

Report No: ACS18457 v2

Democratic Republic of Timor-Leste

Oecusse Economic and Trade potential

VOLUME I: OVERVIEW OF OECUSSE TODAY & LONG TERM POTENTIAL
VOLUME II: DETAILED ANALYSIS AND BACKGROUND DOCUMENTS

May 2016

GTC02

EAST ASIA AND PACIFIC



Oecusse ZEESM

An assessment of Oecusse's current state and its potential

VOLUME II – DETAILED ANALYSIS OF OECUSSE



Map Source: 2 F. Durand, Internet



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VOLUME II: DETAILED ANALYSIS OF OECUSSE

Volume II presents a detailed chapter on each of the five areas assessed in depth for this report, and summarized in Volume I, chapters 1 and 2. Chapter 3 details Oecusse's living standards across a range of metrics. In Chapter 4 full analysis is provided on Oecusse's agricultural situation today and its prospect for the future. This also includes estimates, costings, and project plans for the OADP. Chapter 5 details challenges of overland transport between Oecusse and Dili and the need for a land corridor. Finally, Chapter 6 provides detailed analysis of Oecusse's migration and remittances flows. A separate background report is available on tourism that seeks to place Oecusse's prospects for tourism development in the broader context of Timor-Leste's tourism and the lessons of tourism in post-conflict societies from around the world.

CHAPTER 3: Living standards

3.1 Introduction

The purpose of this chapter is to compare living standards in Oecusse with its immediate neighbors in order to identify areas of particular advantage or disadvantage. One comparator is the Indonesian province of Nusa Tenggara Timur (NTT), located in the eastern part of the Lesser Sunda Islands. Another comparator is the nation of Timor-Leste as a whole. The analysis considers the following dimensions of wellbeing: (i) population; (ii) education; (iii) employment; (iv) housing; (v) wealth; (vi) agriculture; (vii) health; (viii) crime and safety; (ix) social networks; and (x) facilities and social security.

The data used in the report comes from the following sources: (i) 2012 Timor-Leste Household Income and Expenditure Survey (2012 HIES)⁴² (ii) 2010 Census in Indonesia (SUSENAS); (iii) PNDS-REP⁴³ quantitative baseline data; and (iv) PNDS-REP qualitative baseline data focusing on the village of Abani, located at the most southern border of Oecusse district with Indonesian West Timor.

The rest of this chapter summarizes the key findings of the comparative analysis in Section 2, before providing more detail for each dimension of wellbeing in Section 3.

3.2 Key findings

The analysis confirms that Oecusse is a lagging region in a lagging country, with particular disadvantages in education attainment, access to infrastructure and sanitation, and the share of population in the working age. However, there are more people employed in Oecusse, there is better access to healthcare, and there is stronger social cohesion than in the rest of the country.

- Oecusse has a younger population compared to the rest of Timor-Leste and NTT, but has a smaller working population aged between 15-49 years.

⁴² The 2011-12 Timor-Leste Household income and Expenditure Survey (HIES) was designed to be representative at the national level as well as in the district of Oecusse.

⁴³ The PNDS-REP survey of living standards conducted by the Ministry of State Administration with World Bank support in 2014. It was a baseline survey to allow an assessment of the impact of PNDS, a community driven development program based on block grants and facilitated community participation.

- Though a higher proportion of respondents report receiving no education in NTT, the rate of literacy is significantly higher in the NTT compared to Oecusse and Timor-Leste proper.
- Oecusse is a predominantly agriculture-based economy with over five times the share of people in Oecusse owning or leasing land for agriculture use as in the whole country.
- Oecusse has a higher employment rate than the rest of the country and the NTT.
- Construction materials for roofs and walls of houses are more temporary and unstable, made of palm leaves, rather than brick and/or iron which is more prevalent in the NTT.
- Access to electricity is very limited in Oecusse compared to NTT, with a majority of households dependent on kerosene for lighting.
- A greater proportion of households still openly defecate in Oecusse, compared to Timor-Leste proper and NTT. A significantly larger proportion of households in NTT have a toilet with a septic tank than Oecusse.
- Ownership of most durable goods excluding televisions is very limited in Oecusse compared to the country and NTT.
- Households in Oecusse are more positive about household and general community economic situation compared to Timor-Leste proper.
- Households in Oecusse have better access to healthcare than the rest of the country, and even NTT. Clinics are the most commonly used facility, and all households have sought medical attention when a household member is seriously unwell.
- Crime levels are lower in Oecusse, though the frequency of conflict is higher than Timor-Leste proper.
- Greater trust and willingness to help neighbors exists in Oecusse compared to Timor-Leste proper.
- Higher participation in social groups and events such as religious and traditional festivals in Oecusse compared to Timor-Leste proper.
- Higher percentage of households satisfied with education and school facilities in Oecusse than Timor-Leste proper.
- Overwhelming dissatisfaction with the quality of roads in Oecusse, more than Timor-Leste proper.

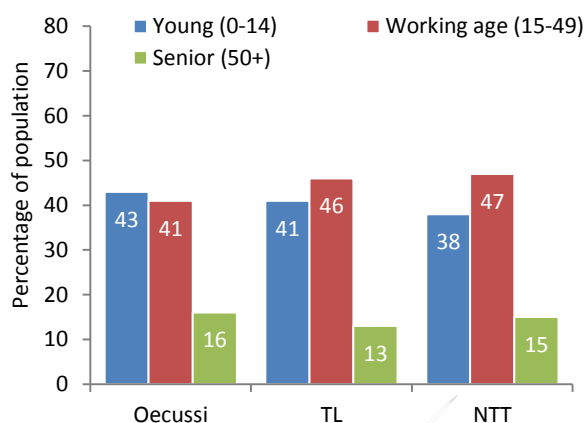
3.3 Analysis of specific dimensions of wellbeing

Where survey data exists, comparisons are made with both NTT and Timor-Leste proper. References are also made to Ambani, a suku in the west of Oecusse that was visited as part of the PNDS-REP qualitative survey.

3.3.1 Population

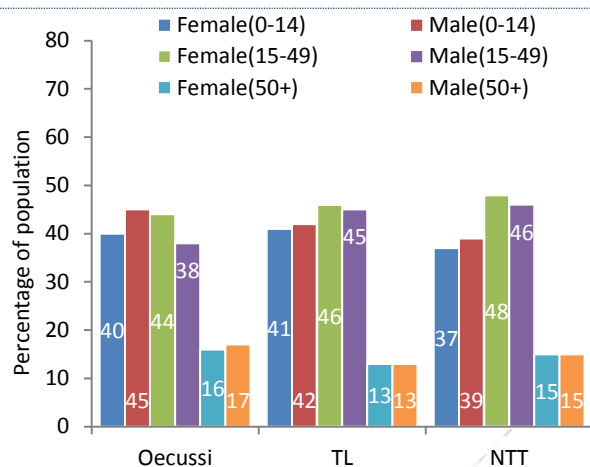
Figure 3.1: Age distribution

Figure 3.1 below compares the age distribution between the young (0-14 years), working age (15-49), and seniors (50 years and above) in Oecusse, nationally in Timor-Leste, and NTT. Oecusse has more young people between 0-14 years than NTT and Timor-Leste proper. NTT has a larger working age population (47%), aged between 14-49 years, compared to Oecusse (41%), and Timor-Leste proper (41%). The proportion of the population aged 50 years and above is higher in Oecusse (16%), than in the rest of Timor-Leste (13%).



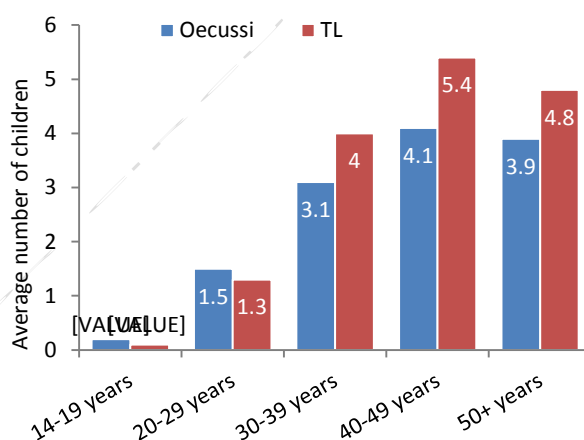
Source: Timor HIES 2012, SUSENAS 2010

Figure 3.2: Population by gender and age group



Source: Timor HIES 2012, SUSENAS 2010

Figure 3.3: Average number of children born per 14+ years old women



Source: Timor HIES 2012, SUSENAS 2010

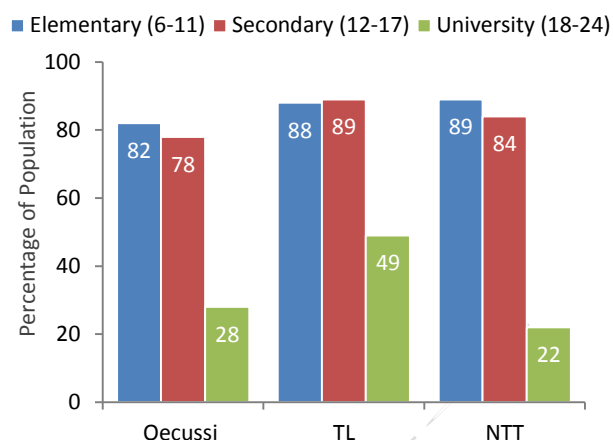
Error! Reference source not found. displays the composition of the male and female population in three different age groups, young (0-14 years), working age (15-49 years), and old (50+). It is interesting to note that while the ratio between the genders is close to equal in all regions, in Oecusse, the proportion of females aged 15-49 years (44%), is significantly higher than males in the same age group (38%). This divergence is not observed at the national level.

Figure 3.3 shows that although women in Oecusse start having children slightly earlier than the national average, they on average give birth to fewer children than at the national level.

3.3.2 Education

Figure 3.4: School attendance (6-24 years)

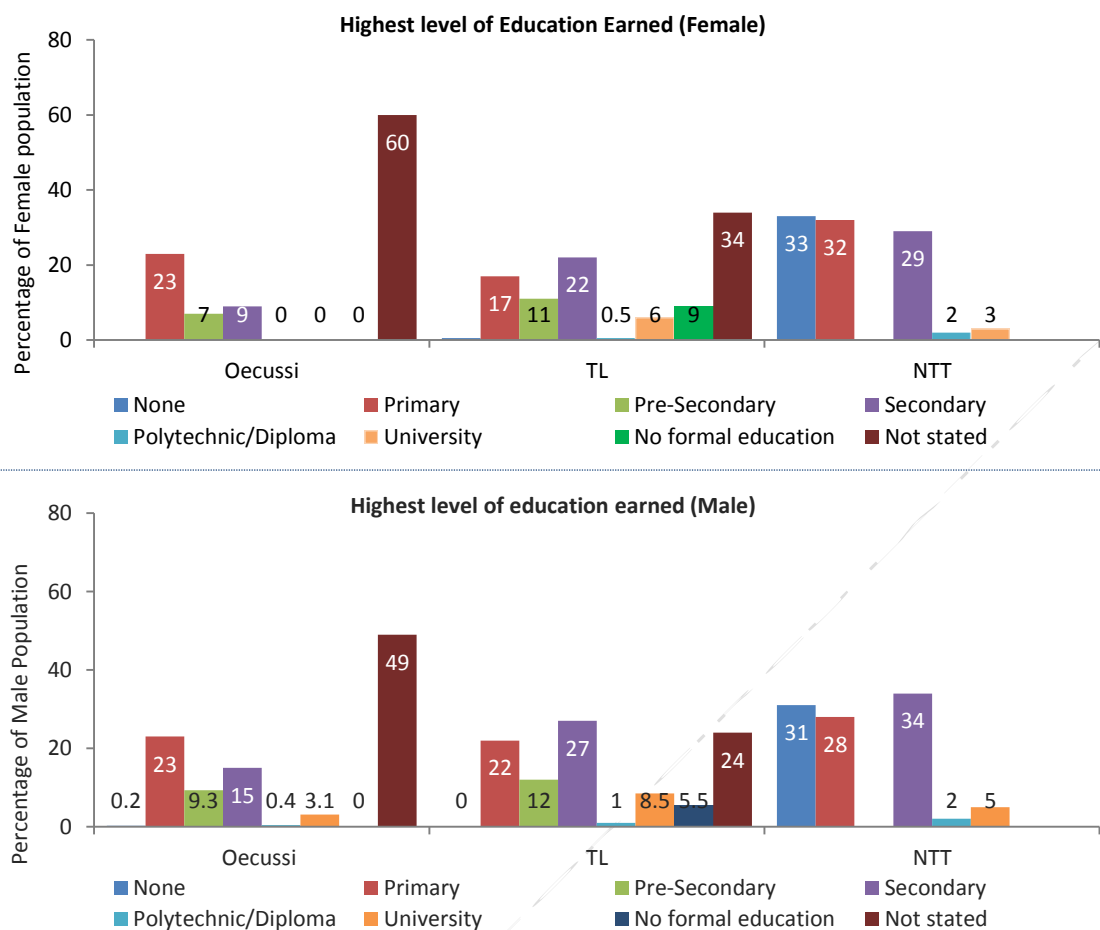
The percentage of primary school aged population (6-11 years) attending school in Oecusse (82%), is less than the national average in Timor-Leste of 88%, and is also less than the attendance in the NTT (89%). A similar representation occurs for secondary school aged children, with 78% of the population attending school in Oecusse, while the national average in Timor-Leste is 89% and attendance in the NTT is 84%. However, in the university aged group (18-24 years), Oecusse has a higher proportion of students attending school (28%), than the NTT (22%). Though this still falls short of the national average in Timor-Leste, which reports a significant 49% of the 18-24 years age group attending school. In terms of non-attendance, 14% of households in Oecusse have at least one child aged 6-12 years that do not attend school, while households in the NTT only report 1% nonattendance rate in the same age group. The national average in Timor-Leste is less than Oecusse, with only 9% of households reporting at least one child aged 6-12 years who do not attend school.



Source: Timor HIES 2012, SUSENAS 2010

Figure 3.5 shows that a higher proportion of males and females have completed their primary education, secondary education and university degrees in the NTT as compared to Oecusse. While more of the population in the NTT have achieved higher levels of education than in Oecusse, a significant percentage have also received no education in the NTT. While the percentage of the sample aged 18 years and above reporting no education in Oecusse is nil, for both males and females, it is a significant 31% for males and 33% for females in the NTT, as displayed in Figure 3.5. Nationally in Timor-Leste, 0% of the population report having received no education. However, more than half of the population in Oecusse (54.5%), while almost one-third (29%) of Timor-Leste national did not state their level of education. While primary education amongst males and females is fairly similar in Oecusse compared to the rest of the country, secondary and university education is significantly lower. Only 15% of males and 9% of females have completed secondary education in Oecusse; and 3% of males and nil females have earned a university degree. Nationally, 37% of males and 22% of females have completed their secondary degree, while 9% of males and 6% of females have earned a university degree.

Figure 3.5: Highest level of education earned



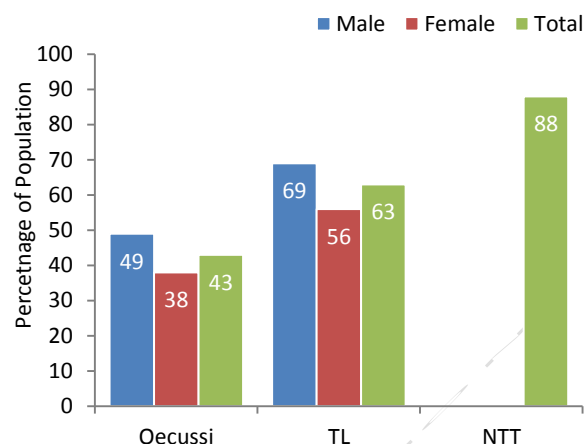
Source: Timor HIES 2012, SUSENAS 2010

However, while attendance rates at the highest level of education are somewhat comparable between Oecusse and the rest of Timor-Leste, and also with the NTT, literacy rates in Figure 3.6 display the

Figure 3.6: Literacy rate (>18 years)

weaknesses in the education system in Timor-Leste, and particularly in Oecusse.

Literacy rates for males and females in Oecusse are 49% and 38% respectively, while the national average is 69% for males and 56% for females. Comparing overall literacy rates, Oecusse falls short at 43%, when compared to all of Timor-Leste (63%). In Abani, low literacy rates were prevalent, and the research team found that a primary reason for the lack of literacy is that children are considered an important part of the workforce and are expected to help their parents in the farm instead of attending school. Non-governmental organizations such as Science of Life 24/7, have opened training centers in Abani and provide English courses to the disadvantaged rural community. The overall literacy rate in the NTT is an impressive 88%, which is significant to note given the disparity in the proportion of the population who have received no education discussed above.



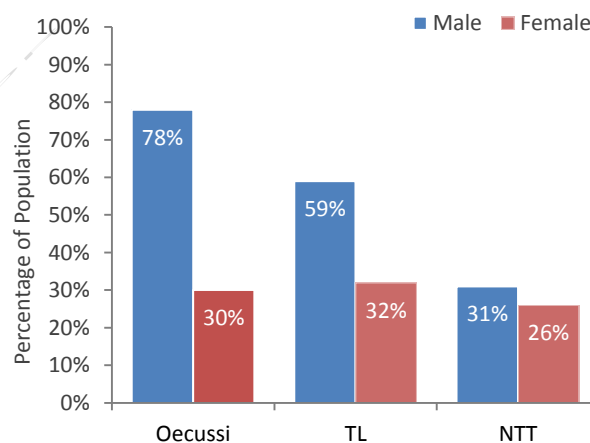
Source: Timor HIES 2012, SUSENAS 2010

3.3.3 Employment

The major occupations in Timor-Leste, including Oecusse, and in the NTT are in agriculture, which also includes fishing.

In Oecusse, 78% of males and 30% of females are employed in the agricultural sector. This is significantly higher than the NTT, where 31% of males and 26% of females engage in agricultural occupations, and the rest of Timor-Leste (59% males, 32% females.) [Figure 3.7] A significant percentage of females in Oecusse (58%) and overall, in Timor-Leste (53%), are also engaged in elementary occupations which include household work. In Abani, a majority of the population farmed for a living even if they were engaged in salaried work such as being a civil servant or a member of the village council. Small vegetable gardens can be seen in the yard of almost every household, and the community in Abani produced a variety of crops such as cassava, sweet potatoes, corn, and vegetable. However, the sector is still largely subsistence-based and crops are grown for household consumption or livestock feeding.

