down to 11 KV at the plant substation. Generator sets will be utilized for construction power.

Emergency power requirement for initial commissioning of cement grinding is not required. For full plant 1.5 MW genset will be required. Thermal power plant shall include black start power requirement separately.

b. Water Supply

The water requirement for the cement project shall be met from groundwater by drilling bore wells. A makeup water supply of approximately 3,150 m^3/day is required for operations including requirement of mines, colony and green belt which may be possible to obtain this from one or two boreholes.

An underground aquifer is reported to occur below the mining blocks. As there is no industry in the area, the exploitation of water resources during the operation is not expected to adversely affect the water availability in the area for other competing users.

A detailed hydrogeological study is proposed to be carried out to assess the availability of groundwater in the area. Water shall be required for:

- Process Water Circuit;
- Cooling water (required for machine cooling);
- Make-up water shall be provided while re-circulating water shall be in a close loop;
- Water required for township;
- Water for on-site facilities;
- Construction and operations (dust suppression).

c. Waste Water

The cement plant is being designed as a Zero Discharge facility and there shall be no discharge of waste water outside the plant premises. All the process waste water shall be treated in Water Treatment Plant and reused for plantation purposes. The waste water generated from domestic activities shall also be treated and reused for dust suppression, green belt development to the extent possible.

d. Solid Waste

Domestic solid waste generated from plant and jetty area shall be segregated and will be sent to waste disposal site as allocated by the local administrative authorities.

1.2. Location Study

The proposed cement plant and marine jetty are located in Suco Tirilolo, Aldeia Osso-ua, in the Baucau administrative post of Baucau municipality, Timor-Leste. The location is about 120 km east of Dili and approximately 16 km west of Baucau.

The Proponent has been granted a Prospecting License for limestone over three blocks, including, Block I-1 (Bucoli North Area-1), covering areas of 576 ha. The prospecting blocks are spread over Sucos Tirilolo, Bahu, Caibada, Triloca, Bucoli, and Wailili in administrative posts of Baucau, Vemasse and Venilele in Baucau municipality.

Sources of clay are located at Suco Wailacama within 10 km from proposed plant site. Corrective iron ore and additive gypsum are proposed to be procured from Australia. Coal will be used as a fuel for the kiln and power supply at the cement plant and is proposed to be procured from either Indonesia or Australia. The location of plant, mines (Block I-1) and jetty are shown in figure below.

Source : https://commons.wikimedia.org/wiki/File:Sucos_Baucau.png
https://www.mof.gov.tl/about-the-ministry/statistics-indicators/sensus-fo-fila-fali/download-suco-reports/baucau-suco-reports/

Figure 1.1 Location of TL Cement Development Project

1.3. Scope of Works

According to scope of works from WorleyParsons, the social impact assessment study will assess the following task :

- Identifying the condition of social economic culture of the communities in the study area;
- Predicting potential impacts from the proposed project related to the communities;
- Preparation of recommendation the mitigation measures to avoid adverse impacts and to enhance the project benefits to the communities;
- Conduct social economic and cultural survey using appropriate methodology.

2. METHODOLOGY

2.1 Data Collection

This study relied upon the ethnographic strategy. The original plan was to conduct questionnaire-based surveys and in-depth interviews to fill the gaps in the survey results, and then collect secondary data to obtain a general picture of the demographics. After the initial visit to identify the research area and the feasibility of a questionnaire survey, the plan was modified to account for the following issues:

1. The settlement patterns consists of hamlets (*aldeia*) widely dispersed according to the local availability of staple resources, so a questionnaire survey would take an unfeasibly long time; it is feared that interviewers might try to artificially speed up the process by writing subjective and biased reports.
2. Household units within residential territories are based upon patrilineal and patrilocal lineages, so the choice of a nuclear family unit might not produce representative results for the entire lineage unit, it is supposed to represent, especially with regard to questions about views/response towards the project and about decision-making processes over acquisition or the sale of land;
3. Despite the use of money for trade, the local population is still anthropologically categorized as subsistence households;
4. The local topography and availability of natural resources play an important part in shaping the local population's agricultural patterns and subsistence strategies, creating a relatively homogeneous pattern of life; this kind of situation can only be captured through in-depth interviews;
5. The local population's isolation and external parties' (*i.e.* the government's) lack of attention towards their welfare, anthropologically speaking, has caused them to rely on their own resources and show little interest in cooperating with people outside their lineage group; this tendency can only be captured with an ethnographic approach, especially in comprehending the surplus accumulation strategies permitted by customary law and the importance of ancestral land in signifying identity (and rights) as a member of the village community.

The ethnographic survey was performed through observation, in-depth interviews, and secondary data collection at the village level, especially in areas likely to suffer direct impact from the project. This is based on the assumption that the people in such areas are the most likely to suffer significant impact (in terms of changes to their subsistence livelihoods). The people elsewhere are expected to be less significantly affected since the potential benefits provided by the project in the form of employment opportunities are not likely to dramatically change their resource exploitation habits, except under intense empowerment to increase the productivity of existing resources.

The study were undertaken on the following activities:

- Preliminary observation on 5th – 9th May 2015
- Ethnographic study 20th May – 2nd June 2015 (This ethnographic study was conducted by two anthropologist)

Observation was performed to understand land use patterns and the resource situation, crop types and planting schemes, cooperation in the exploitation of subsistence resources, the location of residential areas relative to the project site, the location of cultural identity sites (such as cemeteries and traditional/customary houses) relative to the project site, and resource exploitation activities (agriculture and fisheries) in order to understand subsistence patterns.

In-depth interviews were intended to understand the production systems and patterns needed for the survival of the nuclear family and the lineage group; distribution arrangements between woman-giving and woman-receiveing lineage groups in the context of group reproduction and the development of intergroup networks, and customary norms in the exchange between woman-givers and woman-receivers as social capital in the social security context; accumulation strategies in accord with customary norms to manipulate the demands of obligations as a member of the lineage group; types of crops and planting (production) strategies to fulfill subsistence needs; and modes and processes for acquiring cash income from produce in order to fulfill consumption needs and accumulate surplus.

Apart from these three livelihood factors, the in-depth interview also sought to develop an understanding of customary and religious rituals with regards to the affirmation of lineage membership after the introduction of new indentity paradigms by the church. The focus lies upon the importance of these two identities to the individual as a member of the village community, as well as to land and the attached rights for the community member.

Secondary data was extracted from two different sources. The first is the data from the 2010 population census. This data was compared to the latest demographic data from 2015, which was available in the village. This comparison was meant to figure out the population growth rate in the villages around the project site, namely the villages (Suco) of the Baucau and Vemasse Subdistricts. Not all villages around the project site had a complete suite of demographic data that included levels of education, occupations of family members, vulnerable groups, and age groups (especially productive age groups). For the purpose of analyzing impacts upon the villages that may incur indirect impacts from the project, the old but easily available data from the 2010 census can still be used to obtain a general idea of the number of working-age residents, levels of education among family members, the numbers of employed and unemployed residents, the number of vulnerable households, and other relevant data.

Other important secondary data include demographic records at the hamlet or *aldeia* level, which was obtained from family cards. These cards contained data about the names, age, education, and occupation of all family members, whether male or female. Unfortunately, most hamlets within the project's likely impact area did not have such an extensive record of family cards as the one found in the Tirilolo Village. Although complete demographic records in the form of family cards were only available in Tirilolo, it is possible to describe the pattern of occupation and education levels among village households in the project's likely impact area with the use of the demographic picture obtained from the two *aldeia* groups of Tirilolo Vilage (two *aldeia* at the center of Baucau City) and four *aldeia* in rural areas (Caisido).

Another secondary data source that provides information similar to the demographic data in family cards was monthly reports from the auxiliary clinic in the Caisido *Aldeia*, Tirilolo Village. This auxiliary clinic provided medical services for the people in four *aldeia*. The clinic lies within the area likely to incur direct impacts from the project. The monthly reports recorded the number of visits and the number and type of medical complaints reported by the visitors, categorized by age group. This data is very important since it correlates with the socio-economic condition of the local population's residential environment.

2.2 Data Analysis and Impact Assessment

Secondary/quantitative data was analyzed to find out tendencies and patterns. This data is particularly useful for finding out the reasons and considerations behind the villagers' behavior, especially those within the indirect impact area. Meanwhile, quantitative data for villages in the direct-impact area is used to forecast the spread, magnitude, and accumulation of reversible and irreversible impacts.

Quantitative data from medical reports was analyzed for patterns in the diseases commonly found among the local population and their relationship to sanitation conditions, the scarcity of clean water, and the local population's socioeconomic well-being.

Ethnographic data is analyzed to comprehend the rationality of individual behavior in developing and nurturing mutual survival interests. Customary systems and mechanisms for member reproduction, as well marriage institutions and related customs, provide opportunities to develop social networks for the purpose of enhancing social security; meanwhile, customary laws and institutions provide an opportunity for individual economic development through the accumulation of surplus under the constraints of limited resources, customary obligations to maintain communal unity, and the lack of attention from external parties. The project will directly and indirectly cause positive changes to behavioral (cultural) patterns in terms of more rational surplus accumulation with fewer customary and ritual constraints; or the strengthening of member reproduction systems and mechanism and customary economy in response to ongoing changes, especially among people who haven't derived any benefits from the project. These two possibilities aside, traditional/customary houses would probably remain an important element in group identity, particularly in the context of how social lineage groups respond to attempts to merge their traditional group identity into religion-based communities through the baptismal names of past traditional elite figures. Theoretically speaking, the contrivance of setting up customary territories on the basis of baptismal names is deemed acceptable since it provides benefits to both sides.

Impact assessment is based upon the following guidelines:

1. IFC's Performance Standard on Environment and Social Sustainability 2012.

2. Riki Therivel, John Glasson, and Andre Chadwick. 2010. Introduction to Environmental Impact Assessment. 3rd Edition. Routledge. London and New York.

3. The main subjects of analysis are:

    a. Direct and indirect impacts;

    b. Extent and magnitude;

    c. Cumulative Impact;

    d. Reversible or irreversible;

    e. Manageable or unmanageable;

    f. Impact consequences with and without the project;

2.3 Study Area

Intensive ethnographic research was performed at the mine site and plant site – traditionally known as the Caisido region, consisting of the Parlemento, Caisido, Lialaileso, and Osso-ua *Aldeia* in the Suco

Tirilolo. In the Wailacama *aldeia*, Suco Vemasse is the closest site to the clay area. The Wailacama *aldeia* community currently resides on the clay site. The fields in the area are currently being left fallow while the owners reside elsewhere. Beyond these five *aldeia*, observation was also made upon several sucos in the Baucau subdistrict as well as Suco Vemasse, which exhibit certain similarities and peculiarities in terms of ecology, ricefield cultivation, perennial gardens, etc. Apart from this direct observation, secondary data collection was conducted in suco administrative centers, and also interviews with *chefe suco* to find out their knowledge, response, and hopes about the planned project.

3. ENVIRONMENTAL BASELINE

3.1 Administrative Boundaries of the Project Area

3.1.1 Administrative Boundaries

The planned site for the clinker cement project is administratively located in Suco Tirilolo, Baucau Subdistrict, and Suco Vemasse, Vemasse Subdistrict. The mine site and plant site are located within the Osso-ua *aldeia*. Access roads to the Osso-ua *aldeia* pass through the Parlemento, Caisido, and Lialaileso *aldeia*. All four *aldeia* comprise a region within Suco Tirilolo historically known as Caisido. The mine and plant sites are located approximately 7 km away from the Baucau – Dili main road. The four *aldeia* are still relatively isolated, particularly in the case of Osso-Ua. Roads that allow access to four-wheeled vehicles were built approximately 3 years ago. With the establishment of the road, public transportation cars now make 2 trips per day from Baucau City to the Parlemento *aldeia*, but the route does not extend into Osso-ua. Passengers going to Osso-ua must stop at the Caisido T-junction and walk the remaining 4 km. Most Osso-ua residents who wish to travel to or from Baucau City prefer to walk approx. 7 km to an intersection on the Baucau-Dili road, where they then take a ride on local transport to the city. About 10 motorcycles for hire park at the end of this road to serve trips to the four abovementioned *aldeia*. However, most local residents prefer to walk the distance since the cost of a motorcycle trip ($2 - $3) is deemed too steep.

These four *aldeia* were settled around two or three generations ago. Several interview subjects stated that the *aldeia* Parlemento, Caisido, and Lialaileso have been inhabited for a long while, while the *aldeia* Osso-ua was settled around 1945. This a*ldeia* was settled by (or designated as a settlement for) lepers from throughout Timor Leste. The history of this leper colony will be described later.

The clay mining site in Wailacama was located within Suco Ostico up to 1975. Local settlements of the *aldeia*'s population around the clay mining site are relatively isolated. At the time of the Indonesian invasion in 1975, the hamlet consisted of 15 households, which were relocated to their current habitations along the Baucau – Dili main road. The new settlement still uses the name of the Wailacama *aldeia* but it is administratively located in Suco Vemasse. However, land resources at both the new and the old site are part of the Ostico customary lands, especially those under the possession of the Wailacama residents. As such, the current population of the Wailacama village resides within their traditional customary resource areas. The identification of customary areas is very important to individuals and their descendants since it bears upon the descendants' inheritance rights and limits external parties' ability to claim possession over resources outside their own ancestral lands. The importance of customary land rights will be more fully explained later on. Access from the new settlement site to Suco Ostico is available through a 3 km dirt road through secondary forest, traversable with four-wheel-drive vehicles.

Although the planned clinker cement project will only cause direct impacts upon the abovementioned five *aldeia*, the overall influence may extend to other sucos within the subdistrict, especially by raising hopes for employment and business opportunities for the younger generations in two subdistricts. These hopes were reinforced when Suco leaders from the Baucau and Vemasse Subdistricts were brought to review the central site of the cement industry plant in Australia. During the visit, they were given information

about potential benefits for the local population, especially in terms of employment opportunities and the development of social facilities in the area.

Apart from the abovementioned explanation, the arrival of a large manufacturing project in the Baucau region's subsistence farming landscape inevitably brings about hopes for benefits from the project. The fulfillment of these hopes constitutes the indirect impact of the project. In other words, the construction of the clinker cement plant is expected to cause direct impacts to five *aldeia* in two sucos as well as indirect impacts to other villages around the project site **(Table 3.1).**

Table 3.1 Village Boundary, Direct, and Indirect Impact

Subdistrict	***Direct Impact Sucos***	***Indirect Impact Sucos***
	Mine, Clay site, and plan site.	
Baucau	Tirilolo	Bahu
	-	Bucoli
	-	Baruma
	-	Wailili
	-	Samalari
	-	Gariuai
	-	Triloca
	-	Seical
	-	Caibada
Vemasse	Vemasse	Ostico
	-	Ossoala
	-	Luilubu
	-	Uaigae
	-	Uatu-Lari
	-	Caicua

Source: Survey Inventarisation, May 2015.

3.1.2 The History of Adat Identity and Territory

One of the informers explained that Baucau was settled by people from the western region of **Waiweko/Waihaloi** who initially migrated to the east (Manatuke) to the area between Dili and Baucau, followed by a further migration to Waikeke (west) and finally to Baucau. Immigrants from **Waihaloi** are dominated by the Da Costa group. The first destination at Waikeke was already occupied by the Amaral, Soares, Ximenes and Sausagroups, which prompted them to remigrate westwards or 'upwards' to what is now Baucau. These clan names were based upon the baptismal names of leaders among the

territorial elite at the time. These names were then adopted by community members born and residing within the territory of particular sucos.

At the moment, certain baptismal names signify a person's origins or residence in a suco. The Baucau Subdistrict is traditionally dominated by three surnames, namely *Da Costa, Belo,* and *Flores.* Local legend holds that these three surnames originated from three brothers who owned/controlled resource in their respective territories (sucos). Each lineage owns an *adat*/customary house used for communal rituals with their ancestors. This *adat* building is located in Suco Bahu. Ceremonies are held on an irregular schedule, depending on whether the house requires repairs or not. Ceremonies are led by the oldest male member of the groups. This leadership is not passed down to a late leader's son but is transferred according to seniority.

All the sucos, whether in the Baucau or in the Vemasse Subdistrict, are dominated by particular baptismal surnames (**Appendix 1**). All residents of the village/suco identify with or are identified with the historical baptismal name of their traditional elites. Although the village/suco residents use the same baptismal name throughout the entire suco, they usually do not share the close blood ties that such a shared surname would normally imply. Theoretically, all communities have elite and follower components. To affirm the power of the traditional elites, the power is institutionalized in certain rituals. The ritual site and mechanism are chosen to reinforce the power of the traditional elite over their territory. This traditional power is performed through rituals, along with the organizational apparatus needed to arrange and conduct the rituals.

No such ritual activities have been found in the project area apart from that performed by lineage groups in their customary houses. In this respect, the baptismal surname cannot be accurately seen as clan names, but rather as territorial groupings. The possible goals for the use of these baptismal surnames as markers of territorial identity will be discussed later.

3.1.3 The History of Osso-Ua's Leper Colony

Suco Tirilolo is the oldest suco along with Bahu and Caiboda. These three Suco were the origin of a social group based upon a baptismal surname, namely Belo. This Suco was historically divided into two regions: the inland Caisido region (now the Aldeia Caisido) and the upper region (Old Market, Baucau Subdistrict). The inland (Caisido) region is made up of 4 Aldeia: Caisido, Parlemento, Lialaileso, and Osso-Ua. All these four Caisido had been settled prior to 1945 except for Osso-Ua. Osso-Ua is located approximately 4 km away from the other three aldeia towards the north, an isolated site that can only be reached over a footpath.

Informers state that, around the year 1945, the Portuguese government (Portu) designated Osso-Ua as a quarantine area for lepers from all over East Timor. The lepers were left to fend for themselves with no amenities provided by the government – no housing, arable land, nor healthcare. The lepers were managed solely through restrictions on the use of the clean water sources passing through the village. The lepers were directed to use the smaller water source (*Uai Mata Anna*) while the larger water source (*Uai Mata Uli*) was reserved for the general public. This separation was intended to prevent contagion. Attempts to approach and treat the lepers began under Indonesian rule (1988). Medical care was provided by church sisters. Intensive care only began in 2008 and has continued to this day. Reports from village family cards and church records indicate that only 2 lepers remain in the area. Recent information hints that the leper colony will eventually be moved to Bondura, a coastal site to the west of Osso-Ua.

3.1.4 A Chance of Community Empowerment

Over 400 years of Portuguese colonization, 29 years of Indonesian occupation, and 16 years of independence, the people of Caisido (four *aldeia* around the mine and plant sites) have received scarcely any attention from the outside. External attention only began to manifest itself during the Indonesian occupation in the form of:

1. The construction of clean water conduits from the army base at the Baucau-Tirilolo road junction, utilizing a water source originally tapped to serve the military base. The clean water supply went all the way to Caisido with a flow rate of 1000 l/second in the 1980s.
2. 2011 saw the electrification of four villages (including Tirilolo) with the construction of 18 km of power lines from Caibada Village to Caisido by the State Secretariate on Electricity (*Secretario Du Estado Elektrisidade*)
3. The isolation of the area and the lack of medical care has motivated the Australian Red Cross foundation to widen the 3 km access road from the Baucau main street (in front of the military /*Falintil Forcas de Defesa de Timor Leste*/FFDTL base) to Caisido – Caibada and a 4-km stretch on the Caisido – Osso-ua route, and to build clean water reservoirs in Caisido. This was done three years ago on the initiative of Baucau community figures who contacted the Australian nonprofit.
4. 2013 saw an expansion of the electrical network from Carabela (Vemasse) to Osso-Ua;
5. Food aid and improvement of the road from the T-junction on the main street to the four *aldeia* by the US NGO CARE International (*Cooperative for Asisstance and Relief Everywhere*).
6. In 2002-2003 the WHO (World Health Organization) brought in food aid for pregnant and lactating mothers and children under five years old, as well as treatment for malaria; this was done in cooperation with the ministry of integrated community healthcare (SISCA / *Servico, Integrado, Saude Comunitario*).
7. In 2004, existing clean water conduits underwent maintenance in the form of the replacement of old pipes with new pipes of the same diameter (2 inches);
8. In 2014, the clean water distribution network was expanded to Osso-Ua from the existing pipeline (Caisido);
9. 2015 saw the construction of new clean water pipes parallel to the old pipes. The new pipes wil fill 10,000 l water storage reservoirs in several locations (**Appendix 2**) with water taken from Garuwai.
10. In 2013, the World Vision foundation provided aid for the construction of an elementary school in Parlemento and healthcare clinics. The new clinics began to operate in June 2014. This aid was directed towards the fulfillment of education and healthcare needs, while the local population's hopes for agricultural empowerment have not yet been addressed.

3.1.5 Cultural and Historical Sites

Neither interviews with the *Chefe Aldeia* (*Aldeia* Chief) nor field observations at the mine and plan sites and the clay area has revealed any signs of historical artifacts. According to Senor Januario, the District Director of Environment of Baucau, there is a sacred location (*lulik*) on the Tirilolo coast. The place is

said to be guarded by a sea guardian spirit (*Na'in Ba Tasi*). Januario could not point out the exact location, but Palmer's 2011 report (*Water Selection: Customary System and the Management of Baucau Citiy's Water*) identified the sacred location at the beach below Baucau City (Wotabo), or more precisely the site of a spring that discharges from Bucoli to Wailili and then straight to Wotabo Beach. This site is quite distant from the Osso-Ua beach.

There are two cultural sites that figure prominently in lineage group identity around the mine and plant site, namely the cemetery and the *adat* (customary/traditional) house or *rumah adat*. These two places serve as venues to pay respects and pray to deceased ancestors (the cemetery) while and to maintain the integrity of lineage group identity. Memorial and bereavement rituals for the death of a family member (*ikat bunga*) are performed at the cemetery with the sprinkling of flowers and the recitation of prayers for the dead. The ceremony is conducted a year after the death and is repeated afterwards on a yearly basis. This ceremony involves prayers led by the pastor. The prayers can be said at the site or during Mass at the church without the need to take the priest to the gravesite. All family members are involved in the ceremony. Apart from praying for and remembering the dead, the ritual also serves the function of strengthening social bonds among living family members.

There are two distinct opinions about the possibility of relocating the cemetery. The first opinion states that graves cannot be relocated since such an action would bring bad consequences upon the living members of the family, such as local disasters. The second opinion holds that graves can be relocated in times of great need with a ceremony similar to the original funeral ceremony and presided by a priest.

An informer – the village *Lia nain*—said that it is difficult to find an appropriate site for a cemetery complex. The difficulties in bringing the graves together into a central location are mostly due to the lack of sites with at least 2 meters of soil without any large rocks.

At the jetty site on the coast of Osso-Ua *Aldeia*, there are 7 graves spread between two sites. These graves are expected to be directly affected by the jetty construction plans.

Another institution that plays an important role in the maintenance of lineage group identity is the customary house (*rumah adat*). The customary house is a simple building quite similar to other local houses. The house is mostly made up of bamboo and roofed with thatch made out of palm leaves. The customary house provides a place to store the clothes left by a deceased person; these clothes are stored in a basket (*toah*) made out of fronds harvested from the palm trees growing nearby. Outside the basket storage area, a number of seats are placed around the house. Customary or cultural ceremonies are performed at the same time as repairs to the building when it is deemed necessary. The ceremony is led by the oldest male member of the lineage group and the male heads of nuclear families. During the ceremony, the names of lineage ancestors and the original (pre-baptismal) names of lineage members are recited. The order in which the names of lineage members are recited is based on memory. To maintain lineage identity, all members of the lineage adopt the name of the ancestor who resided in the customary house (the name of the customary house). This name allows members of the lineage to identify their kinship to each other.

There are 17-37 *rumah adat* (customary houses) in the four *aldeia* closest to the project site. These houses are generally grouped together at the same site as the original customary houses built by the ancestors. In the Osso-Ua *Aldeia* there are a number of customary houses (around 3-4) situated apart from the complex of customary houses built by the rest of the population. Instead, these segregated customary houses are located much closer to the residential hoises of their lineage groups. The reason for this remains unknown. Their owners and everybody else generally answer that it was done to

facilitate maintenance of the customary houses. Our conjecture is that these families were descended from lepers who deliberately sited their customary houses apart from the others'.

The importance of the *rumah adat* as a symbol of core cultural identity for the kin/lineage groups make them even more difficult to relocate than graves. The graves themselves are not merely body disposal sites, but also a place where the living family members undertake '*… to remove the corpse and dead soul from the secular world and fix them firmly in the sacred, and to serve the lineage kin. From their tie with the sacred world and restore them to secular life*' (Hicks, 1976:114). The funeral process involves the woman-giving party as 'givers of life' along with the lineage group of the deceased.

Table 3.2 Number of Adat Houses in Project Area

Suco/Aldeia	*Number of Household*	*Number of Adat House*	*Number of Lineage*
Tirilolo			
Aldeia Parlemento	99	17	17
Aldeia Caisido	184	37	37
Aldeia Lialaileso	101	27	27
Vemasse			
Aldeia Wailacama	27	1	1

Source: Survey Inventarisation, May 2015.

3.2 Demography

3.2.1 Population Numbers in the Subdistrict and Affected Suco

The population of the sub-districts around project activity sites is 41,895 for the Baucau Subdistrict and 9605 for the Vemasse Subdistrict. Compared to the census figures from 2010, the Baucau population has experienced a 4% decline while Vemasse saw a 12% growth. Prior, all the datas related to population number were calculated by population growth rate formula. Datas required from census 2010 and monography suco 2015.

$$r = (Pt - Po)^{\frac{1}{t}} - 1)*100$$

r= Population growth rate formula

Pt= Total population on last year

Po= Total population on basic year

t= year differences between Pt and Po.

Nearly all sucos in the Baucau Subdistrict exhibited population growth within the last five years, varying between 0.3% - 7% per year with the highest figure being found in Tirilolo (as the directly affected area)

at 18%/year, followed by Salamari at 7%/per year and Buibau at 5%/year. Meanwhile, Baruna saw a sharp population decline (-28%/year).

Table 3.3 Population Growth in Suco, Direct, and Indirect Affected Areas for 2010 – 2015

Subdistrict	Suco	Direct Area			Rounding	Indirect Area			Rounding
		Number of Pop.		Population	Off	Number of Pop.		Population	Off
		2010	2015	Growth (%)		2010	2015	Growth (%)	
Baucau									
	Tirilolo	2815	6441	18.003525	18				
	Bahu					5188	6727	5.33	5
	Bucoli					2179	2711	4.46	4
	Buruma					15664	3063	-27.85	-28
	Buibau					3708	4705	4.88	4.9
	Wailili					3519	3573	0.31	0.3
	Samalari					1534	2183	7.31	7.3
	Garuai					4518	4663	0.63	0.6
	Triloca					2442	2193	-2.13	-2.1
	Saical					1876	2231	3.53	3.5
	Caibada					3057	3549	3.03	3
Total						**45695**	**37613**	**-3.82**	**-4%**
Vemasse									
	Vemasse	4679	3132	-7.714442	-8				
	Ostico					1240	1612	5.39	5.4
	Ossoala					665	1578	18.87	18.9
	Luilubu					1146	1255	1.83	1.8
	Uaigai					366	744	15.24	15.2
	Uatu-Lari					858	1192	6.8	6.8
	Caicua					54	1083	82.16	82.1

Subdistrict	Suco	Direct Area			Rounding	Indirect Area			Rounding
		Number of Pop.		Population	Off	Number of Pop.		Population	Off
		2010	2015	Growth (%)		2010	2015	Growth (%)	
Total						**4329**	**7464**	**11.51**	**12%**

Source: Census 2010 and Monography Suco, 2015.

Similarly, almost all sucos in the Vemasse subdistrict experienced population growth. The growth varied between 2% - 19% over the population figures from five years ago, with the most extreme growth happening in Suco Caicula (82%) or 8 times the initial calculations from the 2010 census, with Ossoala coming a distant second at 19% and Uiegea at 15% (**Table 3.3**) Suco Vemasse alone experienced an 8% decline over the last five years.

What caused these population changes? Our experience in the field suggests that the population records in most sucos are poorly kept, with the exception of Tirilolo where the suco administration keeps family card records for the population in its *aldeia*. The village secretary explained that the population numbers cited in village monography is recapitulated from these family card records.

The family card provides a complete record of each family member's age, level of education, and occupation. Other sucos have not undertaken such a complete recording of family cards as in Tirilolo. As such, social assessment of the general picture of the subdistrict's working-age population, educational status, and occupations has to rely on data from the 2010 census. A recapitulation of the family card data from Tirilolo is used as reference material for detailed description and comparison.

3.2.2 Number of People and Houshold Likely to be Directly Affected by the Project

As explained elsewhere, the mine and plant site are located in Suco Tirilolo, especially in the Osso-Ua *Aldeia*, while transportation activities during construction will affect the Caisido, Parlemento, and Lialaileso *Aldeia*. The population of Osso-Ua is approximately 598 (93 households) or about 9% of Tirilolo's population and a quarter (25%) of the Caisido population.

The local population growth rate is 1 – 2%/year, lower than in large cities where the growth rate may reach 2 – 3%/year. The dependency ratio in Caisido averages around 1 – 2 people, or in other words the productive-age population/workforce must support 1-2 unproductive people on average although they have 4-6 family member/houshold.

Table 3.4 Population by Age Group Suco Tirilolo by 2011

Aldeia	Total Family	Age Groups	Total	Productive (16-59)	Non Productive (0-15 & 60+)	Ratio
Betulale	382	0-5	147	1390	540	2.57
		6-15	227			

Aldeia	Total Family	Age Groups	Total	Productive (16-59)	Non Productive (0-15 & 60+)	Ratio
		16-35	766			
		35-45	317			
		46-59	307			
		60+	166			
Lutumuto	541	0-5	1107	4112	2457	1.67
		6-15	1242			
		16-35	1282			
		35-45	1392			
		46-59	1438			
		60+	108			
Caisido	150	0-5	58	381	320	1.19
		6-15	181			
		16-35	247			
		35-45	70			
		46-59	64			
		60+	81			
Lialaileso	126	0-5	145	299	317	0.94
		6-15	130			
		16-35	209			
		35-45	53			
		46-59	37			
		60+	42			
Parlemento	113	0-5	84	245	208	1.18
		6-15	82			
		16-35	84			
		35-45	91			
		46-59	70			
		60+	42			

Aldeia	Total Family	Age Groups	Total	Productive (16-59)	Non Productive (0-15 & 60+)	Ratio
Osso-Ua	127	0-5	83	300	281	1.07
		6-15	146			
		16-35	175			
		35-45	62			
		46-59	63			
		60+	52			
		46-59	70			

Source: Secondary Data from Suco 2015

Table 3.5 Number of Family Member

Suco	Aldeia	Total	Household	Fam. member/house
Tirilolo	Betulale	1937	383	5.06
	Caisido	719	174	4.13
	Lialaileso	583	119	4.9
	Lutu-Muto	2081	434	4.79
	Osso-Ua	606	123	4.93
	Parlamento	470	116	4.05
Subtotal		**6333**	**1349**	**4.69**
Triloca		2193	444	4.94
Ostico		1612	293	5.5
Vemasse		3075	700	4.39

Source: The Latest Suco Statistic, 2015

Observations in the field indicate that the number of households that will be directly impacted or may end up being located inside the cement plant's activity area is approx. 10 households at the mine site, 15

households in the nearest settlement to the mine site, and 7 households near the jetty. The rest of the households are within the activity influence area but would not need to be relocated.