Figure 3.7: Population engaged in agriculture by gender

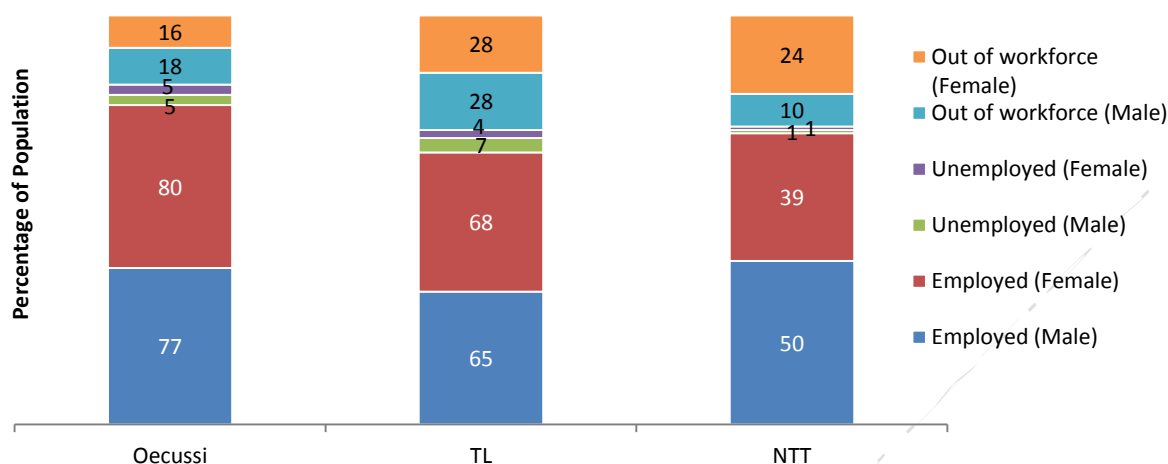


Source: Timor HIES 2012, SUSENAS 2010

Figure 3.8 displays the labor force status of individuals 15 years and older, in the week before the implementation of the census in each respective region. **Oecusse reports a significantly larger employment rate for both males (77%) and females (80%),** compared to the national average of 65% for males and 68% for females. The NTT has a far lower employment rate, at 50% for males and only 39% for females. Unemployment rates are higher in Oecusse (5%), compared to the NTT (1%). Oecusse has a lower unemployment rate for males (5%), than the national male unemployment rate of 7%. The female out of

workforce population is smallest in Oecusse, at 16%, compared to nationally (28%), and in the NTT (24%), suggesting fewer homemakers in Oecusse.

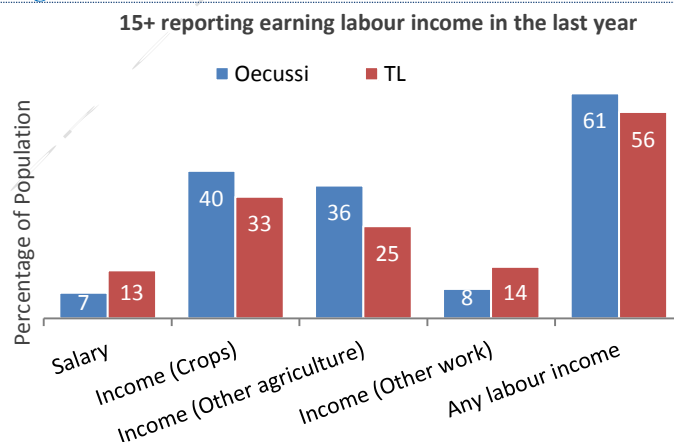
Figure 3.8: Labor force status in the last seven days (15+years)



Source: Timor HIES 2012, SUSENAS 2010

Figure 3.9 displays the sources of labor income earned by individuals 15 years and older in Oecusse, and overall in Timor-Leste. **Individuals in Oecusse derive most of their income from agricultural practices, Oecusse being a predominantly agricultural economy.** 40% of individuals in Oecusse earn income from crops, compared to the national average of 33%. Similarly, 36% of individuals in Oecusse earn income from other agricultural work compared to the national average of 25%. Salaried income and income from other work is lower than the national figures.

Figure 3.9: Sources of income



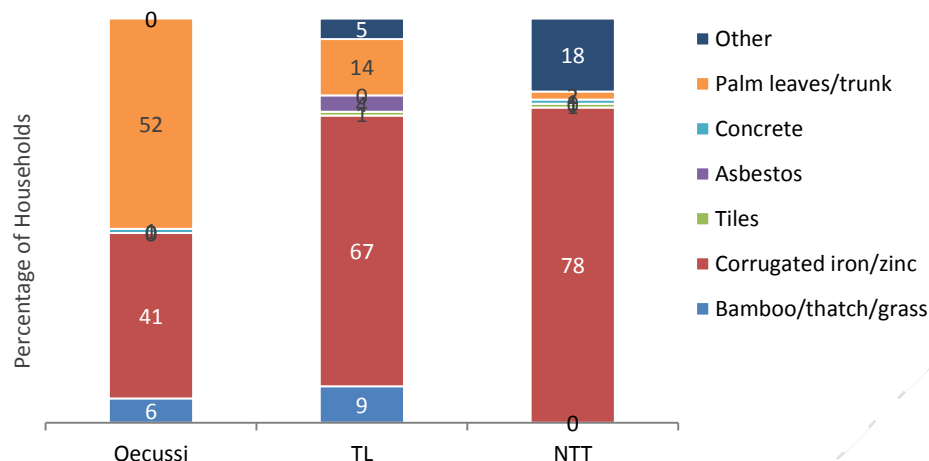
Source: Timor HIES 2012

3.3.4 Housing

Materials used to construct houses in Oecusse are of a more temporary and less stable nature. Figure 3.10 shows that a majority of roofs are built from palm leaves (52%) in Oecusse, compared to Timor-Leste nationally (14%), and the NTT (2%). Furthermore, only 41% of the population in Oecusse have roofs made of corrugated iron and zinc, compared to the NTT which reports a significant 78% of households with iron roofs. In Abani, most houses were constructed using locally sourced material such as bamboo, wood, and grass. These materials are unstable and impermanent, making houses more vulnerable to harsh climatic conditions. Timor-Leste nationally reports 67% of households with an iron roof, which is still significantly higher than in Oecusse. Similarly, Figure 3.11 displays the various construction materials used to build the walls of houses which include concrete or brick, wood, bamboo, corrugated iron, clay, palm trunk, rock or other materials. While 34% of Timor-Leste and 33% of the NTT have walls made of concrete or brick, only

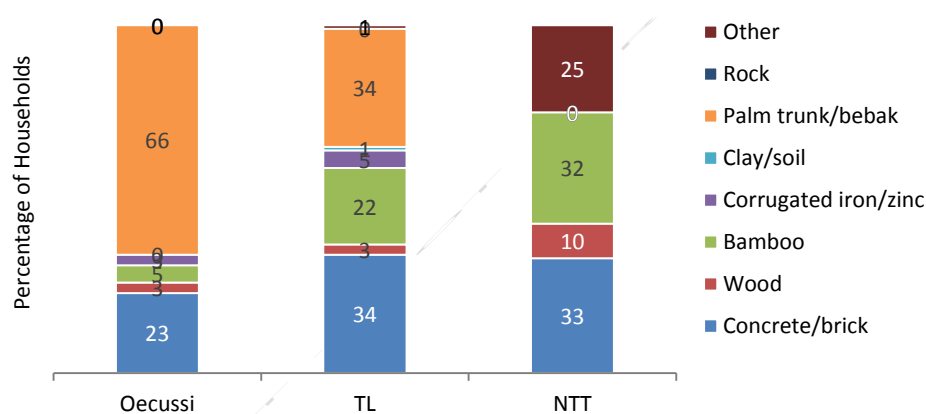
23% of houses in Oecusse have brick or concrete walls. A significant percentage of houses in Oecusse have palm trunk walls (66%), compared to the national average of 14%. Nil houses in the NTT report having walls made from palm trunk.

Figure 3.10: Construction material of roofs



Source: Timor HIES 2012, SUSENAS 2010

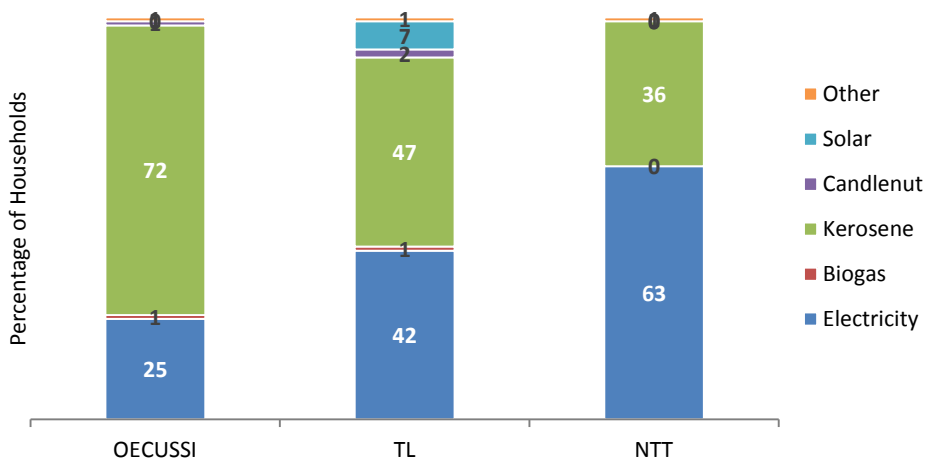
Figure 3.11: Construction material of walls



Source: Timor HIES 2012, SUSENAS 2010

Almost three-fourths (72%) of the population of Oecusse are still dependent on kerosene as a source of light, as shown in Figure 3.12. In comparison, only 47% of Timor-Leste nationally use kerosene as a light source, and an even smaller percentage—36%—continue to use kerosene in the NTT. Conversely, 63% of the NTT use electricity, while only one-fourth of Oecusse have electricity in their homes. This is still much lower than the national average of 42%. In Abani, electricity only reaches the town center, but only for 6 hours during the night. When the qualitative research was being conducted in Abani in June 2014, there were ongoing government projects to expand the existing coverage of electricity to other parts of the suku, beyond the town center. Additionally, many who live further away from the town center in Abani use solar panels donated by the government.

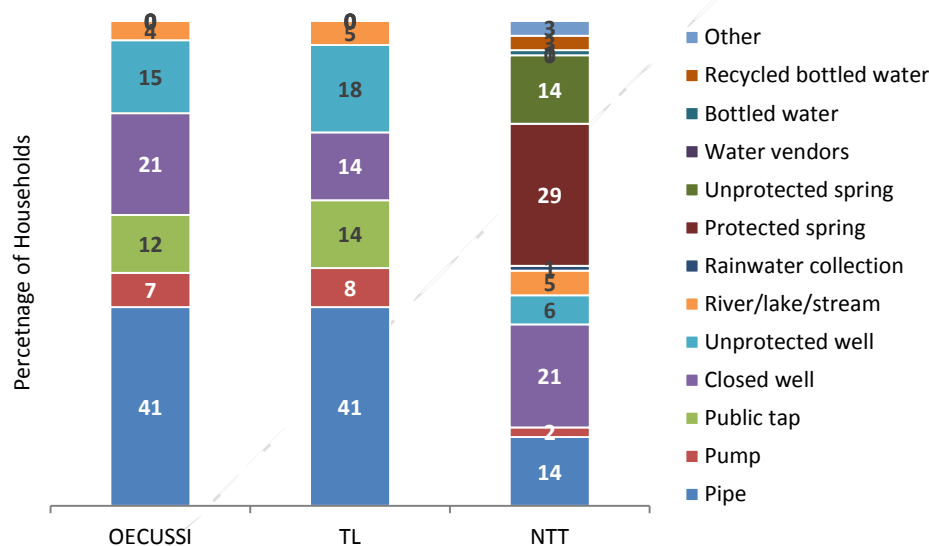
Figure 3.12: Sources of light



Source: Timor HIES 2012, SUSENAS 2010

The majority of households in Oecusse, source water from a pipe (41%) and closed wells (21%), whereas the large part of NTT's water is sourced from protected springs (29%), as seen in Figure 3.13. Closed wells are also a primary water source in the NTT (21%). Additional water sources used in Oecusse and in Timor-Leste are unprotected wells and public taps.

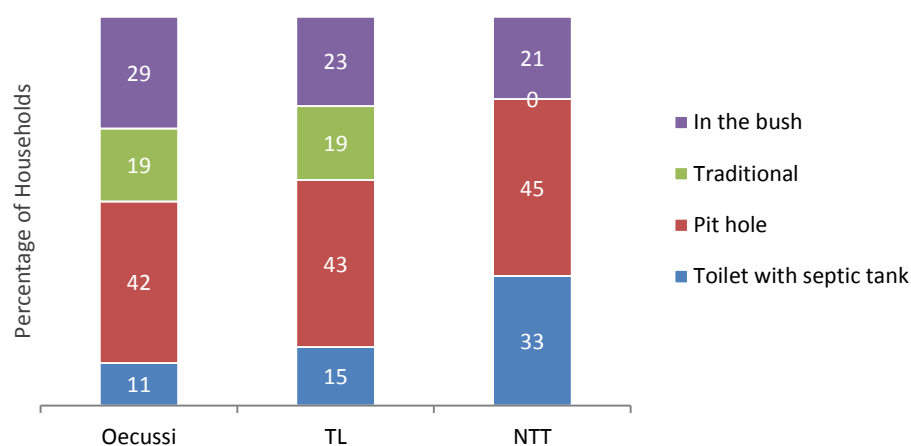
Figure 3.13: Water Sources



Source: Timor HIES 2012, SUSENAS 2010

The majority of Timor-Leste (43%), including Oecusse (42%), and the NTT (45%) use pit holes as their primary source of sanitation, as shown in Figure 3.14. A significantly larger proportion of households have a toilet with a septic tank in the NTT (33%) than in Oecusse (11%). Nationally, 15% of households in Timor-Leste have access to a toilet with a septic tank. Prevalence of using a bush as a toilet is higher in Oecusse (29%) than in all of Timor-Leste (23%), or the NTT (21%). In Abani, a majority of the community practiced open defecation.

Figure 3.14: Access to sanitation

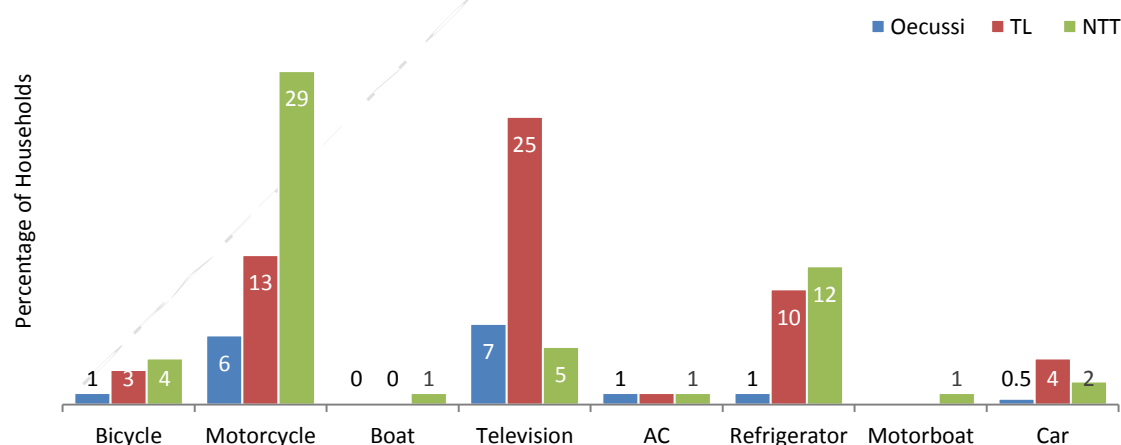


Source: Timor HIES 2012, SUSENAS 2010

3.3.5 Wealth

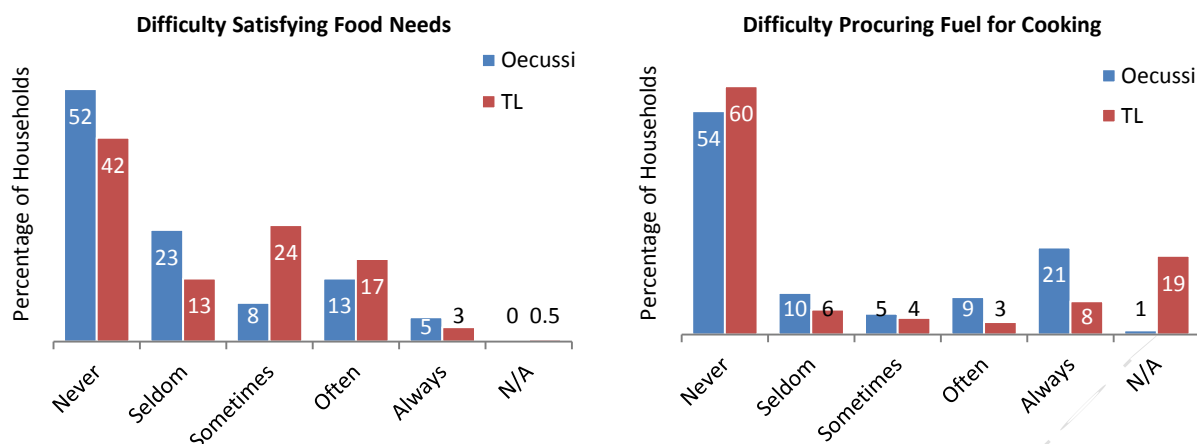
Ownership of durable goods such as bicycles, motorcycles, boats, televisions, air conditioners, refrigerators, motorboats and cars were all lower in Oecusse compared to Timor-Leste nationally, and also to the NTT as shown in Figure 3.15. Particularly striking are the differences in ownership of motorcycles, owned by 6% of the population in Oecusse, 13% nationally in Timor-Leste, and a significantly higher 29% in the NTT. Similarly, while only 1% of the population in Oecusse own a refrigerator, 10% own a refrigerator nationally, and 12% in the NTT. The only good that has a higher proportion of ownership in Oecusse when compared to the NTT are televisions, at 7% and 5% respectively. Nationally, 25% of Timorese households own a television.