There are no people known to reside at the planned clay site in Wailacama customary land. In the past, 15 households were known to have lived close to the planned clay site, but these families were moved next to the Baucau-Dili road during the Indonesian occupation. This relocation changed their administrative status from being residents of Suco Ostico to residents of Suco Vemasse. However, the customary land and resources remain in the ownership of the relocated families. Due to the relocation, their customary land around the clay site has not been cultivated except for the lands owned by one person who uses it as rice fields. Their displacement to the new location has not completely severed their connections to their original suco.

There is a trail passable by four-wheeled vehicles from the Wailacama site to suco Ostico, so the people do not feel physically or socially dissociated. The new settlement site is occupied by 71 households, consisting of 15 native Ostico households, 12 households of their descendants, and 44 immigrant households. These include the household of the customary chieftain's wife, 7 households of the Waturo group and 10 households of the Watanaru baptismal group. They follow a patrilocal (woman-receiving) dwelling pattern. As immigrants, they have no customary right to local resources. They currently work as firewood collectors in Ostico's forests.

3.2.3 Potential Labor Force in Suco and Subdistricts near the Project Area

The working-age population (ages 16-50) in the Baucau subdistrict numbers 20,597 with 11,586 men or 25% of the total population and 9011 women or 19% of the total population. The numbers in the Vemasse subdistrict are 2088 in total with 1077 men (25%) and 1011 women or 22% of the total population.

Nearly all suco in the Baucau Subdistrict have experienced 0.3% - 7% of population growth in the last five years, but the subdistrict as a whole has seen a population decline of -4%/year. The two extremes are Tirilolo with a growth rate of 25%/year and Suco Baruma with a steep decline of 28%/year. In the Vemasse Subdistrict, all suco experienced 2% - 19% population growth with particularly high rates of growth in Ossoala (19%/year) and Uaigae (15%/year) (see **Table 3.3 in sub chapter 3.2**). On average, each suco had a population growth rate of 12%/year, with the exception of suco Caicua where the population nearly doubles every year.

In suco Tirilolo, the recapitulation of family card data shows a total population of 6441, 3869 of whom live in the two urban *aldeia* while the remaining 2572 reside in the rural Caisido region. The potential workforce, especially in Caisido, is made up of 45% (1157) men and 55% (1415) women.

The numbers of men and women in the workforce are relatively balanced. In traditional sectors, employment opportunities for women mostly exist in gardening, farming, and firewood harvesting activities, while employment opportunities in the mining sector are more likely to attract the male segment of the workforce.

3.2.4 Employment Opportunities and Occupational Structure

The working-age population of 11,586 men (25%) and 9011 women (19%) in Baucau sub district plus 1077 men (25%) and 1011 women (22%) in Vemasse sub district is quite large for a region that ostensibly depends on subsistence farming in difficult conditions, both topographically and hydrologically,

and with underdeveloped market activity. According to census 2010**,** only 50% of productive-age men and 26% of the women in Baucau subdistrict are employed, and only 60% of the men and 29% of the women in Vemasse subdistrict. However, there is no detailed breakdown available of their occupations.

This detailed picture of employment status and occupation among the local population (especially of the Baucau Subdistrict) had to be extrapolated from the recapitulation of family card data in suco Tirilolo. The recapitulation distinguishes between urban and rural *aldeia* (see **tables in the Appendix 3 for Suco Tirilolo Family Card Record, 2015**).

According to the family card records, 34 – 56% of the heads of households in the 'urban' areas (Baucau subdistrict) work in the traditional (agricultural) sector, while the remaining 44 – 66% work in non-agricultural sectors. There are 17 – 20 occupations listed, with schoolteachers, private sector employees, police officers, merchants, drivers, and public servants being the most prominent. Most wives tend to be stay-at-home housewives (38 – 81%), but a number work in the traditional farming sector (3 – 45%), and even in non-traditional sectors (17 – 18%). There are 9 – 11 kinds of occupations open to such women, the most prominent being schoolteachers, public servants, and public functionaries.

Among the children, 8 – 10% of boys and 2 – 6% of girls are employed. Most (92-98%) are still at school. The most common occupation, both for working age for boys and girls, is that of private sector employees. There are 6 – 9 other occupations found among these children (see **tables in the Appendix 3 for Suco Tirilolo Family Card Record, 2015).**

In inland (Caisido) communities, 69 – 95% are heads of households and 70 – 95% are wives working in the traditional (agricultural) sector. The rest of the community work in non-agricultural sectors. There are 2 – 11 kinds of occupations recorded among the heads of households with the most important being drivers, private sector employees, merchants, brickmakers, and public servants. Meanwhile, the most common occupation among the women is as merchants/traders. There are 1 – 2 other occupations such as teachers and public servants.

Their children, consisting of 14 – 38 working age and 15 – 40 girls, also work mostly in the traditional (agricultural) sector. Not many kinds of occupations outside the traditional sector have been successfully developed whether for boys or for girls (2 – 6 types in each case), some of the most important being merchants, drivers (for boys), public servants, teachers, and NGOs (see **table in Appendix 3**)

The tabulation of the data from Tirilolo shows that employment opportunities in urban areas are more diverse than those in rural areas. In rural regions, traditional (agricultural) occupations still dominate, both for wives and their children. The most common employment opportunities are as public functionaries, merchants, private sector employees, teachers, and public servants. This picture is likely to hold for other sucos in the Baucau and Vemasse Subdistricts. The planned construction of industries in the inland/rural regions would probably lead to a greater variety of employment and business opportunities. The plant is also likely to intensify transportation activities in the rural areas.

In the Wailacama aldeia, the heads of the 16 migrant households from Ostico work as either drivers (10) or merchants (6). Others who still have some kin relationship to the wives of the Wailacama natives (44 households) work as firewood collectors in Ostico forests.

The Ostico settlers in Wailacama used to rely on rice cultivation in their original habitations. Now, the lack of water resources has prompted them to move to non-farming sectors. In our opinion, the main factor in the abandonment of rice cultivation is the low productivity of the land and the difficulty of finding capable workers, while on the other hand working as drivers or shop/kiosk-owners offer a larger and certain income.

Meanwhile, although the immigrant families come from woman-giving groups, they weren't given the chance to cultivate rice fields or farms except for subsidiary food i.e. cassavas and sweet potatoes due to concerns that it might cause conflict (especially with regards to land possession issues in the future).

3.2.5 Level of Education

According to the 2010 census, the level of education among people over 5 years old in the two subdistricts closest to the project site varies between primary, pre-secondary, and secondary education. This census data gives a general breakdown of education among people aged 5 and up, especially by gender (male and female); but it does not give a clear picture of the level of education for every single family members, particularly the head of the family and his wife.

Once again, data from family card records in Suco Tirilolo is used to develop a better picture of the educational status within local families. The degree of education found in this suco is deemed fairly representative of other sucos in Baucau sub district.

The 2010 census shows that most people (68%) aged 5 and up in Tirilolo had primary school education, while 13% had preschool education and the same percentage had secondary education. Only 1% had any higher (college/university) education. Meanwhile, recent data for the two *aldeia* in Tirilolo's urban segment (Baucau sub district) shows that 6% - 9% of the heads of local households had junior highschool education, compared to 11% - 14% of housewives. 27% - 31% of the heads of households had senior highschool education, and so did 37% - 39% of their wives; 11% - 15% of the heads of households and 11% - 16% of wives had college diplomas or university edcucation. Among the younger segments of the population, 10% - 23% of boys and 12% - 16% of girls had junior highschool education; 19% - 24% of boys and 22% of girls had senior highschool education; and 9% - 12% of boys and 8% - 10% of girls had college/university-level education (**see tables in Appendix 4).**

Meanwhile, the general picture of education in the four inland (Caisido) *aldeia* of Tirilolo is: 10% - 20% of boys and 12% - 21% of girls had junior highschool education; 5% - 17% of boys and 12% - 25% of girls had senior highschool education; and 13% - 31% of boys and 13% - 24% of girls had bachelors' degrees **(see tables in Appendix 4).**

Therefore, the level education throughout the family (father/head of household, mother, son, and daughter), both in urban areas (Lutumutu and Betulale *Aldeia*) and in rural ones (Caisido: Caisido, Parlemento, Lialaileso, and Osso-Ua) has seen a considerable improvement. Unfortunately, there are no complete records about the level of education among heads of households and their wives in this region (unlike the records from the urban *aldeia*), so it is difficult to see whether there has been any improvement. All the same, the data on the education level of family members in the Caisido region above will play an important part with regards to job opportunities for the local youth.

Heads of households in the Caisido region appear to be highly motivated to put their children in school. This can be seen in the fact that 5 out of 7 case respondents have children who are undergoing higher education, whether in Dili or in Indonesia. They generally hope that their children will be able to have a better life without being limited by their origins in Caisido.

3.2.6 Vulnerable Groups near the Project Site

The number of vulnerable people (including elder women, elder men, elder men's spouses, invalids, and widows) in the *aldeia* closest to the project site is relatively low, being around 6% - 11% of the total

population. The highest number is found in the Osso-Ua *aldeia* at 11% of the total, while the lowest is in the Parlemento *Aldeia* at 6%. However, these numbers are relatively high when compared to other *aldeia* in suco Tirilolo, being twice the proportion of vulnerable groups in urban areas (3% - 5% of the total population).

Table 3.6 Number and Category of Vulnerable Group

Category	***Aldeia***				***Total***
	Parlemento	**Lialaileso**	**Caisido**	**Osso-Ua**	
Elder Women	6	10	8	17	31
Elder Men	6	13	20	17	56
Elder Men's Spouse	5	8	10	10	33
Invalid	0	4	2	1	7
Widow/Women Housewive	7	3	11	12	32
Infant	84	145	58	83	370
Sub-Total	108	183	109	140	540
Total Population/*Aldeia*	416	594	823	598	2431
Percentage (%) of Vulnerable Group	23	31	13	23	22
Number of household in *Aldeia* Wailacama			71		
Ummane Group: Number of households			44 (61%)		

Source: Elaborated from Suco Family Card Tabulation, May 2014

In the context of the planned project, residents aged 0-6 years (toddlers and small children) can be categorized as a vulnerable group due to the likelihood of dust and noise exposure.

The Timor Leste government provides vulnerable groups with a $30/month allowance on a quarterly basis through its department of social affairs. This sum is deemed sufficient to fulfill these individuals' subsistence need. The price of moderate-quality rice is around $10 for every 25kg sack. With 4-5 family members per household, the average family takes 7-10 days to consume that much rice. This shows that a vulnerable household's rice requirements can be fulfilled out of the welfare allowance. The only constraint is that the quarterly payment of the allowance may make it difficult to maintain a steady subsistence. However, nearly all households in the four *aldeia* cultivate gardens and orchards for their own private needs, so the quarterly distribution of the allowance can be seen as a helpful addition to the family's own produce towards the fulfillment of their subsistence demands.

About 44 households *ummane* group (women-giving group) are all stay in *aldeia* Wailacama following the *fetosaun* (women-receiving group). However, they dont have any access to main resource (land). Their livelihood depend on collecting firewood in suco's secondary forest (common property).

After East Timor's independence, the government decided to provide welfare funds for veterans and guerrilla supporters ("clandestines"). The "clandestines" are people who provided non-combat support to Timorese guerrillas, such as by supplying them with food. The high degree of secrecy about their identity means that the number of people in this category (whether in Ostico or in Tirilolo) is relatively small. Guerrilla fighters are similarly few and far between. As an expression of gratitude, the government offers

varying allowances that depend on the beneficiary's time in service. There are three known categories of allowances:

a. 4-7 years in service: $1,000 one-time payment

b. 8-14 years: $275/month, with an initial one-time payment of $6,000

c. 15-19 years: $375, with an unknown initial payment

The stipends/allowances for the third category remains unknown since there are very few beneficiaries in this category in Baucau and none were encountered during the study. Neither did we manage to find a detailed numerical breakdown of how many people are eligible for these allowances in total, which is unfortunate since the information would be important in assessing the people's ability or opportunity to develop the fulfillment of their subsistence needs. In Ostico, one of the beneficiaries of the "clandestine" stipends stated that he used the funds to rebuild his brick/stone house. In Caisido, a veteran we managed to interview said that the initial payment he received was saved for his son's education in a college in Dili, while the monthly allowances were used to help him fulfill his everyday needs. He had not thought of improving his house with the money. The reason for this will be explained in another sub-chapter on the farmers' economic morality.

3.2.7 Community Health Situation in Caisido

Since the establishment of an auxiliary community health clinic in Caisido, the number of visits by local people to the clinic has been relatively high. There has been an average of 3000 visits per year to the clinic; the proportion of genuine medical complaints is also high, ranging from 50% to 98% of the total number of visitors (**see Table 3.7 and Figure 3.1 & 3.2 below**). The clinic is staffed by a doctor (educated in Cuba) and three nurses. The clinic serves the community's health needs except for the lepers, who are specifically under the care and custodianship of church sisters. The clinic's doctor stated that he would have liked to keep tabs on the lepers' medical situation and development but the information has been hard to get. He believes that he needs the information to plan the health service program for other residents due to the small possibility of contagion to other community members who may visit the clinic. The information is deemed necessary for early warning and prevention against such contagion.

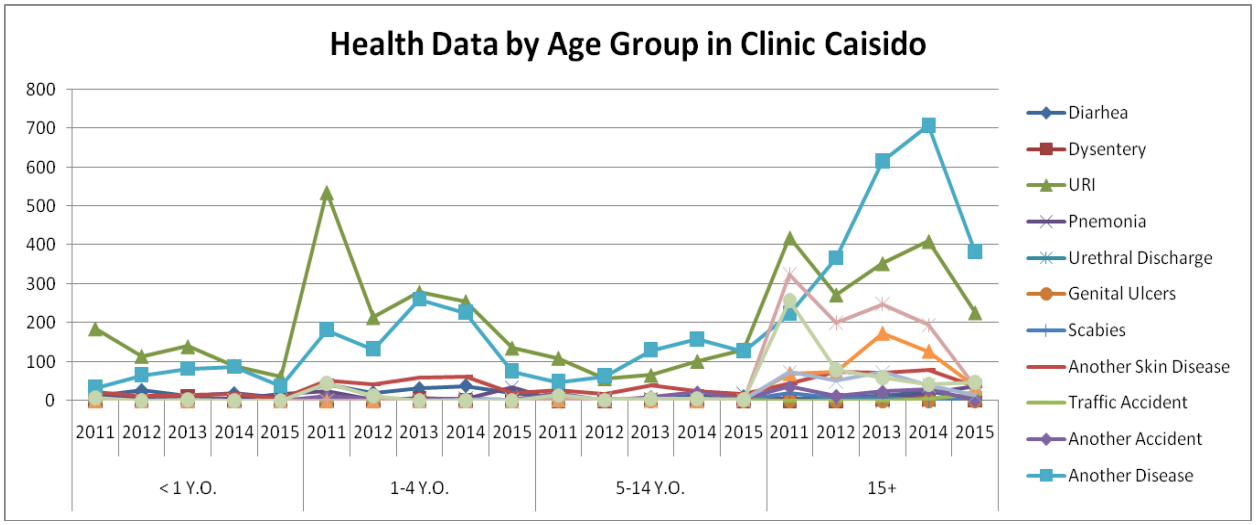
Amidst such difficulties, the government is planning to conduct a census on family health. This census will probably be very useful in informing disease prevention, education, and treatment efforts along with the provision of adequate and appropriate medical supplies to the clinic.

Table 3.7 Health Table by Age Group per Years

Health Table By Age Group per Year

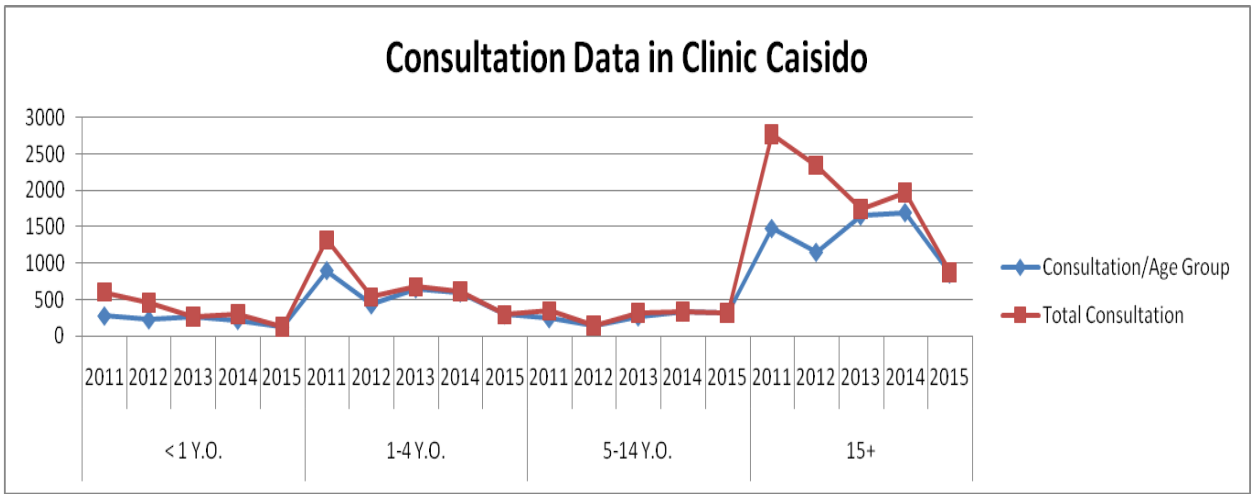
Disease	< 1 Y.O.					1-4 Y.O.					5-14 Y.O.					15+				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Diarhea	12	27	11	19	6	43	21	32	39	19	6	2	3	13	11	4	10	12	25	2
Dysentery	0	0	11	0	1	2	0	6	2	2	0	0	2	2	1	1	0	5	6	2
URI	185	114	139	89	60	536	214	279	255	135	109	56	65	101	131	419	272	353	410	226
Pnemonia	18	6	4	4	17	23	3	5	6	34	0	0	3	0	18	1	0	4	20	36
Urethral Discharge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5
Genital Ulcers	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0
Scabies	1	0	0	1	0	4	0	5	0	0	7	0	3	0	2	19	8	7	2	6
Another Skin Disease	21	12	15	18	5	52	42	59	60	20	27	16	40	24	18	44	73	70	78	37
Traffic Accident	0	0	0	0	0	0	0	0	0	2	0	0	1	4	2	0	0	1	4	17
Another Accident	0	1	0	0	0	11	4	2	4	2	19	1	9	21	5	36	12	23	29	2
Another Disease	33	66	82	87	37	182	133	260	227	76	48	63	130	158	127	224	367	616	708	383
Gastritis	0	0	0	0	0	0	0	1	0	0	3	4	2	1	5	70	74	173	127	37
Bronchitis	0	0	1	0	0	0	0	1	2	3	4	5	2	2	2	72	50	73	40	14
Rheumatism	0	0	0	0	0	0	0	1	0	0	3	2	0	1	0	325	201	249	195	38
Anemia	8	0	3	0	0	44	12	0	1	0	14	2	6	6	3	257	79	59	43	47
Consultation/Age Group	278	226	266	218	126	897	430	651	596	293	241	151	267	333	325	1472	1148	1646	1689	852
Total Consultation	607	465	269	301	129	1323	542	681	619	298	351	153	321	346	323	2775	2344	1747	1971	877

Source:Tabulation from Clinic Caisido Statistical Report 2015



Source: Tabulation from Clinic Caisido Statistical Report 2015

Figure 3.1 Graphic of Health Data by Age Group



Source: Tabulation from Clinic Caisido Statistical Report 2015

Figure 3.2 Graphic of Consultation Data

The information about plans for a cement industry raised the doctor's hopes that he would be able to map the health status and disease patterns in his area of responsibility. This data will be important not only for the doctor's disease management efforts but also for the project in developing healthcare aid programs for the local population around the project. Therefore, it would be a good idea to develop cooperation by offering aid in the form of improvements/reinforcements to the human resources available to the clinic and the provision of technological apparatus (especially computers) for database storage.

Reports from the clinic indicate that, since the opening of the clinic (2011) to the present (first three months of 2015), nearly the entire Caisido population has visited the clinic and there are probably even some visits by outsiders (since the total is 108% – 144% of the Caisido population). The proportion of people with actual diseases or medical complains is 56% - 98% of all visitors.

Patients came from all age groups. Among children under 1 year old who visited in 2011 – 2015, 9%-13% had actual medical complaints; so did 16% - 26% of the visitors aged 1 – 4 years, 4% - 19% of visitors aged 5 – 14, and 54 – 67% of visitors aged 15 years and above. This seems to indicate an increasing incidence of disease as people age. The number of medical complaints from infants under 1 year old is relatively low, probably since they still consume breast milk and thus their health is relatively well-maintained. As children enter the 1-4 years age bracket, the number of medical complaints begins to increase while they are being weaned and converted to solid food. The next age bracket (5 – 14 years) sees further reduction in adaptive capability. In the final age bracket (15 years and over), the predominant complaints are those of old age; the large number of anemia, rheumatism, bronchitis, and gratitis cases hints that the local people's physical condition tend to deteriorate as they enter advanced age.

The most common types of diseases among all age groups are the big three (Upper Respiratory Tract Infections/URI/*ISPA*), other skin diseases, and other diseases not classified in the table before. There is an increased incidence of diarrhea among children 1 – 4 years old. This may be due to difficulties with the weaning process. Similarly, the prevalence of URI can be attributed to the dry and dusty environment. Another observation is the prevalence of diseases and disorders associated with

dehydration due to the limited supply of clean water. It is interesting to note that there are no indications of malnutrition despite the uncertain state of the local population's subsistence. Is it possible that some of the other diseases recorded in the clinic can be attributed to malnutrition? However, people living in subsistence economic conditions are not necessarily poor households. The subsistence category essentially means that the people are able to fulfill their calorific needs, but not to excess. However, the situation as a whole still seems quite risky, since natural disasters or disturbances may render the local population vulnerable to mass famine.

Table 3.8 Number of Visits and Patients at the Caisido Auxiliary Clinic

Year	Total Population (Caisido)	Total Visitors	(%)	Total Patients	(%)
	2431[1]				
2011		5056	208%[4]	2888	57%[2]
2012		3504	144%	1966	56%
2013		3018	124%	2825	94%
2014		3237	133%	2849	88%
2015[3]		1627	67%	1594	98%

Source: Elaborated from clinic report

[1]) Number of visitors in 2015 but only in the first quartal (3 months)

[2]) % Calculated from total visitors

[3]) Total of population as asumed in the settle condition (relatively fixed), due population growth in Caisido are 1%/year.

[4]) % Total visitor calculated according to total population

Table 3.9 Number of Visitors and Patients by Age Group

Year	*Total Visitors*	*Total population/age group*							
		<1 year old		1 – 4 year old		5 – 14 year old		15+	
		Total	%	Total	%	Total	%	Total	%
2011	5056	607	12%	1323	26%	351	7%	2775	55%
2012	3504	465	13%	542	15,5%	153	4,4%	2344	66,9%
2013	3020	269	8,9%	681	22,5%	321	10,6%	1749	57,9%
2014	3237	301	9,3%	619	19,1%	346	10,7%	1971	60,8%
2015	1627	129	7,9%	298	17,9%	323	19,9%	877	53,9%

Source: Elaborated from clinic report
% calculated from total visitors by age group

3.3 Economic Activity

3.3.1 Ecological Condition

The ecological and geographical situation of Timor is marked by environmental destruction and degradation, which creates serious problems for Timor Leste. Another description of the situation in

Timor is: *'An island-wide ecological crisis, caused by swidden agriculture systems and population pressure..'* Pannel also states the *'characterisation of subsistence systems as a voracious slash and burn agricultural regime', with 'low agrarian production'* (Pannell, 2011:217).

Pannel's opinion is meant to describe Timor as a whole, but some of these characteristics are also visible in the Caisido (inland) region of Tirilolo. Informer's statements on the migration of the Da Costa and Flores groups to the Baucau region and the use of Osso-Ua as a leper colony around 1945 indicates a substantial history of settlement in the area. The signs of environmental degradation and destruction can be seen in the form of empty uncultivated fields overrun with bushes and shrubs. Osso-Ua still has some secondary forests area that experiences constant deforestation under the pressure of logging for building materials and firewood. The agricultural land is cultivated under a slash-and-burn cultivation system that rotates from one farming plot to the next on a 3-year cycle (fallow system). The soil is riddled with limestone boulders which limits local subsistence patterns to low-productivity agrarian production. This situation leads to considerable population pressure. This population pressure is attributable not to a large population but to the low productivity of arable land (especially dry orchards) in fulfilling subsistence needs.

Agricultural water sources are relatively rare, except in Osso-Ua where water is largely limited to domestic uses. The exploitation of natural resources depends heavily on the availability of rain, so the types of crops that can be cultivated are relatively limited and cannot respond to market demands. Even when the locals sell their produce on the market, it is merely to obtain cash for the fulfillment of other needs. This pattern is theoretically categorized as subsistence farming. The longstanding isolation and lack of attention from the outside has led the Caisido (inland) peoples in Tirilolo to develop their social and cultural organizations in a 'rural' or 'parochial' manner, as described by Appdurai: *"… place is produce through the interaction of social relation, expression of identity and the practice of culture."* (cited from Pannel, 2011:220).

3.3.2 Land Use and Land Status

The Caisido people in Tirilolo (*Aldeia* Parlemento, Caisido, Lialaileso and Osso-Ua) distinguish various types of land according to their status and usage.

A. Land Status

Land in Caisido is divided into two categories according to status, namely private land/property and government property. Government property generally covers all land not cultivated by local residents. This category has unclear boundaries since there are many fields that have been left fallow and become scrublands but are still claimed as private property. Some land around Osso-Ua is full of perennial plants and not cultivated but claimed as private property. One exception is the mine site, where the secondary forest is categorized as government property. This land is not claimed or cultivated but the local residents harvest the trees for building materials. The key difference is supposed to be about whether the land is cultivated or not but the difference between the two remains ill-defined except when private owners have a clear idea of the boundaries of their property. Some issues have surfaced with regards to the scrublands on either side of the access road from the Baucau –Parlemento *aldeia* main road. The land is generally uncultivated but claimed as private property. This claim is understandable since the local cultivation pattern follows a 3-year cycle of land clearance and crop rotation. The rocky soil and lack of knowledge about fertilizers means that landowners have to restore their lands' fertility by leaving them

fallow for a certain interval prior to recultivation. Humus for the land is obtained from the ashes of the burned bushes and scrubs.

Land ownership status is generally not supported by official documentation. Claims to possession of land are corroborated only by the statement of neighboring landowners. The Suco administration does not make much fuss about formal land ownership in any case since there is currently no taxation system for privately owned land. The village doesn't have detailed land registers that record the type, extent, and ownership of private land for tax collection purposes.

Field boundaries take the form of piled stone fences. The owners seldom know the exact area of land they have in numerical terms. Land is commonly measured by means of the stone fence boundaries, and the local residents usually quote how many fenced plots they have. 24 years of Indonesian occupation in Timor Leste had not successfully introduced the concept of quantitative land measurement. This can be explained by the local system of slash-and-burn cultivation, where land clearance mostly depends on the availability of labor to process and estimate the amount of produce needed to fulfill subsistence requirements.

B. Land Use

In terms of land use, the local population distinguishes between four categories, namely paddies/rice fields, forests, gardens/orchards, and bushes/scrubland.

Paddy Fields. Information from the Chefe Suco in Tirilolo and Vemasse state the existence of rice fields in the local area but not the areal extent in each suco and the fields' geographic location. In the Caisido area near the planned project site, there is an approximately 0.5 ha rice plot in the *Aldeia* Osso-Ua. This field draws water from a local water source so that the owner can plant upland rice. Due to the cultivation of paddies on the land, the owner categorizes the plot as a rice field.

Statements from the chefe suco and our own field observations indicate that the rice fields in the area depend heavily on rain. Once the land has been used to grow rice, it cannot be reused for other crops due to the lack of water for further cultivation. Some sucos have ricefield plots watered from springs in Bucoli (Palmer, 2011:145) and in the Wailacama *aldeia* (the planned location of the clay source) but the lack of farm labor means that the field only produces one crop per year or is left completely fallow.

Land cultivation is done in a very simple manner; once the land has been watered, a water buffalo is used to churn up the soil until it is suitable for planting. The government has provided aid in the form of tractors for rice cultivation, but the local population seems unable to use the machines effectively so their use remains very limited. Ricefield owners who do not own buffaloes may cooperate with the owner of a buffalo in cultivating his land. In this arrangement, the owner of the buffalo gets the same share as the owner of the field. The owner of the buffalo becomes responsible for the cultivation of the land all the way to the harvest. This system has not seen much development since landowners are often reluctant to share their produce.

For the most part, ricefield owners also own a buffalo (or more), so their land cultivation work is done with the use of their own buffalo by the head of the family (male). The next phase is to plant cultivated rice seedlings with the aid of several workers. Most of the workers in this phase are women, and are generally relatives or neighbors of the owners. Non-related workers are paid about $5/day while relatives only receive food during the planting work and a discretionary amount of the produce later on based on their contribution during planting and their economic condition. Once the rice has been planted, it is generally left without any further care or fertilizers until it is ready for harvest. This simple rice cultivation

regime results in very low productivity. Calculations during the field study indicate that a 0.5 ha field planted with three sacks' worth of rice seeds would produce 60 sacks of rice of the same quality. After the rice has been dried, the end result is 30 sacks weighing 25 kg each.

This low production rate and scarcity of labor has prevented rice cultivation from becoming a major factor in economic development. Garden/orchard cultivation has a better potential for surplus accumulation than rice cultivation. One of the problems is that rice fields (especially in the Vemasse subdistrict) cannot be used to cultivate other crops. The land gets waterlogged during the rainy season, making rice the only option available. The rice produce is generally not sold but kept for the farmer's own consumption.

The lands claimed as rice fields in the Osso-Ua *aldeia* are planted with dry (upland) rice. These lands do not generally receive much excess water so the owner retains the choice of planting them with other crops.

Ricefield owners, especially in the sucos of the Baucau and Vemasse districts, are likely to be the oldest settlers in each suco in a similar fashion to the villages in West Timor (NTT, Indonesia). Rice fields are owned by traditional elites since rice represents a more certain means of subsistence compared to other traditional sources like coffee (Achmad, 2002). In Timor Leste, especially in Baucau and Vemasse, the merging of lineage groups into baptismal name groups (as explained earlier) makes it difficult to decide (for example) which Belo or which Freitas is directly descended from the founder group in the tribe. However, land clearance and cultivation for rice fields tends to demand considerable amounts of labor, so only local elites are capable of mobilizing the necessary workforce. Our meetings with ricefield owners in Vemasse and Ostico tend to support the notion that they are usually some of the oldest residents in their suco. The limited availability of labor and water has prevented these ricefield owners from developing much better subsistence conditions, except when they also have orchard lands that can be used to plant cash crops.