Figure 3.15: Ownership of durable goods



Source: Timor HIES 2012, SUSENAS 2010

Figure 3.16: Households' difficulty in satisfying food needs and procuring fuel for cooking (%)

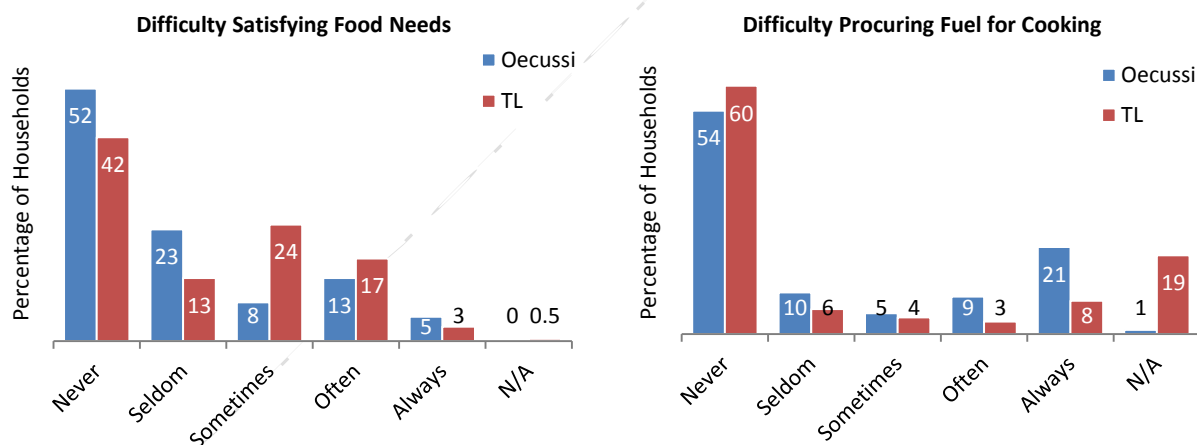


Source: Timor HIES 2012

Source: Timor HIES 2012

displays the difficulty households have in satisfying daily food needs and in procuring fuel for cooking. While a greater percentage of households in Oecusse stated that they always had difficulties in procuring food (5%) and fuel (21%) compared to the national average of 2% and 8% respectively, a higher percentage of households in Oecusse also stated the converse. **52% of households in Oecusse stated that they never had difficulties in satisfying food needs compared to the national average of 42%**, which can be attributed to the significantly larger population (54.5%) engaged in agriculture in Oecusse compared the rest of the country (45.5%).

Figure 3.16: Households' difficulty in satisfying food needs and procuring fuel for cooking (%)

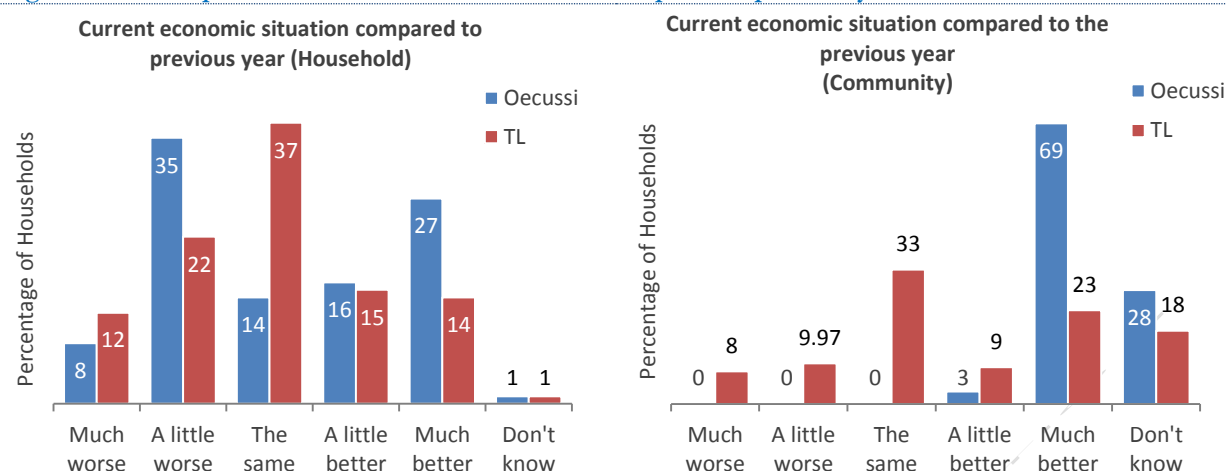


Source: Timor HIES 2012

Source: Timor HIES 2012

In general, while a greater proportion of households in Oecusse felt that their economic situation had worsened by a little (35%), as compared to the national average of 22%, 27% of households in Oecusse also felt that their economic situation was much better compared to the previous year, which is significantly higher than the national average of 14%. Additionally as shown in the figure below, 69% of households in Oecusse feel that the current economic situation in their community is much better than the previous year, compared to Timor-Leste nationally at 23%. **Both at the households and community level, respondents in Oecusse are overall most positive about the economic situation compared to the rest of the country.**

Figure 3.17: Perception of current economic situation compared to previous year



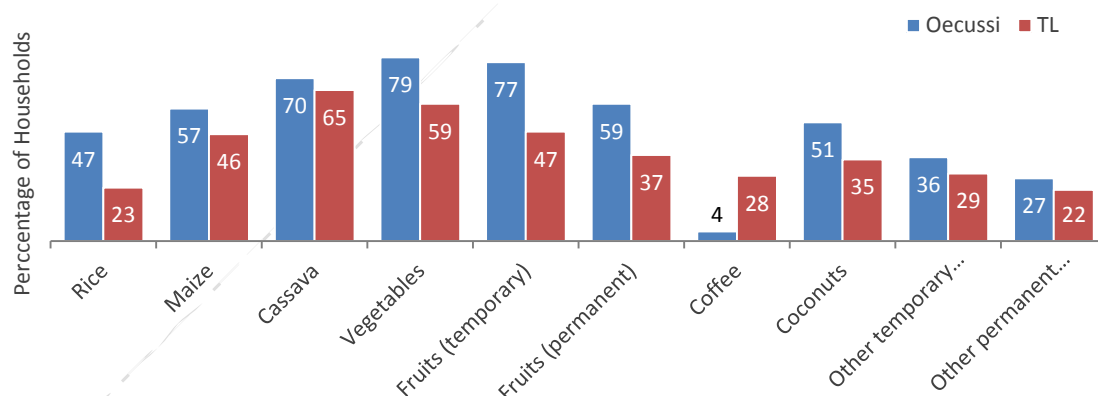
Source: Timor HIES 2012

Source: Timor HIES 2012

3.3.6 Agriculture

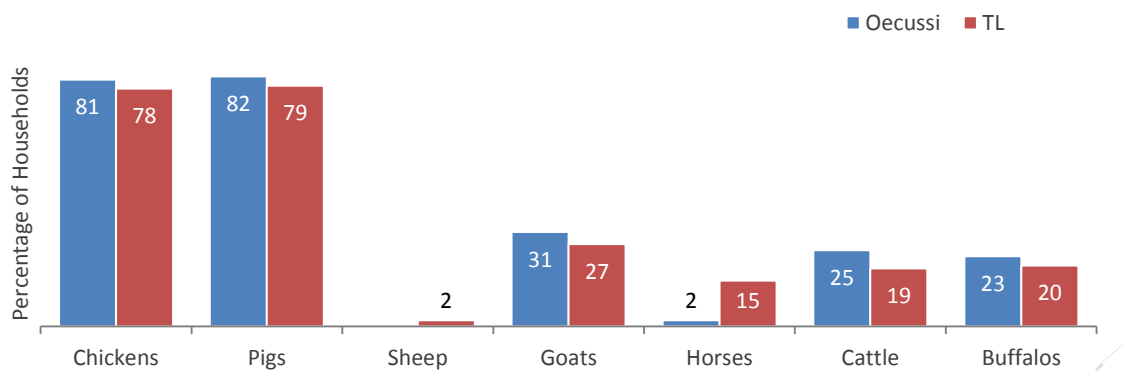
As mentioned earlier in the employment section, Oecusse is a predominantly agriculture based economy. **91% of the population in Oecusse either own or lease land for agriculture, while nationally in Timor-Leste only 16% of the population own or lease land specifically for agricultural purposes.** Figure 3.18 displays the prevalence of different crops in Oecusse and nationally in Timor-Leste. In all cases, apart from coffee, a larger percentage of households in Oecusse grow each crop in the figure below than the national average. Similarly, livestock is owned more predominantly in Oecusse, than nationally in Timor-Leste, apart from horses, as shown in Figure 3.19.

Figure 3.18: Types of crops grown (% of households)



Source: Timor HIES 2012

Figure 3.19: Types of livestock owned (% of households)



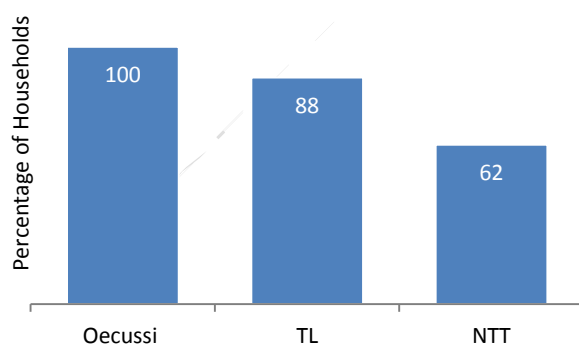
Source: Timor HIES 2012

3.3.7 Health

Households in Oecusse appear to be receiving adequate healthcare services compared to the rest of the country and the NTT. Only 0.4% of households reported a member seriously ill in the last 12 months in Oecusse, while 4% of households reported the same nationwide in Timor-Leste. The graph below shows the percentage of households that sought medical attention when a member had a serious illness in Oecusse, Timor national, and the NTT. 100% of households in Oecusse sought medical attention when a member had a serious illness, compared to 88% nationally and 62% in the NTT.

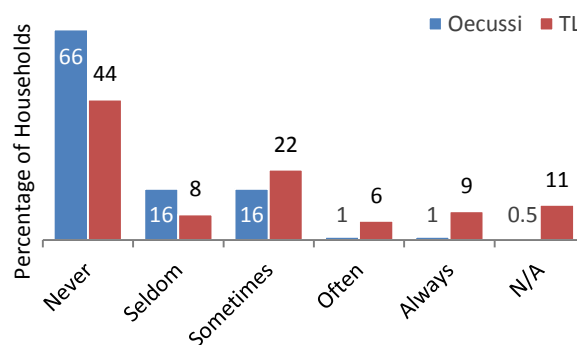
Furthermore, 66% of households in Oecusse never had difficulty satisfying healthcare needs, compared to 44% nationally, as shown in the figure below. Only 16% in Oecusse had difficulty satisfying healthcare needs sometimes, compared to the national average of 22%. 1% in Oecusse always had difficulty satisfying healthcare needs, while 9% had nationally had the difficulty doing the same. In Abani, the suku had two health clinics located in Haemnanu and Passabe, and a maternity clinic in Passabe staffed by nurses, doctors, and midwives. Many interviewees had visited these facilities when they were in need of healthcare treatment.

Figure 3.20: Households that sought medical attention when a member had serious illness (%)



Source: Timor HIES 2012, SUSENAS 2010

Figure 3.21: Households' perception of difficulty in satisfying healthcare needs (%)



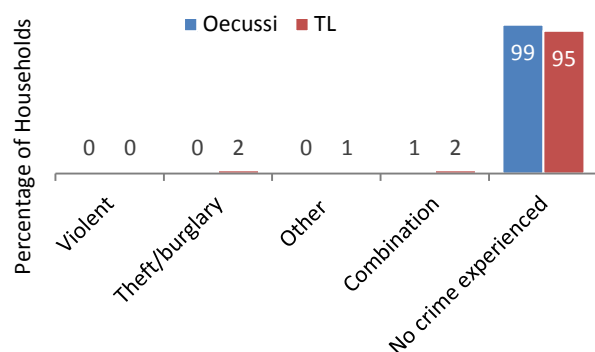
Source: Timor HIES 2012

3.3.8 Crime and Safety

While 95% of households in Timor-Leste experienced no crime in the past year, 99% of households in Oecusse stated the same for the past year (Figure 3.22). Additionally, 68% of households in Oecusse

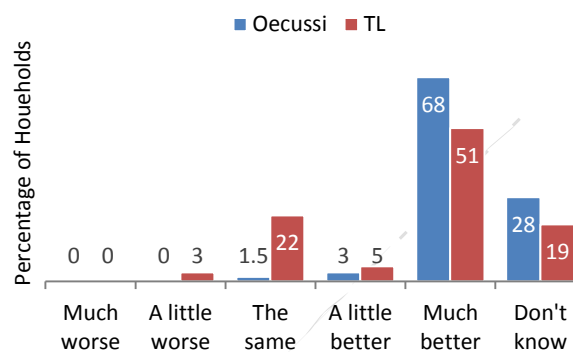
felt that the neighborhood level of crime was much better than the previous year, compared to 51% nationally (Figure 3.23). Involvement in a dispute over land ownership, money, or a personal grievance was lower in Oecusse (1%) than nationally in Timor-Leste (4%).

Figure 3.22: Types of crimes experienced (% of households)



Source: Timor HIES 2012

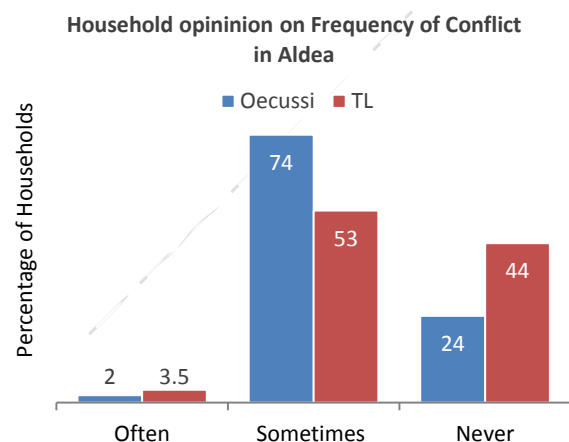
Figure 3.23: Households' perception of neighborhood level of crime and safety compared to previous year



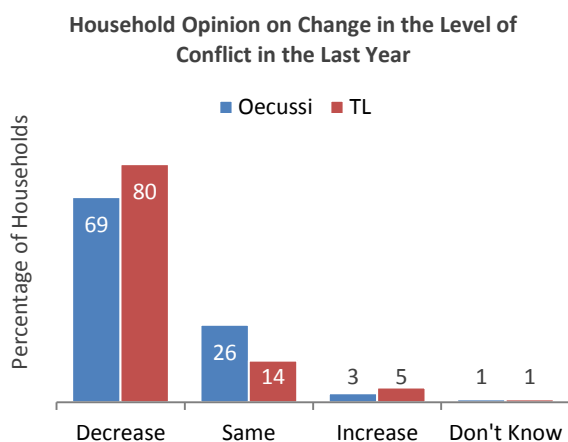
Source: Timor HIES 2012

While households in Oecusse experience lower levels of crime than the rest of the country, conflict and strife appear to be an ongoing problem compared to the rest of the country (Figure 3.24). 74% of households in Oecusse feel that conflict occurs “sometimes” in their aldeia, as opposed to 53% nationally, as shown in the figure below. Clearly, households in Oecusse are prone to a higher level of conflict than the rest of the country as 24% of households stated that conflict never occurred in their aldeia, compared to 44% nationwide. Only 69% of households in Oecusse felt that the level of conflict had decreased in the past year, compared to 80% overall in Timor-Leste. 26% of households in Oecusse felt that the level of conflict had remained static in the past year, while only 14% felt the same nationwide.

Figure 3.24: Households' perception of conflict



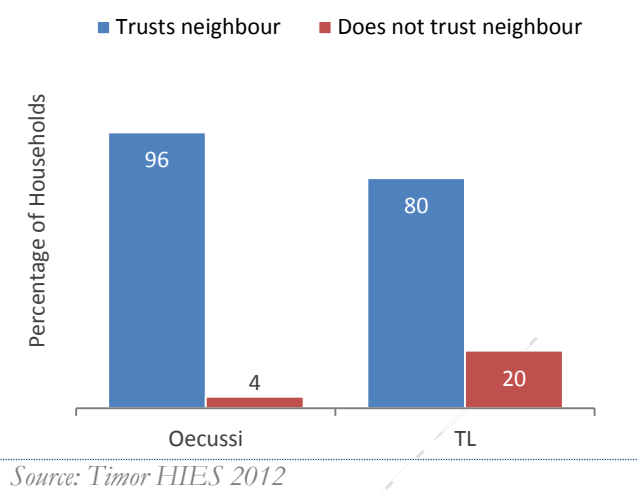
Source: Timor HIES 2012



Source: Timor HIES 2012

Figure 3.25: Trust in neighbors to carry in Dili in case of an emergency (% of households)

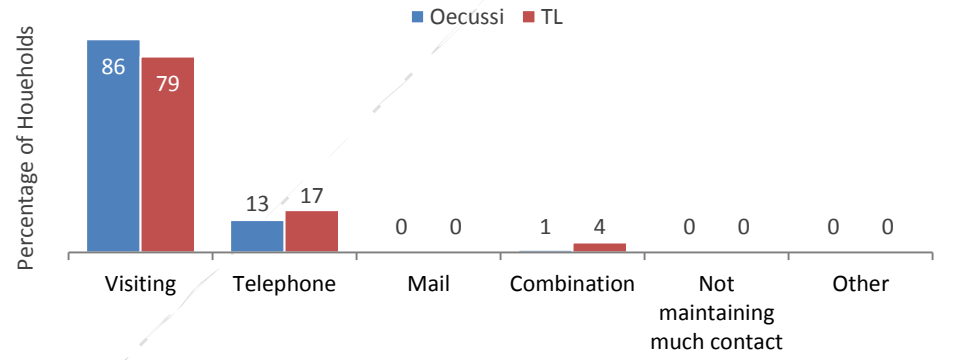
While the frequency of conflict appears to be higher in Oecusse than the rest of the country, trust and willingness to help are higher, perhaps contributing to the lower rates of the crime in Oecusse than the rest of the country (Figure 3.25). 100% of households in Oecusse feel that their fellow aldeia dwellers can be trusted, compared to 97% nationwide. While 98% of Timor-Leste believe that the neighbors in their aldeia are willing to help if needed, 100% of households in Oecusse feel the same. The figure below displays households' trust in their immediate neighbor to carry money to a relative in Dili, in the case of an emergency when a member of the household was unable to go. While only 80% of households across the country felt that they would be able to trust their neighbor with such a responsibility, a significantly higher 96% of households in Oecusse felt the same.