Forest. Forests around the cement plant site are mostly located in the Osso-Ua *Aldeia* of suco Tirilolo, as we have mentioned before. Other forested areas are found in the Wailacama *aldeia* (formerly part of suco Ostico) and the buffer zone of the planned clay site inside Suco Ostico. The secondary forests in these two areas are fairly thick. Both areas are currently exploited by the residents of Ostico and the Wailacama *aldeia*. They see the forest as a place to hunt and to harvest wood for building materials (whether for their own use or for sale) or for firewood. The *chefe* of Wailacama *aldeia* stated that virtually all immigrant families (44 households) in his jurisdiction collect firewood as their primary livelihood. There is no definite information about how many trees have been cut down for their wood, but he said that most locals pick firewood from already fallen trees. There is no clear information about the average income of firewood collectors either, but each collector can probably earn $10-$15 per harvesting trip at a price of $0.5 per firewood bundle. One Wailacama resident can be regarded as an entrepreneur for his success in earning $200 - $300/month by selling firewood to the city. For this purpose he hires large trucks at a price of $40/ trip.

Some Ostico residents engage in similar activities, but they only fell trees to find building materials for their own houses. One of the things that may cause some ambiguity over land ownership in this suco is the presence of candlenut plants growing in local settlements and nearby forests. Lands where these trees grow may be claimed as private property even though the land would otherwise be seen as public forests when judged by the variety of other plants growing in the vicinity. This Ostico forest is located outside the clay mining site. Almost all the land in the projected clay mining site are rice fields, both those presently cultivated by their owners and those that have been abandoned by owners who moved to a different area, namely the Wailacama *aldeia* as we have described in a previous section.

Since the introduction of white teak trees by the Indonesian government, a number of Wailacama residents have begun to plant these trees near their settlements. The tree takes 5 years to grow before it is ready to harvest. The white teak is generally used as house construction material.

Local residents in the two *aldeia* closest to the forest have not mentioned the existence of any forbidden or sacred ground inside. Neither do they view the forest as the location of dead ancestral spirits that must not be disturbed. Their belief system holds that their ancestral spirts reside in the customary house (*rumah adat*) and tomb.

Gardens and Orchards. Horticultural lands (gardens and orchards) are the main source of subsistence for the Caisido people (Parlemento, Caisido, Lialaileso, and Osso-Ua). This land is mostly dry lands planted during the rainy season. Gardens are orchards are normally located close to the owners' houses or settlements. Cultivated orchards are usually protected with stone fences to prevent interference by livestock. Most residents own more than one fenced orchard located close to each other, or alternatively a single large orchard (about 1 ha) divided into smaller plots with stone fences. The division into multiple sub-plots usually correlates with the planting and cultivation strategy. Most gardens/orchards are worked for 2-3 years and then moved to a different location for the same interval. This rotation is meant to restore soil fertility since the orchards are given no fertilizers whatsoever. The only measure for increasing soil fertility is burning the brush growing on the land. There is no effort to use livestock manure as fertilizers either since most livestock are not kept in pens but rather left to roam free in the scrublands around the village.

The cultivation of the orchards begins in August-October or November. Planting should be accomplished by December or January at the latest. In the event that the rains begin in December, the planting process is likely to fail. The work from August to November mostly consists of land clearance and the burning of the cut-down vegetation. The clearance can be done with the aid of unpaid labor from close relatives in return for help in clearing these relatives' land in turn. Despite this extra labor, the amount of land opened is still limited according to how much land the owner can realistically manage by himself. The tending of the orchards is generally performed only by members of the nuclear family since each family is fully occupied with tending its own land and there's not much opportunity to enlist help from others. Every person/household has an associated garden or orchard so there are no landless laborers to hire either. Neither are there any rent or sharecropping arrangements apart from the lending of some land to the husband of a sister who lives with his wife's kin group. Despite this lease of land, the lender does not incur any obligation to help in the management of the oldest male relative's orchards from the wife's side (a form of corvee labor). This is due to the fact that every single farmer must devote full attention to tending his/her land in the face of their dependence upon the whims of the weather. Climate change or early rains inevitably influence the choice of crops to plant and how much land should be cultivated.

After the land has been burned, it is tilled with hoes. Garden/orchard lands usually have stones strewn randomly across them, so plants are normally placed in an irregular manner to make use of the available non-rocky patches of soil. The most important crops are maize and groundnuts. The maize is normally consumed by the family and livestock, while the groundnuts are primarily used as a cash crop. Other crops commonly planted in the area tubers like cassava and sweer potatoes and vegetables such as green tomatoes and chili peppers. The tubers are primarily meant for subsistence while the vegetables are usually intended for both subsistence and cash.

There are two main planting strategies used by garden/orchard owners. Those who own large numbers of plots may plant a single type of crop in every fenced plot to maximize production, especially for cash crops such as chili or shallots. People who use this strategy usually intend to sell all their produce.

Although each plot is designated for only one specific kind of crop, usually the larger plots are still reserved for subsistence staple crops. The amount of land planted depends on estimations of subsistence requirements. More focused monoculture of cash crops is likely to be more profitable for the fulfillment of subsistence needs, but this strategy is very uncommon except among people who have enough land to be worth dividing into a number odf monoculture plots. This strategy is usually adopted when there is considerable need for a cash income, for example by a respondent with four children who are undergoing higher education in Indonesian universities (in Surabaya, Malang, and Jakarta).

The second strategy is most prevalent among farmers who have a relatively large amount of land concentrated in a single contiguous expanse. This expanse is then fenced up into several smaller plots and each plot is used for a single type of crop. In this case the largest plots also tend to be reserved for staple crops like maize and groundnuts. In this case the owner errs on the side of safety by prioritizing self-subsistence needs over cash income.

These first two strategies depend on the farmer's diligence and the availability of labor. One example is a case respondent who chose the first strategy. The respondent is a Muslim man, and despite his advanced age he continues to put a great deal of work into his orchards for his children's sake. Any surpluses are stored in the form of livestock or sent directly to one of his children. Thus, these surpluses do not go into improving his wood-and-bamboo house as in the case of most other villagers. His reluctance to renovate his house is based upon his reluctance to show off his material wealth. This relates to the local standards of morality, which will be discussed in a later section. Despite his Islamic beliefs, he uses a baptismal surname (Belo) to affirm his status as a native resident of Parlemento, and as a member of the lineage he continues to contribute livestock for ceremonies in his lineage's customary house (*rumah adat*).

The second case respondent is a horticultural farmer who also owns a simple mom-and-pop store. He has the motivation to maximize the productivity of his orchards, but the demands of running the store prevent him from devoting his entire attention to farming. He divides his land into a dedicated plot for staple crops such as maize and groundnuts, while secondary crops such as green tomatoes, cassava, and sweet potatoes are planted haphazardly in the spaces between the main crops.

The first respondent tends to sell his produce immediately at harvest-time, but the second respondent prefers to hold on to his groundnut harvest until the price rises. For the vegetable crops, the second respondents harvests them in stages according to their differing harvest times and then sells them directly in the old market. The proceeds from the sale are used to buy goods to resell in his shop. This allows him to fulfill his subsistence needs at the same time he replenishes the stock in his shop. His profits and/or surpluses are saved up by buying livestock such as pigs, chicken, and goats.

The planting and sale strategies utilized by those two farmers are not common among other gardeners/orchard-owners. Most of them have rather small plots (topping out around 50 x 50 m or 50 x 75 m), so they lack the capability to adopt the strategies used by larger landowners. They mostly plant a variety of crops such as maize, groundnuts, shallots, and chili peppers with some sort of intercropping or random planting pattern. The main consideration in choosing which crops to concentrate on is the demands of subsistence (maize) and for cash (groundnuts, shallots, and chilis). However, the small amount planted for each type of crops means that the yield (especially for cash crop) tends to fluctuate. Sales are made in stages as each crop ripens for harvest. The lack of traders who visit the farmers to collect produce means that the farmers must go to the market to sell their produce by themselves. There are merchants in the market who would buy up the entire groundnut crop for resale, but none for the

vegetable products so the farmers have to sell them directly to individual shopkeepers in the market or even to customers in the street.

The horticultural situation in Osso-ua is relatively better than in Parlemento, Caisido, dan Lialaileso. The gardens and orchards in Osso-Ua are quite suitable for vegetable crops such as shallots, upland rice, and chili peppers. All of these are regarded as cash crops. The relative remoteness of the area from the closest public transportation facility (around 4 km from the closest point served by public transportation cars going to Caisido) means that the farmers tend to be reluctant to sell their produce directly in the market. The produce is normally sold to buyers who travel from the city (the old market) to pick up the commodities at Osso-Ua.

It is not easy to calculate the productivity of local gardens/orchards since the harvest is normally performed in several stages, except by the owners of particularly large plots. Most owners do not know how much horticultural land they have and use, and for the most part they only count how many fenced plots they have. Therefore, the calculation of horticultural income is done by fenced plots.

The *Lia nain* of the suco describe a set of ritual strictures for the management of gardens and orchards from the land clearance phase, to the burn, the tilling, the planting, the harvest, and all the way to the storage of the harvested produce. We do not study this matter in detail in this study since it is deemed irrelevant for a social assessment. The main objective in understanding the local population's economic activities is to figure out whether they are already capable of fulfilling their subsistence needs with their main sources of livelihood, how they regulate their production and consumption, distribution systems (especially within kin groups), how they accumulate surplus, and how they invest surplus to guarantee the household's future economic sustainability (especially in the context of women's needs) as we will explain in a later section.

Bushes and scrubland. The bush and scrublands are usually regarded as reserve lands for the 3-year plot rotation system. These lands are covered in long grasses and bushy growths (especially *Imperata cylindrical, Cromolaena adorata, and Lantana camara L*). These sites are also used as pastures for buffaloes, oxen, and goats. The parts where the grasses and shrubs grow densely are ecologically regarded as a normal part in the succession towards secondary forest. The bushes and scrub do not cover the land in a fully continous manner, so external parties are prone to categorize the land as uncultivated wastes or government property. However, further exploration will reveal linear piles of stones that mark out field boundaries. Each farmer knows the boundaries of their plots. Most of the bushes and scrubland in Caisido are located outside the projected mine and plant sites, except in the Wailacama *aldeia* where some is found in the planned clay extraction site.

3.3.3 Tenure System

The land as the main resource for the fulfillment of the local population's subsistence needs is usually obtained through ancestors from the people's forebears. There is no clear indication of when the ancestral settlers began to reside in the Caisido region. Theoretically speaking, given the lineage-based social structures, it is likely that the ancestors only go two generations back (current residents' fathers and grandfathers). As such, the Caisido region was probably settled around 75-100 years ago.

Those estimations aside, the local residents' assertions that their land ownership proceeds from ancestral rights shows that they feel that they have the rights of possession. This possession usually comes without any form of written or formal proof. The local population generally does not feel any pressing need to obtain formal acknowledgement of their land ownership since the legal status of their

claim to the land has never been seriously disputed before. Only with the plans for the construction of a cement factory does the issue of ownership come to the fore. This is particularly relevant to the bushes and scrublands since there is some concern that the lands being left fallow might be claimed as government property despite the existence of ownership markers in the form of stone fences or boundaries.

Apart from these individual ownership claims, the local population would also like to stake out their communal rights as members of the Belo group. The Belo group is a territorial control identity for all the people acknowledged as members of the Belo group. Other baptismal surnames will find difficulties or may even be barred from claiming possession of lands within Belo territories even if they choose to marry a woman from the Belo territory. The only kind of opportunity that may be made available is as a temporary borrower in lands owned by the wife's family.

Ownership and possession of land is passed down through inheritance. Only sons receive inheritance rights while daughters do not, although the latter remain the ward of the oldest son in the family (*lia nain*). All sons have a claim to the inheritance but the control of the land is given to the oldest son, who will then arrange for the distribution of workable land; if any son is a minor or is uninterested in faming (such as if they have already a job in the city), the right to manage the land is handled by the *lia nain* who also takes responsibility for the distribution of subsistence needs. In this case the wife usually regulates the management and fulfillment of common subsistence needs.

When a son relinquishes possession rights to the land, such as by selling off his share, his economic and political status as a lineage member is no longer under the *lia nain*'s responsibility and he loses the right to participate in decision-making at the kinship and hamlet/*aldeia* level. Therefore, the relinquishment of land possession rights is a decision that cannot be taken unilaterally and must involve both the *lia nain* in the kinship group and the *lia nain* for the village as a whole.

Daughters do not get inheritance rights since they will eventually fall under their husbands' custody. If the husband dies without descendant, the husband's property will fall under the management of the oldest male in the husband's kin group. However, if the property comes in the form of land, the widow may still have rights to make use of the land. In this regard, interview results indicate that most wives and mothers would invest the property of a deceased husband towards their children's education. These children represent the mother's principal hope for future livelihood.

If the widow wishes to return to her parents' kin group, she becomes a ward of her group's *lia nain*. If she wishes to remarry and the new husband would like to move in with the wife's kin group/family, he must seek the approval of the woman's *lia nain* (the oldest male in the lineage elder).

In any case, no matter who dies in the relationship, customary exchanges between woman-giving and woman-receiving parties remain in force. Indeed, if the widow chooses the remarry, it merely creates a larger network of exchange relationships. Local informers state that it is very difficult to avoid the customary burden brought about by these obligations.

3.3.4 Animal Husbandary

Animal husbandry is one of the traditional sectors in the livelihood of the Caicido population (in Parlemento, Caicido, Lialaileso, and Osso-Ua). However, not all families own livestock. Livestock are mostly treated as a way to invest the surplus obtained from agriculture, especially gardening/orchard farming. The most common types of livestock are horses, water buffaloes, oxen, goats, pigs, and chicken. It is not easy to find out the exact number of livestock and the number of households that keep

them since the Suco administration has never performed any census on livestock ownership. The following **Table 3.10** is based upon estimations offered by the Village Secretary and *Chefe Aldeia*, though neither of them could give precise estimates of the combination of livestock types and how many of each type are owned by individual families. Even so, this data may prove useful since it still contributes towards the main research objective of observing the forms and functions of traditional investment in communities that still struggle with subsistence needs. The functions of livestock will be explained in the following sections, while surplus strategies will be described elsewhere.

Table 3.10 Livestock table and ownership

Livestock	Caicido		Lialaileso		Parlemento		Osso-Ua	
	Total Family: 184		Total Family: 127		Total Family: 99		Total Family: 184	
	Total Owner	Total Animal	Total Owner	Total Animal	Total Owner	Total Animal	Total Owner	Total Animal
Goat	120	200	110	250	90	100	127	200
Sheep	100	250	115	230	90	120	130	150
Horse	15	25	11	36	15	30	16	30
Cow/Buffa	8	40	17	60	18	30	15	30
Pig	180	250	129	160	118	230	127	260
Chicken	182	400	180	360	118	230	238	260

Source: Tabulation From Suco Tirilolo 2015

Chicken. Buffaloes, pigs, and chicken are symbols of wealth that carry not only economic value but also considerable social and ritual significance. Chicken are regarded as livestock with the lowest value. Despite this low economic value, chicken provide a way to fulfill emergency demands at very short notice. These demands include offering food to important guests, providing aid to neighbors in distress, making contributions to celebrations of life-cycle events, and obtaining cash to cover unexpected needs.

Goat and Sheep. Sheep and goats are important livestock for *belis* contributions. They also provide a source of quick cash, being the next most easily sold type of livestock after chicken. Sheep and goats are usually not bought for household consumption but rather become the first choice for surplus investment. Their relatively affordable price compared to pigs makes them some of the most intensely traded livestock in the market.

Pigs. Pigs have a substantially higher economic value relative to chicken and goats; they also play an important part in various individual and group rituals, in addition to being acceptable gifts or dowery given by the wife's family to the husband's or vice versa on ceremonial occasions. A gift deemed inappropriate or inadequate may be taken to signify a lack of respect that may lead to friction in the relationship between the two parties. Pigs are also an important component in sealing deals or agreements to resolve past disputes.

Buffalo. Are the most valuable type of livestock and also very important in traditional religious rituals as well as *belis* contributions. Buffaloes are used in death rituals, rituals in the customary house (*rumah adat*), and bonding activities when the entire lineage gathers at the end of the year (for Christmas and New Year).

3.3.5 Traditional Fisheries

The planned jetty site on the Osso-Ua coast is currently used by some Osso-Ua villagers for fishing activities. They go out to fish when the waves are not too high. Their fishing activities are conducted with very simple equipment such as fishing poles with lines and bait as well as rowboats.

The fishing methods are also quite simple; one of the boat's crewman takes the fishing tackle a short distance out to sea, about 50-75 m from the coast. After the line is released, the boat does not return straight away to the beach but waits for some time while moving the fishing tackle around in several directions to attract attention to the bait. Once a fish has taken the bait, somebody on the beach would alternately draw and play out the line until the fish tires out. When the fish's resistance has subsided, the line would be fastened to a bamboo pole sunk into the beach. This procedure is repeated until some or all of the fishing lines have caught enough fish.

This activity may provide up to $10 - $20 per fishing trip. Larger fishes are usually sold to buyers in Baucau, who can be contacted over a cellular phone. Fish that are not (or cannot be) sold are not preserved in the form of salted fish but used for housed consumption.

Everyone can engage in fishing but a boat provides the owner with an important productive asset in this regard. Relatives may borrow the boat; so can non-relatives, but seldom more than once before they acquire their own boats.

3.3.6 Non Farming Activities

Caisido's isolation and the difficult circumstances for agriculture has not prompted the development of non-farming activities. There is only 1 small shop/kiosk owned by the chief *Lia nain* in the Suco, 2 canned drink sellers, and 1 greengrocer. The *lia nain*'s shop sells several types of canned and packaged drinks, children's snacks, light dry snacks, and rice. Due to the shop's location right across a school, it receives a great deal of patronage from the children during the school's break times. The owner stated that he opened the shop to help the local people obtain basic necessities, especially during long dry seasons and drought periods when there's not much chance to farm productively and the local people have to come and buy rice on credit. The payment is deferred until the next harvest. The shop only provides credit for the purchase of rice, while other commodities have to be paid for in cash. The owner believes that credits for non-essential items (other than rice and baby supplies) would saddle the borrowers with an unbearable burden; indeed, even the rice credits are only given on a limited basis.

Shop inventory is acquired from the old market in Baucau and transported with the use of public transportation cars passing by the shop. The shop owner does not buy produce from the locals or accept loan payments in kind. Such transactions may in fact be profitable, but the owner believes that groundnuts are the only produce with considerable market value and its price tends to be quite low at harvest time. Farmers may hold on to their nuts until the price rices, and indeed the shop-owner does so for his own produce, but he does not feel comfortable doing so with his customers' produce since he fears that he may be accused of being selfish and lose his respectability as the *lia nain*. By encouraging fellow villagers to sell their produce on their own, he tries to avoid becoming a subject of gossip and resentment.

Capital for the store was obtained from his own savings. The original capital was acquired by buying livestock like goats, pigs, and chicken, or by strategically timing the sale of his groundnut harvest. The groundnuts are not sold immediately at harvest time but kept until the price has risen by a reasonable extent; for example, the price of groundnuts at harvest may go as low as $10 for every 25 kg rice sack,

but during scarcer times it may rise as high as $20 - $30/sack. The significance and mechanism of this surplus accumulation system will be explained later.

The two sellers of drinks and children's snacks in Parlemento and Osso-Ua cannot be properly called food/beverage merchants since their stock of merchandise is very limited, consisting of a few cans of drinks, several instant noodle packages, and some snacks.

A Parlemento resident can be categorized as a greengrocer. His inventory comes from a combination of purchases from his neighbor, produce from his own garden, and purchases in the old market of Baucau. He then ties together the vegetables in certain amounts to be sold in retail. He actively pursues his commerce activities since he needs a great deal of cash to provide food and milk for an infant child. He also feeds nieces and nephews playing at his house dring mealtimes, so he needs some money to buy extra rice. At the same time, he also works as a lottery brokers, but neglected to mention it for unknown reasons.

Apart from these mercantile activites, there are also 10 two-wheeled vehicles operated by Caisido residents to serve trips to and from far-flung local settlements. These motorcycle taxis usually gather beside the main road at the junction with the road towards Caisido. The fares vary between $1 and $3 depending on the distance. There are not many passengers for these motorcycles aside from outsiders who wish to travel into the area, such as the research team. One of the motorcyclists explained that he usually earns no more than $5/day.

Handicraft and food industries remain underdeveloped. For the most part, it is limited to old women weaving baskets for their own use from the leaves of *lontar* palms growing around the *aldeia*.

Informers state that there have been no empowerment initiatives for the development of household industries. Such empowerment remains a difficult proposition due to the absence of a substantial market.

3.3.7 Economic Morality Among Kin Groups and Neighborhoods

Economic activities in Caisido cannot be equated with rural economic activity in Java, where money economy and the accumulation of surplus by individual households have become long-established fundamental features. In most parts of Caicido, the village community is made up of members of the same lineage. The lineage's social unity is affirmed through kinship and marriage relationships that involve special reunification/reaffirmation ceremonies involving all lineage members in the customary house (*rumah adat*). These ways mark the local population's identity as native residents.

Land as a livelihood resource is only possessed for the fulfillment of life's necessities. Private possession rights are transferred through an inheritance system. The nuclear family as the smallest unit in the local community's economy is given some latitude in choosing how to fulfill its subsistence needs. However, as part of a larger kinship or lineage group, these families have the obligation to share their subsistence resources with members of the same kin/lineage groups before they share with the rest of the village. These differences underlie a mutual aid system based upon a morality of exchange within the community. This is particularly visible in the marriage system, which regulates the types of goods to be exchanged and the moral values of the exchange. These institutional arrangements provide direct and indirect social guarantees for mutual subsistence while at the same time presenting obstacles to the development or improvement of an individual household's socioeconomic condition. In this context, limited resources, the ecology of the land, and the lack of empowerment initiatieves have limited the village economy to the fulfillment of subsistence needs under mutual uncertainty.

Morality of Exchange. There are several important details that must be observed to understand the economic system of the Caisido community. Firstly, most of the local population manages to survive in social and physical terms amidst resource limitations on land that can only support the cultivation of a few types of food crops. Access to the market economy is also rather limited, except for livestock. Similarly, there are relatively few opportunities to acquire cash. These circumstances prompted the development of mutual sustenance patterns, especially with regards to how social and moral systems can guarantee the formation of social institutions. The social structures and organizations thus formed, although united by kinship ties, still leave room for a considerable degree of inter-lineage social competition where the groups openly profess their kinship to each other but privately prefer to attend to their own interests.

Amidst these resource limitations, the society needs an institution that can guarantee the mutual fulfillment of subsistence needs, namely an exchange institution. The exchange institution is also developed to provide social security and fulfill individual sustenance needs as well as group reproduction needs. The exchanges in Caisido partake of both reciprocity and redistribution. Reciprocal exchanges play an important part in forming livelihoods and maintaining social insitutions.

The social norms contained in reciprocal giving imply that the gift is made to bind the recipient with an obligation to reciprocate, especially when the gift takes the form of a marriageable woman. This obligation perpetuates itself indefinitely as long as the parties are bound in a well-maintained social bond. No calculations are made on the basis of economics (money) or the types of goods exchanged. Valuation stresses the idea of 'need' and the social relationship between the two actors, such as between a woman-giving lineage and a woman-receiving lineage; this exchange pervades all livelihood, social, economic, and ritual aspects. Reciprocity with members of the same village is based upon religious norms, common congregations, or baptismal brotherhoods. This reciprocity happens on a much more limited level.

The variety of choices in terms of exchanged goods remains bound to the exchange morality or rules that provide a common ground for the actors in the exchange. Generally speaking, the reciprocal exchange system has an important role in establishing and maintaining social relationships between woman-giving and woman-receiving groups.

Owing a *belis* debt is not seen as a shameful or disgraceful thing. Indeed, the pervasiveness of the reciprocal indebtedness indicates the extent of a person's social network and the degree of trust in his ability to reciprocate. This reciprocal indebtedness pays no heed to the value of the exchanged goods or any fixed timeframe for the reciprocation expected from relatives by marriage.

The rules that regulate requests for loans are determined by the group's status as either the woman-giver or the woman-receiver. The gift of a dowry in the form of ceremonial items by the groom's side to the bride's family places the woman-receiving group as the first group who will be approached for a loan or aid by relatives from the woman-giving side. The borrower is not required to repay the loan with the exact same quantity and kind of goods; for example, the loan of a buffalo may be repaid with women's ceremonial items of unequal value with the item originally borrowed. Repayment with the exact same type and value of goods is seen as a breach of tradition. Such a violation would affect the relationships that have been so painstakingly established.

The Accumulation of Wealth. Amidst the complexity of the reciprocal indebtedness morality, the poor ecological resource situation, and the underdeveloped market economy, it is quite difficult to accumulate considerable amounts of wealth. However, this does not mean that the exchange institution does not provide any opportunities to accumulate surplus, only that not all individuals are capable of doing it.

The traditional morality allows group members the chance to acquire livestock as a way to accommodate surplus. Livestock is commonly kept as a form of savings to finance the future education of the owner's children. These savings are seldom used to buy more land or to increase the added value of the owner's house since there is hardly any purchaseable land to begin with. In the last few years, farmers with large orchards have begun to invest their surplus by buying motorcycles that are then hired out to help fulfill local transportation demands. This initial investment outside traditional sectors may signify a change of paradigm in material investment. The notion of 'helping' serves as a convenient excuse for the investment. Theoretically, a change in the preferred type of investment asset may be the initial signs of the more widespread introduction of money economy that will create opportunities for socioeconomic stratification that have been absent thus far.

Money. In a society that still depends on a subsistence cycle where transaction systems provide the main principle for the exchange and redistribution of goods and labor, the definition of money is that of a device that serves as a medium of payment, a way to measure the value of goods, a calculation apparatus, and the means to accumulate savings.

In Caisido, certain kinds of livestock such as buffaloes, pigs, and chicken can be seen as money from the perspective of local value standards, with buffaloes having the greatest nominal value. People in Caisido are already familiar with money but have not yet begun to use it extensively except to obtain education and healthcare services and to transact with outsiders in purchasing everyday necessities that are not produced within the village.

Giving transactions usually involve the transfer of goods according to need. Ritual goods are deemed unsuitable for monetary reimbursement or even valuation. This does not mean that people do not keep money at home, but rather that keeping significant amounts of money at home is unprofitable since it would invite others to request loans and thus prevent the owner from effectively saving the money.

As with more traditional means of exchange, the use of money is also categorized into several levels from the highest to the lowest priority. The payment of education/tuition fees take first priority, and the higher the level of education the more important it becomes. Other high-priority items include the conduct of important rituals and healthcare expenses. Home improvements occupy the lowest priority.

In a community that relies upon a traditional exchange economy, the introduction of money does not always result in the immediate spread of market economy as long as the use of the 'new' means of exchange (*i.e.* money) does not nullify or interfere with existing priorities among actors and categories of goods. In Caisido, the use of money occupies its own distinct scale of priorities, while more traditional means of exchange such as buffaloes and pigs are used to fulfill needs on an altogether different scale of priorities. The institutions of exchange transaction remain relatively unchanged. With regards to the unique properties of money as it is commonly understood, traditional commodities such as buffaloes remain irreplaceable since they are regarded as more than mere 'assets' but also as living creatures with a symbolic value that figures into the transaction process. In the context of traditional customs and values, the functions of these alternative means of exchange are integrated with other socio-cultural elements into an inseparable whole.

New material symbols of wealth (motorcycles) have not displaced more traditional symbols. This can be seen in how exchanges to repay *belis* debts do not utilize money as the unit of value. The fulfillment of material needs has not caused the emergence of social stratification based on conditional hierarchies since everyone is regarded as members of the same group. The only available opportunities rely on the cultivation and maintenance of relationships that establish social networks with woman-giving and woman-receiving families and brother-sister relations as a way to guarantee livelihood through a number

of mechanisms, especially in times of crisis. Examples include the customary demand to always provide food for people in need and social institutions that require people to accumulate wealth in the form of ritually significant goods (such as livestock).

Social Stratification. The Caisido community does not exhibit significant disparities in wealth. Although certain persons and families may own more land or livestock, they generally do not flaunt this wealth in everyday life, as exemplified by the Muslim informer mentioned in a previous section. There are no rules against displays of surplus, but most people apparently do not wish to openly display excess wealth. Many of the respondents in our in-depth interviews expressed a preference to invest their surplus in the education of their children and the purchase of livestock as savings assets. These kinds of surplus investments are deemed traditionally respectable since the improvement of children's human resource value can help counteract the image of the home village as an underdeveloped area.

Unlike in Caisido, the people in Ostico are less reluctant to show off their wealth by improving the visible condition of their houses, *e.g.* by replacing a wood and bamboo-mat construction with wooden walls and corrugated metal roofs. This ostentation is motivated not only by the lifting of resource constraints; we have been informed that such improvements are partially driven by neighbors' success in improving their houses from wooden to stone constructions and also by the success of relatives who have moved to the city. These urbanized relatives may return in brand-new vehicles and smart clothes during Christmas and New Year Holidays to show off their success in the cities, such as in becoming a ranking government functionary.

These differences may be attributed to the ecologically critical resource situation and the limited opportunities for expansion, which leads to the notion that ostentatious displays of superior wealth should be regarded as 'deviations' against traditional norms and as cause for suspicion, especially when the ostentatious party is prone to ignoring local norms of the communal economy.

3.3.8 Income and Expenditure

With the extreme ecological conditions, the rarity of water, and the poorly developed market economy (lacking traders to collect the local population's produce), it is difficult to see why the Caisido residents persist with their subsistence patterns and strategies. The main exceptions are people who have enough land to develop market-oriented cultivation strategies, such as by devoting each particular plot of fenced land to a single type of market or subsistence crop. This makes it easier to quantify the collected harvest. On the other hand, in the more usual paradigm where horticultural farmers only own and open as much land as they think they need and the available labor, the harvest is more difficult to measure quantitatively except for main staples like maize and groundnuts. Other crops are planted in an intercropped/interspersed manner, haphazardly maintained, and harvested as they ripen. These methods make it very difficult to count or estimate the total size and value of the harvest.

Some case respondents have willingly provided information on their produce, categorized by the type of main staple crop:

Table 3.11 Garden and Orchard Production for Subsistence Needs in Caisido

	Case Studies				
	1	**2**	**3**	**4**	**5**
Total Garden (*pagar*)	**1**	**5**	**2**	**3**	**1**
Estimated Area (m^2/*pagar*)	100 x 100	50 x 50	50 x 75	50 x 50	50 x 100
Crops					
Corn	5 sacks	5 sacks	2 sacks	5 sack/s@10 Kg	5 sack/s@10 Kg
Peanut	10 sacks	23 sacks/@ 10 Kg	4 sacks/@ 10 Kg	20 sacks/ @10 Kg	10 sacks/@ Kg
Tomato	1 sack/@10 Kg	-	1 sack/@ 10 Kg	1 sacks/@ 10 Kg	1 sack/@ 10 Kg
Kale/Kangkung	-	-	-	-	-
Red Chili	1 sack/@10 kg	-	-	1 sack/ @10 Kg	1 sack/@ 10 Kg
Cayenne Pepper/Cabe rawit	-	-	1 sacks/@ 10 Kg	-	-
Red Onion	-	-	-	-	-
Cassava	-	-	-	-	-
Tuber/Ubi jalar	-	-	-	-	-
Rice Needs					
Total Family Member	4	2	8	4	4
Rice needs/week	1 sacks @25 Kg/week	2 sacks @25 Kg/week	5 sacks @ 25 Kg/ week	1 sack @25 Kg/week	1 sack @25 Kg/week

Source: Case Study of household income

Note: (-) cannot be calculated

Table 3.12 Income from Non-Agricultural Sectors in Wailacama

Activity	Case Study		
	1	2	3
Driver	$500/month		
Small shop		$100/week (gross)	
Forest/firewood			$10 - $15/week
Total Family Member	3	5	4
Rice needs/week	2 sacks @25kg/ month	1 sack @25kg/ month	2 sacks @25 kg/month

Source: Survey result/case study.

The case studies show that case respondents 1, 2, and 4 are capable of fulfilling their subsistence needs. This is correlated not only to how much horticultural land they own and farm, but also two other supporting factors. One is lower subsistence needs, where a 25-kg sack of rice can be made to last for a week and 2 sacks for a month. Another is that respondents 1 or 2 successfully engineered the sale of their produce, not selling them immediately after the harvest but holding on to them for several months to get better prices.

Both respondents could utilize this measure since they have built subsistence fulfillment reserves from their shop profits and personal savings. On the other hand, respondent 4 managed to fulfill his subsistence needs because his family could obtain additional income from fishing. The remaining case respondents – 3 and 5 – could not resort to these measures since they lacked alternative sources to help fulfill their needs and to adopt a more sophisticated produce-selling strategy, so they were forced to sell when prices were still low. The price of groundnuts can fall as low as $10 – $15 per 10kg can depending on whether the nuts have been peeled or not, meanwhile, in scarcer times groundnuts can sell for as much as $30 - $40 per 10kg can in peeled condition. The difference in these sale prices is not as dramatic as it seems since freshly harvested groundnuts are volumetrically larger and thus fewer of them will fit the can than when the nuts have been peeled and dried for several months. The discrepancy between freshly harvested volume and the dried volume after 2-3 months of storage can be quite dramatic; the freshly harvested nuts may be half again as large as the dried ones. This results in a price difference of only around $5 – $10 /can. The problem is how would a subsistence farmer fufill his family's needs and his own for the 2-3 month it would take to wait for favorable prices? It is only possible when the farmer has substantial surplus or an alternative source of income that can help fulfill his household's needs. It is quite difficult to find out how many households in Caisido fall into this category.

These case studies lead to the conclusion that a household's ability to fulfill its subsistence needs cannot be judged according to the amount of land it cultivates, but rather by how many alternative livelihoods are available to fulfill subsistence needs so that the household would have the freedom to develop more optimal subsistence strategies. In many cases the gardens/orchards are the only sources available for the fulfillment of all family members' sustenance demands.

The results of in-depth interviews provide a general picture of the daily consumption patterns commonly found among Caisido households. All case respondents state that they always eat breakfast made out of whatever produce they have at hand, such as nuts, corn, and tubers. Lunch should ideally include rice, especially for children. Adults may eat other carbohydrate sources instead (such as tubers) and defer their consumption of rice to dinnertime. Dinner (usually in the evening) serves rice as the principal carbohydrate source for all family members. Issues may arise when there are infants or toddlers that still require milk. For example, respondent 3's wife gave birth to twins but could not produce breast milk, so he had to buy canned milk for the twins. Infant malnutrition and survival rates should ideally be deduced from fertility and mortality data. Unfortunately, the data is not available in the local clinic so it is very difficult to figure out the infant survival rate. Still, the low population growth rate of around 1% per year can be taken as an indication of the local population's lack of subsistence capacity.

A different picture emerges in the Wailacama aldeia, where the availability of income from outside the farming sector has doubtlessly helped the residents in fulfilling their subsistence needs. The main exceptions are the households that rely on firewood harvesting. The main opportunity to ensure the fulfillment of subsistence needs lies in the chance to work land owned by the woman-giving side; this chance is relatively small since land is not considered an integral part of the *belis* dower, so the woman-giving lineage is not saddled with the obligation to 'give' as part of the exchange. The provision of cultivable land may lead to worries about the future.

The largest expenditure for all households in Caisido and Wailacama is the purchase of rice. Rice is generally not produced locally but rather purchased in the market. Although the price of rice has remained within reasonable bounds at $10 - $15 per 25kg sack, the subsistence pattern carries considerable risks if the market fails to meet the demand (such as if production or distribution was disturbed by a natural disaster) or if the price of agricultural produce experiences dramatic fluctuations. All of these circumstances can affect the local population's subsistence/survival capabilities.

Table 3.13 Livestock and Crop Prices

Unit Name	Price	Unit	Note
Brick	$0,45 -$0,65 cent	1 Piece	-
Brick	45 cent	1 Piece	-
Chicken	$5 - $20	1 Chicken	Depends on size
Chili	$25	1 Sack 25 kg	-
Cow/Buffalo	$600	1 Big Cow	-
Firewood	50 cent	1 bundle	-
Firewood	$0,5	1 bundle	-
Fish	$15	12 Fishes/ kg	-

Unit Name	Price	Unit	Note
Goat	$60-$200	1 Goat	Depends on size
Guava	50 cent	4 Fruits	-
Jati wood	$600 - $700	1 m^3 or 40 pieces firewood with 2 x 30 cm size	In condition you have to share the profit with somebody who have saw/chainsaw to cut the wood. In Addition before you cut the wood you have to gain permit from authority then you have 3 days estimation as clausal.
Kale (Kangkung)	25-50 cent	1 Bundle	-
Peanut	$15 - $45	1 Sack 25 kg	Depends on size Sells by urge or not already/not already peels out.
Pig	$30 - $50	1 Pig	Depends on size
Tomato	$3	1 *kuncimas*/large bucket 10 kg	-
White Jati/ Philiphina's Jati	$100	1 m^3	-

Source: Survey Inventaritation, May 2015.

Note: Rice's price for 1 sack (25kg) equal $12-$15.

3.4 Social Organization

3.4.1 Hierarchies of Authority

The Baucau District is subject to two main spheres of authority, one being the government's (Formal) and the other being the church's (informal). Although their authorities differ, they both have the ability to mobilize the masses and the need to support each other.

A. *Formal Authority*

i. Regent/District Administrator in Baucau

The formal government hierarchy in Baucau proceeds from the Regent (district administrator) to the subdistrict, then to the suco, the *aldeia*, and finally to the *bairo* (citizen). The Regent and the Subdistrict Administrator are appointed by the central government in Dili while the head of the Suco is generally

elected by the local population. Although the Regent and the Subdistrict Administrator are not elected, their power and authority to lead the *bairo* are widely acknowledged. They act on behalf of the government through the suco administration. In case of any deadlock related to the project (such as with land issues), they have the final say within their respective spheres of authority and can compel obedience from the *bairo.*

The present emergency in Baucau has given the Police Department wide-ranging powers in the interest of maintaining law and order, especially in the suppression of the MM (Maut Muru) 'rebellion.' Any activities by external parties must obtain the approval of both the civil government and police authorities. This approval must be obtained through the proper bureaucratic procedures. The procedures are largely vertical to signify the respect/acknowledgement given by the leader(s) of the requesting institution to the local government authorities. According to these procedures, all the bureaucratic staff at the central (district), subdistrict, and suco level will obey their orders and carry out their duty in serving the interests of the external party (investor, researcher, community empowerment initiative, or the like).

ii. Subdistrict Office and the Roles of the Camat/Baucau Sub-District Administrator

The subdistrict is the level of government immediately below the district and is further divided into several suco. As the intermediate institution between the district and the suco, the sub-district is responsible for implementing decisions and policies from the district level down to its subordinate sucos. Conversely, it forwards inputs, performance reports, and complaints from the sucos up to the district level. The subdistrict office contains a number of services/specialties that handle specific aspects of government, the economy, economic and social development, security, the youth, women, and traditional/customary (*adat*) issues. These services' activities depend heavily on the Subdistrict Administrator's performance. The agencies may implement top-down programs from the central government or bottom-up programs initiated at the suco level. The program to gather inputs and initiatives from the suco level has been in the works at the suco level but has not proceeded to the final implementation stage. Empowerment initiatives are usually made by third parties cooperating with the appropriate agency under the central government. The District, Subdistrict, and Suco administration merely get notified of the program. Some numbers are adjusted to be more in line with the programs already planned by the Subdistrict.

However, there are programs initiated at the suggestion of local NGOs to foreign donor institutions outside the Subdistrict's lineup of programs. The unilateral implementation of empowerment actions by external parties has become a major issue for Subdistrict and Suco administrators since such initiatives may invite dissatisfaction from other sucos or groups. However, Subdistrict or Suco administrators can only refuse such programs (initiated by foreign donors through local NGOs) with great difficulty since the programs are intended to benefit the region's people in the first place.

Subdistrict institutions and the administrator are meant to play a central role in planning and implementing various citizen empowerment programs, but this role has not been satisfactorily implemented. Still, the success or failure of local development is closely tied with the Subdistrict Administrator's performance in the eyes of the *aldeia* citizens. According to the informer (*Chefe Aldeia*), the average citizen has virtually no power to change the prevailing conditions no matter what. For this reason, the arrival of a major project in the form of a cement plan is hoped to change life in Baucau for the better.

iii. Role and Authority of the Suco

The Chefe Suco is the lowest representative of the central government's authority at the local level. The Suco's role is to serve the citizens' interests and implement the central government's programs to the citizens at the suco level. For this purpose, the chefe suco is aided by an administrative staff that includes the suco secretary, aides/representatives for specific issues (youth, women, healthcare, religion, education, economy), and the customary chieftain at the suco level (*lia nain*) (**see Appendix 5).** All of these suco staff members are appointed by the Chefe Suco, except for the *lia nain* in Tirilolo who is chosen through a popular election process. This particular office is usually given to a person deemed to have the most extensive knowledge of traditional laws and customs. This person does not have to be of advanced age or a descendant of the previous *Lia nain*. The Chefe Suco is directly elected by the people. In some of the villages we visited, the Chefe Suco were common people who had managed to prevail over rivals coming from the local elite (the rich). According to these Chefe Suco, they were elected since the people wanted an accessible leader hailing from among the common people so that the Chefe Suco can be more easily met or contacted without having to navigate too much bureaucracy.

The Chefe Suco's role and authority are respected due to his position as a government representative. The Chefe has the power to make decisions in dealing with outsiders. In matters that solely involve local citizens, the Chefe Suco frequently delegates authority to the *Chefe Aldeia* at the hamlet/*aldeia* level or to the specialist staff. The principal staff member who has the greatest effect upon the strengths and weaknesses of the suco administration as the whole is the suco secretary. Although the secretary is appointed by the chefe, he/she wields considerable influence upon the leader. The Suco Secretary in Tirilolo seems to have an even more important role in the suco's administration than in the other villages we visited.

Although the organization chart of the village names many of the staff members we have previously mentioned, in none of the villages (Tirilolo, Triloca, Ostio, and Vemasse) do these staff perform their office at the suco's administrative center? Most of them usually handle their duties from their homes and occasionally visit the village center to obtain information related to their duties. If the Chefe Suco needs them, they can be summoned through telecommunication apparatus such as cellular phones.

An important village-level institution that handles conflicts between village people or among the youth is the KPK (*Konsellu Polisia Komunitaria/Community Police Councils*). This agency has two co-leaders, one appointed by the police (*community police*) and one community representative. This institution also includes representatives from youth, women's, religious, *aldeia*, and business interest groups **(see Appendix 6).** In practice the KPK leadership and the Chefe Suco act to handle local issues and disputes so that they don't have to be taken to the police.

iv. The Final Level in The Hierarchy of Authority: The Aldeia.

The *Aldeia* is the furthermost extension of the Suco organization. This lowest level of village administration is led by a *Chefe Aldeia* elected by the hamlet's residents. The Chefe's role and responsibility as a local leader is to serve the needs of the people. As a normal citizen in the hamlet, he should be quite familiar with all aspects of the hamlet's life, from whether certain villagers are native to the village to their employment status, the education of their children, and their places of residence. Despite the status of the Chefe *Aldeia*, his power or authority in certain matters (such as the acknowledgement of land boundaries and the making of deals with external parties) can only be exercised in consultation with the local citizens, as otherwise the decision is likely to face considerable

resistance. Such important decisions are normally made through a citizen's meeting to obtain a local consensus.

At the projected mine and plant site, the *aldeia* official is elected by the villagers, but he is not fully interested in becoming the *Chefe Aldeia.* He was elected at the behest of the local population, but he sometimes objects to the burden of the office since it does not provide him with any stipends or allowances for travel to the village's administrative center. The obligation to attend village meetings twice a week is straining his resources. At the same time, his activities in accompanying outsiders have raised suspicions among the local people; these suspicions are mostly along the lines that he might try to arrange things for his own private profit. In the case of the cement plant, the *Chefe Aldeia*'s busy schedule in accompanying the researchers caused some resentment since some villagers believe that the Chefe is hiding information from them. Arguably, the *Chefe Aldeia* should hold more frequent community meetings to explain the ongoing activities.

At the clay mining site in the Wailacama hamlet, the leader of the *Aldeia* is also the leader of the male members in the kin group of his customary house (*rumah adat*). His election as the *Chefe Aldeia* owes much to his experience as a former Special Forces soldier in the Indonesian armed forces. However, his ideas for the development of his *aldeia* have garnered little response from the Chefe Suco. For example, his request for the repair of blocked irrigation channels leading to the rice fields in his hamlet and his suggestion for the building of a new road along the Wailacama – Ostico – Lui Lubu – Fotumata – Venelale – Osu – Wikeke route have not received any response from the Chefe Suco and the Subdistrict. As a subordinate leader, he can only complain and hope that the government's agricultural department would somehow turn its attention to his local area. He does not know how to express his hope to the relevant agencies if the Chefe Suco and the subdistrict administrators do not take a more proactive role in planning and proposing programs for their areas of responsibility, so the hamlet has been left to stagnate.

B. Informal Authority: The Political Power of Religion

A non-governmental entity with the power to affect people's lives in Baucau is the Catholic Church. The people of the Baucau district and subdistrict are devout Catholic. The tough environmental conditions (dry due to the lack of water sources suitable for intensive farming), underdeveloped market economy, longstanding isolation, and dearth of economic or human resource empowerment initiatives are all factors that have influenced group solidarity models.

As mentioned in a previous section, the basic social structure in the area is based upon kinship or lineage bonds. This model of social organization means that the structure of the hamlet community is made up of related kinship groups that stand independently of each other as social, economic, and political units that compete for survival resources. Whether consciously or not, territorial division along the lines of baptismal surnames is intended to control potential conflict over available resources. The ecological conditions that do not support intensive food-crop agriculture have prompted kin groups to lay claim over large expanses of land. Thus there is the need for a customary division of lands in order to allow coexistence between different groups.

In the past, the colonial government never raised substantial objections to the control of land by traditional elites. The distribution of ownership and possession over survival resources is made on the basis of closeness to elite groups, such as to followers, allies, and slaves. The distribution of rights over the resources could potentially lead to social stratification against the interests of lower-class groups, followers, and slaves. These facts on the ground, in contrast to egalitarian Christian teachings, may have

prompted the Church to perform social engineering though the granting of baptismal names to traditional elites to delineate the boundaries of their traditional authority.

The division of territory according to baptismal identity has important implications to the Church's mission of placing all worshippers on an equal fooring. Traditional elites do not view the identification of territorial control with baptismal names as a threat to their traditional authority. However, in the long term this surname uniformity may eventually undermine traditional power structure. As a consequence, the territorial groups based on baptismal names no longer know who among them are truly descended from traditional elites. All members of a hamlet community sharing the same baptismal surname have equal rights to exploit the local resources.

The identification between baptismal surnames and individual customary lands remains in force to this day. The baptismal surname serves to identify the person's place of origin along with the concomitant rights. This issue should be considered if it becomes necessary to relocate the people closest to the project site as we will explain later.

The Church's authority in demographic matters is based upon its role in recording births upon baptism. The birth of a new family member usually prompts adult relatives to report it to the Church for baptism. The Church then records the child's date of birth, status within the household, and place of residence. The Church does not issue birth certificates but the records issued by the church are regarded as valid proof of birth by the villagers. The Church's role in this regard has not attracted any objection from village or formal government authorities since the Church's actions are seen as the manifestation of a religious obligation that must be performed by all members of the congregation. Godfatherly bonds are one of the issues that must be considered by people living closest to the project sites if they have to relocate beyond their traditional customary lands. The bond lasts for life; in particular, during death-related rituals, the godfather (priest) plays an important role in guiding the soul of the dead to their final resting place. The priest's role in building vertical relationships with the dead is seen in the handling of the deceased's body and the funeral arrangements.

As a socio-religious institution, the Church has a hierarchical organization to nurture and manage the piety of the flock. The lowest-level institution that handles religious matters at the *aldeia* level is the catechist. In daily life, the piety of the flock depends on the catechist's activity in serving and managing the believers in each *aldeia.* The cathechist arranges visits by a priest or sister to say Mass or perform other religious ceremonies in rotation between the various *aldeia* and suco. This mechanism maintains the people's closeness to the Church. Such Church activities are facilitated by the formal leadership and may even become official village or *aldeia* programs. This is most apparent in the celebration of Catholic holidays such as Christmas, New Year, Easter, Ascension Day, All Souls' Day, the Assumption of the Virgin Mary, and All Hallows' Eve. The celebration of Christmas and New Year involves all relatives within an extended family or lineage group gathering together. This mobility back to one's place of birth has an important role in the remembrance and reinforcement of kin relationships among people born in the same hamlet/village.

3.4.2 Teritorial Grouping

It has been explained above that the Baucau population originated as immigrants from Waiweko to Baucau who brought baptismal names as their group identity. Anthropologically speaking, this baptismal identity is not a clan or tribal identity. Our informants state that Tirilolo is a word in the Makasae language that means 'one word.' This means a Tirilolo is supposed to express his/her opinions in a single statement. Once the statement is made, he/she would not state any other word or decision about the

matter. However, the current name of the Caisido region comes from a Waima'a word that means an inland or rural region. Language-based ethnic groups are more commonly discussed in anthropological records (McWilliam and Troubeed, 2011) than the territorial groupings based on baptismal surnames commonly used in Baucau.

Key informers name three main baptismal groups that migrated into Baucau: Bahu was settled by the Da Costa, Tirilolo was settled by the Belo, and Caibada was settled by the Flores. The question is why baptismal names are always linked to certain suco, and conversely why the name of the suco is more easily identified with baptismal surnames than with ethnic groupings. The baptismal surnames had been used by the original settlers in Baucau under Portuguese colonial rule.

This complexity can be explained as follows. First of all, the Makasae ethnologuistic grouping occupies quite a large area, so there is the need for further precision – in this case by the use of distinct (baptismal) surnames to identify territorial origin and residence. This may bear comparison with other ethnic groups that are spread over large areas, such as the neighboring Tetum and Fataluku ethnicities (see Mcwillian and Troube, 2nd. 2011) Do these ethnicities also practice the same method of territorial division and identification as in Baucau?

The second possibility is that the colonial government engaged in deliberate cultural engineering by merging ethnic identity with religious identity, so in the long term the local cultural identity becomes dissociated from its roots. This is not a particularly strong possibility either since the local inhabitants continue to maintain their social organization by keeping the customary house (*rumah adat*) as the center for the reorganization of the group's basic social structure.

The third possibility is that the Church might have wanted to unify its flock without the social stratification between elites, followers, and slaves traditionally found in Timor (Hick, 1976). This social engineering suits the Church's vision and proselytized teachings that all worshippers should be equal. This strategy appears to have been acceptable to traditional elites, who then adopted the baptismal name for all the people residing within their traditional domains. This prevented the total loss of traditional social relationships. Whether they realized it or not, the use of a common surname appears to have gradually blurred the lines between elites, followers, and slaves. This hypothesis is also unable to provide a complete explanation for the phenomenon since a different part of Timor -- particularly West Timor (Indonesia), which had historical social, economic, and political ties with the East (Gunn, 2005) – does not recognize territorial division by baptismal surnames of the kind found in East Timor, especially Baucau.

West Timor has a relatively similar history of Catholic influence; the original social structure and organization of the traditional society was also very similar, being originally controlled by patrilineal clans (*embu*). However, the clan identity there remains in force and so does the traditional social structure (see Achmad, 2002). Traditional control over territory and resources is still recognized and controlled through ceremonies centered upon the customary house (*rumah adat*). The ceremonies involve all groups such as the ruling elite, followers, allies, and slaves gathering together and reidentifying with their traditional status along with all the concomitant rights and obligations. Such ceremonies have not been observed in the customary houses of the first three settlers in Baucau (in Bahu). Traditional ceremonies are only performed in lineage groups. This fact underlines the *de facto* equality between the holders of the same baptismal surname. Marriage between people of the same baptismal surname is not prohibited either as long as the bride and groom come from different customary houses and/or different ancestors. One of the most important aspects in the territorial identification with baptismal surnames is rights of use and possession over resources available within the territory.

Apart from these theoretical possibilities, what are the consequences of this social organization model? First, there is no collective leadership that can act on behalf of all villagers. The chief of the hamlet is only a leader in the administrative sense, while much of the decision-making authority remains with the lineage *lia nain*. Second, control over local resoures also constrains the domain of the local population. The difficult ecological conditions reinforce limitations against the control of resources by external parties outside the traditional territorial systems. Third, the introduction of new resources outside traditional sectors in a customary domain may lead to potential conflict over perceptions of control over customary land. People from other territorial units (suco) can bring up the issue that kin relationships and the history of territorial segmentation by the Church should not always be rigidly followed and that there is room for compromise. This would give people from outside the project area a chance to claim the right to enjoy the benefits from the project.

3.4.3 Basic Social Structure of the Community

The use of baptismal surnames as the signifier of social territorial units gives the impression that the inhabitants of a single hamlet or suco form a single kinship group descended from the same ancestor. This is obviously mistaken since, despite their social and territorial unity, they are not always closely related by blood or by marriage.

Within the uniform surname shared by all members in a hamlet, there are smaller kin-based social units made up of individuals descended from a common ancestor. The members of such groups are aware of their closer bonds as kinsfolk to each other. In anthropological terms, this kind of social unit is known as lineages. The lineage unit is led by the oldest male member of the kin group. In Caisido, membership in the same kin group is signified by affiliation to a particular customary house (*rumah adat*).

The customary house serves not only to remember and maintain a spiritual relationship with ancestors and deceased lineage members; it also acts as a nexus of identification for the living members of the kin group (**see table 3.14**). Within a customary house, a lineage member is known and identified by his/her original traditional name and the ancestor's original name**.** This identity is an important fixture for validating each person's rights and obligation as a hamlet resident and a group member, When the lineage group gathers in the customary house, the traditional chieftain/elder (*lia nain*) – the oldest male member of the lineage – recites the traditional name of every member. For convenience's sake, all lineage members must know their ancestor's traditional name. Customary houses are normally situated together with other customary houses, as in the case of the houses owned by the people of the *aldeia* closest to the mine and plant site, However, in some cases the customary house may be built outside the consolidated site. This variation does not seem to be viewed as a transgression against customs and traditions.

Table 3.14 Some Lineage Ancestor Adat House Name of Osso-Ua

Betulale	*Cai-Ono*	*Loledeso*
Lole Utohamo	Gei-Uono	Loladeso-Anamesa
Caiada Maucul	Caiwada Cakrano Uake	Caiwada Au Bala
Rubiace	Sinielaki	Wonolila

Source: Interview with key informant, Osso-Ua, 2015

This difference has not attracted complaints from other villagers. Neither the *chefe aldeia* nor the customary head of the relevant *lineage* considers the owner aloof or asocial. They seem to be able to accept the reason offered, which is to make it easier to care for the customary house.

Nevertheless, the customary house (*rumah adat*) continues to play an important role as a symbol of identity and the people's reaffirmation as native residents of a hamlet. As a member in a hamlet/suco, the control and possession over the limited resources available in the hamlet/suco is a critical factor in ensuring survival. The customary house can be theoretically viewed as a response to the Church's attempts to impose a new identity by compressing social strata into a single egalitarian layer without any distinction in power between one class and the next. The aims and relevance of this institution has already been discussed above.

3.4.4 Marriage System and the Debt of Exchange

It has been explained above that the basic social structure of the Caisido communities (the *aldeias* Parlemento, Caisido, Lialaileso, and Osso-Ua) is the patrilineal and patrilocal lineage. This group consists of a set of nuclear families led by related males. If a daughter/sister and her husband continues to live with the group, her household does not count towards the reproduction of the lineage group, or in other words the children of female descendants are not regarded as members of the parent lineage.

The reproduction of the lineage is conducted through the marriage of a male member with a woman from another lineage. There are no rules or restrictions about which lineage's women are deemed suitable for marriage. Neither is there any prohibition against marrying people from the same hamlet, or in other words with the same group. For instance, a Belo may marry with another Belo as long as the two do not come from the same lineage (the same customary house/*rumah adat*). However, the sons of a certain lineage (such as Belo) are generally encouraged to find a mate from a surname group (such as Soares). This is meant to build wider-ranging social networks, which at the same time expands the web of socio-economic exchange and mutual political protection. Still, this does not guarantee the possibility of resource exploitation within the territory owned by the parents of the *fetosaun* (daughter-in-law). The establishment of social networks through marriage bonds will provide greater social security through a perpetual exchange arrangement.

Marriage not only allows reproduction for the members of lineage groups but also forms a perpetual exchange relationship between the two lineages (*ummane-fetosaun*). There are few or no customs that dictate whom one might marry or how the lineage might arrange marriages. Young men are generally free to choose their prospective mates. The marriage procedure is quite long and involved.

First, when a man wishes to propose marriage with a woman, the man's family must make an initial approach or state a preliminary wish to propose to the woman's family ('*ketok pintu'* or 'knocking the door'). After the proposal has been accepted, the male side must offer livestock – usually buffalo or oxen – as '*pembuka jalan*' ('opening the way.'). The livestock will then be used in a ceremony in the customary house to inform the ancestors of the woman's family about the plan; once this has been accomplished, the two parties will then discuss the size of the bridewealth (*belis*). When they have reached an agreement the male side will pay the bridewealth (*belis*). The demanded *belis* is always rather costly, but the male side does not always have to pay it immediately. In fact, even if the male side is capable of paying the entire sum at once, such a one-time payment would be rejected as being inappropriate and a customary transgression. The male side usually makes an initial payment of the *belis* in the form of a buffalo, ox, horse, or goat depending on their financial capabilities. The rest of the *belis* would be paid later after the marriage as some sort of debt repayment. The *belis* debt is called and paid when the

female side needs it, whether to provide *belis* for a male member of their own lineage, to conduct ceremonies in the customary house, to defray funeral expenses, or to fulfill some similar need. The payment should ideally be in the form of livestock as in the initial *belis* payment. Neither side is allowed to make an exact reckoning of whether the debt has been paid in full or not. Any discussion about calculating the debt, especially when initiated by the male side, is regarded as a breach of taboo and a transgression against longstanding customs. If it happens anyway, a customary fine is levied upon the male side in the form of livestock similar to the original *belis* payment.

After receiving the *belis*, the female side reciprocates by giving a *modo* (or *sayur*) in the form of a pig, a chicken, a piece of cloth, etc. The relative position between the two lineages remains the same; that is, if one side wishes to throw a feast for the other, then it must remember its original role as either the woman-giving or the woman-receiving side. Any mistake in the kind or amount of payment made at any point is seen as a customary violation and the transgressor must pay a fine.

Even when the *belis* has not been completely paid out, any children from the union is regarded as a descendant of the male lineage. The children of a female member of the lineage does not count as a member of the mother's lineage, but may request baptism by one of the mother's male relatives if he/she wishes to use both the paternal and the maternal baptismal surname. Similarly, when a woman marries into a different baptismal surname, she would continue to use her original baptismal surname by appending it before her husband's surname, *e.g.* Maria Belo Suares. In this case Belo would be the baptismal surname of Maria's parents, while Soares is her husband's baptismal surname appended at the end of her own. This naming signifies identification and respect for both surnames.

The use of baptismal surnames as personal identity is closely intertwined to rights to partake of the resources in a traditional/customary territory. Today the demand for this is largely economic in nature, especially in terms of membership in the parents' customary house (*rumah adat*) and lineage grouping. The political side of these rights (such as eligibility to become a *chefe suco*) is no longer influenced by particular traditional identities, and tends to depend more on the ability to connect with ordinary people **(see sub-chapter 3.4.2. Territorial Grouping).**

Although female members of the lineage have been 'released' to their husbands' respective lineages, they still maintain some degree of connection with their parental families through brother-sister relationships. For instance, if a married woman dies, some of the first people the husband would inform are the wife's parents or *lia nain*. In the process the husband or the male side of the exchange is supposed to send livestock in a similar manner to the payment of the *belis*. Similarly, if the husband dies and the wife would like to remarry, the new husband-to-be should ask for permission from the widow's parents or lineage elders, not from the oldest male member of the late husband's lineage. In either case, the bonds of exchange between the lineages are not severed upon the death of either party in the marriage. The presence of the woman-giving side (regarded as the life-giving side) and the woman-receiving side are required for joint funeral arrangements. This involvement by both sides is deemed important not only for the sake of the soul of the departed, but also for those left behind to gain some closure. Hicsk (1976) states "that the passing of information to the woman-giving lineage is related to beliefs about how to take care of the soul of the departed so that it can rest in peace in the afterlife and so that the living members of the lineage can come to terms with the loss.".

This explanation can be summarized in that the role of female members of the lineage is not limited to being reproductive agents but also as the means for the establishment of a web of exchange relationships that can have beneficial effects to her lineage of origin. In the religious-magic sense, she plays a major role in death-related rituals as a representative of the life-gicing lineage. Her rights in her

own lineage may seem quite weak since she does not have inheritance rights, but she is an important asset to her lineage in the establishment of extensive social security networks through a system of her perpetual exchange and her role in taking care of death- and funeral-related arrangements. The customary exchange system through marriage can be seen as a socioeconomic burden to the male side, while at the same time providing the customary lineage group with the social capital to accumulate surplus in the face of resource scarcity.

Under all this customary pressure, the traditional system allows the opportunity to answer economic challenges (subsistence needs) with the aid of a complex exchange network. In this context, it would appear that the apportioning of customary lands through baptismal surname groups and the harsh ecological conditions have influenced the modes of social organization. From the spatial perspective, the territory of the baptismal surname group is a *'place produced through the interaction of social relation, expression of identity and the practice of culture.'* (Appadurai, cite from Panneli, 2011: 220)

3.4.5 Women's Position and Gender

Women's position and role in the Suco Tirilolo community in general and the Caisido region in particular (the *Aldeias* Parlemento, Caisido, Lialaileso, and Osso-ua) – and even among the Baucau population as a whole – appear to be rather contradictive. As a member of the lineage group, her presence is an important asset for the rest of the kin group in establishing social relationships, especially for economic purposes. On the other hand, she lacks the right to inherit subsistence resources (particularly land) from her lineage group.