3.3.9 Social Networks

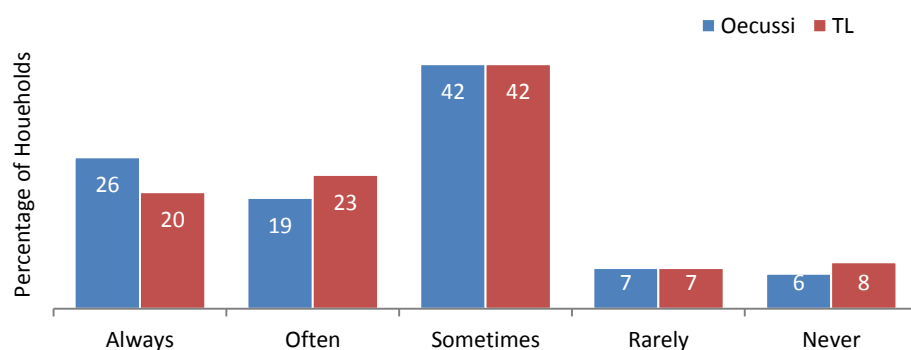
The most popular modes of communication with family and friends in Oecusse are house visits (86%) and the telephone (13%). Nationally, a greater proportion of the population use the telephone (17%) comparatively to households in Oecusse (Figure 3.26).

Figure 3.26: Modes of communication with family and friends (% of households)



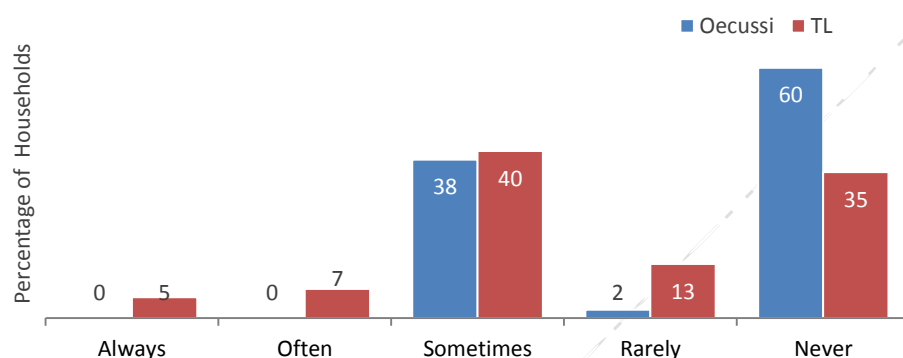
Participation in communal events, such as construction projects, traditional and religious festivals have a higher attendance rate in Oecusse than in the rest of the country. Figure 3.27 shows that 26% of households in Oecusse always participate in social groups and events, and only 6% never participate in such events. Nationwide, 20% always participate in social groups and events, and 8% never participate. However, as Figure 3.28 shows, a significantly larger proportion of households in Oecusse (60%) state never sharing food with family or friends, compared to 35% nationally in Timor-Leste.

Figure 3.27: Participation in social group/events (% of households)



Source: Timor HIES 2012

Figure 3.28: Sharing food with family/friends (% of households)



Source: Timor HIES 2012

Figure 3.29 displays the extent of participation by the community in paid and unpaid community construction projects. While 34% of the sample in Oecusse felt that everyone participated in voluntary community construction projects, only 24% felt the same nationwide. When asked the same question about paid construction work, only 34% of the population in Oecusse felt that all households would participate, compared to the nationwide average of 43.5%, perhaps indicating a **difference between communal goodwill in the participation of an unpaid project versus paid labor**, especially when a significant percentage of the population in Oecusse are already engaged in agricultural employment. In Abani, voluntary participation in community projects was very prevalent.

Figure 3.29: Participation in paid and unpaid community construction projects (% of households)

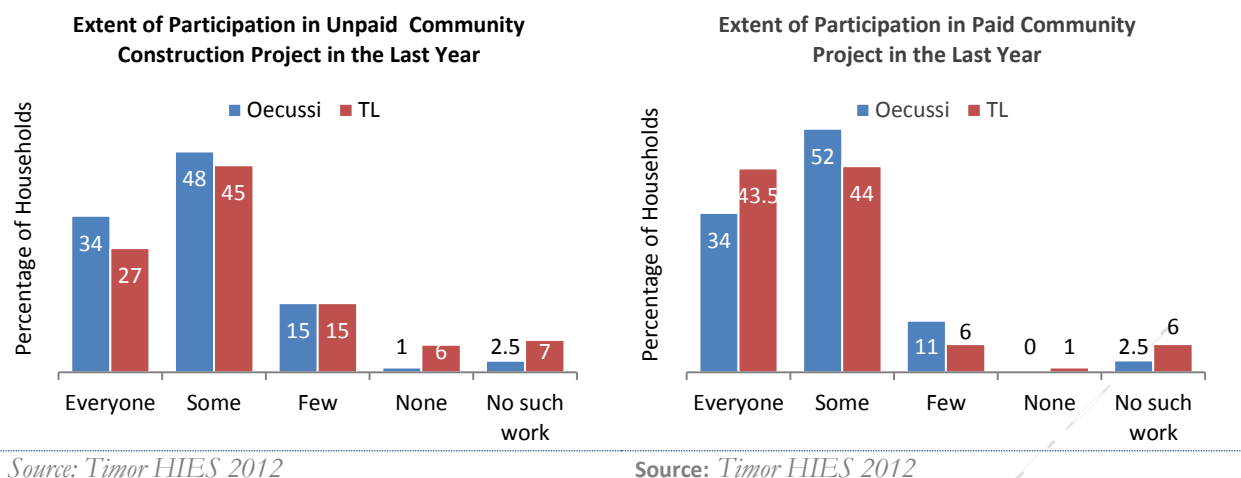
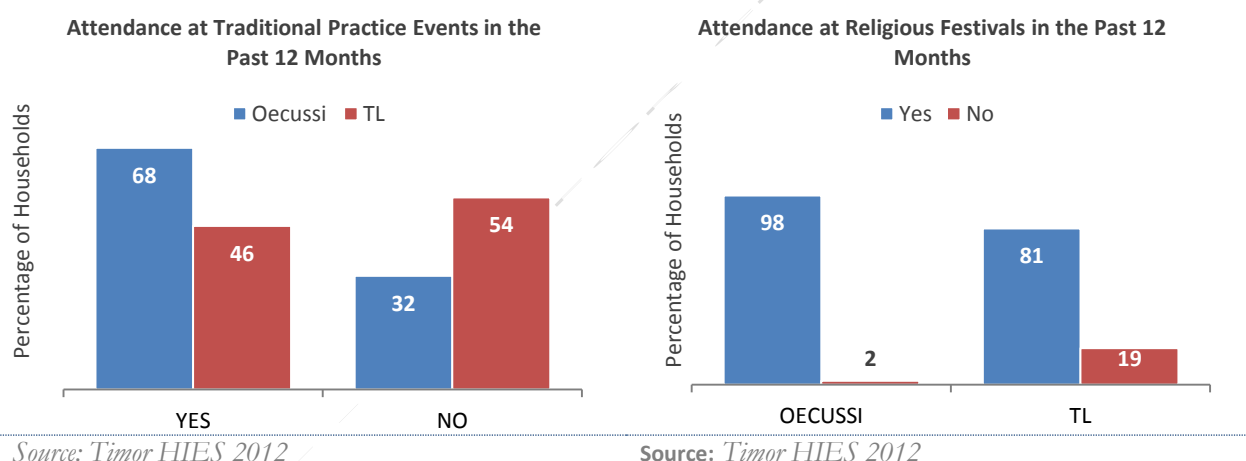


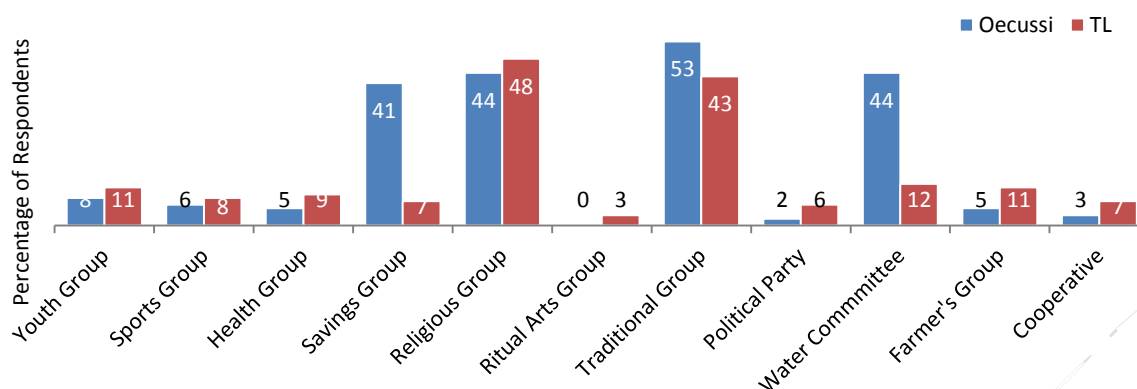
Figure 3.30 displays the high attendance and participation rates of households in Oecusse in traditional practice events (68%) and religious festivals (98%), compared to the overall country average of 32% and 81% respectively. While the entire sample in Oecusse stated that they always contribute money, food or animals to religious or traditional festivals, 91.5% did the same overall in Timor-Leste.

Figure 3.30: Attendance at traditional and religious events (% of households)



Certain groups have a greater presence and participation in Oecusse than in the rest of the country (Figure 3.31), particularly savings groups (41% Oecusse; 7% nationally); traditional groups (53% Oecusse; 43% nationally); and water committees (44% Oecusse; 12% nationally). Higher participation in social groups and events, festivals, and voluntary construction projects indicates a greater degree of communal goodwill in Oecusse, fortified by the trust and willingness to help neighbours that was discussed in the previous section. In Abani, community driven village groups are very prevalent. Villagers organize themselves into small and big village groups specializing in farming, cooking, sewing traditional clothing, and providing financial services through credit cooperatives locally known as UBSP (Joint Loan and Deposit Group). Most of these groups are sub-groups of larger umbrella organizations called *Forum*. Other groups are more independent and have a smaller number of members. Many of the villagers identify themselves according to their participation in these groups and some are members of multiple groups.

Figure 3.31: Participation in groups (% of respondents)

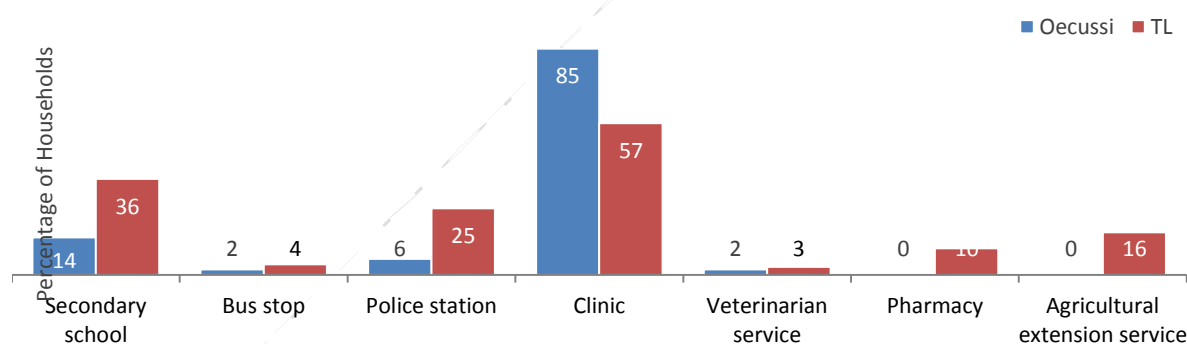


Source: Timor HIES 2012

3.3.10 Facilities and Social Security

While usage of facilities such as secondary schools, bus stops, police stations, clinics and agricultural extension services are fairly low in Oecusse compared to rest of the country, the one exception are clinics, used by 85% of the population in Oecusse and 57% nationwide, as displayed in Figure 3.32. This reinforces the finding in the Health section above that households in Oecusse had a significantly greater proportion that sought medical help when a member contracted a serious illness compared to the rest of the country or the NTT, and had little difficulties satisfying healthcare needs.

Figure 3.32: Usage of facilities (% of households)



Source: Timor HIES 2012

Oecusse households are more satisfied with drinking water facilities than nationally, but less satisfied with the state of roads and bridges and the quality of schools (Figure 3.33). While a greater proportion of households in Oecusse are unsatisfied with the quality of schools and educational facilities (43%) compared to Timor-Leste nationally (40%), a greater percentage of households are also satisfied with the quality of schools in Oecusse (31%) when compared to the entire country (27%). Interestingly, a higher percentage of households are also satisfied with the drinking water facilities in Oecusse (25%) compared to the country (19.5%), and are less dissatisfied (52%) than Timor-Leste nationally (62%). As mentioned in the previous section, the prevalence and participation in water committees by households in Oecusse may attribute to the higher satisfaction with drinking water facilities in Oecusse. Abani had many USAID financed

water tanks and canalization systems installed in various points in the suku. These tanks were located near the roadside and were located strategically close to households. However, a community member responsible for water maintenance in Abani mentioned that during the dry season water from these tanks diminished, and the community had to source water from rivers and springs. Finally, there is an overwhelming dissatisfaction with the state of roads and bridges in Oecusse (95%), compared to the rest of the country (85%).

Figure 3.33: Satisfaction with public facilities (% of households)

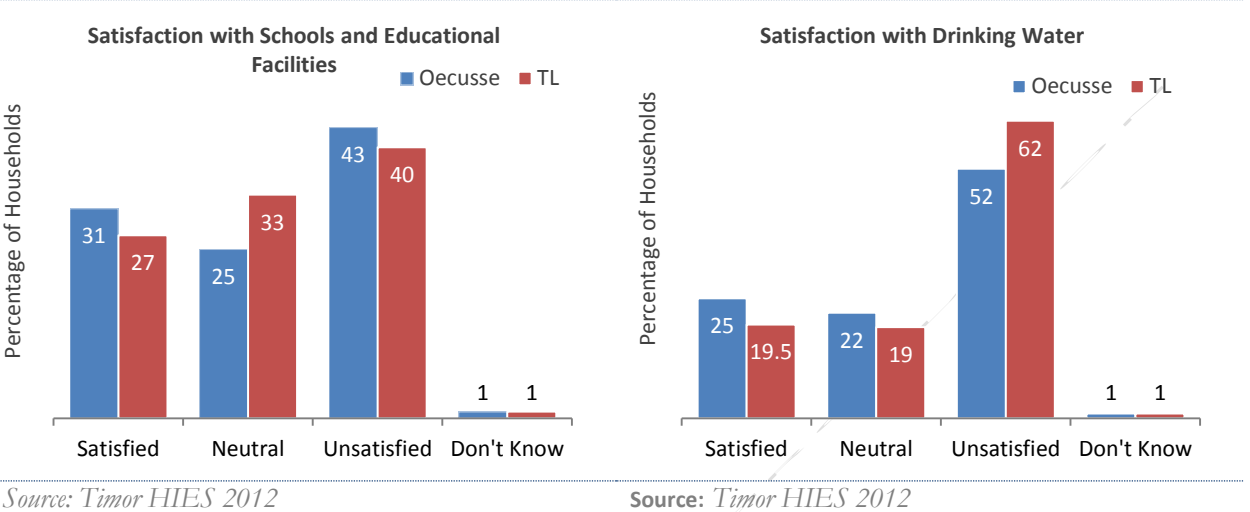


Figure 3.34 shows the types of social security received by households in Oecusse, and overall in Timor-Leste. The two major forms of assistance received are old age pensions, which are approximately received by the same proportion of the population in Oecusse and all of Timor-Leste (30% Oecusse; 31% Timor-Leste); and school feeding, which a slightly higher proportion of households in Oecusse report receiving than the rest of the country.