The patrilineal and patrilocal system in Tirilolo (and Baucau in general) is rather unique. In a normal patrilineal system, the woman's bridewealth (*belis*) must be paid in full, and afterwards neither she nor her husband retains any obligation to aid in the provision of dowries or bridewealth for her male relatives who would like to marry. If the husband dies, the woman (and her children) fully becomes the ward of the husband's family.

In Baucau, although the woman has to be 'purchased' by her husband, custom dictates that the man should not pay the requested bridewealth (*belis*) in full even if he is capable of doing so. The outstanding sum becomes a perpetual debt that the husband must stand ready to repay throughout the marriage, and also creates a bond of mutual indebtedness between the lineage groups that will last for generations. Neither side is supposed to raise the point of whether the price has been paid in full or not. Any discussion of the matter is seen as a taboo.

Once a bond has been formed between woman-giving and woman-receiving lineages (*ummane – fetosaun*), the relationship is perpetuated in the form of occasional exchanges. Each side must keep its original role in mind in performing later exchanges or offering aid. The woman-givers (*ummane*) would give something commensurate to the original "*sayur",* such as pigs, chicken or something similar. On the other hand, the male side must offer contributions or aid of similar form and value as the *belis*, such as buffaloes, oxen, goats, or horses. These customary obligations also apply in offering meals (or throwing a feast) for either the woman-giving or woman-receiving side. Mistakes in offering gifts or serving food would require the party at fault to pay customary fines.

Although a woman has been given by her lineage to her husband's lineage, she is required to maintain elder-younger sibling (*maun – alin*) or brother-sister bonds. If the woman dies, the husband must promptly break the news to the wife's family, especially her elder siblings. This communication is accompanied with a gift of livestock similar to the original *belis*. The notification is mostly about the process of taking care of the deceased spouse's body. Similarly, if a woman gets widowed and another

man wishes to marry her afterwards, the new husband-to-be should put forth his proposal to the oldest male member of the woaman's lineage. The agreement does not have to wait for consent from the woman or her late husband's family. Afterwards the remarried woman will reside according to the terms of the agreement, sometimes with her new husband's lineage and sometimes back with her original lineage on land managed by the oldest male member in her lineage group (*lia nain*).

On one hand, women do not have equal status with their male relatives, but their role is very important in building social security networks for her lineage's descendants and in achieving closure in matters that touch the world of the afterlife. Amidst these ambiguities, women/wives need to develop strategies to guarantee their futures.

Local natural and ecological circumstances that do not support market-oriented intensive farming, stagnant subsistence patterns, the lack of local investment opportunities outside traditional sectors, the burden of mutual indebtedness between *ummane* and *fetosaun* and elder and younger siblings – all of these are challenges that must be overcome by lineage groups and especially the women in order to be able to accumulate surplus and invest them for the future (**see sub-chapter 3.3**).

3.4.6 Decision-Making Among Kin Group and The Neighborhood

It has been explained in previous sections that the patrilineal lineage constitutes the basic social structure in the Caisido community. This kind of structure places decision-making power in the hands of the oldest male member of the lineage. Although the oldest male holds the power, he must consult with his male relatives. Husbands of female relatives living with her lineage group are not counted in the consensus, and even if present they do not have the right to express their opinions.

In relation to the project, any major decisions related to land purchases and or resettlement/relocation will require several consultative meetings, since it is possible that the solutions/suggestions chosen in the local meetings may fail to garner official government approval. By the same token, any decisions or suggestions made by governmental authorities must be discussed and mooted with male relatives in the lineage group; the process goes back and forth until an agreement is reached.

At the hamlet level, the Chefe Aldeia's office as the head of the hamlet does not give him the authority to make unilateral decisions, especially when it may affect fellow villagers' assets. Any decisions must be made together by the lineage as a whole. It may take multiple meetings to reach a final decision since, as mentioned above, the decisions made by the lineage's *lia nain* cannot be implemented unilaterally without consulting with male relatives within the lineage.

Hamlet-level consultative meetings involve all *lia nain* according to the number of customary houses (*rumah adat*). Since every lineage group has decision-making authority, there is probably going to be some differences in opinion between the lineages. However, in dealing with the project, the decisions of the most directly-affected lineages should be prioritized, while the remaining lineages should not have the authority to speak for the affected lineages or for the hamlet as a whole. The chief of the *Aldeia* does not have the authority to interfere with any villager's interests. His role as the leader of the *aldeia* or suco is merely to facilitate the meeting and pass suggestions from the other parties that he represents. The chefe of the aldeia and/or suco cannot impose his will and can only offer recommendations. Should the matter fall into a deadlock, the decision would be referred to the Regent/District Administrator. The Regent's decision is binding and final, and the villagers treat the District Administrator (*Bupati*) as the symbol of the government's ultimate power, but the decision must inevitable take account of the interests of all parties without unfairly benefiting any single party over the others. Still, the lack of any written and

legal proof of possession over the land resources managed by the villagers places these villagers in a relatively weak bargaining position.

3.5 Project Issues

3.5.1 Information and Responses about the Project

Efforts to disseminate information about the project by TL Cement took the form of several public consultation meetings:

On 9 May 2014, a meeting in Suco Tirilolo, attended by the Chefe Suco of Tirilolo, Bahu, Triloca, Caibada, Bucoli, Garuwai, and Wailili. The institutions involved include:

- District Administrator of Baucau
- Chief Police Commander in Baucau
- Baucau Subdistrict Administrator
- Local NGO *Hamahun*
- Director of IPG (Institute of Petroleum and Geology)
- Director of BGC/TL Cement
- Director of Land and Property of Baucau District
- Director of Environment of Baucau District
- Representative of Veterans in Baucau District
- Local Authorities
- Tirilolo community; an estimated 90% of community members from the 4 *Aldeia* closest to the project site were present at the meeting;
- Tirilolo youth

A. The response from the Caisido community can be summarized by the following points:

- Response:
  a. The Caisido community is 100% willing to welcome the investment and the cement factory in the area.
  b. The community and youth in Caisido (38 traditional houses), will not impede the progress towards the development of cement factory and will be working with the GoTL to improve the economic condition of the population.
  c. We appeal to the government to decide upon a new neighbourhood for our resettlement and to make sure that the development of the cement factory will generate benefit for our present and future generations.
  d. We appeal to the company to provide a clear plan for protecting our future livelihood and for ensuring good coordination the government.
  e. We appeal to the company to establish an agreement with the Government of Timor-Leste.

- Concerns About:
  a. Whether there are any traditional houses that the development may impinge upon.
  b. How the government and other stakeholders would pay due respect to our cultural inheritance.
  c. Clear identification of boundaries for the development site(s).
  d. The Government should clarify land ownership and possession status with the Caisido community.
  e. The Government and stakeholders should continue information dissemination and consultation efforts with the community.

B. Responses to the community's concerns from the authorities and TL-Cement Agency:

The Director of Land and Property

The Director of Land and Property responded about status of the land; first he explained that there are several types of land, *i.e.*

a. Abandoned land/state property.
b. Heritage/customary land passed down from the ancestors to become communal property, such as a suco's common lands.
c. Private property land, registered with land ownership certificates.
d. Dowry property exchange.

Furthermore, he explained that before the project begins, his team will work together with local authorities to identify the proprietor(s) of each type and plot of land, and then affected plots will be measured to calculate the appropriate compensation value.

Baucau district Administrator

"Affirmed that the company has every intention to improve the community's livelihood and that they (the community) should not pay any attention to rumors that the company will destroy Suco Caisido's natural environment. He added that he will keep fighting for the community's wishes and that his team will frequently visit the communities so that they can hear the local communities' concerns and report them to the government for consideration."

Police District Commander of Baucau

"Stated that they are ready to provide full security in the designated area and assure that since many young people will be employed, there will be no youth confrontations. He also appealed to the community to ignore rumors spread by those who clearly do not want to develop the nation. He emphasized that his team will work together to support the government by supporting the project. He appealed to the community that this is their 'battle' and that everyone should take the chance to win it as this will reduce the unemployment rate in the country and improve our economic condition."

The Youth Group

"Their full support for this project and agreed that it will generate profits for their community by reducing the unemployment rate in Baucau District."

Responses fromthe BGC/TL Cement to the community's concern, spoken by the Director

"He explained that in order to manage the HR, they will use following method:

- Training
- Assign the right person to the right position

They will also employ local people in the following capacities:

- Labour
- Janitors/Cleaning Service
- Security
- Administration
- Construction worker
- Carpenter

He also affirmed that the government and its counterparts will be working together to reduce the unemployment rate in the country and that they will keep fighting for the community's well-being. This will increase the local HR capacity so that they will not rely on other nations' HR."

1. After General meeting on may 9. The TL-Cement representative held intensive meeting with local people at several suco, i.e.
2. On 24 June 2014, another public consultation was held in Suco Tirilolo. The meeting was attended by the *Chefe Suco* and the Youth Groups of Suco Tirilolo. It raised the issue of the status of the land. The community expressed their hopes:
    - The Community recommended that the government and the company should prioritize the interest of the local population in the Caisido region, especially the four *Aldeia*: Caisido, Lialaileso, Parlemento, and Osso-Ua. This is the recommendation and information from the Tirilolo Community.
3. On 16 July 2014 there was a public consultation to discuss cultural ceremonies at the planned project site. For this purpose, TL Cement was requested to clearly delineate the project site's boundaries, since the community would like to perform an animal (buffalo) sacrifice ceremony at the site.
4. On 14 October 2014, a meeting was held with the *King of Suco Ostico* Status over the administrative status of Wailacama *aldeia*'s traditional territory. The explanation was intended to clarify that the clay area falls under the Ostico customary jurisdiction even though the residents are now affiliated with suco *Vemasse*.
5. On 10 November 2014, a meeting was held with the community and landowners in the Macadai *aldeia*, Suco Bucoli. The results stated that:

- The planned mine sites AD-1, AD-7, and MI-3 were formerly arable lands but they are currently abandoned. There are other plots of fallow or abandoned land, and around 5% are owned by community members. This calls for compensation to prevent conflict;
- The community is glad to hear that an industry will be established in the Baucau municipiality for the first time. It will be advantageous for the community and will benefit the livelihood of the community and future generations.

6. Meeting with the Bucoli community and landowners. The topic was an explanation by TL Cement over the public's concerns, especially about the recruitment of workers for the project. The recruitment will be '**…** based on their capacity and skill and they will be given training for the relevant positions ranging from technical ones to non-technical ones such as administration'.

All statements quoted in this section are based on the minutes of public consultation as documented by TL Cement (Project No. 301012-02135)

7. In addition, on 1 March – 7 April 2014, the stakeholders from Baucau and Vemasse Subdistricts were taken on an inspection to the central plant of TL-Cement in Australia.

3.5.2 Knowledge About and Responses to the Project Based On Survey Results

The survey was performed randomly upon the Chefe Suco and a number of local residents, especially in the Osso-Ua and Wailacama *Aldeia*. We did not manage to meet up with all the Chefe Suco who were involved in the public consultation since some of them were away when we visited the locations. We met in person with the Chefe Suco of Tirilolo and Triloca, and the Suco Secretaries of Ostico and Vemasse. These village secretaries appear to have a more forward-thinking view in the collection and expression of community opinions. Our associates indirectly collected community wishes and opinions from the Sucos Bahu, Bucoli, and Garuwai.

The overall results of the survey are: the general response from the Sucos is relatively consistent with the opinions expressed in the existing minutes of public consultations, so most of them do not bear repeating. Most of the concerns relate to the project's commitment to employ local workers, transparency in labor recruitment, and an equitable distribution of employment opportunities for the youth from all Sucos in the Sub-district, and finally the degree of TL Cement's commitment to local development.

Although the Chefe Suco had already attended the public meetings, they still expressed some doubts, *e.g.*:

1. Wouldn't the plant cause dust and noise pollution in the local area?
2. Would TL Cement really implement the same standard and type of manufacturing equipment as in the Australian plant? There are concerns that TL Cement might use lesser-grade equipment that could cause environmental problems in Timor-Leste.
3. Would TL-Cement apply the same remuneration scale and system as in TL-Cement Australia?
4. Will the project truly employ as many locals as asserted in the public meetings?

Among the common people of Osso-Ua and Wailacama *Aldeia*, there were a number of questions about the possibility of compensation and/or relocation due to the proximity of residential sites to the project site. Some of the specific questions and responses were:

1. Would the compensation for appropriated land really involve consultation? They hope that the compensation process should include appropriate discussions and consultations to take due account of the present owners' wishes.
2. If people have to be relocated, the government should ideally prepare the relocation site beforehand. The resettlement site should preferably remain within the territory of the same hamlet or teritorial area, such as Belo. Even when the relocation happens in the same suco, there must be detailed consultation with the community in the planned resettlement site to pre-empt conflicts over land use and possession. The problem would be more serious if the people are to be resettled to a different suco inhabited by a different baptismal surname, since it will be more difficult to rebuild the resettled people's livelihood.
3. In the Wailacama *Aldeia*, the Chefe *Aldeia* stated that land appropriations under his jurisdiction (for the clay site) will not be based on a purchase model, and that he would demand the use of a leasehold model; if the land was sold straightaway, he would lose ownership and possession rights for good, while with a rent/lease system he would still be able to maintain his descendants' rights to the land.
4. The possibility that some gravesites may be affected by the project. It is hoped that the graves would not have to be relocated, but merely fenced in to protect them *in situ*.
5. Most community members are already aware of the plans to build a factory/industry, but many still do not have a clear idea of when and where the factory would be built. Some who saw their Chefe Aldeia accompanying outsiders have raised questions about what the Chefe was doing, since he had not shared much information even though the people were curious about what the outsiders were up to. This lack of information has brought suspicions about what the strangers were doing in their territory.

4. IMPACT ASSESSMENT

Introduction

This chapter on impact assessment describes both the potential positive and the potential negative impacts (primary and secondary) that may result from the implementation of the TL Cement project.

The potential positive and negative impacts upon the environment are divided into three categories:

- Impact due to project pre-construction
- Impact due to project construction
- Impact due to project operation

The most common social impact prediction methods may not be perfectly applicable to the local region and/or communities, so these methods require some degree of modification and improvisation to suit the local situation. Some programs may cause both intended and unintended results. It should be kept in mind that the impact of monetization in a subsistence community would have long-term effects and the consequences of the impact might diverge into several different directions due to regional diversity. In Baucau's case, ecology is a significant factor that influences the nature of impacts. The adverse ecological situation in the Caisido area requires special attention or treatment. It should also be noted that mitigation efforts would directly impact the Caisido area as the center of social impacts.

In Caisido, the aspects of life that would be affected by the project are not restricted to employment opportunities, but also include the loss of land as a source of livelihood; the uprooting of cemeteries and traditional/customary ritual houses; noise, dust and ash pollution; intense traffic in heavy vehicles and other means of project-related transportation; and the day-to-day behavior of the labor force. Therefore, the projects's effects to daily life would be quite significant. In contrast, the impacts to other communities would be mostly a matter of emerging employment opportunities even though these opportunities would not become available in particularly large numbers.

4.1 Pre Construction Phase

The major activities in the pre-construction phase are the acquisition of land for the mine and plant sites and the construction of roads to the clay site as well as the jetty and various supporting facilities. These activities are expected to cause a number of significant positive and negative impacts in the form of:

Potential Positive impact.

- High expectations among the local people

Primary potential negative impacts.

- Conflict over the status of land
- Conflict over compensation values and systems;
- Conflict over the dismantling of graves and customary ritual houses/*rumah adat*;

- Resettlement

Secondary potential negative impacts.

- Potential conflict of interest inter-suco.
- Potential damage to household subsistence condition

4.1.1 Potential Positive Impacts

1.) High Expectations Among the Local People

The plans for the construction of a cement factory in the Baucau Subdistrict has raised great expectations among the local residents for the social and economic development of their home region. These hopes were further strengthened when the project invited local representatives to visit and review the site and activities of a cement plant in the cement industry's central location in Australia.

Other activities that have contributed to the local residents' high hopes are studies held on behalf of the project and meetings to disseminate information about the potential risks and benefits of the proposed project. The principal expectation among formal government authorities from the district level all the way down to the sucos and among youth representatives are the creation of new employment opportunities; the improvement of public and social infrastructure and facilities such as roads, medical clinics, and schools; and the revitalization of local and sub-regional economic activities. The recruitment of a large number of workers for relatively long-term employment is seen as a factor that would inject a measure of vitality into the social and economic life of the region, which has previously remained stagnant due to dependence upon the traditional agricultural sector where the limited availability of labor and the harsh environmental conditions have stood in the way of economic expansion. This difficult situation places the local residents in an uncertain and precarious subsistence situation. Change is deemed unlikely in the absence of an external stimulus (in this case, the arrival of the cement industry).

4.1.2 Primary Potential Negative Impacts

1.) Conflict Over The Status of Land

The plans for a clinker cement factory demand a considerable amount of land. The required amount of land for limestone extraction is around 576 ha, while the requirements for the clay site, access roads, processing plant, additional facilities, and the jetty have not been fully calculated. The limestone extraction area is categorized by the Director of Land and Property in Baucau District as uncultivated secondary forest. The land needed for the rest of the project infrastructure and facilities lies on a variegated landscape of gardens/orchards, rice fields, and residential properties.

According to the Director of Land and Property, the legal status of a plot of land is largely based upon the absence or presence of human cultivation. Cultivated land is treated as private property, while uncultivated or abandoned land is regarded as public or government property. This categorization according to cultivation status may lead to conflict with the owners of land that have been or are being left fallow for several years, whether due to the need to restore the fertility of the land or due to labor shortages and the underdeveloped market economy, which makes it impractical or undesirable to work more land than what the farmer needs to fulfill his family's subsistence needs; damage or neglect to

traditional irrigation networks has also caused the abandonment of arable land, as in the case of the former rice fields in the planned clay extraction site.

Unlike rice fields that are worked in every planting season, garden and orchard plots are usually exploited for a specific period between 3 and 5 years long and then left fallow for roughly the same amount of time before the site is cleared and taken back into cultivation. As such, horticultural land may appear to be abandoned when in fact it is being deliberately left fallow to restore soil fertility.

Another point of difference is that rice fields that have been abandoned or left fallow tend to remain identifiable as former rice fields, unlike abandoned gardens and orchards that quickly become undistinguishable from the surrounding bush apart from traditional markers like the low stone fences used to mark field boundaries. These fences are easily damaged or brought down by livestock grazing or browsing on the land. Nevertheless, these traditional fences are acknowledged by the village community as markers of land ownership. The fences are mended and rebuilt whenever the fallow plot is cleared and reopened for cultivation.

The lack of formal land ownership certificates places traditional smallholders in a weak bargaining position. At the same time, local community structures are based upon kinship/lineage groups and socioeconomic bonds between woman-giving and woman-receiving groups, and this tends to facilitate the spread of any potential conflict. The involvement of the woman-giving side would eventually influence the morality of exchange between the woman-giving and the woman-receiving side; it may also weaken women's bargaining position as we shall explain in a later section.

2.) Conflict Over Compensation Value and System

The determination of compensation prices/values and the type or model of compensation payment is a follow-on impact of land acquisition. Another major issue is the appropriate value and system of compensatory payments for communities that still live at a subsistence level.

These secondary negative impacts may become primary impacts under the influence of two factors that may lead to the accumulation of impacts. The first stems from the unilateral determination of land ownership status according to the government's criterion of whether the land is being worked or not; the proportion of land being actively cultivated is relatively small, so the landowners' bargaining position in negotiating compensation values tends to be rather weak. The attribution of inadequate amounts of land to the local residents is the likely result of unilateral decision-making through the District Administrator's fiat. Even if the owner is capable of driving a hard bargain, the eventual amount of the compensation agreed upon by both sides would probably still be too low to allow the purchase of enough land elsewhere, especially since there is no market for land and everybody needs their own land so nobody is inclined to sell.

The amount of compensation money gained by the landowner is probably going to be inadequate for setting up a business in non-traditional sectors. The market economy is still too underdeveloped and the landowners have virtually no trading experience.

Another major issue is the choice of compensation system. The land acquisition system usually involves the outright sale of land, which suits the preference of most project investors. However, this may not be suitable for the subsistence landscape of the Caisido communities, since the money suddenly injected into a subsistence economy is likely to end up being squandered in consumptive pursuits. This would

lead to more problems as the local people become trapped in a position of even more uncertain livelihood than before since they have lost their original source of livelihood. This tendency would have a particularly pronounced effect upon vulnerable groups, which make up as many as 11% of the households in Osso-Ua. Despite the availability of government stipends amounting to $30/month, the allowance is not really sufficient to fulfill all household needs. Orchard/garden plots have always been the primary source of subsistence with the government stipends as a complimentary resource that helps reduce uncertainties in the fulfillment of subsistence needs.

Compensation through cash payments would lead to potential follow-on impacts such as the proliferation of impoverished households, reduced environmental quality, the perpetuation of substandard housing, poorer healthcare (especially among vulnerable groups), and the deprivation of opportunities for finding industrial jobs, all of which are associated with the deterioration of the physical environment as the local population's subsistence resources shrink or even completely run dry. These accumulated impacts would be practically irreversible and very difficult to manage. In this way, the project would not improve the quality of local human resources, housing situation, and subsistence certainty, but instead it would lead to poorer and more uncertain livelihoods. This possibility would certainly run contrary to the hopes of the local population and the project's promises to promote the improvement of local socio-economic conditions.

Unlike Caisido landowners who do not exhibit a clear preference for any particular form or system of compensation payment, the Wailacama people have figured out that they would like to receive compensation in the form of rent rather than a cash purchase. The project would ideally not buy the necessary land outright but rather lease it from the local population. This rent system prevents the local landowners from losing their rights to the land if the industry should cease its operations in the future. The renting of land by an outside party would also keep the locals in a strong bargaining position. As native inhabitants of the suco, the local residents would retain all social, economic, and economic rights in the hamlet. This solution may seem unattractive to the project but it is socially understandable. The landowner and chefe aldeia said that a leasehold system would allow his descendants to retain their identification with their place of origin. Territorial identity is an important matter to the people of Baucau. After all, traditional territory provides the site for the customary house, which hosts the symbols of the lineage's ancestral identity.

The Wailacama landowners' preference for a lease-based compensation system creates a more complex issue than in Caisido. However, it makes perfect sense to the local landowners, since they do not face much uncertainty about the present fulfillment of their subsistence needs but they do feel some uncertainty about their descendants' future identity. This leads to a strategy oriented towards the long term. The project should not feel threatened by this particular demand. The landowners' concerns are based upon their interest in protecting their traditional identity in connection to their customary territories. As such, there are two factors that may influence how far they would press their case about the preferred compensation model. First, as long as a landowner still has a significant amount of land that is not affected by the project, he will not be so worried about entirely losing his traditional identity. Second, as the native residents of Suco Ostico, the consultation over land acquisition matters would be preferably done in their ancestral suco in order to guarantee the recognition of their identity as the original settlers of Ostico. This recognition lies at the heart of their concern for their descendants' identity. Of course, this cannot be separated from Suco Vemasse's parallel interest insofar that the opportunity to demand

benefits from the project would depend to some degree on whether any of its residents are directly affected by the project. This interest must be accounted for in such matters as the allocation of employment opportunities and village development/ empowerment initiatives.

From the analysis above, it can be said that the secondary impacts of land acquisition in Wailacama are probably going to be less significant than in Caisido. With the proper mitigation measures described above, the impacts can be managed and (to some degree) reversed to prevent them from causing follow-on impacts, and there is less risk of causing the accumulation of impacts upon landowners and suco residents as long as their concerns about their loss of identity as native suco residents can be assuaged. Moreover, the project opens more opportunities to develop a more dynamic economy in both Ostico and Vemasse, especially since TL Cement has specifically promised to provide employment opportunities and regional development assistance. The development of the local economy will remain sluggish in the absence of the project's stimulus.

3.) Conflict Over The Dismantling of Graves and Traditional Ritual Houses

The construction of the cement industry would affect a number of gravesites and approximately three customary/traditional ritual houses (*rumah adat*) in the vicinity of the plant and jetty sites. The number of affected religious-cultural sites would be quite small, but it would be unwise to underestimate their significance to the traditional belief system and their importance in symbolizing the integrity of lineage identity. Any disturbance to gravesites would interfere with the spiritual connection between living family members and the souls of the dearly departed. In conjunction with the impacts of land acquisition, this may lead to an accumulation of impacts that adversely affect the psychological condition of living family members. The concomitant psychological and physiological stress would be attributed to the disturbance to ancestral graves. This stress cannot be easily reversed.

Another kind of cultural site that requires great care in its handling is the customary ritual house (*rumah adat*). Based on our informant who owned the customary house, there are 3 customary houses that will have to be relocated. These houses are located away from the hamlet's main cluster of customary houses, ostensibly so that the lineage groups that own them would have an easier time conducting their rituals. We suspect that the actual reason was that these lineages were descended from the lepers exiled to Osso-Ua. The traditional rituals are performed on an irregular schedule and the local population seems to have largely forgotten those families' identity as the descendants of lepers, so it's unlikely that there would be any major objections to their relocation.

The relocation of a customary house is expected to go much more easily than the exhumation and relocation of a gravesite. The customary house essentially symbolizes a lineage group's identity. This symbol of group identity plays an important part in allowing members of the same territorial community to distinguish themselves from each other. As the basic social structure in the area, the lineage group provides a venue for group reproduction and the establishment of social security networks through bonding rituals between woman-giving and woman-receiving groups. There is no indication that customary houses are regarded as the abode of the souls of departed ancestors. However, communication with the souls of departed ancestors is performed in the customary house, such as when the lineage would like to accept a marriage proposal from another lineage. The customary house also serves as an institution to socially bond the lineage members together. *Rumah adat* or *Ummanenum* is

symbolic rute of the patrilineal linieage groups of members. Therefore the relocation of a customary house and the attendant ceremonies would require a great deal of intensive consultation beforehand.

There are no known gravesites or customary houses in the projected clay mining site within Wailacama territory. This means that the project will have an easier time in handling issues related to these two types of religious-cultural identity sites.

The degree and extent of impacts from the relocation of these cultural sites would be relatively limited, but there is the risk of accumulated impacts against the local population's traditional beliefs. The impacts would also be basically irreversible, so the mitigation efforts should involve consultation with all relevant parties to protect the interests of the living family members. This would allow the effective management of the impacts.

These issues aside, the project is still likely to end up being economically and socially beneficial, not only to the families affiliated with the relocated graves and customary houses but also to the Caisido population as a whole. This should be put into perspective against the situation in the absence of the project, in which case there would be fewer opportunities to open the region to the outside world.

4.) Resettlement

The construction of a cement factory would require the resettlement of at least 10 households in the vicinity of the mine and plant sites and 2 households near the jetty. This number is relatively small, but any population resettlement presents complicated issues. The implementation of the resettlement plan should take account of the residents' wishes, the state of the resettlement site, and assistance for the social and economic reestablishment of the relocated households.

Consultative meetings have shown that Caisido communities offer a great deal of support but also expect much in return from the cement factory. They are willing to help in overcoming potential hurdles in the interest of local economic development. Community leaders do not always seem to be aware that the construction of the cement industry would require the relocation of graves, customary houses, and households. These three issues are the prerogative of the affected lineages, whose decision-making powers cannot be assumed by a different party. Of course these affected households would probably not go openly against the majority opinion, but any decision over the appropriation or relocation of private property should involve direct consultation with the affected parties. This expectation was expressed by the households whose gravesites, customary houses, or homes would be directly affected by the project.

Resettlement action cannot be treated separately from the relocation of graves and customary houses as disparate issues that require consultation. Each issue has a unique battery of impacts in terms of extent, magnitude, and accumulation, but the mitigation demands an integrated approach. For this reason, the consultative approach would treat the discussion of these three principal issues as a single package. The consultation should discuss the management of the issues in a thorough and transparent manner with regards to the risks and benefits to the hamlet residents so that the household leaders (lineage *lia nain*) would be able to take decisions without duress or pressure. The complexity of the issues faced by the owners of the houses, graves, and customary houses due for relocation means that the project's negotiators should be willing to engage in multiple and repeated consultation sessions.

The analysis above shows that resettlement action is associated with significant primary impacts not only with regards to the restoration of livelihood for the resettled population but also in the relocation of graves

and customary houses, so there is considerable risk of impact accumulation. However, the impact is largely reversible and manageable. The management of the affected groups should be relatively achievable due to their small numbers.

Neglect and lack of attention towards the resettled population's attempt to reorganize their lives may cause significant economic decline and (at least in theory) might even trap them in long-lasting poverty. As such, it would be wise to engage in the comprehensive treatment of resettlement issues and to allocate employment opportunities for at least one member of each resettled family.

Despite the complexity of the issues described above, the presence of the project is still expected to enhance the dynamism of the local socio-economic conditions. Local resources and capabilities for the fulfillment of subsistence needs have largely been constrained by various uncertainties and harsh natural conditions. The cement industry would allow the population to overcome these constraints by taking advantage of new employment opportunities and the opening-up of their region to the outside world.

4.1.3 Secondary Potential Negative Impacts

1.) Potential Conflict of Interest Between Sucos

In addition to conflicts over individual land ownership status, there is also the potential for conflict over land rights between neighboring sucos, especially on the clay site. The land historically belonged to Suco Ostico, but the owners are currently residents of Suco Vemasse. The main issue is who should represent the owners in the negotiations over land acquisition – Suco Ostico's administration, or Suco Vemasse's? This involvement issue becomes particularly important in light of the cooperative suco empowerment plans promised by TL cement in prior consultative meetings. Although the landowners reside in and are administratively regarded as residents of Suco Vemasse, they are still sociologically oriented towards their former status as the people of Suco Ostico. Reasserting their identity as Ostico residents would strengthen their bargaining position in negotiations with project personnel. However, this choice may lead to the economic and political marginalization of the 15 kin groups who originated from Suco Ostico. This marginalization may not necessarily have a substantial effect upon their livelihoods since they do not depend heavily upon the resources available in the Vemasse traditional territory. For the 44 immigrant households who live with their woman-receiving lineages, the social and economic risks are not likely to be significant either since their economic activities largely consist of harvesting firewood in Ostico traditional lands. Still, this activity provides a relatively precarious livelihood to begin with since the income thus gained is somewhat lower than that of the woman-receiving households who host them.

These immigrant households do not experience quite the same indirect impacts as the woman-receiving lineages. However, their residence in Vemasse depends heavily upon the goodwill of their woman-receiving host group; if the formal leadership in Vemasse does not approve of the Wailacama immigrants' preference to identify with their hamlet of origin, the Vemasse leader may be somewhat disinclined to include these immigrant households in the list of job-seekers registered with the project management. In this way, the immigrant households must face a greater degree of social and economic uncertainty that will place them at the mercy of the economic exchange morality between woman-giving and woman-receiving households. One possible mitigation measure would be to facilitate ricefield cultivation in hamlets that currently experience difficulties in finding access to water. The opportunity to engage in rice cultivation would help sustain the traditional norms of perpetual exchange between

woman-giving and woman-receiving lineages. The landowners would be able to lease their land or hire farm workers since they are no longer interested in working the land themselves, considering the greater profits from work or investment in non-traditional sectors.

We can conclude from this analysis that land acquisition will cause different potential impacts in the two affected sucos. Around the activity centers of the cement factory, the potential direct impacts take the form of potential conflicts over land stewardship rights if the criterion of ownership is decided unilaterally according to the government's standards. The probable consequence is that the local population will receive less compensation than they actually deserve since the extent of land deemed eligible for compensation would be limited to the garden/orchard plots being presently cultivated. The affected parties would be limited to the people of Osso-Ua, but that is not insignificant since they make up 25% of the Caisido population. The impact may also exacerbate the situation when the affected household is affiliated with the customary houses (*rumah adat*) or gravesites that would be directly affected by the project; this further weakens their bargaining position and places them under greater psychological stress. These impacts can and should be managed to reduce or even eliminate the potential direct and follow-on consequences, such as by taking appropriate decisions about land ownership status, compensation value, and the relocation of graves, residences, and/or customary houses through intensive consultation with the aid of a third-party facilitator such as an NGO or the Church. It should be remembered that the project is supposed to improve the local socio-economic and residential condition. The absence of the project would leave the local population at the mercy of the present uncertainties of their subsistence livelihood, especially in the face of unpredictable weather and market price fluctuations.

In the Ostico (Wailacama) territory, the primary impact is the potential conflict between sucos over the lands to be acquired by the project. This impact is not likely to have substantial follow-on effects to the 14 households from Ostico, since the probable consequences – in the form of administrative neglect or ostracism by the Vemasse village leaders – are not likely to affect their main sources of livelihood. A different set of follow-on impacts should be considered for the 44 households hosted by woman-receiving lineages (vulnerable group), as we have explained above. In either case, the impacts to the Wailacama residents who moved in from Ostico and to later migrants are deemed reversible and manageable. These impacts do not pose much risk of the accumulation of follow-on impacts such as the loss of livelihoods, barriers against participation in the project, relocation demands, or permanent damage to exchange relationships between woman-giving and woman-receiving lineages.

Seen as a whole, the project is probably still going to have a net positive impact, especially with the opening up of the Ostico region to the outside world and the opportunities to develop currently neglected agricultural lands. These two opportunities should promote and accelerate the development of the Vemasse area. Meanwhile, the absence of the project would leave Vemasse in its current isolation with a substantially different pace of change.

2.) Potential Damage to Household Subsistence Situation

In Caisido, no matter how much land is acquired by the project, the results will inevitably affect local households' subsistence situation. This is particularly related to the change in the status of the reserve/fallow fields, which are traditionally regarded as private property but might end up being treated as government property with no attached rights for individual compensation. In that situation, even if the owner receives compensation, the sum might be insufficient to offset the loss of the land. The

money/capital thus obtained would not be enough for the development of businesses outside the traditional sector that the owners are already familiar with.

The case study on household economies has revealed that households with alternative sources of income (apart from horticulture) are more likely to be able to secure their subsistence situation and accumulate surplus. The employment opportunities provided by the project may also help replace the loss of traditional subsistence resources. However, this opportunity may be beyond the practical reach of some households. The average size of a household in Osso-Ua and other hamlets is no more than 4-5 people, and as such there would normally be only one family member who could work at the factory, and even then they would likely end up in a non-skilled position with correspondingly low wages. The family will have an even harder time trying to accumulate surplus if the employment is intermediated by a third party. This situation would persist throughout the existence of the cement industry unless there are adequate efforts to empower the traditional sector with the aim of increasing field productivity.

Records indicate that 12 households in the vicinity of the mine site and 3 households near the jetty will be directly affected by land acquisition activities. The number of landowners who would be affected by the road-building project is currently unknown, but the geographical extent of the impact would be limited to the Osso-Ua aldeia. The direct impacts may be transitory but their consequences may extend far into the future, especially in the absence of initiatives to empower the traditional sector and create employment opportunities. The impacts may accumulate if the subsistence condition persists, which will lower the value of local human resources in terms of health and fitness and thus impair the local population's chances for involvement in the project. However, the impact is essentially manageable and reversible. Also, if the project is properly planned and managed, it should be able to improve the social and economic situation of local communities as a whole. The absence of the project in the Caisido region would thus leave the region in its present stagnation since there would be no external empowerment initiatives that address the core issues in local economic activities.

4.2 Construction Phase

Main Activities

- Land clearance and site preparation
- Jetty construction
- Employment opportunities
- Mobilization of heavy equipment

Primary Potential Positive Impact

- Employment opportunities

Secondary Potential Positive Impacts

  - Improvement in local households' social and economic condition

Primary Potential Negative Impacts

- Conflict Over Recruitment Job Opportunity

- Termination of employment at the end of construction

Secondary Potential Negative Impacts

- Influx of workers from outside the local region
- Women's bargaining power
- Dependence upon Cash Income/Money in Household Subsistence Arrangements
- Public health

4.2.1 Primary Potential Positive Impact

1.) Employment Opportunities

Employment opportunities are one of the main issues that the project relies upon for attracting the support of the local population. Construction activities for the cement industry are estimated to require a peak number of around 1000 workers, or about 9% of the working-age population in the two local subdistricts.

Our estimation based on analogical with similar project the employment will be 12% of the employment opportunities created would be for management staff, 28% for technical workers, and 60% for unskilled laborers. The Sub-district Baucau population, in our opinion, should ideally be able to fill all the required positions, except for management staff and technical skill. Surveys reveal that around 19% - 22% of young men and 22% of young women have senior high school education while 9% - 12% of young men and 8% - 10% of young women have college or university education. In the rural (Caisido) region about 10% - 20% of boys and 12% - 21% of girls have achieved junior high school education, 5% - 17% of young men and 12% - 25% of young women have senior highschool education, and 13% - 31% of young men and 13% - 24% of young women have bachelor's degrees.

There is a secondary technical school in Suco Uailili of the Baucau sub-district that accepts student from the entire Baucau region. The graduates from this school should be able to fill some of the technical worker positions required by the project.

However, based on our experiences, there may be some issues related to the management of workers by a third party in the form of a business partner. This kind of employee Management Company often goes overboard in implementing man-day efficiency by reducing the number of workers to the bare minimum, utlizing cheap workers brought from outside the local area, and ignoring environmental management directives. Another potential source of problems lies with the allocation/distribution of employment opportunities among local villages and administrative sub-units. Wages would be pushed down to the minimum permissible standard rather than a reasonable daily amount. It is very likely that these business partner organizations would be owned or run by local elites such as former guerrillas, relatives of high civil or military officials, or the chefe suco. As businesspeople, they would naturally try to seek profit by using the efficiency measures mentioned above. This would be particularly troublesome in light of the fact that the project has already made several promises, so it would be difficult to mitigate or prevent potential conflicts (see sub-chapter 4.2.3. sec. 1).

Table 4.1 Recommended Distribution of Employment Opportunities

Sub-District/Suco	Number of males of working age	Percentage of workforce utilization (out of 3000 opportunities)	Total number of households	Percentage of workforce utilization / household
Baucau	8,811		7,523	
Vemasse	1,629		1,866	
Sub-Total	10,640	9%	9,389	11%

Source: Processed from Table 3.3 and 3.4 in this report above.
Note: This analysis is based on our estimation in peak activities that the project will absorb approximately 1000 opportunities mostly for semi and non-skilled labors.

4.2.2 Secondary Potential Positive Impact

1.) Improvement of Household Economic Condition

The possible availability of employment opportunities in the local area is an important follow-on impact that helps provide more certainty for household subsistence. Case studies show that households with additional sources of income in non-traditional sectors are more likely to be able to fulfill their subsistence needs. The availability of $15 daily (based on our experience during site visit) pay over a fairly long period would help guarantee the fulfillment of subsistence needs for young men's parental households while the parents would still be able to work their traditional gardens and orchards. Although not all jobs will be available for the entire duration of the construction phase, several days of work per month would still help greatly towards the fulfillment of subsistence requirement. A $15 daily wage is equivalent to 1 sack or 25 Kg of rice. This much rice would fulfill 2 weeks of subsistence needs for 4-5 family members in a household. There is relatively little concern that the availability of cash will attract potential borrowers since all households in the immediate area would stand to benefit from the project.

Problems may arise since, in theory, communities with a long tradition of subsistence living may have difficulties in turning their cash (capital) surplus into productive spending. From the same theoretical standpoint, it would be difficult to make productive investments since there are few or no local opportunities. The harsh natural and soil conditions and the fragmented ownership of small, widely dispersed plots of land tend to make it difficult to improve the efficiency and productivity of the land. However, the possibility is not entirely absent.

Field productivity can be increased in two ways, namely with the more extensive planting of marketable crops and the introduction of fertilizers. These two treatments would open more opportunities of work in the traditional sector, especially for women and the elderly. These activities would also help the promotion of a market economy since the growth of the traditonal sector can be expected to aid the growth of the commerce and transportation sectors. All of these would depend on the availability of outside help, such as agricultural inspectors who can motivate and teach the farmers about ways to increase the productivity of their plots. The project may get involved in these activities by supporting the distribtion of fertilizers and high-quality seeds in cooperation with the relevant government authorities.

These steps should be begun during construction to ease further assistance efforts during the operational phase. Such efforts would be very important in getting women to be more involved in the economy of their village.

The improvement of local households' social and economic conditions is the follow-on impact from the availability of employment opportunities. This impact would only be sustainable in the presence of assistance efforts to invest surplus income in the development of a market activity for horticultural activities. Without such efforts, the surplus income would merely benefit traders who offer consumptive goods. Proper empowerment measures would result in more widespread positive impacts that would have cumulative effects in other sectors, such as the improvement of human resource quality, better certainty for the fulfillment of subsistence needs, and the greater involvement of women in the local and regional economy. Conversely, the absence of empowerment efforts can nullify the positive impacts by accustoming local households to consumptive economic behaviour. This last concern can be managed as long as the mitigation efforts are begun as early as possible (during the construction phase). In the long term, the project can help traditional subsistence agriculture patterns become more efficient in the operational phase, by facilitating the sale of vegetable produces in the open market for the fulfillment of subsistence needs (or in the production-market-consumption model). This subsistence model can be quite risky, but fortunately the types of crops planted for local consumption needs do not appear to be highly vulnerable to market price fluctuations. Local farmers have developed adequate knowledge about natural patterns for the purpose of anticipating the vagaries of the weather and natural conditions, so the risk of failure should be quite limited.

The subsistence households in Caisido are not poor per se, but their traditional gardening and orchard cultivation activities do not provide much opportunity to accumulate surplus. Without the empowerment discussed above, it would be difficult for them to improve their households' economic condition. The rise of a labor-market (industrial) economy in the midst of a subsistence economic landscape creates a developmental paradox that is initially expected to empower the regional economy but may end up causing economic dependence instead.

4.2.3 Primary Potential Negative Impacts

1.) Conflict Over Employment Opportunities and Recruitment Practices

The opportunity to exploit traditional resources has hitherto been restricted to local residents or the dominant territorial grouping in a suco.

It is not unlikely that a new resource (such as employment opportunities) would be treated under the same paradigm of control. The Chefe Suco in Tirilolo and Triloca both stated that half of the employment opportunities created by the project should be given to the people of Tirilolo while the other half would be distributed among remaining sucos. This may not sit well with the other sucos, especially with their youth groups, since this 50% scheme would mean that fewer than 1000 jobs would have to be divided between 15 sucos (8,830 workforce), thus absorbing no more than 6% of the available workforce in those sucos while Tirilolo would benefit from the absorption of 31% of its workforce (1,610 workforce), or equal 5 times more opportunity from other sucos This situation is likely to spark discontent and perhaps even open conflict between youth groups in the abovementioned sucos.

Based on our experiences and according to Cernea (1988), we suggest that the selection and management of employee applications should be handled by a special institution formed through consultative processes with sub-district and suco leadership to remove the need for an external busines partner.

The formation of the institution should ideally involve youth groups representing their sucos. In Baucau, it should also involve the KPK (*Konsellu Polisia Komunitaria*) as a protector. The project should form an institution to handle relations with formal leaderships, managements, coordinators, and supervisors and to receive complaints from the community about unfair treatment (a Grievance Mechanism). Such a measure would be necessary since there are not many employment opportunities outside the traditional sector in the Baucau district, so the appearance of a large number of employment opportunities would attract widespread interest and the concomitant conflict potential.

The employee management institution should play the role of a coordinator, opportunity distributor, and negotiator over pay scales and employment terms, in addition to organizing training programs as planned by the project by TL-Cement during socialization (**see sub chapter 3.5.1**). With regards to this plan, there is the question of whether it will be possible to hold training for all the workers required in the construction process. In our opinion, the first step would usually require induction (explanation about workplace safety) whereas the public perception is that the training would largely be about how to perform skilled and semi-skilled work. This matter should be clarified beforehand so as not to cause message dissonance with the formal institutions hitherto tasked with disseminating information to the public.

It will not be easy to perform induction for such a large number of workers. The project should thus develop an appropriate recruitment schedule with due attention to need, types of work, and project timeframes. The schedule would be an important tool for the employee management institution in distributing the demand among subdistricts and sucos according to prior agreements. Experience shows that the lack of such a schedule tends to result in tension with job-seekers from *sucos* located far away from the project site. This discontent would then spread to the *chefe suco*, who would feel that his people has been neglected. The discontent would normally be directed towards the project and lead to a breakdown in the good relations that had been so painstakingly built between the project management and the local population. This is where the grievance mechanism induction would play a crucial part.

The analysis above indicates that the employment opportunities available during the construction stage would have both positive and negative primary impacts. The positive side lies in the follow-on impacts to other aspects of life, such as increased certainty of subsistence, especially in the Caisido region; increased work experience outside traditional sectors on a massive scale; and indirect training for youth groups who handle of this big recruitment workers in the orderly management of large numbers of workers over a long period of time. These follow-on impacts would be very difficult to replicate without the presence of a major project like TL-Cement.

The primary and follow-on impacts listed above are essentially nonrepreatable since similar opportunities would not always be available. The potential negative impacts from improper management can be put under control to prevent their perpetuation.

In our opinion, the advent of the project in the Baucau District would open far more possibilities for regional development than in its absence. The traditional agricultural sector faces numerous natural and

ecological difficulties that makes it hard to promote social and economic development without the aid of non-traditional sectors that can absorb labor on a far larger scale.

2.) Termination of Employment at The End of Construction

The recruitment and involvement of local labor during construction does not only result in positive impacts; it would also create a major problem at the end of construction activities. Local workers can have positive impacts upon the economic state of their own households and of the village as a whole as long as they remain actively employed. However, as construction activities reach their conclusion, the flow of income would stop. The cash income from project activities cannot be easily obtained from other locally-based activities. While the operational phase would bring about its own employment opportunities, the numbers are no more than a third of the opportunities available at the peak of the construction phase. This means that at least a quarter (± 25%) of the locally recruited construction workers would lose an important source of cash income. This possibility would present a major problem if not properly anticipated and planned for in advance.

There are a number of measures that can be taken as explained in the impact mitigation section. One such measure is to encourage the utilization of the cash income for investments that increase the productivity of the local agricultural sector. There are also several other possible paths of socio-economic empowerment, as we will explain in a later sub-chapter about the impacts of operational-phase employment opportunities and the empowerment of the local/regional economy (**see sub chapter 4.3.2. sec. 1**).

The conclusion of construction activities may have follow-on (secondary) impacts in the form of a reduction in transportation activities, the increasing dependence of the household economic structure upon sources of cash income outside the traditional sector, and/or the growth of consumerism if the cash income is not invested to achieve increased production in the traditional agricultural sector. These impacts would be relatively widespread due to the large number of employment opportunities made available during the construction phase, would be very difficult to reverse without appropriate planning for the development and empowerment of the local exonomy, and may lead to a rift in the community between project workers' families with their substantially improved socio-economic condition and the rest of the local population who still have to struggle with the low productivity of the traditional sector. Fortunately, these impacts can be mitigated with proper anticipative measures, as we shall explain later in the section about the empowerment of the local economy. Compared to the situation in the absence of the project, the impacts of the termination of employment at the end of construction are still relatively manageable, especially once the beneficial impacts of the project are taken into account.

4.2.4 Secondary Potential Negative Impacts

1.) Potential Impact of the Influx of New Workers upon Local Social and Cultural Aspects

Although the construction phase would involve the recruitment of many workers, there is relatively little likelihood for an influx of job-seeking outsiders into the Baucau and Vemasse Subdisticts. This can be largely attributed to customs that hinder the entrance of outsiders into a suco's territory. As such, we predict that the majority of skilled and semi-skilled workers will be recruited from within the two local subdistricts. Although different sucos have different dominant baptismal names, relationships between

the residents of different sucos are relatively amicable except in the matter of resource control, where prohibitions exist against the entrance of a suco's residents into the territory of a different suco. There will be some employment opportunities in the cement factory for people from outside Tirilolo, but the number would not be large enough to overwhelm local workers from Suco Tirilolo.

The workers' dispersed/distributed activities and the demands of daily commute for workers from outside Suco Tirilolo means that the outsiders are not likely to have intense contact with local residents, especially local women. The devout Catholic faith of most local residents also contribute to the strength of faith-based social bonds and norms so there is little cause for worry about undesirable forms of social contact between men and women. Despite the presence of several different territorial groups, the tendency is to place more of an emphasis upon the common features of local belief systems as represented by the customary houses (*rumah adat*) along with the norms of exchange in marriage arrangements and the stewardship of graves and customary houses. Thanks to these factors, the presence of a large number of project-affiliated workers is not likely to significantly affect or change the local culture. Instead, the most likely cause of social transformation is the widespread introduction of a cash wage system, as explained in other sub-chapters.

2.) Women's Bargaining Power

The cement industry provides attractive employment opportunities for male job-seekers. On the other hand, the industry does not offer many opportunities specifically intended for women. Indeed, women were not even involved in the preliminary consultative meetings, except for the heads of the Baucau Subdistrict and Sucos Triloca and Bucoli (all three were positions that happened to be held by women at the time).

Traditionally, women have an important role in the lineage for the establishment of exchange networks. However, their decision-making position is relatively weak. The exception is in the management of the household economy, where the wife normally has the authority to determine the household's consumption pattern. The wife's role in garden/orchard cultivation is largely that of supporting the husband in his cultivation activities. Similarly, women hold a secondary position in deciding how the produce should be marketed.

The project's recruitment of a predominantly male workforce may facilitate opportunities for women to take a more significant role in horticulture or trade. Since trading activities tend to be hindered by a shortage of capital, the only major opportunity available would be to fill labor requirements in the traditional garden/orchard farming sector. Even so, such activities still provide no guarantees for the woman's future; for instance, if her husband dies, the horticultural lands will tend to fall into the hands of the husband's oldest male relative.

In theory, this situation should encourage women to develop a strategy to plant different crops from the ones hitherto cultivated by their husbands. Traditional cultivation patterns see staple crops as the main crop while cash crops are used only to make up subsistence shortfalls. In this regard, the woman's role is limited to helping the husband manage the production process to fulfill household consumption needs. The migration of male labor into the industrial sector may then encourage women to take a greater role in the traditional horticultural sector. This time their involvement would not merely be in the capacity of executing and aiding the husband's cultivation strategies, but rather would call for them to develop their

own long-term strategies to guarantee their subsistence after retirement age by planting cash crops to accumulate surplus. Literature review has revealed examples of how women use accumulated surplus to improve their children's level of education. Better-educated children are expected to provide a form of insurance for the parents especially for mother in old age. This phenomenon has not been widely observed in Caisido except among the owners of larger or more tracts of horticultural land.

The empowerment of horticultural activities towards greater productivity (as suggested above) should help women in developing their household economy without having to depend on their husbands' or sons' work on the project. Their success in increasing their gardens/orchards' productivity would restore their bargaining position vis-a-vis the men and their cash income from their industrial work. The women's role in helping their male relatives pay *belis* cold elevate their position within the household since the provision of *belis* and *sayur* aid by the women would no longer depend on the fruits of men's work. This way they should theoretically be capable of increasing their decision-making role in their households.

This long-term process towards the improvement of women's bargaining position can be regarded as the indirect impact of the absorption of the male workforce by factory jobs.

On the other hand, the analysis above also reveals the possibility that the availability of industrial jobs for men may lead to the long-term weakening of women's bargaining position in the development of Caisido households' economy. This impact would have considerable extent due to the widespread recruitment of male workers from all sucos in two subdistricts. It also carries considerable risk of impact accumulation through the abandonment of traditional farming by the men, which leads to the increasing dependence of women upon men as the breadwinner in the family, the lack of physical and psychological activity for the women (which may lead to health problems), and the deterioration of the women's bargaining position in finding husbands among their household socio-economic relatively equals. These potential follow-on impacts are largely reversible since they can be mitigated through the empowerment of the traditional horticulture sector where the women can still find some productive work.

Those potential follow-on impacts present a bleak picture for women's future, but fortunately the impacts are still within manageable limits. The project can also be said to provide an opportunity to improve the women's bargaining position through their success in managinf the traditional economic sector in a more productive manner. This possibility would be quite difficult to imagine in the absence of external factors in the form of a male job market that prompts changes to stagnant traditional institutions.

3.) Dependence Upon Cash Income/Money in Household Subsistence Arrangements

The widespread availability of a large number of employment opportunities for all sucos in the two local subdistrict – and the subsequent payment of regular wages to recruited workers – could create a dependence upon cash in the household economy. The likelihood of gaining cash income from the traditional sector has been quite limited thus far, and the harsh ecological conditions of the local area have also limited the growth of market-oriented endeavors in the traditional agricultural/horticultural sector. Of course, the small amount of cash income obtained from the traditional sector has been very important, but it does not play a central role in the local economy, so the introduction of money has not caused a dramatic cultural change that eventually results in social change. An important indicator of this is the relatively weak social stratification among community members, especially in the Caisido region. Indeed, the adverse ecological conditions and the limited availability of land and labor have combined to

promote the development of a relatively unstratified society characterized by a reluctance to display excess personal fortune for fears of being seen as a prideful person with a lack of social consciousness.

The introduction of a cash wage system on such an extensive and long-term basis can trigger a shift to a subsistence model that prioritizes market-oriented production over household consumption. The traditional farming sector would then be demoted to secondary priority or even neglected entirely, as in the case of Wailacama households that have abandoned farming to become merchants or salarymen. For Caisido households, the convenience of having regular pay as a principal source of subsistence resources would only last until the end of the construction phase. The sudden cessation of cash income could reduce the local residents' subsistence capacity and lead to intense competition over the fewer jobs available during the operational stage, perhaps even to the extent of open conflict between residents (**see sub chapter 4.3.3. sec 1.**).

Before the advent of the project, there is hardly any visible competition between local residents over the fulfillment of subsistence needs. This lack of competition can be attributed to the common experience of facing environmental constraints in taking out a living through the traditional sector. The accumulation of surplus through the traditional sector is performed through traditional institutional mechanisms (such as investment in livestock) so there has been no particularly strong impulse for the development of social stratification.

The introduction of money economy into the traditional sector, such as through the planting of cash crops, has familiarized local residents with the use of money. However, money has not penetrated very deeply into the traditional sector, such that the hiring of farm laborers remains rather uncommon. As a result, the process of social stratification has proceeded at a very slow and gradual evolutionary pace. This process has not resulted thus far in any sharp or distinct social segregation. In the Caisido region, there does not seem to be any major difference between the haves and the have-nots in terms of the ownership of garden/orchard plots, so any tendency towards social stratification is not immediately visible.

However, the introduction of a cash wage system through the industrial sector (with the recruitment of construction and factory workers) may precipitate a process of rapid and sharp segregation between those who benefit from the industry and those who have to continue to rely upon the traditional sector. This segregation would become particularly pronounced in the absence of any dedicated effort to facilitate the involvement of the traditional sector in the market economy. Prior to the project's arrival, the Caisido communities have managed to maintain a relatively egalitarian structure that helps guarantee mutual survival; but when the project introduces a number of powerful benefits for a large number of recruited workers, the community may fragment between an enclave of well-off factory workers and the remaining residents who have not gained any direct benefits from the factory's activities. This kind of development could cause considerable damage to the project's image and its ability to fulfill the promise to improve the social and economic condition of the local population, therefore the regional economy development is needed (analysis for this issue **see sub chapter 4.3.2**).

4.3 Operation Phase

Main Activities

- Employment Opportunities
- Development of Regional Socio-Economic Activity

4.3.1 Primary Potential Positive Impact

1) Employment Opportunities

The employment opportunities in the operational phase would be for top managers, senior experts, junior experts, computer science undergraduates, and non-specific workers with various levels of educational requirements (from high school to junior high school or even elementary school). The estimated number of employee requirements is around 700, this number is based on our estimation that the project will absorb approximately 700 opportunities mostly for skilled, semi-skilled, and unskilled labors. TL-Cement would continue to prioritize applicants from the local area. All workers would receive prior training to bring their skills up to the standards demanded by TL-Cement.

The number of workers required would be around three-quarter (75%) the number at the peak of the construction phase. However, the operational workers have the advantage that they would become permanent employees for the term of the industry's operation, with the attendant social security facilities, health insurance, and other social security measures according to the prevailing rules and regulations in TL-Cement. Similarly, the system and amount of remuneration would not differ much from the standards that apply to TL Cement plants elsewhere.

The reduction in the size of the workforce at the construction phase – for a total of around 700 workers (75%) – in our assumption means that the industry will only be able to accommodate a maximum of 7% of the working-age men in the two associated subdistricts (10,640 workforce). If the distribution of opportunities is calculated down to a household basis (9,389 workforce), only 7% of households in the two subdistricts would be accommodated, which constitutes a rather low number amidst the scarcity of employment opportunities outside the traditional sector. This might cause high competition and conflict (for this potential impact **see sub chapter 4.3.3. sec. 1**).

4.3.2 Secondary Potential Positive Impact

1) The Development of Regional Socio-Economic Activity

The TL-Cement management promised during the information dissemination and consultation meetings that the: 'Government and its counterpart will be working together to reduce unemployment rates in the country and that they will keep fighting for the community's well-being.' This statement would obviously be repeated and remembered among the sucos. In our opinion, it should not be too difficult to turn these promises into reality. Major companies have an inherent responsibility to promote the empowerment of local communities through Corporate Social Rensposibility (CSR) programs. The impact mitigation and management measures suggested for the individual impact categories above can be made into an integral part of CSR. However, this requires consultation and cooperation with the suco administration and related government agencies at the district level.

Community representatives and survey results both indicate that the local residents would like to see repairs to irrigation infrastructures in order to restore rice field productivity in certain areas where rice cultivation has recently become impracticable. They would also like the introduction of more productive garden/orchard farming practices, especially for environmentally-friendly organic vegetable crops. These efforts would empower the local economy through increased transportation activity, the emergence of vegetable commodity middlemen, and increased trade in agricultural supplies such as tools and fertilizers. These developments would open employment opportunities for women who are largely unable to apply for industrial jobs.

These efforts would not be entirely free of risks, since the introduction of money as a predominant mode of exchange may lead to the rationalization of *belis* or *sayur* exchanges. This possibility is very real, but certain kinds of exchange goods such as buffaloes, oxen, goats, pigs, and chicken are more likely to remain irreplaceable since there seems to be certain constancy in the ritual practices at the customary house and the involvement of woman-giving and woman-receiving lineages in the care of deceased relatives. This can be seen in the fact that the introduction and spread of a new faith (Catholic Christianity) over several centuries has not managed to entirely wipe out local belief and ritual systems. Similarly, money may become a new common exchange medium but its functions would remain constrained by existing cultural exchange practices that place a great deal of emphasis in preserving the local cultural identity. In fact, the ease of acquiring and accumulating surplus with the use of money may help the local population carry out their traditional social functions while at the same time improving their children's level of education.

Another issue that may arise from the workings of the agricultural/horticultural sector is the demand for labor. Both rice and garden/orchard cultivation in the area is predominantly handled by men. Traditional farming practices have not maximized the use of women's labor, partly because women remain less effective and efficient in working the land. This problem may be addressed through intensive education and training programs to encourage women's involvement not only as farm workers but also as agricultural/horticultural entrepreneurs. The demand for farm labor may be filled by inviting or involving workers from women-giving groups outside the local territory. Alternatively, the demand may attract people from other areas to work as paid farm laborers in the Baucau and Vemasse Subdistricts. This possibility is facilitated by the availability of facilities for daily or weekly horizontal mobility.

The explanation above shows that CSR efforts constitute the unforeseen or indirect impact of the cement industry. This impact would have considerable geographical extent due to not only the growth of the commercial farming sector but also the incentive for inter-regional labor mobility (a cumulative impact). The potential negative follow-on impacts from the introduction of a money economy are probably going to remain within controllable bounds. The Church and customary institutions have hitherto played their respective parts in preserving group identity and the traditional exchange system, thus maintaining the integrity of local cultural valies. However, there is a case for strengthening the Church's involvement in maintaining the consistent implementation of religious norms. Theoretically speaking, cultural change is unlikely as long as the main elements of the culture remain functonal. In this case, the most important cultural elements for the Baucau community are the customary (ritual) house and the exchange morality.

4.3.3 Primary Potential Negative Impacts

1) Potential Conflict Over Employee Recruitment and the Distribution of Opportunities

During the consultative meetings, the sucos outside the project area expressed their desire to get a share of the employment opportunities.

The relatively high pay and attractive social and health security facilities during the operational period would obviously be very attractive to job-seekers, and this may lead to struggles over the employment opportunities – not only among the job-seekers themselves, but also among chefe sucos who would like as many of their people as possible to be admitted as workers. The outcome of this competition over a limited number of jobs would depend on how the distribution of employment opportunities is managed during the construction phase. The successful management of this issue would help greatly in defusing potential conflicts over employment opportunities in the subsequent operational phase. On the other hand, if the local labor recruitment institution (run by the local youth) fails to manage it properly, tensions will persist and may grow into open conflict.

Employee recruitment for the operational stage is probably going to be a more sensitive subject than in the construction phase. The recruitment of employees in the formal sector tends to raise suspicions about nepotism, whether to the benefit of lineage groups, territorial surname groups, or individual loyalties to former freedom fighters. One of the factors that contribute towards the intense competition is the scarcity of employment opportunities outside the traditional sectors, especially jobs with attractive employment benefits similar to those offered by TL-Cement. Fortunately, it is possible to manage this potential conflict.

The explanation above marks employment opportunities in the operational phase as a significnt direct impact. Although the number of jobs available would not be as large as during the construction phase, the impact is more sustainable and irreversible due to the scarcity of similar jobs in the Baucau region; the impact has considerable extent and causes accumulated impacts in the form of guaranteed and comfortable livelihoods for a reasonably long period, increased trust due to the fulfillment of the project's promises, and improved human resource quality thanks to the training programs. The follow-on impacts include the increase of public transportation activity, more income for shopkeepers and small taders, and increased quality of housing in the Caisido region. However, if the employee recruitment process is not properly managed, the employment opportunities may produce the opposite primary impact in the form of potential conflicts between sucos.