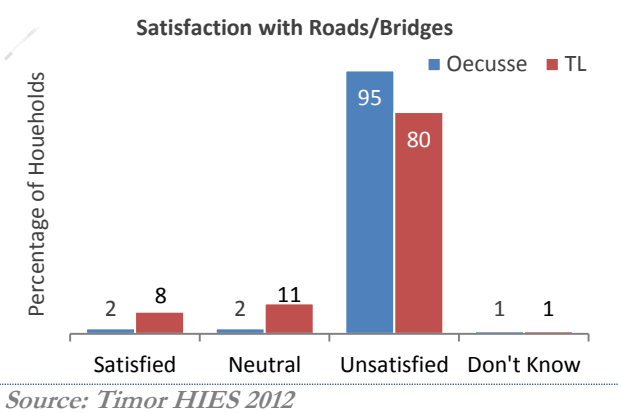
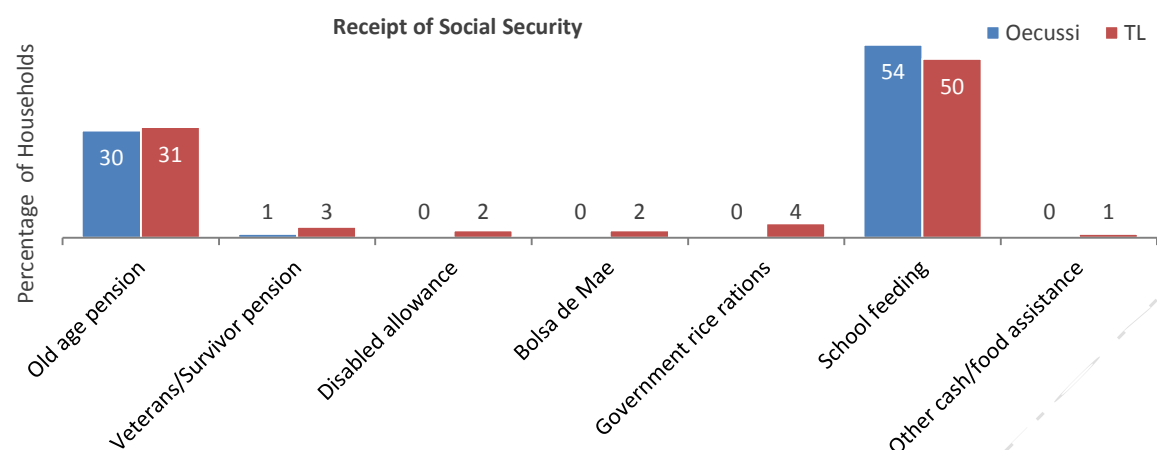


Figure 3.34: Access to social security (% of households)

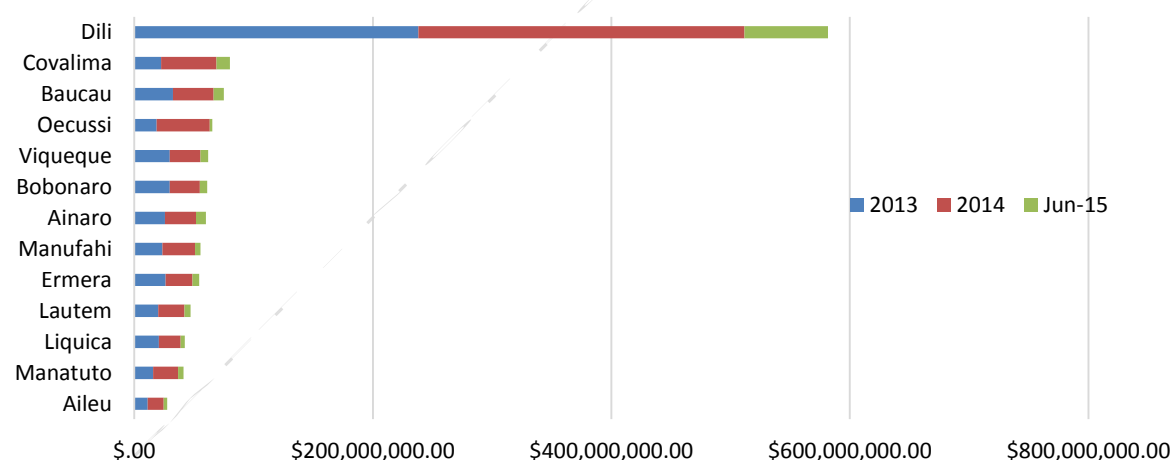


Source: Timor HIES 2012

3.3.11 Government Spending

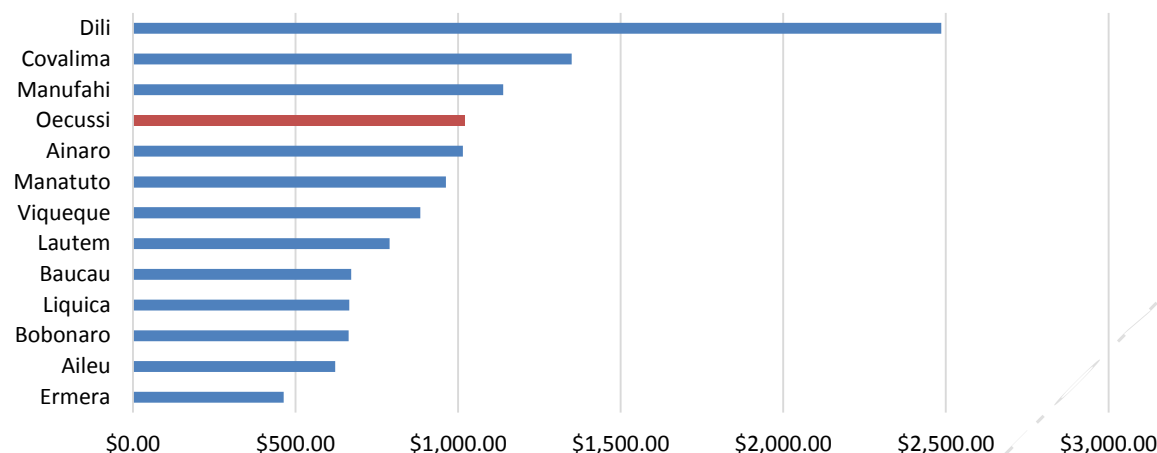
Comparing available data on Timor-Leste's Government spending by District, from 2013 to 2015, Oecusse ranks 4th out of 13 between the districts that were the most benefited in terms of total resources received from the Central Government in for of public spending. The ranking is the same when spending per resident in each district is considered. It is important to highlight though that data on most Government spending is not disaggregated by districts.

Figure 3.35: Government's accumulated total expenditure by District (2013- June 2015)



Source: Transparency portal

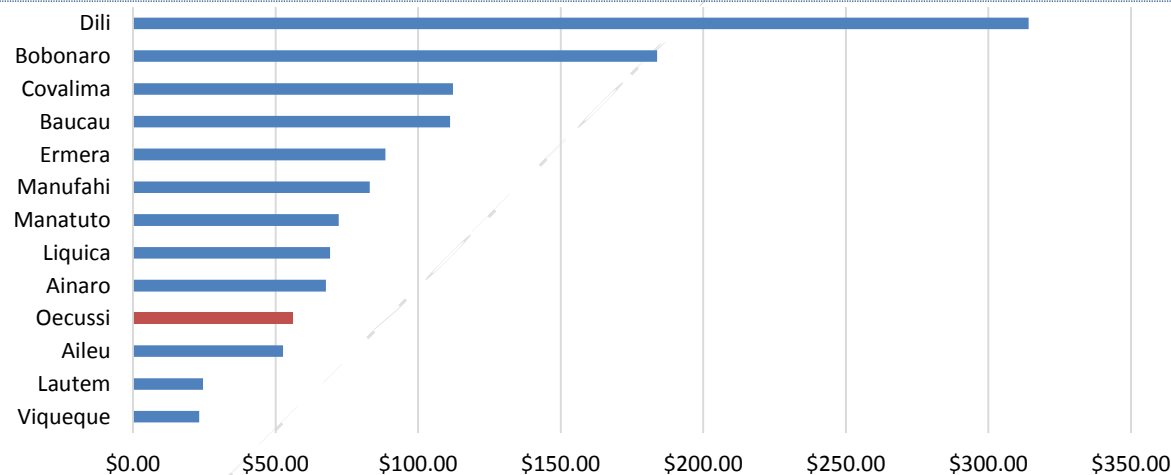
Figure 3.36: Government's total expenditure by District (2013-June 2015, per capita)



Source: Transparency Portal

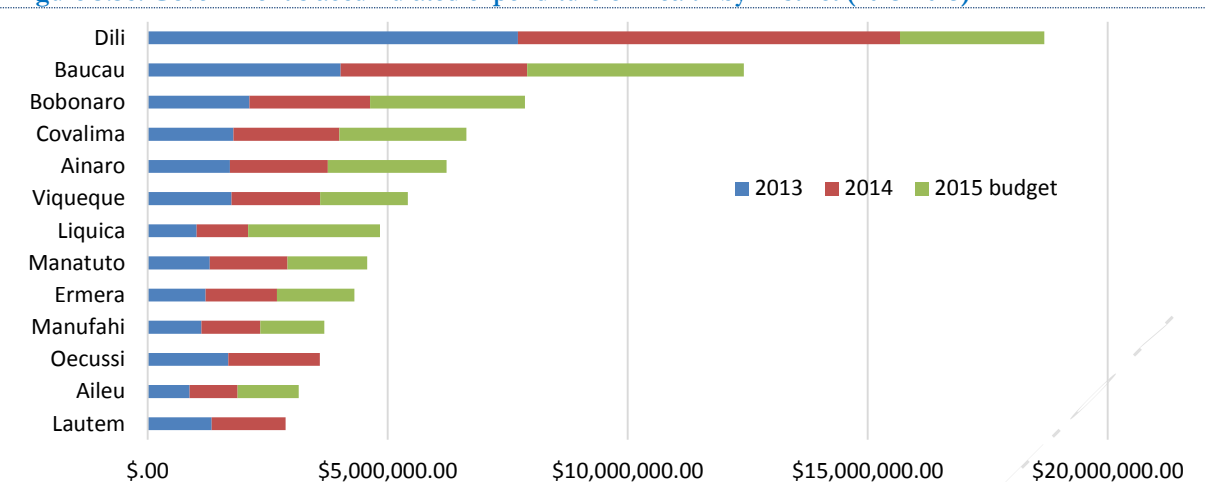
However, looking at the sectors of spending that more directly impact local population's well-being, such as health and education, Oecusse is between the districts that have been the most neglected. Considering spending accumulated over 2013-2015, it ranked 10th out of 13 for per capita spending both on health and on education. It also ranks poorly in per capita spending on social security, at 10th out of 12.

Figure 3.37: Government's expenditure on health by District (2013-2015, per capita)



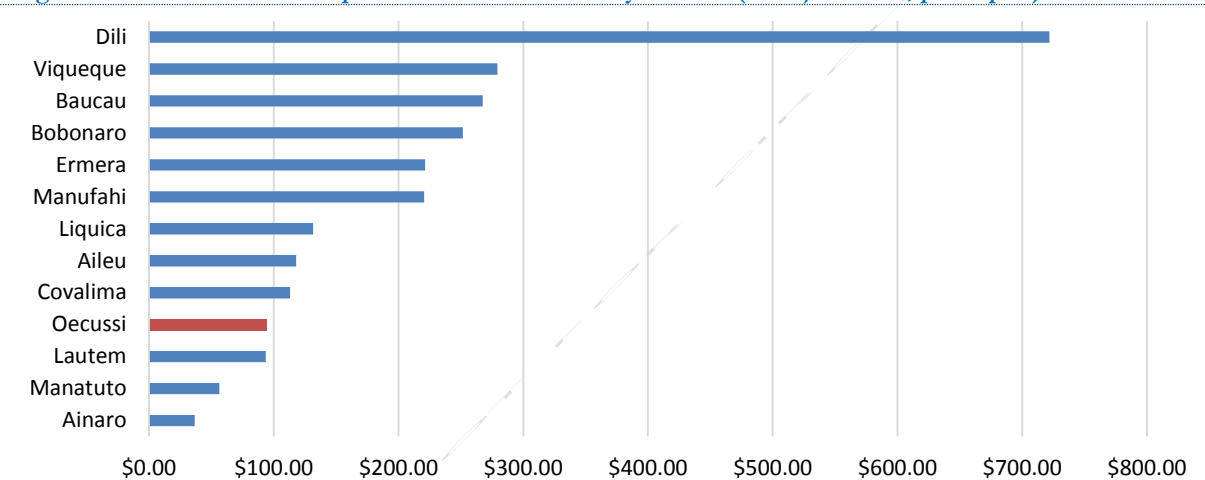
Source: Transparency Portal

Figure 3.38: Government's accumulated expenditure on health by District (2013-2015)



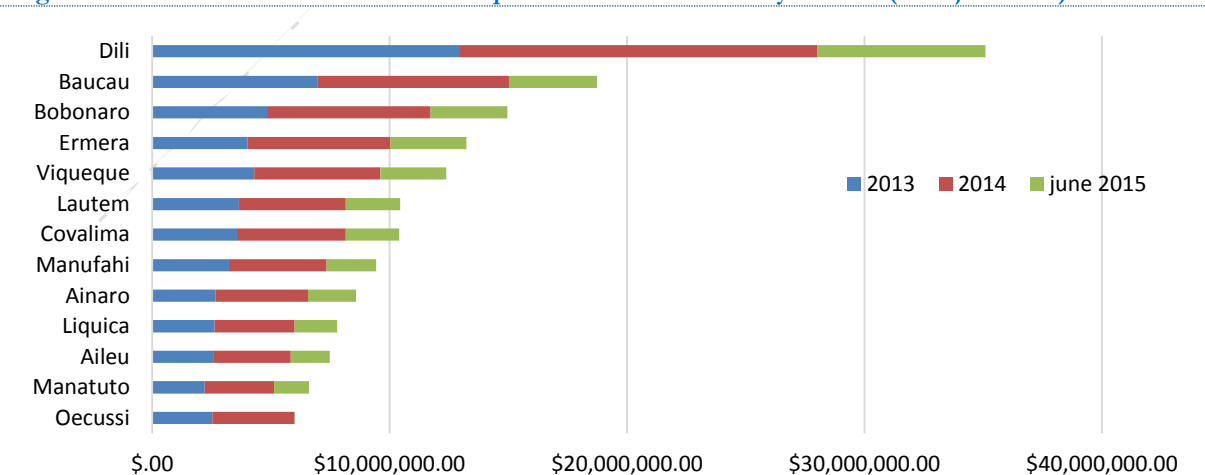
Source: Transparency Portal

Figure 3.39: Government's expenditure on education by District (2013-june 2015, per capita)



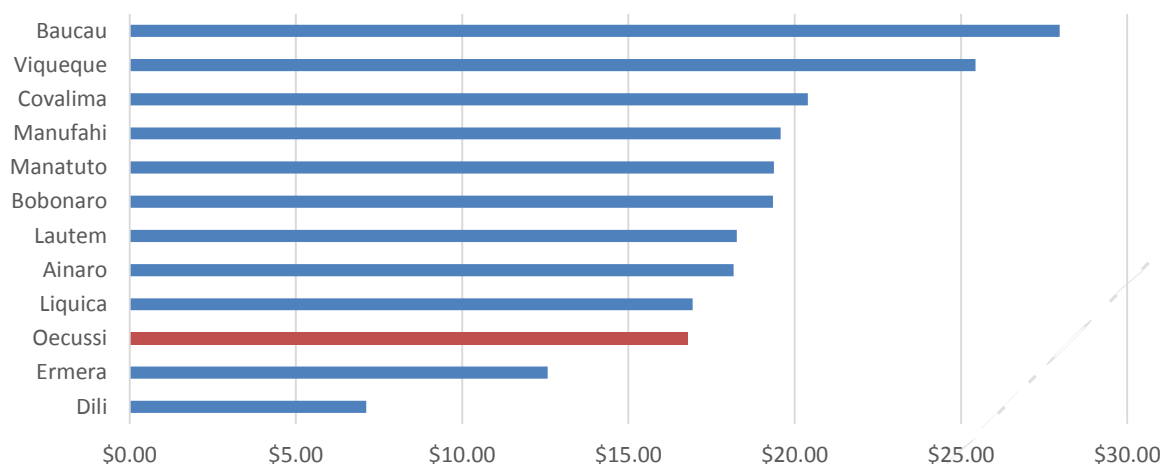
Source: Transparency Portal

Figure 3.40: Government's accumulated expenditure on education by District (2013-june 2015)



Source: Transparency Portal

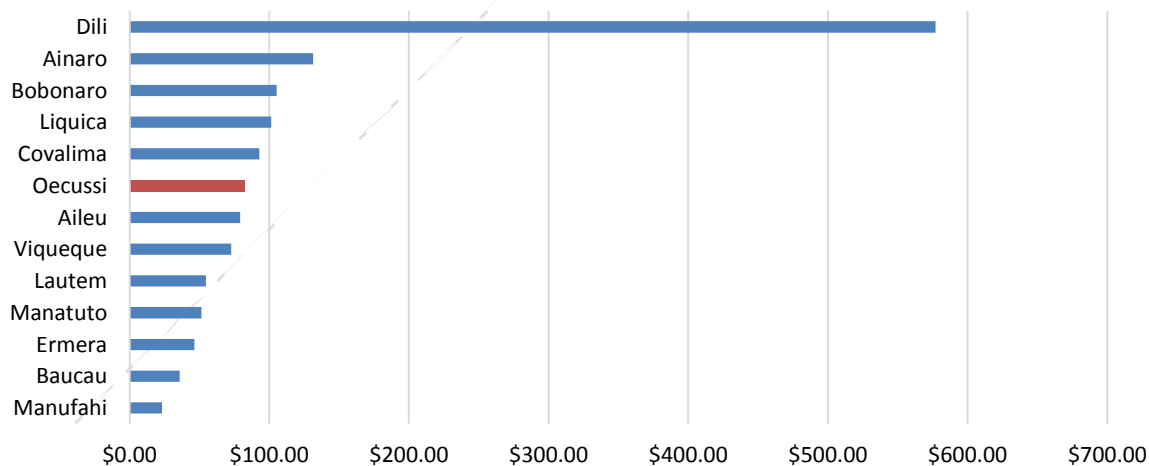
Figure 3.41: Government's expenditure on social security by District (2013, per capita)



Source: Transparency Portal

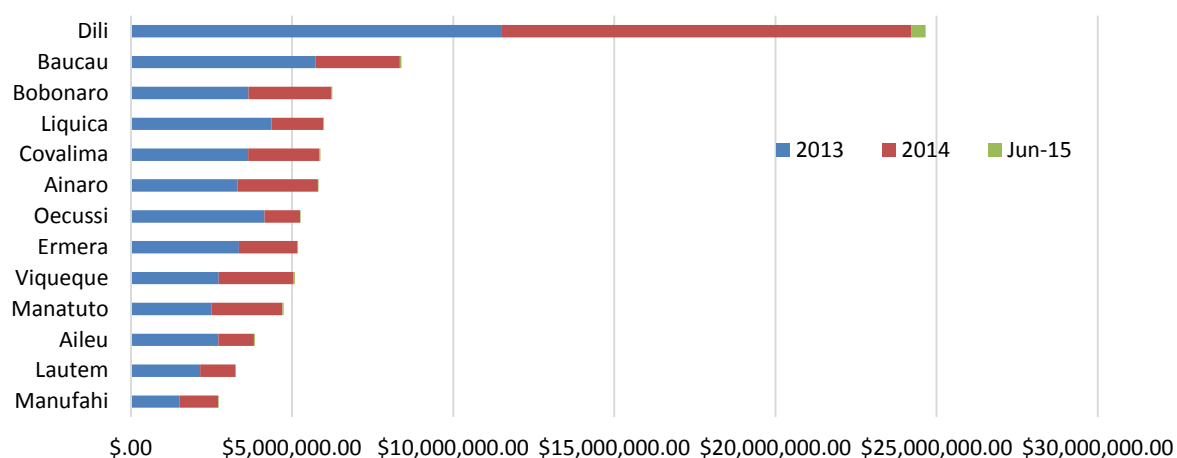
Spending in infrastructure, however, has been higher in Oecusse than in most district, considering spending per inhabitant, accumulated over 2013-2015. It ranks 6th in the District Development programs (PDD, PDID), which finances the development of small scale infrastructure according to the needs of local communities (e.g. roads, education facilities, health facilities, water supply and sanitation and irrigation systems). Projects under these programs are tendered to Timorese owned construction companies only. Under the Infrastructure Fund, Oecusse is between the districts that were most directly benefited, ranking 3rd, due to spending on the Oecusse Region Development Program in 2014, when it was formalized as the Special Social Economic Market Zone.

Figure 3.42: Government's expenditure on District Development (2013-june 2015, per capita)



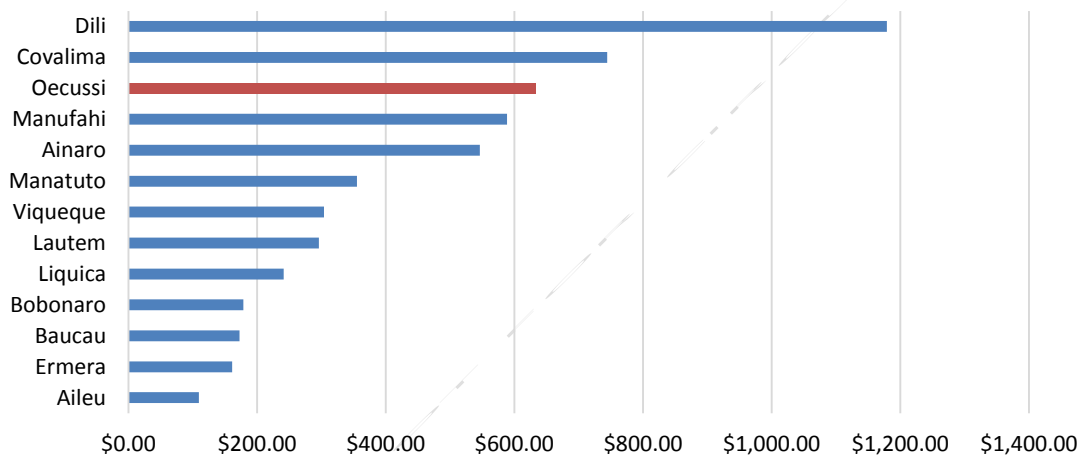
Source:

Figure 3.43: Government's accumulated expenditure on District Development (2013-June 2015)



Source: Transparency Portal

Figure 3.44: Government's expenditure on infrastructure by District (2013-june 2015, per capita)



Source: Transparency Portal

CHAPTER 4: Agriculture

4.1 Introduction

This chapter provides a detailed review of the state of the agriculture sector in Oecusse today and its potential, based on a proposed Oecusse Agriculture Development Plan (OADP).

The first part of the chapter reviews Oecusse's agriculture endowments in terms of natural and human resources, as the initial conditions for an analysis of Oecusse's potential.

The second part describes the OADP and its expected impact in terms of increasing sustainable farm incomes, and agriculture's contribution to economic growth while at the same time protecting Oecusse's fragile environment.

This analysis is based on costs of production and value chain analyses under three scenarios, including the current situation, and two potential scenarios with improved technology and new crop and livestock production interventions:

- (i) Oecusse's agriculture today (the current situation [CS]). Variables include crop and livestock production levels, farm incomes, costs of production, and international competitiveness;
- (ii) Oecusse's medium term agriculture future (the potential situation [PS]) - Oecusse's agriculture potential for existing agriculture products with the application of currently proven technical interventions which have worked in other parts of Timor-Leste (mainly improved crop yields and heavier livestock at the point of sale). Variables include crop and livestock production levels, farm incomes, costs of production, and international competitiveness; and
- (iii) Oecusse's long term potential - considers what the sector might look like in (say) 20 years' time if it receives *its proportionate additional share of resources* (which are currently allocated for overall Zone development) for implementation of an OADP which is based on existing and new agriculture products⁴⁴ - the latter being perennial cash crops and high-value timber - and the application of improved production technology for all products.

4.2 Natural and Human Resources

Agriculture production in Oecusse is determined by the availability and quality of the following nine key resources:

- (i) areas of land (ha) which are suitable (in a sustainable way) for various types of agricultural production, such as irrigated cropping, rain fed farming, livestock grazing, commercial tree crop farming, farm forestry, etc.;
- (ii) water resources - natural rainfall (and rainfall patterns), and supplies and reliability of irrigation water;
- (iii) areas of natural forests which might be sustainably harvested, and/or re-planted;

⁴⁴ Based on the number of people likely to be involved, keeping in mind that the majority of people in Oecusse are currently subsistence farmers.

- (iv) numbers of farming households (and family members) who supply most (if not all) farm labor;
- (v) livestock populations from which surplus animals can be sold;
- (vi) public sector resources in the form of; (a) agriculture extension services, (b) production inputs such as fertilizer and mechanization services, and (c) buildings and other facilities;
- (vii) connectivity between rural households; and the main towns, markets and ports - road access and communications;
- (viii) level of support from civil society - national and international NGOs, and the Church; and
- (ix) The level of social cohesion amongst members of rural communities.

Oecusse is generally not well-endowed with natural resources when compared with other parts of Timor-Leste, although the Tono and the Natuka irrigation schemes are exceptions. Oecusse has poor and infertile soils, low rainfall and a long dry season, large areas of steep land, limited aquifers, and a natural resource base which is shaped by hundreds of years of over-exploitation and abuse by invaders and the indigenous population. In addition, farmer's knowledge of improved agriculture production practices is very limited; and the Ministry of Agriculture and Fisheries (MAF)⁴⁵ is unable to support farmers with effective extension services due to inadequate operating budget, and limited staff skills and experience.

Other Districts in Timor-Leste are also constrained by a poor agriculture natural resource base, such as the steep upland and mountain slopes in the center of the country, but Oecusse is particularly badly degraded (Figure 4.2 and Figure 4.7) and experiences some of the lowest rainfalls in the whole country. In terms of direct comparison, if Government was trying to decide where to expand Timor-Leste's agriculture sector on a commercial basis, it would be more logical to target the flat, and relatively fertile alluvial soils along the south coast which experience much higher (and bi-modal) rainfall than most of Oecusse.

4.2.1 Land Resources

The current agriculture production systems in Oecusse, even on irrigated land, are not sustainable for many reasons, including:

- (i) failure to replace nutrients removed in agriculture produce - organic farming will not resolve this issue because there are too few ruminant livestock, and farm gardens are scattered and often far from villages;
- (ii) uncontrolled grazing by ruminant livestock (mainly cattle and goats) which denudes native grasslands and destroys remnant forests;
- (iii) annual burning of all vegetation on crop land to control weeds and to "create soil out of rocks"⁴⁶ - see Figure 4.1;
- (iv) short swidden cycles (upland, rain fed cropping frequencies) as inherent soil fertility declines, and the population increases;
- (v) cropping on steep and highly erodible hillsides with annual soil losses as high as 100Mt/ha⁴⁷;
- (vi) over- exploitation of native forests for fuel wood, with very little rehabilitation planting;

⁴⁵ now referred to as the "Agriculture Administration" in Oecusse

⁴⁶ Statement by a swidden farmer who was interviewed by the World Bank's ZEESM team in November, 2014.

⁴⁷ Source: DFAT's Highland Agriculture and Social Development Project, Northern Thailand, Dr. Greg Wells pers. com. Research conducted by this project in the 1980s reported soil losses from swiddens of between 50 and 100 Mt/ha.

- (vii) increasingly variable rainfall patterns as El Niño and La Niña events become more frequent;
- (viii) over-cultivation of dry soils prior to planting in flatter areas which have access to mechanization services; and
- (ix) watershed degradation, and associated flooding and low basal stream flows for irrigation systems, due to catchment over-grazing and deforestation.

There are six basic land systems in Oecusse:

- (i) irrigated land (mainly for paddy production) associated with the Tono and Natuka irrigation schemes - plus small areas of community irrigation schemes of less than 100 ha (see Table 4.1);
- (ii) rain fed maize production on alluvial flats along the north coast;
- (iii) rain fed, swidden maize production on rolling inland hills;
- (iv) over-grazed and denuded uplands which are exhausted and no longer suitable for rain fed agriculture;
- (v) high and steep mountain areas with some remnant forests, but which are also grazed heavily and used as sources of fuel-wood; and
- (vi) small areas of home gardens which grow mixed vegetables, and some fruit and other commercial trees.

Figure 4.1: Burning to “Create Soil” in Oecusse



Source: Philip Young

Table 4.1 lists the estimated current land use in Oecusse, and with the associated photos, highlights that:

- (i) thirty percent or 24,420 ha are classified as forest (Figure 4.2), of which 50% or 12,210 ha (15% of the total area) is degraded (Figure 4.3);
- (ii) 18,200 ha (29% of total area) are considered, by MAF, to be suitable for permanent arable irrigated or rain fed agriculture (Figure 4.4 and Figure 4.5);
- (iii) about 5,000 ha comprise towns and small villages, plus river beds and streams; and
- (iv) the remainder (about 23,780 ha or 29%) is currently swidden farmland (Figure 4.6) and mixed free grazing on eroded hills and slopes (Figure 4.7).

Figure 4.2: Good Condition Forest in Oecusse



Source: Philip Young

Figure 4.3: Flat Land Ploughed for Rain fed Maize Production



Source: Philip Young

Figure 4.4: Degraded Forest in Oecusse



Source: Philip Young

Figure 4.5: Swidden Farming System in Oecusse - based on Sesbania



Source: Philip Young

Figure 4.6: Irrigated Land on the Tono Irrigation System



Figure 4.7: Over-Grazed and Denuded Land in Oecusse



Source: Philip Young

Source: Philip Young

There are nevertheless land use improvements and modified farming techniques and systems which can be used in Oecusse which will increase agriculture production, for all land use systems. The constraints imposed by the Zone's small (in area), poor (low inherent fertility), and degraded (over-grazed and over-burnt) natural resource base can be overcome by techniques to generate increased benefits from land, the first of the natural and human resources listed above. These were factored into the farm production modes when analyzing the two potential scenarios referred to above.

Table 4.1: Current Land Use in Oecusse

Total area (km ² and ha)	814 km ²	81,400	%
Area classified as forest (30% of district) a/		24,420	30.0
Of which 50% is degraded forest (ha)	12,210		15.0
Potential maize production area (ha) b/		12,500	15.4
Potential irrigated paddy production area (ha) b/		5,700	7.0
Total area suitable for arable agriculture (ha)	18,200		22.4
Capital of Pante Macassar (ha) (est)		2,000	2.5
Other small towns (ha) (est)		1,000	1.2
Rivers and streams - excluding irrigated area (est)		2,000	2.5
Balance (ha) - swidden farming land, free grazing, eroded hills, etc.		33,780	41.5

Source: derived from various maps, and MAF's official crop areas, and estimates by World Bank team.

a/ As surveyed by MAF in 2012 and reported in 2013 – with assistance from JICA.

b/ MAF's official crop potential areas.

The largest potential lies in the rain fed maize and irrigated rice areas, but improvements will take time. Experience from other parts of Timor-Leste and nearby countries (particularly West Timor) is that increasing production from such a fragile environment is a difficult task which can take a generation. And communal participatory natural resource planning and implementation are essential transformation methodologies.

4.2.2 Water Resources

Irrigation

Once rehabilitated, existing irrigation schemes have the potential to increase yields from the 2,140 ha of land which is currently irrigated, rather than expanding irrigation to the 4,120 ha of reportedly potential irrigation land. Oecusse has two main river systems with sufficient water flows for irrigated agriculture: (i) Tono in the north east near Pante Macassar which irrigates about 1,700 ha; and (ii) Natuka along the western boundary with Indonesia (about 200 ha).

Table 4.2: Oecusse's Irrigation Resources

Suco a/	Irrig'n System s	Area (ha) b/	Household s
Malelat	3	182	106
Abani	4	25	62
Bobmento	4	31	107
Usitas fae	3	181	150
Bobocase	2	85	176
Costa	7	445	550
Lifau	6	305	645
Maimeco	5	122	397
Lalisuk	20	690	1,484
Cunha	9	245	563
Taiboco	1	100	167
Bene-Ufe	9	1,452	517
Usitaco		30	50
Suni-Ufe		80	150
Lela-Ufe		120	265
Benafi		25	36
Total	73	4,118	5,425

Source: Derived from Special Economic Zones of Social Market Economy – First Steps Towards a New Oecusse, 2013-2014, UNDP Supported Report, Table 4, Page 25

Notes: a/ errors in addition in original table.

b/ These figures are not consistent with those in Table 11. There is an error in MAF's different estimates of potential irrigated areas.

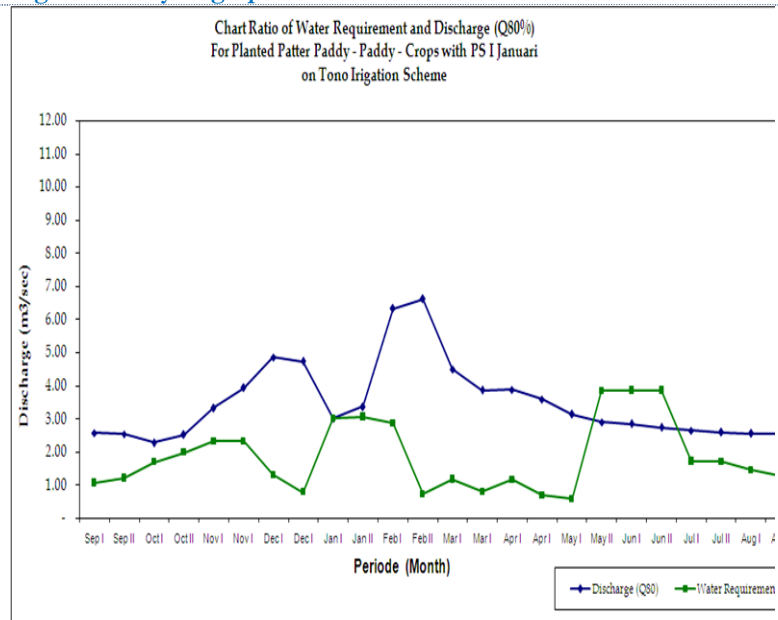
In addition there are small communal irrigation schemes scattered throughout the Zone, based on small rivers, streams and springs. The current area irrigated is estimated to be about 2,140 ha⁴⁸, out of a MAF-defined potential area of 5,700 ha. The irrigated areas in the four sub-districts are: (i) Pante Macassar - 1,578 ha (including most of the Tono Irrigation scheme); (ii) Nitibe - 317 ha; (iii) Oesilo - 161 ha; and (iv) Passabe - 84 ha. Another source of information on Oecusse's irrigation resources is the recent ZEESM situation review - Table 4.2 indicates a potential irrigated area of about 4,120 ha⁴⁹.

The Tono scheme is being rehabilitated at a cost of about \$10 million (funded by Government). This work is not expected to increase the area irrigated. However, by providing increased water and more reliable supplies, the refurbished scheme should impact on cropping intensities, crop diversification, and crop yields. The Natuka scheme is functional but needs maintenance work on the intake system. Once these schemes are functioning at design capacity it should be possible to substantially increase paddy production, provided: (i) agronomic and farmer skills constraints are addressed; (ii) tube-wells and small pumps are used for supplementary irrigation⁵⁰; and (iii) there are markets for surplus products.

Bringing the remaining 1,980 ha of paddy land (4,120 ha less 2,140 ha) into production could cost about \$12,000 per ha, which means that production would be uneconomic⁵¹.

Furthermore, as shown in Figure 4.8 which is a hydrograph for the Tono River developed in 2009, there may be an insufficient basal stream flow for second season cropping because the water requirement is greater than the discharge in the dry season. In this event, the use of tube-wells and small pumps will become even more critical for the economic viability of river based irrigation schemes. Water deficiencies in the dry season are likely to be even more severe now, because the Tono watershed has been further degraded since 2009.

Figure 4.8: Hydrograph for the Tono River



Source: Source: CWN's 2009 Report on Irrigation Feasibility for MAF

⁴⁸ Source: MAF survey of Oecusse's Operational Irrigation Systems, November, 2014.

⁴⁹ Note: these differing irrigation areas numbers are symptomatic of a fundamental problem with agriculture planning in Timor-Leste - conflicting and unreliable agriculture statistics.

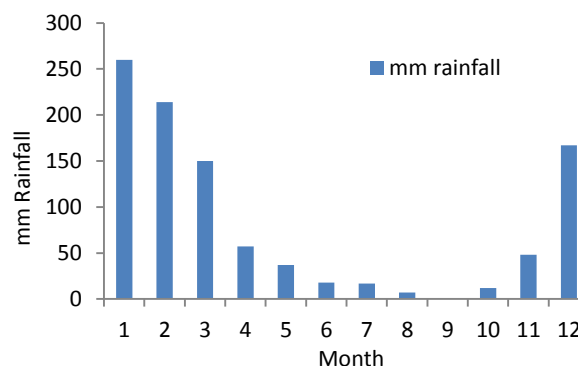
⁵⁰ See Section 4.4.6 for additional comments on this development option.

⁵¹ See: Ministry of Finance and the World Bank, Public Expenditure Review of Investment in Infrastructure, (internal report), 2014; and Section 4.4.6 for additional comments in irrigation economics in Oecusse.

Rainfall

Oecusse has relatively low rainfall. Oecusse's annual rainfall (about 1,000 mm in Pante Macassar), its rainfall pattern, and monthly temperatures are shown in Table 4.3 and Figure 4.9. The rainfall figures in red in Table 4.3 illustrate just how dry Oecusse can be even though its climate is classified as tropical. A more accurate classification would be sub-tropical as the maximum temperatures during the wet season are sufficiently high to cause plant stress during the growing season if rainfall is low or intermittent. In summary, Oecusse's rainfall is not high and sustained periods of low or intermittent rainfall mean that new cropping systems will need to be based on introduced conservation agriculture principles which are currently being trialed by FAO and USAID on the mainland.

Figure 4.9: Monthly Rainfall in Pante Macassar



Source: en.climate-data.org/location/714879

Table 4.3: Oecusse's Annual Rainfall and Monthly Temperatures

Month	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
mm rainfall	260	214	150	57	37	18	17	7	1	12	48	167
°C (min)	24.7	23.8	23.4	23.1	22.9	22.0	20.8	20.5	20.9	22.6	24.8	25.1
°C (max)	29.9	29.4	29.9	30.7	30.9	30.4	29.8	29.6	29.6	30.0	30.7	30.3

Source: en.climate-data.org/location/714879

4.2.3 Forest Resources

Oecusse's forest resources are under severe stress, with 50% of the forested area degraded through over-harvesting for timber and fuel wood (and little re-planting) and uncontrolled grazing by ruminants - See Table 4.1. This resource has very limited remaining potential which might be expressed through a managed forest harvesting program. As the OADP elaborates below, the only development option for this class of natural resource is large-scale re-forestation using mixed hardwood timber and agro-forestry species. This will require substantial private and public sector investment, and committed participation by communal land owners.