2) Potential Development of Enclave Communities

One of the undesirable potential impacts from employment opportunities in the cement industry/factory is the segregation of a relatively well-off community of factory laborers and employees from the majority of subsistence/traditional farmers who remain incapable of overcoming the barriers to the growth of the agricultural and horticultural sector. Therefore, it would be wrong to neglect the social and economic empowerment of the traditional farming sector. The empowerment of the traditional sector should pay appropriate attention to the difficulties and potentials presented by the local ecological landscape, so as to minimize the likelihood for the development of local and regional disparities. (**See sub-chapters 4.3.4. sec. 2. below**).

4.3.4 Secondary potential Negative Impact

1) Potential Dissatification Over Actual Results Compared to the Project's Promises

As the operational phase begins, local stakeholders will begin to closely scrutinize TL-Cement over its promises to provide employment opportunities and improve the local socio-economic situation. The issues that would stand out in the eyes of local communities include worker recruitment and the distribution of employment opportunities, wage levels and remuneration systems, the handling of land acquisitions, and the relocation of gravesites, customary houses, and local residences. Efforts to empower the local population through CSR (Coorporate Social Responsibility) programs initiated by the project in the interest of transformingg the local/village and sub-regional economy (as promised in information dissemination meetings with formal leaders from the District Administrator all the waydown to the heads of individual villages, and with local youth groups) is another matter that would determine how the local population sees the project's intent to contribute towards the local economy.

The project's willingness to turn these promises into reality – such as by setting up a special institution within the project to listen to and address the local people's complaints against the project – would be a crucial element in building a synergistic relationship with local stakeholders. If the project does not devote sufficient attention to the development of such a harmonious relationship, all the effort put into impact mitigation and management would not be able to stop the growth of dissatisfaction among the local communities. This would in turn tarnish the project's image in the eyes of external donors and investors. In this kind of situation, while the cement industry would be able to continue its operation, it would lose the trust needed to expand into new raw material extraction sites. Even if such plans manage to obtain the support of local authorities, resistance by the local population would become a cause for worry. The ultimate impact would be to discourage investors from contributing to the industry's financial sustainment.

Since the opportunity for social and economic empowerent through the project would develop in a gradual manner, the full benefits from the project would not be immediately felt. However, once these benefits take root, their impact would be irreversible.

2) Potential Development of Disparities in the Regional Economic Condition

If the empowerment of local social and economic potentials (as promised by TL Cement leadership) is not properly integrated with the abovementioned impact mitigation efforts, or if it does not pay adequate attention to local variations in ecological potentials and constraints, there is the risk that the effort may lead to disparities in local economic development.

The variation in local ecological conditions between the Baucau and Vemasse subdistricts has not caused any dramatic difference in social and economic development between the two. This situation can be attributed to the lack of effort to optimize the development of the traditional sector. The project's arrival in the middle of this stagnant socio-economic situation must be properly managed to prevent the local residents from becoming overly dependent on the project. This might involve the development of hinterland regions around the proj ect. The project itself does not have to be the leading actor in these empowerment effort, but it should be willing to initiate plans and provide motivation for the development of the local region. The project's long-term presence places it in a position to become an important agent

of development, which incidentally would fulfill the hopes expressed by local stakeholders in consultative meetings.

Variations in local ecological and demographic conditions remain an important factor that may cause disparities in local social and economic development among sucos. However, the customary system for the exchange of women through the giving of *belis* and *sayur* presents an institution that can facilitate cooperation between the local communities. This institution forms the principal mechanism in managing and balancing the relationship between suco communities. The bonds of exchange between woman-giving and woman-receiving lineages are a form of social capital that can curb potential development disparities.

There is no way to completely eliminate the potential for disparities in local social and economic development since this potential has it roots in the unavoidable reality of ecological factors (especially soil condition). However, this does not excuse any lack of attention towards the social and economic development of the local area. On the contrary, the development of the hinterland/buffer zone around the centers of project activities is likely to benefit both the project and local communities by reducing the communities' dependence upon the project's resources (especially employment opportunities as a source of household income). This impact is unavoidable and may be difficult to accept but it is essentially manageable. The devout Catholic faith of the local population can help them cope with this reality. In the long run, the social and economic disparity between sucos may balance out against the possibility of social segregation between relatively well-off project employees and other local residents who still have to rely on the relatively unproductive traditional sector. This interaction between factors may help even out the rate of local social and economic development so that any disparities would only grow in a slow, gradual, and manageable manner.

Another issue that must be anticipated is that while local residents can be assisted and motivated in increasing the productivity of their agricultural/horticultural ventures, the distribution (marketing) of their produce out of the local region and the provision of food items and agricultural supplements from the outside remain under the control of traders/entrepreneurs coming from outside the Baucau and Vemasse subdistricts. This situation promotes unbalanced social and economic development across different regions. On one hand the Baucau and Vemasse residents still have to contend with the low rate of return in the primary agricultural sector, while entrepreneurs from outside these two subdistricts would be able to extract most of the surplus by the control they exert over the buying of farm produce and the sale of farming tools and everyday needs that the local residents can't produce on their own. Therefore, the empowerment efforts for the population of the Baucau and Vemasse subdistricts should not be restricted to the improvement of the farming sector, but must also involve the development of entrepreneurship capabilities in the mercantile and transportation sectors.

3) Potential Local Community Health Condition

Operation phase activities in mine and plant site will be generated particulate matter and gases. Based on air quality modelling, the dispersed pollutants are predicted to be able to reach the sensitive areas, but the concentration level reaching these areas are all below the standard for each averaging time. From the modelling, it is known that only NO_2 paramater is exceed the standard, however the dispersed only around the Plant or Mine Site where the operation phase is undertaken to the North West Direction.

Higher concentration of these pollutant may occur during the dry season which last from July to November, because during these months wet deposition rarely happens.

From the above description, the activities in operation phase would potentially affect to the community health in the long term (as long as the operation phase of the project). Therefore, to mitigate all unexpected possibility from the dispersed, it is sugessted to provide buffer zone or green belt around plant site and/or mine site. Moreover, for safety reason, it is necessary to re-develop the settlement near the site. This activity could be included as corporate social responsibility programme/fund and can be categorized as corporate compensation without using money toward the community (see **sub-chapter 4.1**).

5. IMPACT MITIGATION

The table below presents summaries of the mitigation efforts for significant impacts. The detailed description will be presented in following section.

This report does not account for the cost of the mitigation measures from TL-Cement's viewpoint and for the project's economic viability from the costs-and-benefits standpoint. Such feasibility evaluations are beyond the scope of this study.

Table 5.1 Summary of Proposed Impact Mitigation Measures

Potential Impact	Proposed Mitigation Measures
Land acquisition: • Loss of subsistence resources • Loss of bargaining power over land status, value, and compensation system	Intense negotiation with landowner, chefe aldeia, chefe suco, and *lia nain*
Population displacement/resettlement	Comprehensive resettlement program
Relocation of ancestral cultural sites: graves and customary ritual houses (*rumah adat*)	
Recruitment of workers and distribution of employment opportunities	Establishment of a labor recruitment institution
Loss of women's bargaining power	Development of an agricultural development and market integration plan
Dependence upon cash income in household economic subsistence systems	Establishment of a regional development board
Transformation of traditional agriculture and the promotion of regional development	Empowerment of women's role in agricultural and horticultural production

5.1 Intensive Negotation with Landowners

The determination of land ownership status by the Director of Land and Property on the basis of present cultivation status would weaken local landowners' bargaining position over land that is being left fallow in their rotational cultivation system. The lack of formal written proofs of ownership is another factor that weakens the landowners' bargaining position. The determination of land ownership status according to present cultivation status means that each individual landowner would only be compensated for a small amount of land. This prevents the landowners from negotiating a truly fair amount of compensation. With the relatively small amount of land attributed to them under the government's criterion, they would be unable to obtain enough compensation to buy an amount of land that will replace the actual extent of their losses. The lack of existing land sale and purchase instiitutions, the small amount of compensation made available, and the socio-economic dependence (especially in Caisido) upon subsistence

agriculture means the owners would face difficulties in making use of the compensation money for productive pursuits. As such, it would be preferable to present the compensation to Caisido's subsistence farmers in some form other than cash, except in the case of Wailacama households that are better acquainted with the money economy. Some of the suggested solutions in this regard are:

- To involve multiple stakeholders in the negotiations, such as the chefe aldeia, chefe suco, dan suco *lia nain*
- To replace cash payments with another form of compensation, such as social security over a certain period or the construction of replacement houses for displaced households;
- To guarantee the recruitment of one productive family member for long-term employment with the project.

These efforts would contribute towards the mitigation of the principal impact to these groups, which is the loss of the subsistence resources they have relied upon thus far.

5.2 Resettlement Plan for the Osso-Ua People

Introduction

The resettlement is expected to affect no more than 15 households. It is not clear whether the relocated group includes the owners of all the lands affected by the project. In any case, the resettlement will proceed according to the wishes of the households that understand their position as people affected by the project:

- The households wish that their new settlement would remain within the territory of the same hamlet or the same baptismal name group (such as the Belo);
- The site and house construction costs should be borne by the project or the government;
- If the new settlement is located close to another populated settlement, there must be proper consultation to ensure the existing residents' willingness to accept the resettled hoiseholds, since this issue is related to the availability of livelihood resources in the future;
- The resettled households need some form of certainty about their future livelihood (especially for their descendants), particularly if all their traditional resources have been taken over by the project.

5.2.1 Outline of Proposed Resettlement Program

According to the resettlers' wishes, the choice of the resettlement site would be made under the following methods:

1. If an owner still has some land left unaffected by the project, a new house may be built upon this available land;
2. Some government-owned land unaffected by the project would be found for a cluster of houses for the 15 resettled households. The location would be chosen with due regard to ease of access to schools, medical clinics, work (i.e. project) location, and essential resources such as clean water.

3. At least 500 m² of garden/orchard land would be made for intensive cultivation by women while the men are given the opportunity to work in the project.
4. The 1.5 ha needed to establish a new house and garden/orchard plot is provided by the project with a guarantee of the land's legal status for the benefit of the resettled households; this would constitute the non-monetary form of compensation suggested in a previous section. This policy should only be taken after proper consultation with the households to be resettled.

5.2.2 Ressetllement Components

The components of resettlement include land axquisition, the construction of a residential complex and its houses, the construction of public facilities, agricultural mechanisms, and the establishment of a grievance institution/mechanism.

A. Land acquisition

The acquisition of land for resettlement purposes is the responsibility of the project as an integral part of other land acquisition activities (for the main site, plant site, jetty, clay area, etc.). The choice of the resettlement site should involve proper consultation with local residents, both those about to be resettled and those already living in or near the resettlement site. This consultation is intended to provide closure so that the resettled population would have no lingering doubts about their new settlement.

B. Site preparation and construction of houses

Site preparation (land clearance) and the construction of new houses should involve not only the resettled population but also existing residents around the resettlement site and their *lia nain.* These groups' involvement would be necessary in the determination of the resettlement timeframe, the alignment of buildings, the choice of sites for graves and customary houses, and the model and arrangement of houses within the housing complex. The involvement of these related parties would help establish good relations with neighboring communities so that the settlers can establish themselves in peace.

C. Construction of public facilities

The construction of public facilities and infrastructure (especially clean water distribution systems and access roads) should take account of not only the resettled population's needs but also the interests of existing residents in and around the resettlement site. If there is a significant difference in quality between the resettlement houses and the houses of current residents, the existing houses may also have to be renovated to prevent dissatisfaction among the local population. The funding for this could be taken for the compensation funds originally intended for the people displaced by the project, of specially budgeted as part of the special costs by the project for its environmental management efforts.

D. Provision of subsistence rations during the wait for resettlement and the initial resettlement period.

The provision of food rations while the displaced population waits for the resettlement site to be constructed and during the initial resettlement period at the new site is an unavoidable part of the resettlement process. A truly significant issue would appear when a particular settler's traditional subsistence resources have been completely taken over by the project, so the settler would have to rely

entirely upon the project's goodwill from the moment of the resources' acquisition all the way through the first few planting cycles for gardens/orchards in the resettlement site. The provision of such rations would depend upon the state of the household economy restoration program as explained in the next segment. The main issue here is how to make sure that the provision of rations would not engender a dependence upon such handouts, which may hamper the redevelopment of the local economy for many years to come.

E. Medical services

People who cannot avoid resettlement away from their original residences are likely to experience psychological and psychological stress. This stress can be attributed to physical exhaustion, lack of proper nutrition, and/or to belief/supernatural factors. This situation calls for regular medical examinations of the affected population. This should not be too difficult to arrange since the Caisido region already has a clinic with a doctor and three nurses. The project can make use of the clinic's services by sponsoring the clinical staff in the performance of this service.

To avoid psychological stress due to cultural/religious belief issues, especially over the relocation of gravesites and customary ritual houses, the project should facilitate the performance of the traditional ceremonies needed to maintain the balance of the spiritual relationship between the living and the dead. The project will be responsible for funding such ceremonies.

F. Planning and execution of the relocation

The last step in the resettlement process is the physical relocation of the settlers from their old residences to the new resettlement site. This activity should not present unsusual difficulties since the new and the original settlement are still located within the same aldeia. The actual relocation can be performed without involving any other communities, although it would be better to invite their involvement for the sake of maintaining good relations between local communities. These other communities' involvement does not necessarily require payment in cash, and can be facilitated through existing social mechanisms such as invitations to traditional ceremonies and ceremonial banquets. Such activities would principally be performed by the *lia nain* of the suco and the chefe aldeia along with youth and women's representatives from the villages involved.

5.2.3 Economic Restoration

The restoration of the resettled populations's social and economic well-being should be relatively straightforward. Case studies show that the availability of a steady source of cash income would adequately guarantee the fulfillment of the affected households' subsistence needs. The restoration of the settlers' household livelihood can be implemented through:

A. Employment opportunities with the project

A steady job at the project would provide a very important source of cash income for settlers deprived of their previous livelihoods. There is no fundamental barrier against the project hiring one member out of every affected family on a long-term basis. This employment opportunity constitutes one form of non-cash compensation through the provision of steady and reliable employment.

B. Empowerment of the horticultural sector

It has been suggested before that the resettlement site should make a provision for at least 500 m² of horticultural land per household. If planted with market-oriented cash crops, this much land should provide sufficient security of household subsistence. In combination with the cash income from a family member working in the project, each household should be able to guarantee the fulfillment of its subsistence needs. The intensive cultivation of garden/orchard crops would be the responsibility of the women or older people, partly as a measure to counteract the weakening of women's bargaining power due to the uncertainty of their role in the household economy.

C. Development of animal husbandry

Beyond the agricultural/horticultural sector, there should be an effort to facilitate the keeping of economically viable livestock such as goats. This kind of animal husbandry work can be undertaken by women or older people. The project shall provide the necessary capital.

D. Development of mercantile ventures through shops and kiosks

This kind of venture does not have the involve all settlers; instead, the participants would only consist of people who express an interest in taking up this line of work. The project can provide business capital in the form of a revolving fund.

5.2.4 Institutional Development

The development and management of the resettlement effort should ideally be handled by a dedicated institution specifically tasked with ensuring the success of the relocation program. Due to the small number of people to be resettled, this institution can be set up within the project's organization so that it would not require a great deal of external funding. This institution is part of the effort to build and strengthen other institutions it will be explained in the monitoring sub-section.

5.3 Development of Labor Institutions

The large number of employment opportunities with relatively high pay would not be available without the cement industry. As explained in the chapter on initial environmental conditions, the rural workforce is largely under-utilized due to the lack of suitable opportunities. Although the center of project activities is located deep in the rural areas and concentrated in only one suco, the availability of a new resource (in the form of employment opportunities as laborers or clerical workers) would attract job-seekers from far and wide.

In this case, the major issue is customary (*adat*) prohibitions that prevent people from entering the terriotory of a different suco or baptismal surname group and exploiting the local resources there. Even marriage cannot overcome these prohibitions. It remains to be seen whether the utilization of the new resource would have to obey these established customs. The creation of exceptions or circumventions for job-seekers coming from outside the customary territory of the industrial center would inevitably lead to some degree of social tension and negotiation, especially among younger generations that are generally somewhat better educated than their patents. The demand for fairness and transparency in the recruitment of workers may have to compromise with local custom, especially in the recruitment of long-

term operational workers. The limited number of workers that can be recruited, the high and regular wages, and other privileges made available to the factory workers (especially compared to the situation in the construction phase) may become a source of tension over the allocation of employment opportunites. Some suggested solutions are:

- The development of a labour recruitment institution managed by the youth organisations of local sucos under the supervision of TL-Cement and KPK;
- Avoiding the use of a third party for employee management, in the interest of supporting the local labour recruitment institution's function in the distribution/allocation of employment requirements and opportunities;
- Transparency in the worker selection and negotiation procedure;
- Enlisting church institutions to reinforce moral values and faith in divine providence;
- Negotiating an equitable scheme of employment allocations for Suco Tirilolo as the project's central location and other sucos within the Baucau and Vemasse Subdistricts

5.4 Agricultural Development and Market Integration Plan

If the project only devotes its management activities to the people directly affected by the project, the management effort should not be particularly difficult. The most direct and immediate impacts would only fall upon a small number of residents within a relatively small and isolated area. The larger issues would arise from the project's introduction of a cash income system on a large scale, both in the number of workers and the geographical area from which these workers would be recruited. Aside from this substantial cash income, the project would provide additional benefits in the form of health insurance, housing, and several other facilities normally unavailable to the local residents. The opportunity to gain these benefits would only be available to a limited number of mostly male workers, especially in the construction phase. The operational phase would open more employment opportunities for women but the number would be quite small. On the other hand, the traditional sector also provides employment opportunities for women, but it remains rather underdeveloped. The majority of ricefield and garden/orchard cultivators still struggle with the limitations of primitive technology as well as the low productiviy of traditional farming systems and methods. Although this sector already produces a limited amount of cash crops for the market, the market reach and penetration of traditional farm produce remains quite limited, and as a result most local farmers have to take out a subsistence living with painstaking effort. These factors hinder the transformation of the rural economy in the absence of external intervention.

In this kind of situation, a paradoxical change could result from the introduction of a cash wage system with a high value relative to the kind of cash income normally available from the traditional sector. On one hand, the cement industry can provide enormous benefits to the people affiliated with it, while the majority (especially women and productive workers who are not recruited into the project) would still have to contend with the stagnation of the subsistence economy. This could lead to a hitherto unprecendented degree of social stratification.

For this reason, the project's direct or indirect involvement would become necessary for the transformation of local traditional agriculture into a more market-oriented form. This can be implemented through:

- The development of agricultural programs and market integration plans;
- The establishment of a regional economy board;
- Empowerment of women's role in agricultural production (ricefields and gardens/orchards);
- Empowerment of agricultural merchants to enhance their capability to bring new agricultural technologies into the local region and market agricultural products out of it.

These efforts would help in:

- Preventing the local residents from becoming dependent upon the cement industry as their principal source of cash income;
- Enhancing the dynamic growth of the traditional sector according to its own cultivation cycles so that any disturbances to the industrial sector would not cripple the local and regional economy, and so that social and economic class segregation would not become too pronounced;
- Encouraging the involvement of women in the regulation of the household economy so that their position vis-a-vis the men would not be weakened.

6. ENVIRONMENTAL MONITORING

The analysis of a project's social impacts is mostly focused upon the impacts caused in the course of the project's activities. The mitigation of these impacts requires the presence of an institution – either within the project's structure or in the local government's bureaucracy – that takes the responsibility for implementing the management actions. It also requires the monitoring of ongoing management/mitigation efforts to see whether the major impacts develop as predicted, and to provide feedback for the modification of management measures to tailor them to the actual issues encountered in the field.

This basically calls for the establishment of a unit or board within the project to undertake the management function. This unit does not have to take the form of a large environmental division with many experts and supporting staff members tasked with mitigating, managing, and monitoring the various environmental issues in the field. The unit can be as small as a single principal staff member – an environmental expert acting as the manager of the environmental organization. This environmental organization has an equal standing to other divisions that answer directly to the project leader. It has the authority to take emergency actions on its own initiative without requesting the project leader's permission. It also has the power to make decisions in negotiations with external parties, local government institutions, and local community stakeholders in matters directly related to environmental issues and environmental management according to the definitions laid out in the officially approved impact analysis documents.

In its role as an environmental unit, the organization must coordinate with related institutions in planning short-term, intermediate-term, and long-term environmental management measures according to operational directives. The organization possesses the authority to modify the management scheme to take account of the feedback from monitoring activities. As such, the leader of the organization must be capable of composing budgets so that the activities described above would not be hampered by delays in the budgeting process. Such budgets would be proposed as needed when the relevant issues arise (Cernea, 1988).

The manager of the environmental division is aided by the following experts in the performance of his/her duties:

- Community Development Expert
- Medical Expert
- Agricultural Extension Worker

A suitable doctor/medical expert and an agricultural extension worker are already available in the Caisido region, or at least in the Baucau and Vemasse Subdistricts in general. Therefore, the project can coordinate with the appropriate government agencies to take advantage of their expertise in the implementation of its environmental management and monitoring scheme. On the other hand, the comdev staff should preferably be a permanent staff member in the project. Apart from more general management and monitoring tasks, the comdev officer would be responsible for receiving and recording

local residents' complaints over any dissatisfaction with the services of the environmental management workers (*i.e.* he/she woud run the Grievance Redress Mechanism).

To facilitate the local residents' access to environmental management officers, this special staff should be given a workspace at or near the entrance of the factory so that any local community member who wishes to file a complaint would be able to do so without having to contend with the project's security checkpoints. This workspace should include a meeting room designed to put visitors at ease.

6.1 Monitoring Activities

Monitoring activities would focus on the indicators identified for predicted impacts:

Table 6.1 Monitoring Parameters and Schedules

Potential Impact	Mitigation	Parameter to be monitored	Monitoring schedule
Loss of subsistence resources	Integrate part of resettlement plan	The number of landowners and the size of plots outside the affected area	Once after the direct identification of affected households
Loss of bargaining position over the status and value of land and the compensation system	Intensive negotiation with landowners	• Trends complaints and requests from the landowners • Negotiation deadlocks • The effectiveness of an independent third party's involvement in negotiation	Once within three months after negotiation
Dissatifaction/ conflict over the relocation of gravesites and customary/ traditional ritual houses	Integral part of the resettlement plan	• Trends in the numbers and intensity of rites of integration (where the body is incorporated in the world of ancestral ghosts, giving it a sacred status in the cosmos)	Duration of the adjustment period (1-3 years after relocation)
Resettlement	Comprehensive resettlement plan	• The performance and effectiveness of the resettlement plan and the implementation of resettlement schedules • Trends the effectiveness of household economic restoration	Every 3-6 months during the 3-year adjustment process

Potential Impact	Mitigation	Parameter to be monitored	Monitoring schedule
		• Trends number of disease and malnutrition cases • Trends in rites/ceremonies of integration (see explanation above) • Integration with neighboring people (host communities)	
Potential conflict over worker recruitment and the distribution of employment opportunities	Establishment of a labor recruitment institution	• Trends in the effectiveness of the labor management institution • Trends in the number of complaints and conflict incidents • The development of recruitment schedules • Transparency and fairness in worker registration and recruitment criteria	Every three months since the establishment of worker accommodations in the first year; then every 6 months for the duration of construction and operational activities
The loss of women's bargaining power Dependence of the household economy upon cash income Transformation of traditional agricultural practices	The creation of an agricultural development and market integration plan	• Establishment of a regional economic development board • Trends in the development of agricultural market plans • Trends in the empowerment of women's role in the agricultural sector • Trends in the improvements made by agricultural extension workers	Every years for the 5-year plan; or upon every review of the programs

7. REFFERENCE

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APPENDIX

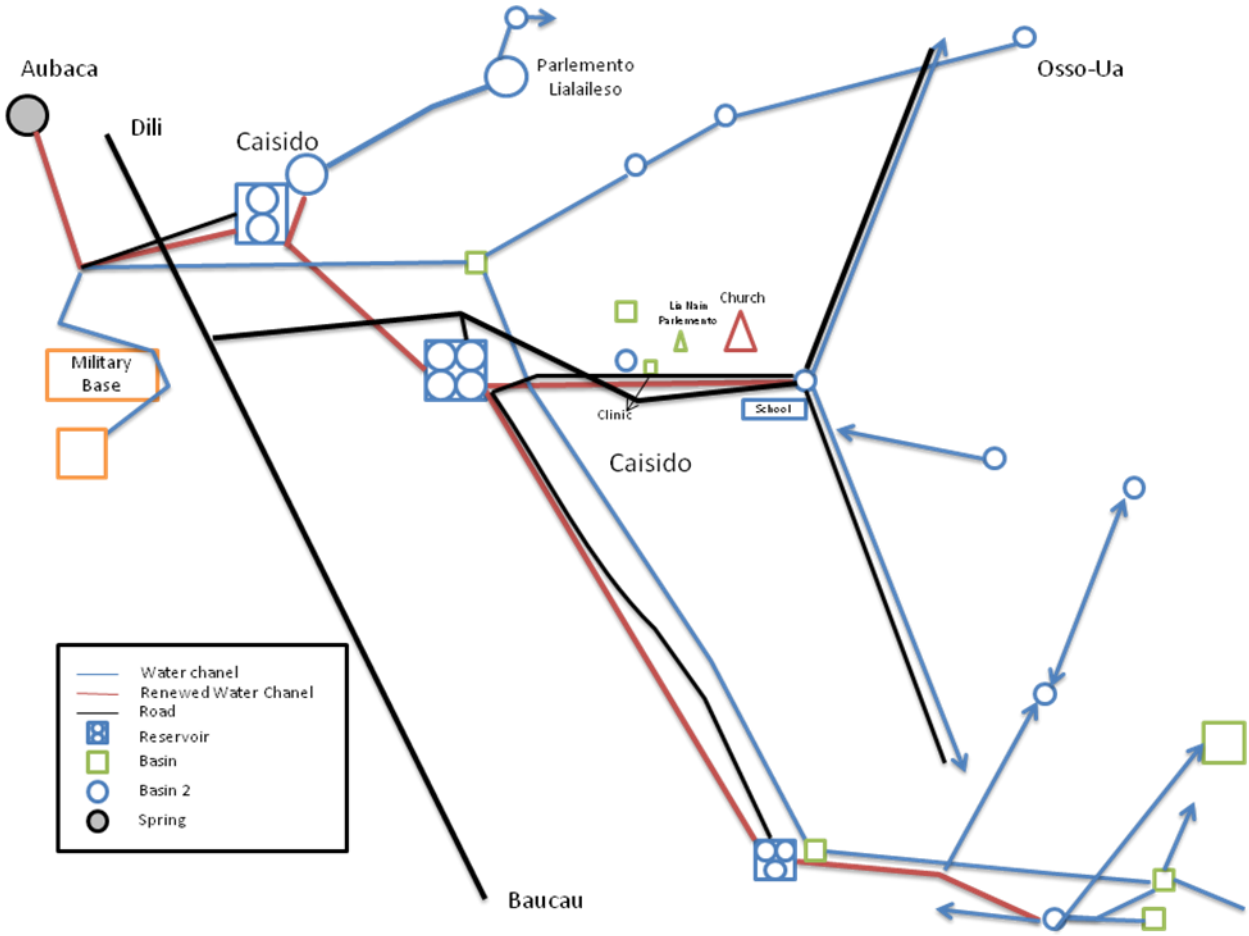
Appendix 1: Groups Domination in Suco near Project Area

Sub-District	Suco	Most Group Dominant	Other Group Dominant
Baucau	Bahu	Da Silva (D+), Buavida (D+)	Do Santos, Correia
	Tirilolo	Belo (D)	Da Silva Belo, Dacosta Belo, Asis Belo
	Bucoli	Da Silva (D),	Da Costa, Dus Reis, Correia, Reis
	Buruma	Ximenez (D+), Da Costa (D+)	-
	Buibau	Xarmento (D+), Ximenez (D+)	Durosario, Correia
	Uatulili	Guiteres (D)	Da Costa, Da Silva
	Samalari	Guiteres (D+), Da Silva (D+), Ximenez (D+)	Da Costa, Xarmento
	Garuai	Da Costa (D+), Da Silva (D+), Guiteres (D+)	Do Santos
	Triloca	Dasilva (D), Da Costa (D)	-
	Seical	Ximenez (D)	Guiteres, Da Silva, Da Costa
	Caibada	Da Costa (D), Da Silva, Ximenez	-
Vemasse	Vemasse	Freitas (D)	-
	Ossoala	Correia (D)	-
	Luilubu	Gamma (D)	-
	Uaiga	Gusmao (D+), Da Silva (D+)	-
	Uatu-Lari	Soares (D+), Da Silva (D+)	-
	Caicua	Da Silva (D+), Soares (D+)	-
	Ostico	Freitas (D)	-

Source: Survey Inventaritation, Mei 2015.

Note: (D) : The Most Dominant; (D+): Half Dominant (share with other group).