4.2.4 Farming Households

Crops and Populations

MAF estimates that the total area cropped each year in Oecusse (irrigated and dryland mixed crops, but excluding tree crops) is about 7,000 ha (2,140 ha of irrigation and 4,860 ha of rain fed crop). Table 4.4 lists the number of rural households who grow various crops and raise livestock in Oecusse, and shows that most households grow a wide range of crops (e.g. 78% grow rice⁵² and 81% grow maize, the latter as a risk management strategy). There are no figures on specific areas of different crops but a good "rule of thumb" is that one family can only manage a maximum of about 0.7 ha of annual crop due to family labor

⁵² Note: this figure seems to be very high given that there are only about 2,000 ha of functional irrigation in Oecusse.

requirements (mainly for land preparation, weeding and harvesting). In the absence of any reliable statistics on crop areas, the remaining analyses are based on these figures.

Table 4.4: Rural Households, and Households Growing Crops and Raising Livestock

Total hhs a/	Crop ---->	Rice	Maize	Cassava	Vegetables	Fruit (temp.)	Fruit (perm.)	Coffee	Coconut	Other (T)	Other (P)
13,890	No. hhs	10,835	11,294	9,807	9,526	10,000	9,509	2,770	9,996	9,645	9,471
	% hh x crop	78%	81%	71%	69%	72%	68%	20%	72%	69%	68%
Rural hhs	Livestock -- -->	Chickens	Pigs	Sheep	Goats	Horses	Cattle	Buffalo			
10,122	hhs with L/stock	10,241	10,009	88	4,950	690	6,178	519			
	% hhs with L/stock	74%	72%	1%	36%	5%	44%	4%			
	No of L/stock	46,158	25,004	1,027	13,344	1,372	16,562	1,791			
	L/stock nos/hh b/	5	2	12	3	2	3	3			

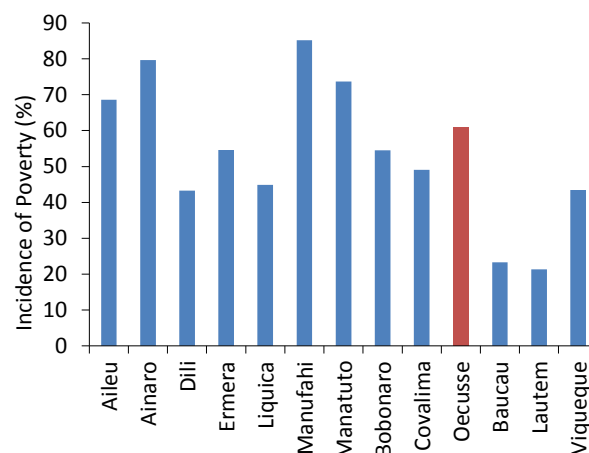
a/ Source: 2010 National Census. Note: between 2004 and 2010, the no. of farmers growing Timor-Leste's main crops declined by about 25%. (reported in the two censuses) except in Oecusse, which reported 150% and 320% increases in hhs growing rice and maize, respectively. b/ Rounded to whole number.

Oecusse's farmers are unlikely to perform better than other farmers in Timor-Leste (in terms of crop, livestock and labor productivity, although it is difficult to compare the skills levels and agriculture productivity of Oecusse's farmers with other farming communities in Timor-Leste. However there are no indications (in terms of crop yields, livestock productivity, sustainable land management, etc.) that Oecusse's farmers are any better than other rural communities in Timor-Leste. In other words, the Zone is not "blessed" with a special group of progressive and innovative farmers. In fact the opposite is probably the case – Oecusse's farmers are conservative survivors in a harsh environment and therefore will need special support if they are to change into "modern farmers".

Figure 4.10: Poverty Incidence in Timor-Leste by District

Rural Poverty and Nutrition

Poverty in Oecusse has historically been higher than the national average. Figure 4.10 shows the poverty incidence in Timor-Leste (by district) in 2007. These data are in the process of being updated⁵³ and it is expected that the overall poverty situation will have improved between 2007 and now. However given under-investment and isolation, poverty rates are unlikely to have improved at the same rate as the rest of the country.



Malnutrition in Oecusse is also severe by national standards⁵⁴, indicating the need for a strong focus in the OADP on human nutrition thorough increased production of nutritious foods. In 2009, 68% of children in Oecusse were stunted, ranked fourth worst in the country, whereas in 2013 58% of children were stunted, ranked third worst. Oecusse ranks highest terms of children underweight - 63% in 2009 and 50% in 2013. And similarly, Oecusse ranks highest in terms of wasted children - 27% in 2009 and 20% in 2013. Whilst there has been some improvement in these figures over the past five years, it is the relativity of these figures which is of the most concern for Oecusse.

Source: Regional Profile of Poverty, TLSLS, 2007

4.2.5 Livestock Populations

Despite high livestock populations relative to other parts of the country, Oecusse has small livestock populations in absolute terms, and the numbers of livestock per rural households are also low (Table 4.4). For example, there are only about 18,350 large ruminants (cattle and buffalo) which might produce a turn-off of about 2,000 head for sale each year; and, on average households which have cattle and/or buffalo only own three head per household. This low production base means that there is currently limited potential for increased beef production in Oecusse. However, the OADP suggests options to overcome this limitation.

4.2.6 Public Sector Resources and Budgets

Extension Services

The Oecusse agriculture administration has sufficient staff, but inadequate budget to deliver necessary services. The Agriculture Administration's Oecusse office currently employs 117 permanent and 20 temporary public servants. The majority are not technically qualified; 89 staff (65%) are only secondary school graduates. This level of staff resources is more than adequate to service about 10,000 rural households, but as shown in Table 4.5, MAF's 2014 budget for Oecusse (before the independent Zone was announced) was only \$363,000, with 72% allocated to wages - leaving only 28% or about \$100,000 for sectoral development work (about \$10 per rural household). Admittedly this budget figure is for the "pre-ZEESM" situation but it is a reflection of just how little public sector investment there currently is in Oecusse's

⁵³ Timor-Leste Survey of Living Standards - with assistance from the World Bank.

⁵⁴ Sources: 2009/10 DHS, and 2013 Timor-Leste Food and Nutrition Survey.

agriculture sector. And once the Tono irrigation scheme has been upgraded its annual maintenance and operational budget is likely to be about \$250,000 - or 2.5 % per annum of the investment cost (\$10 million).

Table 4.5: 2014 Agriculture Budgets for Oecusse

Budget Items (\$'000)	2012	2013	2014	2015
Salaries and Wages (\$)	203	236	251	261
Goods and Services (\$)	164	57	98	102
Transfers				
Minor Capital				
Capital and Development (\$) a/		900		
Total (\$)	367	1,193	349	363
Salaries and Wages (%) b/	55	81	72	72

Source: Derived from National Budget published by Ministry of Finance.

a/ Cost of new office complex.

b/ Excluding capital and development.

Production Inputs

The national agricultural budget is inadequate to honour the government's commitment to free production inputs, especially fertilizer, for all farmers in Timor-Leste. The Ministry's annual operating and salaries budget is about \$27 million⁵⁵. Government policy is to provide 100% subsidized fertilizer, which at a cost of \$450/Mt CIF means that the Agriculture Administration in Oecusse could only supply 56 Mt per year if 25% of its annual goods and services budget is allocated to fertilizer. This would be sufficient for about 280 ha at an application rate of 200 kg/ha, when there are about 7,000 ha of annual crop grown each year in Oecusse. Donors (DFAT/ACIAR Seeds of Life (SoL)) have established a national seed system from which MAF buys certified seed for subsidized distribution to farmers. This system extends to Oecusse. In summary, Oecusse's Agriculture Administration's current budget situation only allows the Ministry to purchase and distribute a very small fraction of the crop production inputs needed if the full demand was to be met.

Buildings and Other Facilities

Administrative building and facilities are adequate. MAF recently (prior to the ZEESM announcement) constructed a substantial office complex on the outskirts of Pante Macassar at a cost of nearly \$1.0 million. This is more than adequate as a base for sectoral development under ZEESM. In addition, there are unused MAF-funded buildings, such as the large warehouse near Citrana and the livestock training centre near Maquellab, which could be used as the basis for farmer and staff training under an expanded ZEESM-funded OADP. These currently unused facilities (the latter two) were constructed using Referendum Budget funds and would require refurbishment as the quality of original construction was poor - see

Figure 4.11: Faulty Roof Beam in MAF Warehouse

⁵⁵ And supporting donors are not prepared to pay for subsidized fertilizer.

4.2.7 Connectivity

All farming operations in Oecusse are severely constrained by poorly maintained roads and bridges; plus the lack of a commercial-scale port. The rural roads focused DFAT/ILO sponsored Roads for Development Program (R4D) was operational in Oecusse but has been suspended since the Special Zone was formally announced. It will be important for the new ZEESM authority to re-start this essential connectivity program. Phone access in rural areas is reasonable, but local markets are very basic.

4.2.8 Support from Civil Society

Oecusse's rural communities are currently receiving considerable support from national and international NGOs, and more broadly, the Church. This is a sound base on which to build agriculture development programs for isolated and poor villages, as these NGOs and the Church have established positions of trust. There are some good examples of aldeias slowly changing their resource use practices in Oecusse following prolonged receipt of support from civil society, and these are a good start in terms of improved natural resource management practices.

4.2.9 Social Cohesion

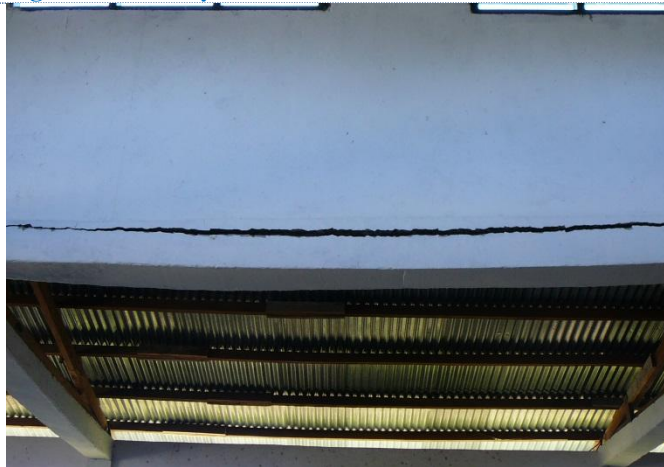
Another positive characteristic of Oecusse's rural communities is their very high level of social cohesion, compared with some other districts in Timor-Leste. Much of this has been built with support from World Neighbours (during the late 1990s) and other NGOs such as Oxfam which have dedicated local staff who are trained in community facilitation and building social capital. Good examples are the savings and loans funds which are now directly operated by recipient communities following initial support in the form of Grameen Bank- type loans⁵⁶.

Having assessed agriculture's natural, human and physical resources in Oecusse, the analysis now turns to the first two of three value chain analyses, namely the current production situation, without interventions, and the potential production situation, with better production practices for



Source: Philip Young

Figure 4.11: Faulty Roof Beam in MAF Warehouse



Source: Philip Young

⁵⁶ There are at least two communal savings and loans schemes in Oecusse with current assets of about \$30,000 - source SoL survey.

existing crop and livestock products. Note that the third value chain analysis which focuses on the OADP includes a range of cash and timber crops which are not included in the first two analyses

4.3 Existing Agriculture Production: What are the main products produced in Oecusse and what are the production costs?

4.3.1 Introduction

This section outlines the current levels of agriculture production in Oecusse (for existing products) and calculates corresponding production costs - the latter with the objective of determining: (i) if Oecusse's agriculture sector is currently competitive (the Current Situation) in terms of potentially exporting surplus products; and (ii) if, improved production practices are introduced (the Potential Situation) would this make the Zone internationally competitive? This section does not analyze the likely impact of an OADP on the sector - this topic is covered in Section 4.6 of this chapter.

4.3.2 Crop Production

Farmers' in Oecusse focus on a variety of subsistence crops rather than a few crops for commercial sale. The two most important staple crops produced in Oecusse are maize and rice. However most rural households typically grow multiple and mixed crops to meet their subsistent consumption requirements and to manage climate risk. According to the 2010 Census (Table 4.4), the majority of households produce some rice, maize, cassava, vegetables, fruit, and coconuts. This suggests that very few households concentrate on any one product for commercial sale, and that transforming the sector into more commercial agriculture (particularly for export) will require major changes in practices and attitudes by rural communities.

Current Maize Area and Production

Crop production and yield statistics in Oecusse are only available for maize and rice and show that Oecusse is the sixth largest maize producer in Timor-Leste. Table 4.6 lists maize production (total Mt, Mt/ha and Mt/hh) by district and shows that if Oecusse's 2014 maize yield and production figures are ignored⁵⁷ then Oecusse ranks as the sixth largest maize producer in Timor-Leste - an average of 6,500 Mt per year, 2.36 Mt/ha and 0.58 Mt/hh. Note that these production figures do not allow for 30% storage losses, or the requirement for retained seed.

There are major inconsistencies in Oecusse's maize production and area figures. Table 4.7 lists estimated maize production potential (ha), past cropped area (ha) and past cropped area (ha/hh) by District for Timor-Leste. Using MAF's figures for 2012-2014, it seems that Oecusse's annual average maize production area is only about 2,480 ha, at a very small average of 0.22 ha/hh. The latter figure seems to be very low when most upland cropping families usually grow about 0.7 ha of maize garden per year.

Table 4.6: Maize Production (Mt, Mt/ha and Mt/hh) by District

District	Total hhs a/	Maize hhs a/	% Maize hhs	Production (Mt) b/			Yield (Mt/ha)			Maize Prod'n (Mt/hh)		
				2012	2013	2014	2012	2013	2014	2012	2013	2014

⁵⁷ The data contains an obvious error - a yield of 14.8 Mt/ha is impossible.

Ainaro	9,664	7,166	74.2%	8,116	2,964	882	2.00	2.50	2.16	1.13	0.41	0.12
Aileu	6,965	5,508	79.1%	6,914	2,665	3,530	1.89	1.89	2.13	1.26	0.48	0.64
Baucau	21,255	12,339	58.1%	6,207	6,722	9,923	2.50	2.64	3.90	0.50	0.54	0.80
Bobonaro	16,883	11,176	66.2%	7,278	3,052	6,475	1.74	1.70	3.61	0.65	0.27	0.58
Covalima	11,105	6,398	57.6%	7,914	7,357	6,456	1.57	1.54	1.32	1.24	1.15	1.01
Dili	35,224	6,000	17.0%	2,052	6,537	2,331	1.00	3.91	2.31	0.34	1.09	0.39
Ermera	19,280	13,962	72.4%	772	6,336	11,600	1.22	1.42	2.86	0.06	0.45	0.83
Liquica	10,351	7,244	70.0%	13,078	8,405	4,879	2.62	3.06	2.60	1.81	1.16	0.67
Lautem	11,447	5,908	51.6%	10,824	30,625	33,901	2.60	3.51	4.27	1.83	5.18	5.74
Manufahi	7,856	4,985	63.5%	1,604	3,864	6,107	2.20	2.92	4.57	0.32	0.78	1.23
Manatuto	6,925	3,578	51.7%	2,422	3,514	4,386	2.29	3.53	3.92	0.68	0.98	1.23
Oecusse e/	13,890	11,294	81.3%	8,182	4,823	24,696	2.08	2.63	14.81	0.72	0.43	2.19
Viqueque	13,807	6,789	49.2%	19,680	13,924	4,558	2.40	1.49	0.54	2.90	2.05	0.67
Total	184,652	102,347	55.4%	95,043	100,788	119,724	2.10	2.35	3.09	0.93	0.98	1.17

a/ From 2010 national census b/ Source: MAF's Food Security Unit c/ Based on SoL's reported OFTD yields

d/ Based on RDP IV's reported "without GAPS technology" yields Note: figures are before losses and kept seed.

e/ Production figure for 2014 cannot be corrected, a yield of 14.8 Mt/ha is impossible

Table 4.7: Maize Potential Production (ha), Cropped Area (ha) and Cropped Area (ha/hh) by District

District	Total hhs a/	Maize hhs a/	% Maize hhs	Potential Area (ha) b/	Maize Area (ha) c/			Maize Area (ha/hh)		
					2012	2013	2014	2012	2013	2014
Ainaro	9,664	7,166	74.2%	9,000	4,058	1,185	408	0.57	0.17	0.06
Aileu	6,965	5,508	79.1%	13,000	3,651	1,410	1,655	0.66	0.26	0.30
Baucau	21,255	12,339	58.1%	16,000	2,483	2,547	2,546	0.20	0.21	0.21
Bobonaro	16,883	11,176	66.2%	25,477	4,179	1,795	1,795	0.37	0.16	0.16
Covalima	11,105	6,398	57.6%	56,113	5,043	4,782	4,891	0.79	0.75	0.76
Dili	35,224	6,000	17.0%	3,200	2,061	1,672	1,008	0.34	0.28	0.17
Ermera	19,280	13,962	72.4%	6,126	632	4,463	4,056	0.05	0.32	0.29
Liquica	10,351	7,244	70.0%	5,000	4,992	2,747	1,876	0.69	0.38	0.26
Lautem	11,447	5,908	51.6%	20,000	4,163	8,725	7,932	0.70	1.48	1.34
Manufahi	7,856	4,985	63.5%	10,000	729	1,323	1,336	0.15	0.27	0.27
Manatuto	6,925	3,578	51.7%	19,896	1,056	996	1,119	0.30	0.28	0.31
Oecusse	13,890	11,294	81.3%	19,435	3,940	1,831	1,667	0.35	0.16	0.15
Viqueque	13,807	6,789	49.2%	12,500	8,216	9,345	8,495	1.21	1.38	1.25
Total	184,652	102,347	55.4%	215,747	45,202	42,820	38,784	0.44	0.42	0.38

Source: a/ From 2010 national census

b/ Source: MAF

c/ Source: MAF's Food Security Unit

Current Rice Area and Production

Oecusse is estimated to be the seventh largest paddy producer in Timor-Leste. Table 4.8 lists paddy production (total Mt, Mt/ha and Mt/hh) by district and shows that Oecusse's ranks as the seventh largest

paddy producer in Timor-Leste - an average of 4,160 Mt per year⁵⁸, 1.88 Mt/ha and 0.38 Mt/hh. Note that these production figures do not allow for about 15% storage losses, or the requirement for retained seed.