Appendix 2: Water Reservoir Map



Source: Sketch by Suco Tirilolo Secretary, 2015

Appendix 3: Occupations and Employment Status Communities

Osso-ua

Occupation	Householder	Spouse	Child		Sum
			Son	Daughter	
Agriculture	88	86	67	46	287
Housewive		2			2
Student			90	112	202
Health Officer					0
Public Functionary					0
Merchant		2		2	4
Driver					0
Nurse/Mother					0
Technician					0
Private Sector					0
National Parliament					0
Bussiness					0
Kindergarten			19	19	38
Security					0
Educator	2	1	1	1	5
Police Officer					0
NGO					0
Cleaner					0
Carpenter					0
Village Officer					0
Military					0
Photographer					0
Art Design					0
Doctor					0
Journalist					0
Mechanic					0
Banker					0
Mason/Bricklayer					0
Fishermen	3				3
Sheperd					0
Project Officer					0
Veteran (retirement)					0
Tailor					0
Total	93	91	177	180	541

Source: Suco Tirilolo Family Card Record, 2015

Lialaileso

Occupation	Household	Spouse	Child		Sum
			Son	Daughter	
Agriculture	72	63	53	40	228
Housewive		15			15
Student			126	119	245
Health Officer					0
Public Functionary	1			1	2
Merchant	6	10	1	2	19
Driver	1		1		2
Nurse/Mother					0
Technician	3				3
Private Sector	5		2		7
National Parliament					0
Bussiness					0
Kindergarten			9	6	15
Security	2		2		4
Educator	2				2
Police Officer		1			1
NGO					0
Cleaner			1		1
Carpenter	1				1
Village Officer	2	1			3
Military					0
Photographer					0
Art Design					0
Doctor					0
Journalist					0
Mechanic					0
Banker					0
Mason/Bricklayer					0
Fishermen					0
Sheperd	6		1		7
Project Officer			1		1
Veteran (retirement)					0
Tailor					0
Total	101	90	197	168	556

Source: Suco Tirilolo Family Card Record, 2015

Caisido

Occupation	Household	Spouse	Child		Sum
			Son	Daughter	
Agriculture	100	97	45	96	338
Housewive		8			8
Student		1	180	114	295
Health Officer	8		2	2	12
Public Functionary	2	2			4
Merchant	1	13	2	3	19
Driver	5		1		6
Nurse/Mother					0
Technician					0
Private Sector	8		2		10
National Parliament					0
Bussiness					0
Kindergarten			29	21	50
Security	2				2
Educator	3	1		1	5
Police Officer					0
NGO	1				1
Cleaner					0
Carpenter					0
Village Officer					0
Military			1		1
Photographer					0
Art Design					0
Doctor					0
Journalist					0
Mechanic					0
Banker					0
Mason/Bricklayer	9		4		13
Fishermen					0
Sheperd	3	1			4
Project Officer					0
Veteran (retirement)	3	1			4
Tailor					0
Total	145	124	266	237	772

Source: Suco Tirilolo Family Card Record, 2015

Parlemento

Occupation	Household	Spouse	Child		Sum
			Son	Daughter	
Agriculture	63	53	17	17	150
Housewive		12			12
Student			97	90	187
Health Officer					0
Public Functionary	1			1	2
Merchant	5	5	1	1	12
Driver	1		1		2
Nurse/Mother				1	1
Technician	1		1		2
Private Sector	2		6	1	9
National Parliament					0
Bussiness					0
Kindergarten				2	2
Security	2				2
Educator	1	1		1	3
Police Officer					0
NGO			2		2
Cleaner					0
Carpenter					0
Village Officer	1				1
Military				1	1
Photographer					0
Art Design					0
Doctor					0
Journalist					0
Mechanic					0
Banker	1				1
Mason/Bricklayer			1		1
Fishermen					0
Sheperd	1				1
Project Officer					0
Veteran (retirement)					0
Tailor	1				1
Total	80	71	126	115	392

Source: Suco Tirilolo Family Card Record, 2015

Lutumutu

Occupation	Household	Spouse	Child		Sum
			Son	Daughter	
Agriculture	130	7	2	5	144
Housewive		167			167
Student	1	3	399	396	799
Health Officer	5	2			7
Public Functionary	15	13	3	5	36
Merchant	10	1			11
Driver	19	1			20
Nurse/Mother				1	1
Technician					0
Private Sector	13	3	1	1	18
National Parliament					0
Bussiness	4	1	1	1	7
Kindergarten			37	37	74
Security	3				3
Educator	12	7			19
Police Officer	8	1			9
NGO	4		1		5
Cleaner	1				1
Carpenter					0
Village Officer					0
Military	1		1	1	3
Photographer					0
Art Design					0
Doctor	1	1		1	3
Journalist	1		1		2
Mechanic					0
Banker					0
Mason/Bricklayer	4				4
Fishermen					0
Sheperd					0
Project Officer					0
Veteran (retirement)					0
Tailor	1				1
Total	233	207	446	448	1334

Source: Suco Tirilolo Family Card Record, 2015

Betulale

Occupation	Household	Spouse	Child		Sum
			Son	Daughter	
Agriculture	116	145	16	19	296
Housewive		123			123
Student		2	676	704	1382
Health Officer	6	4	1	2	13
Public Functionary	25	17	8	8	58
Merchant	4	1		1	6
Driver	21				21
Nurse/Mother				1	1
Technician	1		2		3
Private Sector	82	13	19	10	124
National Parliament	2	2			4
Bussiness	4	1			5
Kindergarten			40	43	83
Security	26		3		29
Educator	20	10	1		31
Police Officer	11	4			15
NGO	7	2	5	3	17
Cleaner	1	1		2	4
Carpenter	4				4
Village Officer	1	1			2
Military	2				2
Photographer	2				2
Art Design	1				1
Doctor			3	1	4
Journalist				1	1
Mechanic	2		2		4
Banker	1				1
Mason/Bricklayer	1				1
Fishermen					0
Sheperd					0
Project Officer					0
Veteran (retirement)					0
Tailor					0
Total	340	326	776	795	2237

Source: Suco Tirilolo Family Card Record, 2015

Appendix 4: Educational Levels

Educational levels for each Aldeia in Tirilolo

Lutumutu

Degree	Household	Housewive	Child	
			Son	Daughter
Non-Educational	78	44	5	4
Kindergarten	*	*	90	90
Elementary	48	19	172	170
Junior Highschool	24	27	43	56
Senior Highschool	71	77	83	100
Diploma	10	10	*	1
Bachelor	29	21	41	34
Total	260	198	434	455

Source: Suco Tirilolo Family Card Record, 2015

Betulale I

Degree	Household	Housewive	Child	
			Son	Daughter
Non-Educational	68	50	*	4
Kindergarten	*	*	46	59
Elementary	65	52	147	150
Junior Highschool	11	18	123	71
Senior Highschool	67	73	113	105
Diploma	9	6	3	8
Bachelor	15	14	50	41
Total	235	213	482	438

Betulale II

Degree	Household	Housewive	Child	
			Son	Daughter
Non-Educational	57	28	11	10
Kindergarten	*	*	53	60
Elementary	23	19	92	114
Junior Highschool	8	21	69	54
Senior Highschool	60	57	89	67
Diploma	16	11	4	*
Bachelor	15	7	46	32
Total	179	143	364	337
Total I+II	414	356	846	775

Source: Suco Tirilolo Family Card Record, 2015

Caisido

Educational Degree	Educational Status			
	Student		Non-Student	
	F	M	F	M
Elementary	64	63	0	0
Junior Highschool	31	21	2	2
Senior Highschool	27	37	2	4
Bachelor Degree	33	30	18	30

Source: Suco Tirilolo Family Card Record, 2015

Lialaileso

Educational Degree	Educational Status			
	Student		Non-Student	
	F	M	F	M
Elementary	63	54	0	1
Junior Highschool	11	23	2	2
Senior Highschool	16	14	3	4
Bachelor Degree	22	21	10	26

Source: Suco Tirilolo Family Card Record, 2015

Parlemento

Educational Degree	Educational Status			
	Student		Non-Student	
	F	M	F	M
Elementary	44	55	0	0
Junior Highschool	14	12	0	0
Senior Highschool	5	12	0	0
Bachelor Degree	28	24	2	4

Osso-Ua

Educational Degree	Educational Status			
	Student		Non-Student	
	F	M	F	M
Elementary	55	45	1	0
Junior Highschool	15	15	1	2
Senior Highschool	12	11	12	8
Bachelor Degree	10	11	30	42

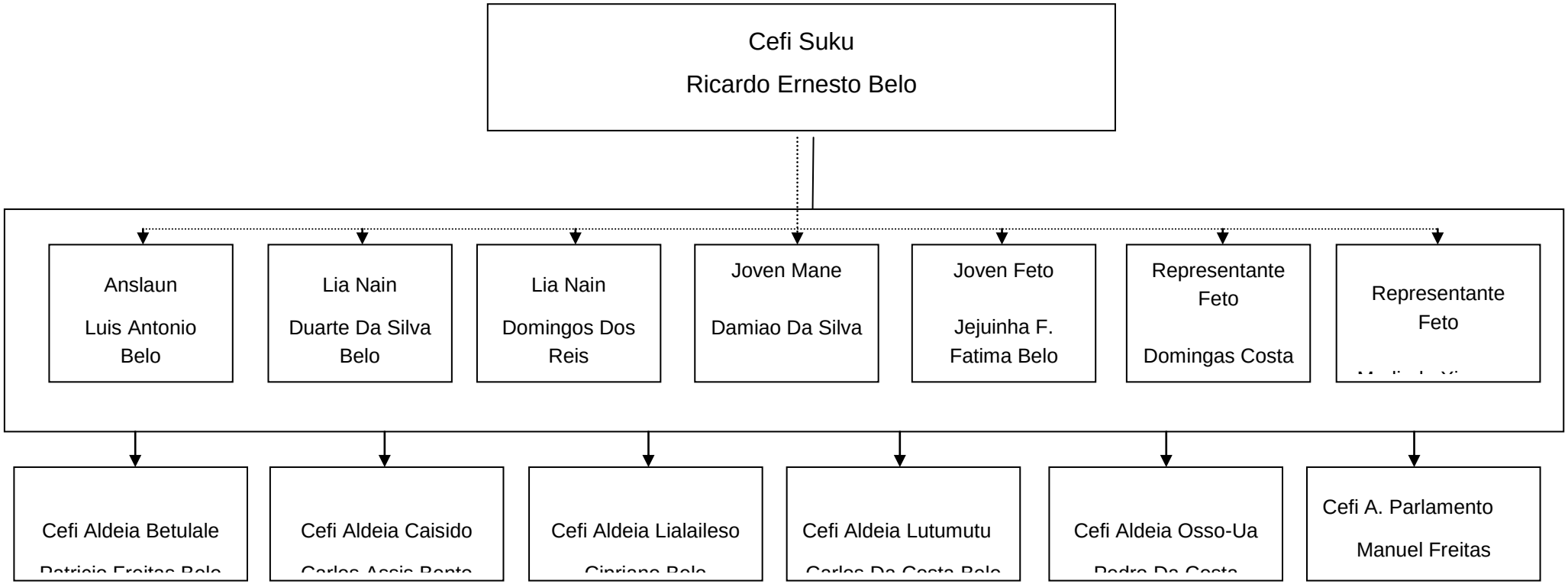
Source: Suco Statistical Report 2015

Population by Age of Five Years Old and over by Level of Education, Subdistrict, and Sex.

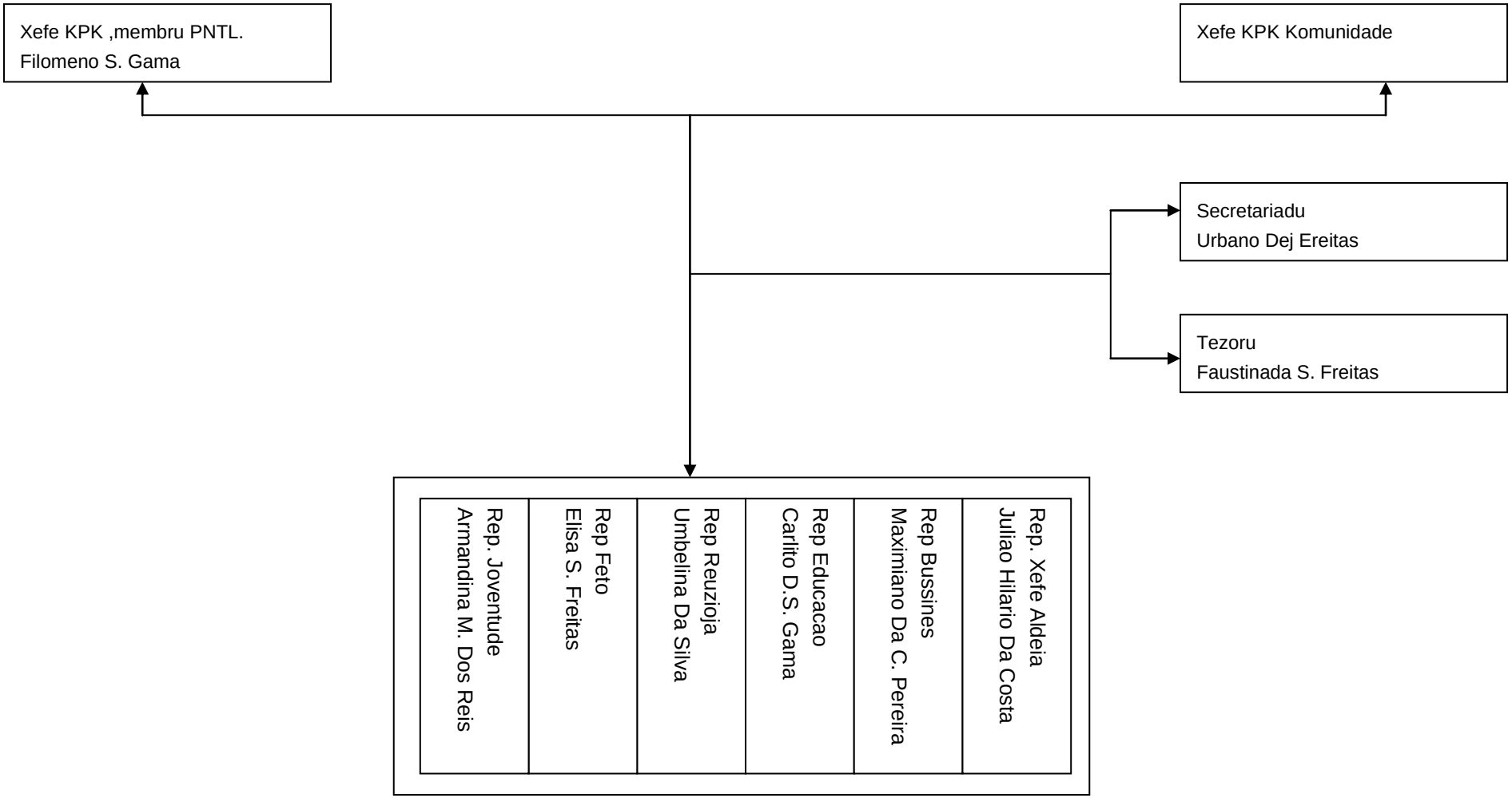
Level Education	Sub-District			
	Baucau		Vemasse	
	Male (%)	Female (%)	Male (%)	Female (%)
Pre-primary	7 %	6 %	5,1 %	0,8 %
Primary/Elementary	46 %	42,5 %	58 %	61,4 %
Pre-Secondary/ Junior Highschool	15 %	18,4 %	17,7 %	20,9 %
Secondary/Senior Highschool	25 %	27,4 %	15,6 %	14,8 %
Polytechnic/Diploma	1,7 %	1,5 %	0,6 %	0,5 %
University	4,3 %	3 %	2,1 %	1 %
Non-Formal Education	0,7 %	0,9 %	0,3 %	0,5 %
Total	100 %	100 %	100 %	100 %

Sumber: Census, 2010

Appendix 5: Suco Tirilolo Formal Leadership Structure



Appendix 6: Konsellu Polisia Komunitaria (Community Police Councils)



Appendix 7: Public Consultation Minutes

WorleyParsons resources & energy

EcoNomics

Project No: 301012-02135
Project: TL Cement EIA

Public Consultation Minutes

PARTICIPANT NAME & ORGANISATION:

- Administrator Distrito Baucau
- Chief of Police District Commander in Baucau
- Baucau sub-district Administrator
- Local NGO *Hamahun*
- Director of IPG (Institute of Petroleum and Geology)
- Director of BGC/TL Cement
- Director of Land and Property of Baucau district
- Director of Environment of Baucau district
- Representative of Veterans in Baucau district
- Chief of Suco Trilolo, Bahu, Triloka, Kaibada, Bukoli, Garuwai, Wailili
- Local authority
- Trilolo community
- Trololo youth

DATE: 09 May 2014

LOCATION: Suco Kaisidu
Baucau Timor-Leste

OBJECTIVE: Consultation with Community and Youth Group in Suco Trilolo

- **Statement from Kaisidu Community**

1. **Positive feedback from Kaisidu community:**
   - Kaisidu community are 100% ready to welcome the investment and the cement factory in the area
   - The community and youth in Kaisidu, 38 Traditional houses, will not impede the progress towards the development of cement factory and will be working with the GoTL to improve the economic condition of population from as well as other districts

- We appeal to the government to decide a new neighbourhood for our resettlement and that when the development of cement factory begins, we it can generate some benefit to us and our generations
- We appeal to the company to clarify a clear plan for our future livelihood and to coordinate well with the government
- We appeal to the company to establish an agreement with the Government of Timor-Leste

2. Negative feedback from Kaisidu community:

- The community are concerned if the Traditional houses are also included in the development land
- How the government and the stakeholder paying respect to the cultural inheritance
- Clear identification of the development land
- Government should clarify the land with Kaisidu community
- Government and stakeholder should continue socializing with the community

- **Statement from Environmental Department**

Quite often the community expressed their concern about the environmental impact which will affect community who reside in the fabric's surrounding area.

The Director of Environmental responded to this concern by highlighting that the fabrics nowadays are operating in a different system from the old one which tends to emit smog and poses negative impact to the local community. He added that his team had paid a visit to Australia, directly observed the condition of the cement fabric to be established in Timor-Leste and was introduced to this system of new technology used in Australia which doesn't produce smog to a level that is harmful to the nearby community.

- **Statement from Director of Land and Property**

The community also showed their concern about the status of their farmland that will be developed into the fabric site or mining site and how will compensation be decided.

The Director of Land and Property responded to this concern by explaining that the land will have the following situation:

- Abandoned land / state's property
- Heritage land, passed down from the ancestors
- Community's property such as suco's land
- Private property, when there is land certificate
- Dowry property exchange

- **Statement from IPG**

The community also would like to know the quantity of limestone and rock to be mined.

The director of IPG responded that when the mining activity is about to start, the Government and the company will establish an agreement on which mineral to be mined. He added that right now his team is conducting a research or study on the limestone that will be used for the industry. He affirmed that the community should not worry about this or lose any hope because they (government and company) will not cause any damage to people's domestic product.

- **Statement from Baucau District Administrator**

Baucau district Administrator affirmed that the company has an intention to improve community's livelihood and that they (community) should not pay attention to anecdote that the company will destroy Suco Caisido's natural environment. He added that he will keep fighting for community's aspirations and that his team will always visit the community so that they can hear community's concerns and report it to the government for considerations.

- **Statement from Sub District Baucau Administrator**

Sub District Baucau Administrator emphasized that during his visit to Australia, he learned that BGC is a big company in Australia. He added that during the meeting, the company also explained how they are planning to invest in Timor-Leste. He assured the company that that they will provide full support to the company regarding security. The company promised to recruit up to 5000 employee and will follow Australia's system. The company also mentioned that they will not discriminate people who don't have the capacity. Moreover, he stated that every new thing always has pro and cons and that happens in any countries in the world.

- **Statement from the Chief of Police District Commander of Baucau**

To respond to security concern raised during the meeting, the Chief of Police District Commander of Baucau stated that they are ready to provide full security in the designated area and assured that that since many youth will be employed, there will no youth confrontation. He also appealed to the community to ignore the anecdote from those who clearly do not want develop the nation. He emphasized that his team will work together to support the government by supporting the project. He appealed to the community that this is their "battle" and that everyone should take the chance to win it as this will reduce employment rate in the country and improve our economic condition.

- **Statement from Chief of Suco**

This above statement was supported Chief of Suco who stated that the time for development has come whether or not we want it. Likewise, he appealed to the community to ignore any rumors.

- **Statement from the Youth Group**

The youth group also expressed their full support for this project and agreed that it will generate profit to their community by reducing employment rate in Baucau District.

- **Statement from The director of BGC/TL Cement**

Both community and the youth expressed their concern regarding the recruitment and HR

- Assign the right person in the right position

They will also employ people in the following field:

- Labour
- Cleaner
- Security
- Administration
- Construction worker
- carpenter

He also affirmed that government and its counterpart will be working together to reduce employment rate in the country and that they will keep fighting for the community's wellbeing. This will increase the local HR capacity so that they will not rely on other nations' HR.

- **Statement from the government**:
  - Government will always work together with the community when any stakeholders want to invest in the country
  - Government will study the investor's investment process in Timor-Leste
  - Government will work with departments that are relevant with the development of factories such as : Land and Property, Environmental department, Health and Geology

This is the statement from May 9th 2014 meeting with 90% of population from 4 sucos in Kaisidu area.

TL Cement representative

Edmundo Ximenes de Sà

Project: TL Cement EIA

Public Consultation Minutes

PARTICIPANT NAME & ORGANISATION:	DATE:	24 June 2014
- Community of Suco Trilolo	LOCATION:	Suco Trilolo
- Youth group of Suco Trilolo		Baucau Timor-Leste
	OBJECTIVE:	Consultation with Community and Youth Group in Suco Trilolo

TOPIC:

During this meeting, the population of Aldeia Trilolo mentioned that the excavation site covers 10% of community's farmland and 90% of abandoned land. The following vegetation is found in the area close to the shore for jetty: breadfruit, teak, coconut and other vegetation that are primarily found in community's farmland.

RECOMMENDATION:

The community recommended that the government and the company should prioritize the interest of population in Kaisido area, such as the four Aldeias: Kaisido, Lielailesu, Parlamentu, and Osowa. This is the recommendation and information from Trilolo community.

TL Cement representative

Edmundo Ximenes de Sà

WorleyParsons resources & energy

EcoNomics

Project No: 301012-02135

Project: TL Cement EIA

Public Consultation Minutes

PARTICIPANT NAME & ORGANISATION: - Member of Traditional council - Member of Suco council - Member s of GoTL - TL Cement Staff	**DATE:**	16 July 2014
	LOCATION:	Kaisidu Suco Center, Baucau Timor-LESTE
	OBJECTIVE:	To coordinate plan for cultural ceremonial activity

TOPIC:

Prior to the commencement of TL cement construction and production activities, it is important to identify the exact location in order to hold the cultural activity, including Animal slaughter.

The following details must be confirmed prior to the commencement of the construction purposes:

- Plan/venue
- Decision
- License
- Determination of the location
- Cultural activity/ traditional counsel
- Animal to be utilize etc.

Material to be purchased as follows:

- Buffalo
- Goat
- Pig
- Spade (surik)
- Tais Mane (waving cloth for man)
- Tais feto (waving cloth for female)
- Belak (traditional necklace)
- Beetle nut
- Chicken

TL Cement representative

Edmundo Ximenes de Sà

WorleyParsons resources & energy

EcoNomic

PARTICIPANT NAME & ORGANISATION:	DATE:	14 October 2014
- King of Suco Ostico	LOCATION:	Suco Ostico Baucau Timor-Leste
	OBJECTIVE:	Consultation with King of Suco Ostico

TOPIC:

During a chat with the king of Ostico, he stated that the area of Wailacama, from where the clay sample was extracted for laboratory analysis, is a part of suco Ostico. During the Indonesian time, the wailacama area was under suco Tasi Vemasse Vila, but it has been added back into Aldeia Baha Mori Suco Ostico. The population is still under the administration of Suku Tasi Vemasse Vila, but historically they are still maintained as part of Ostico.

In the 4 areas where the clays are, the majority of abandoned land (98%) belongs to the state while the remaining belongs to the population who are using it as farmland, coconut and teak plantation. The community is excited that the cement company will create employment opportunity which will improve their livelihood and economic condition in Baucau District. Therefore, many youth support the government's plan to establish cement industry in the designated areas.

TL Cement representative

Edmundo Ximenes de Sà

Public Consultation Minutes

PARTICIPANT NAME & ORGANISATION:	DATE:	10 November 2014
- Community from Suco Bucoli Aldeia Macadai, Lulihen	LOCATION:	Bucoli Baucau Timor-Leste
- The landowners Mr. Virgillio G Antonio, Mr.Oscar Da Silva, Mr. José Da Silva	OBJECTIVE:	Consultation with Community and landowners

TOPIC:

The excavation sites, AD - 1- AD-7 –MI – 3, used to be an area where they farmed; there are no trees planted in the area. They only established old fences around the area. They also declared that there are many abandoned land, and 5% of them belongs to the community while the rest to the state. They expressed their concern on how the government and the company are going to value their heritage to avoid any conflict. Community are happy that there will be an industry to be established in Baucau municipality for the first time. It will be advantageous to the community and will benefit the livelihood of the community and the future generation.

TL Cement representative

Edmundo Ximenes de Sà

Project No: 301012-02135
Project: TL Cement EIA

OBSERVATION

BY:	**DATE:**
- TL Cement	**LOCATION:** Bucoli Baucau Timor-Leste
	OBJECTIVE: Consultation with Community and landowners

TOPIC:

Based on the information we have been capturing from seven sucos: Baha-hu, Trilo-lo, Waili-li, Gari-uai, Bucoli, Caiba-da, and Triloka, many populations frequently concern with Government and the private sector (company)'s mechanism to manage employment when the project is in operation.

To respond to population's concern, we told them that we always explain this matter to the community and we have done socialization with all Sucos and Aldeias about this project and that in the future we will still maintain our work with government representative in the District, Sub-district or Suco that are involved in this project. Quite often, we explained to all the community that when we conduct the recruitment, it will be based on their capacity and skill and that they will participate in training in the relevant positions ranging from technical to non-technical such as Administration.

TL Cement representative

Edmundo Ximenes de Sà

Appendix 8 Community Meeting Minutes

1. Stakeholder Consultation - Lao Hamutuk

Date: 07/01/2016, Time: 09:10

Venue: Lao Hamutuk's Office, Bebora, Dili

Attendees:

- Adilson da Costa (Researcher in Governance and Economy)
- Niall Almond (Researcher in Economic and Natural resources)

WPTL:

- Joana Belo
- Chris Serjak

Comment:

- Lao Hamutuk is interested in many sectors and considers Environment as cross-cutting issues.
- The EIA for Suai Supply Base (SSB) was not completed especially due to no public consultation taken place.

Mitigation:

- Hope WorleyParsons Timor-Leste (WPTL) conducts significant public consultation, not only to socialize project but also to understand the socio economic impact.
- Need mitigation and compensation for affected /displaced persons, eg. Displacement and compensation: Documenting impact of cash compensation on Suai population especially for woman. Proponent should provide housing for displaced persons. Cash compensation is not adequate/suitable or sustainable.
- Public consultation required by category A project GoTL has focused on socialization. Not consultation especially with vulnerable and affected people.
- Need to provide specialty on number and type of Jobs available for local community
- Benefit need to be accrued locally and not offshored to foreign investors, eg. Suai Airport Project used imported Indonesia labor
- Support renewable energy and solar component
- Local community bears brunt of AQ impact from power plant
- Increased activity from traffic and operations
- Land right are a complicated issue
- Land conflict in Timor-Leste has many problems for relocation. Suai Communities unable to be settle
- Need more robust and better implemented plan than SSB.
- Importance of place for livelihoods and destroy communities and families
- Multiyear monitoring and ongoing compensation or benefit from project

- Traffic, safety, pollution, noise peacefulness training of drivers, signage awareness campaign
- Not used to large traffic, night operations?
- Water chemical concentration.
- Concern that only small subset of population represented as per list of attendance most people attended the meeting have the same sure name(Belo)
- Provide Tetum translation of EIS, (Need to respond)
- Need to document /disclose signature, eg. social impact due to lack of land Law

Question and Answer (QA)

1. Type /method used for Relocation/Displacement Management Plan
   Answer: Out of WPTL Scope of Work
2. Environmental impact assessment for coal generated power?
   Answer: Noted but no answer
3. Waste management Plan
   Answer: Solid and liquid waste are treated before disposal
4. Land and Mining Law not yet adopted how would project be implementing without laws?
   Answer: Noted but no answer
5. Power supply is big Question: Why not use national grid? Undermines local source system which had goal of attracting investment capacity of 250 WM at demand of 40MW increased usage is benefit to GoTL
   Answer:
6. Coal fired plant has impacts on environmental as well, need justification
   Answer: due to the low
7. Groundwater Management Plan?
   Answer: See Groundwater Management Plan

8. Stakeholder Consultation - Foundação Haburas

Date: 07/01/2016, Time: 14:30

Venue: Haburas's Office

Attendees:

- Virgilio Guterres (Executive Director)
- Antonio , Vice Executive Director
- Domingos, Rede Ba Rai (advocate Officer)
- Pedro Viera (Advocate Researcher)

WPTL:

- Joana Belo
- Francisco Neto

Mitigation:

- To include community in the decision making process as they need to understand the short, medium and long term impacts of the project and mitigation measures, as well as the advantages/benefit to community.
- Cultural Heritage issues need to be clarified.
- Mining will affect the ground water. WPTL need to come up with a proper Ground water management plan.
- Environmental impact assessment for coal generated power and if substantial, “polluters pay” approach can be applied.
- The history of Baucau water run from Luca , Viqueque, as described by Lisa Palmer Mok, on her book “

Question and Answer (QA):

1. The method used for the relocation / displacement plan.
   Answer: out of WPTL scope of work
2. What is the mitigation to the ground water distraction by the mining in Caisido area.
3. Answer: See Ground water management plan.
4. What is the impact assessment for the energy production from Coal?
   Answer: Several stations for ambient air quality will be set up around the project site and air quality will be monitored every 6 months.
5. What is the pollution management like?
   Answer: The Pollution risk will be low however; several stations will be created around the mine site and it will be reviewed every 6 months.

9. Stakeholder Consultation – Direcção Nacional Controla Qualidade Agua (DNCQA)

Date: 13/01/2016, Time: 14:00

Venue: DNCQA’s Office

Attendees:

- Gregorio de Araujo, Director of DNWQC
- Francisco Xavier, technical Staff Hydrology

WPTL:

- Joana Belo
- Chris Serjak

Comment:

1. There is a need for good mitigation measures especially compensation for affected /displaced persons, eg. Documenting impact of cash compensation on Suai population especially for woman. Proponent should not compensate displaced persons with cash as cash compensation is not adequate, suitable or sustainable.
2. Benefit need to be accrued locally and not offshored to foreign investors, eg. Suai Airport Project used imported Indonesia labor.
3. Increased activity from traffic and operations, thus require best approach to dust and noise management.
4. Land right is a complicated issue in Timor-Leste. Unsolved land conflicts in Timor-Leste caused by the lack of land law has resulted in conflict especially relocation process eg. Suai communities that have been relocated by the Tasi Mane Project so far are unable to settle.
5. Water chemical concentration.
6. Waste management.
7. Only small subset of population is represented on public consultation, eg, most of people attended the first consultation has the same surname (in Timor same surname means related to each other).
8. Environmental impact assessment for coal generated power need to be conducted
9. Ground water will be affected by mining activities therefore, the ground water management plan need to be conducted as well as the chance that mining could hit/intersect with water conduit in karst limestone formation (impact on the local hydrology).
10. Dust and Noise management
11. Concern the water supply will be insufficient as 36.4 litter required per second

Question and Answer (QA):

10. Stakeholder Consultation - Luta Hamutuk (LH)

Date: 13/01/2016, Time: 10:00

Venue: LH's Office

Attendees:

LH:

1. Jose Alves da Costa, Coordinator of Community Network and Initiatives (CNI)
2. Jaime Ribeiro, Staff CNI

WPTL:

1. Joana Belo
2. Francisco Neto

Comment:

- LH appreciates WPTL Initiatives to involve NGO's in listen to their ideas.
- TL Cement activities will benefited Timor-Leste's Economy
- Make well used of Natural resources

Mitigations:

1. Study on dust and its mitigation measure
2. Government plan on resettlement/relocation plan
3. Strategy to maintain the current farming activities in the presence of industry
4. Provide training for local farmers on animal husbandry to provide standardize meat production to project cafeteria and local market
5. TL cement to help improve the livelihood of locals through vivid contribution towards health and education sector
6. Company should identify working age target group for training

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Appendix 9 Community Questionnaire

INTERVIEW QUESTIONNAIRE

Ref: -

Introduction: Explain purpose of Interview

INTERVIEW PARTICIPANT		
	Date and time of interview:	
1.1	Participant name:	
1.2	Position	
1.3	Aldeia / Suco/ Post administrative	
1.4	Telephone number:	
1.5	How long have you been living here:	

KNOWLEDGE OF THE PROJECT		
2.1	Are aware of the Project?	
2.2	If yes, how did you get the information and when?	
2.3	What do you know about the project?	
COMMUNITY RESPONSE		
3.1	Do you agree? Why	
3.2	You don't Agree? Why	
3.3	Any idea what Government/Company should do to prevent any destructions /problems raised?	

YOUR HOPE FOR THE PROJECT		
4.3	What is your expectation towards the project?	
4.14	Any other closing remarks / comments?	