Table 4.8: Paddy Production (Mt, Mt/ha and Mt/hh) by District

District	Total hhs a/	Rice hhs a/	% Rice hhs	Paddy Prod'n (Mt) b/			Paddy Yield (Mt/ha)			Paddy Prod'n (Mt/hh)		
				2012	2013	2014	2012	2013	2014	2012	2013	2014
Ainaro	9,664	1,026	10.6	9,623	1,133	1,106	4.94	2.25	4.27	9.38	1.10	1.08
Aileu	6,965	1,396	20.0	1,090	2,584	1,989	2.39	4.10	4.10	0.78	1.85	1.42
Baucau	21,255	9,300	43.8	40,894	33,594	30,520	3.61	3.10	3.12	4.40	3.61	3.28
Bobonaro	16,883	5,219	30.9	14,336	11,742	10,122	3.25	3.69	3.77	2.75	2.25	1.94
Covalima	11,105	2,938	26.5	13,471	9,871	13,788	2.82	2.58	3.60	4.59	3.36	4.69
Dili	35,224	439	1.2	260	264	240	3.25	3.00	3.00	0.59	0.60	0.55
Ermera	19,280	2,140	11.1	4,579	6,044	5,936	3.22	3.13	3.14	2.14	2.82	2.77
Liquica	10,351	504	4.9	979	1,001	910	2.45	3.64	3.64	1.94	1.99	1.81
Lautem	11,447	2,154	18.8	6,902	2,555	2,374	3.50	2.62	2.62	3.20	1.19	1.10
Manufahi	7,856	1,759	22.4	3,379	1,767	367	2.93	2.43	2.55	1.92	1.00	0.21
Manatuto	6,925	2,080	30.0	13,222	4,863	4,419	3.43	3.14	3.15	6.36	2.34	2.12
Oecussi	13,890	10,835	78.0	8,054	728	3,706	2.43	1.60	1.60	0.74	0.07	0.34
Viqueque	13,807	5,883	42.6	22,772	11,184	10,119	3.36	2.99	3.13	3.87	1.90	1.72
Total	184,652	45,673	24.7	139,561	87,330	85,596	3.33	3.04	3.14	3.06	1.91	1.87

a/ From 2010 national census. b/ Source: MAF's Food Security Unit c/ Based on SoL's reported OFTD yields

Note: figures are before losses and see retention.

Similarly, there appear to be errors in the figures reported on Oecusse's paddy production and areas.

⁵⁸ But with huge annual variations - paddy production was reported by MAF to be 8,054 Mt in 2012 and only 728 Mt in 2013. Such annual variation does not seem logical and there are no obvious reasons for this variance.

Table 4.9: Paddy Potential Production (ha), Cropped Area (ha) and Cropped Area (ha/hh) by District

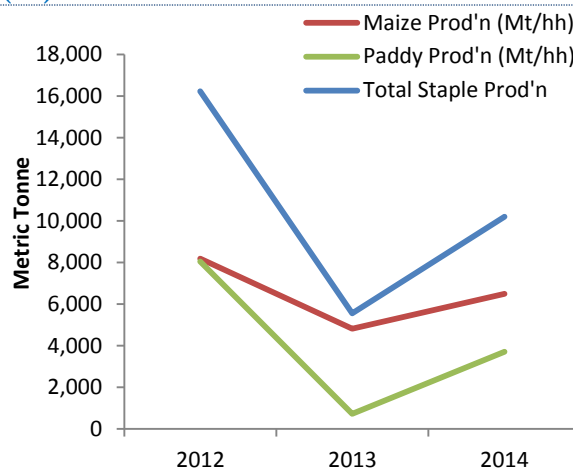
lists estimated paddy production potential (ha), past cropped area (ha), and past cropped area (ha/hh) by District. Using MAF's figures, it seems that Oecusse's annual average paddy production area is about 2,030 ha, at a very small average of 0.19 ha/hh. The latter figure also seems to be too low when in 2009 MAF reported that 4,600 households were dependent on the 1,700 ha Tono irrigation scheme - which is equivalent to 0.37ha/hh, or double the average figure reported for the period 2012 to 2014.

Table 4.9: Paddy Potential Production (ha), Cropped Area (ha) and Cropped Area (ha/hh) by District

District	Total hhs a/	Rice hhs a/	% Rice hhs	Potential Area (ha) b/	Paddy Area (ha) c/			Paddy Area (ha/hh)		
					2012	2013	2014	2012	2013	2014
Ainaro	9,664	1,026	10.6%	6,076	1,948	504	259	1.90	0.49	0.25
Aileu	6,965	1,396	20.0%	776	456	630	485	0.33	0.45	0.35
Baucau	21,255	9,300	43.8%	14,423	11,318	10,833	9,782	1.22	1.16	1.05
Bobonaro	16,883	5,219	30.9%	7,662	4,411	3,185	2,685	0.85	0.61	0.51
Covalima	11,105	2,938	26.5%	5,615	4,771	3,826	3,830	1.62	1.30	1.30
Dili	35,224	439	1.2%	150	80	88	80	0.18	0.20	0.18
Ermera	19,280	2,140	11.1%	2,419	1,420	1,928	1,890	0.66	0.90	0.88
Liquica	10,351	504	4.9%	1,866	399	275	250	0.79	0.55	0.50
Lautem	11,447	2,154	18.8%	3,864	1,972	977	906	0.92	0.45	0.42
Manufahi	7,856	1,759	22.4%	9,942	1,152	727	144	0.65	0.41	0.08
Manatuto	6,925	2,080	30.0%	12,731	3,858	1,548	1,403	1.85	0.74	0.67
Oecussi	13,890	10,835	78.0%	5,705	3,315	455	2,316	0.31	0.04	0.21
Viqueque	13,807	5,883	42.6%	9,793	6,787	3,741	3,233	1.15	0.64	0.55
Total	184,652	45,673	24.7%	81,022	41,887	28,717	27,263	0.92	0.63	0.60

a/ From 2010 national census. b/ Source: MAF c/ Source: MAF's Food Security Unit; note – the 2013 area figures contain an error. This has been corrected in this table.

Rice and maize production in Oecusse have fallen over time, but there is potential to reverse this trend through the application of proven production techniques. Figure 4.12 summarizes the current maize and rice (paddy) production situation in Oecusse. If the obvious error in the reported maize yield is corrected⁵⁹, these figures show a downward trend in production. This is of concern when there is an anticipated increase in demand for food (especially rice) as the Zone is developed. At present there is an estimated annual rice production shortfall in Oecusse of about 5,500 Mt⁶⁰. This trend represents a “quick win” opportunity as there are proven, improved paddy and maize production (and storage) technologies available from other parts of Timor-Leste which could be “fast-tracked” into Oecusse.

Figure 4.12: Summary of Maize and Paddy Production (Mt) in Oecusse

Source: MAF's Food Security Unit

Oecusse produces less food than it consumes but growing imports are difficult to estimate given informal border trade. A reasonable estimate of annual total rice (not paddy) and maize production in Oecusse (after allowing for storage losses and seed retention) is about 8,500 Mt, which is less than domestic

⁵⁹ Assuming an average two-year production of 6,500 Mt.

⁶⁰ Source: figure reported to a DFAT-funded Rice-Based Farming Systems study team in early 2014.

demand based on a population of 70,000 - estimated to be 14,700 Mt. This shortfall in staple food production is met through rice imports (about 6,000 Mt of rice per year) and consumption of other staples such as cassava and sweet potato. Note however, that attempting to balance the accounting staple food demand and supply numbers in Oecusse is very difficult because of informal sales over the Indonesian border, and very unreliable agriculture statistics on cropped areas and crop production. Therefore the only reasonable conclusion is that staple and other food imports are used to balance demand and supply, and that as the economy under ZEESM grows, it will be necessary to either grow or import more food, and more varied food in response to the demand for more varied diets.

Potential Maize Production Area

A possible surplus of maize could be fed to non-ruminant livestock if Oecusse's population switches to consuming more rice. Oecusse's potential maize production area is variously reported by MAF to be between 19,435 ha (Figure 4.7) and 12,500 ha (Figure 4.1) and is another indication of how inconsistent base-line data makes agriculture development planning in Timor-Leste so difficult and inaccurate. At present, only 13% of the theoretical maximum area of maize (19,435 ha) is being cropped, or 20% if the lower figure of 12,500 ha is used. This indicates considerable potential for expanded maize production. However a "note of caution" is warranted as once the demand for maize as a staple food is met, incremental production will have little marginal value as there is a strong trend (throughout Timor-Leste) for changed staple food consumption patterns - with a switch from maize to rice as imported, cheap and sometimes subsidized supplies of the latter increase. Under this scenario, "surplus" maize, which could not compete on international markets due to uncompetitive freight rates (even with a new port in Oecusse - see Table 4.16) would have to be value-added by feeding to non-ruminant livestock.

Potential Rice (Paddy) Production Area

Potential increased rice production depends on the possibility of supplementing river based irrigation with tube wells and small pumps (TWSPs). This is because even after the Tono irrigation scheme has been refurbished (worked commenced in 2015), there will be insufficient water for 100% second cropping - see Figure 4.8. MAF's estimates of the potential paddy production area in Oecusse also vary considerably, from about 2,000 ha (current annual average area cropped in 2012-2014) to 5,700 ha (potential) (MAF,

Table 4.9: Paddy Potential Production (ha), Cropped Area (ha) and Cropped Area (ha/hh) by District

) and 4,120 ha (ZEESM, Table 4.2). These estimates need to be considered in the context of declining basal river flows due to land degradation and varying rainfall patterns, which mean that whilst suitable land resources for paddy production may be available, associated and critical water resources may not be available, at least in the longer-term. Until test drilling has been completed (with the objective of supplying irrigation water from TWSPs for supplementary irrigation) it is impossible to estimate the potential area of irrigation in Oecusse.

The above analyses suggest that there may be greater potential for increased maize, rather than paddy production in Oecusse (in terms of area potential - a total of about 12,500 ha for maize compared with maybe 4,500 ha for paddy). However, market demand is a more important determining factor than simply the potential land area. And it is important to note that these crops are not necessarily mutually exclusive as maize can be grown successfully on land with access to supplementary irrigation water.

4.3.4 Livestock

Current Production

Oecusse has small populations of mixed livestock species which are kept for home consumption (and asset accumulation) and social and religious purposes - see Table 4.4 for numbers. There are small sales to Dili (mainly cattle) and in Pante Macassar, and some illegal sales to West Timor but the majority of livestock products are consumed locally and not recorded as “official” sales. There are no official estimates of livestock production in Oecusse (in terms of Mt of beef, pork and chicken meat, etc.) but it is possible to calculate an approximate figure from first principles. Table 4.10 indicates that total annual meat production in Oecusse (of all types) could be about 875 Mt, perhaps valued at about \$7.0 million.

Table 4.10: Estimated Livestock Production in Oecusse

Livestock ---->	Chickens	Pigs	Sheep	Goats	Cattle	Buffalo
No of L/stock	46,158	25,004	1,027	13,344	16,562	1,791
Annual turnoff (%)	75	75	25	25	15%	15%
Annual turnoff (nos)	34,619	18,753	257	3,336	2,484	269
Liveweight turnoff (kg)	1.00	75	35	35	300	300
Dressing %	70	60	50	50	50%	50%
Dressed Weight (kg)	0.70	45.00	17.50	17.50	150.00	150.00
Carcase yield (%)	70	65	65	65	65%	65%
Meat production (Mt)	17	549	3	38	242	26
Total Annual Meat Production (Mt)						875

Source: prepared by the World Bank team.

Livestock Potential

Livestock potential is less than commonly perceived because of low base levels of livestock numbers.

There is a common perception that Oecusse has great potential for increased cattle production, in part because Oecusse has about 10% of Timor-Leste’s cattle herd. However, this base herd size is so small (only 18,350 cattle and buffalo) that even if productivity (turnoff percent) increased by 50% (from 15% to 22.5%) total annual beef production would only be 363 Mt, an increase of just 121 Mt valued at less than \$1.0

million. Furthermore, even if much-improved cattle production systems were introduced as part of an OADP (see OADP Section 4.6 below), it would take at least 10 years for the base cattle and buffalo herd to double in size. This initial analysis indicates that care needs to be taken when predicting how Oecusse's livestock industry might contribute to the Zone's future economic growth. And these preliminary figures have not factored in the need for improved and more diligent livestock quarantine services.

4.3.5 Forestry and Fisheries

Forestry

There is currently no commercial production of forestry products in Oecusse, but significant potential exists. The Prince Albert Foundation operates a small nursery and the Agriculture Administration's Oecusse complex has non-functional seedling production shade-houses. Apart from NGO- and Church-supported community operated nurseries, there is very little activity in this sub-sector. Historically, sandalwood was produced in Oecusse and it was this product which first attracted the Portuguese. This suggests that there may be potential to re-introduce sandalwood production in Oecusse. In addition, experience in other districts, mainly from Portuguese supported programs⁶¹, indicates considerable potential for high value hard-wood production in Oecusse, provided free-roaming livestock are controlled and farmers are assisted with seedling production.

There is also considerable potential for various types of agro-forestry production systems using results from ACIAR's extensive work in West Timor and Eastern Indonesia. And Oecusse itself has developed a *Sesbania*-based swidden cropping system which would be sustainable if residues were not burnt. Figure 4.13 shows a cleared and burnt area of *Sesbania* (fore-ground) and a remaining three-year old *Sesbania* "forest" (background), plus a fence which has been constructed from *Sesbania* poles. This system warrants further consideration as it could be an important part of an OADP. And as shown in Table 4.1, Oecusse has a large area of land (33,800 ha) which is currently degraded and farmed in an unsustainable way, but some of which could be restored through the introduction of agro-forestry production systems based on multi-purpose tree legumes and more productive tethered ruminant livestock production.

Another important but non-quantified forest-based product in Oecusse is domestic fuel-wood - see Figure 4.14. If there are 10,000 rural households in Oecusse and each burn 10 kg of wood per day⁶², this means that the annual harvest of fuel wood is about 36,500 Mt. If valued at \$0.50/kg this fuel has a financial value of \$18.25 million, far in excess of the value of livestock produced by indiscriminating grazing of the same resource. A figure of this size indicates considerable potential for fuel-wood based agro-forestry production systems.

Figure 4.13: Sesbania-Based Swidden Farming Oecusse

Figure 4.14: Oecusse Children with Bundles of Fire Wood for Sale

⁶¹ Including the EU funded Rural Development Program IV.

⁶² Source: http://www.mercycorps.org/sites/default/files/mercy_corps_c4a_baseline_assessment_report.pdf



Fisheries

There is limited traditional fishing for local consumption, and fisheries is beyond the scope of this analysis. Fisheries is very small-scale partly because many people in Oecusse do not eat fish for traditional reasons, and because the marine sector has not been scoped in terms of resources. Whether there is potential for significant fishing operations in Oecusse’s waters and whether this would be culturally acceptable as a source of employment, requires further analysis, as does quantification of sustainable marine fish resources. Therefore the fisheries sector has been excluded from further analysis because so little is known about sustainable marine resources, or the level of exploitation by neighboring countries.

4.3.6 Crop and Livestock Production Costs

This analysis of the current and potential costs of and benefits from crop and livestock production in Oecusse considers financial and economic costs⁶³. Financial costs are farmers’ direct cash costs and do not include an allowance for the “cost” of family labor (but hired labor is costed). Economic costs are expressed in terms of costs to the country, and include “over-head” or non-farm public sector costs which are incurred in the form of extension services, etc.; plus the opportunity cost of family labor, the cost of maintaining public sector assets such as irrigation schemes, and the opportunity cost of public sector funds invested in irrigation infrastructure.

Tables are available on request to show how financial and economic production costs, product gross margins, and returns to family labor, for Oecusse’s current main agriculture products (crops and livestock species) were calculated. The results are summarized below in

⁶³ Note: this analysis does not include the suggested OADP. It only focuses on current crop and livestock products and not those included in the OADP analysis in Section 4.6.

Table 4.11: Cost of Crop Production and Returns to Family Labor in Oecusse

(for crop products) and Table 4.12 (for livestock products). These tables were prepared with the objective of demonstrating how commodity costs of production could vary if currently available improved production technologies were implemented, and also how families' rural incomes might also vary. Note that these figures are based on simple static models.

Crop Production Costs

Table 4.11: Cost of Crop Production and Returns to Family Labor in Oecusse

lists the following figures for irrigated paddy, rain fed maize, irrigated legumes, and irrigated vegetables: (i) cost of farm inputs (\$/ha); (ii) gross margins per ha (\$/ha); (iii) gross margin per family labor day (\$/day); (iv) crop production (Mt); (v) crop production costs (\$/Mt); (vi) incremental public sector economic costs (\$/Mt); and (vii) total crop production costs (\$/Mt) – in farm-gate financial and economic values⁶⁴, for the “Current Situation” and the “Potential Situation”. These figures should be considered as preliminary as those products selected for inclusion in the OADP will be subjected to more rigorous Benefit/Cost Analyses, and in various combinations to reflect mixed farming situations, rather than mono-cropping. In addition, the importance of Oecusse’s agriculture sector as a major employer needs to be factored into any forward plans.

⁶⁴ Not export parity prices

Table 4.11: Cost of Crop Production and Returns to Family Labor in Oecusse

shows that for all main food crops (other than vegetables) the farm-gate economic cost of production would decline under the OADP situation. For example, the cost of producing paddy would fall from \$415/Mt to \$357/Mt, and the corresponding figures for maize would be \$688/Mt to \$442/Mt. The reason why the cost of producing vegetables does not decline is the high labor inputs required for this crop - and the relatively low labor productivity.

Table 4.11: Cost of Crop Production and Returns to Family Labor in Oecusse

Crop (1 ha model)	Current Situation		Potential Situation	
Irrigated Paddy a/	Financial	Economic	Financial	Economic
Total farm inputs	\$471	\$712	\$1,004	\$1,232
Gross Margin per ha	\$970	\$100	\$1,471	\$163
Gross Margin per Family labour day	\$9.70		\$14.71	
Production (Mt)	2.62		4.50	
Production Cost (\$/Mt)	\$180	\$272	\$223	\$274
Incremental Public Sector Economic Costs (\$/ha) b/		\$375		\$375
Total Production Cost (\$/Mt, paddy - not grain)		\$415		\$357
Rainfed Maize (with storage for potential situation)	Financial	Economic	Financial	Economic
Total farm inputs	\$255	\$500	\$761	\$1,054
Gross Margin per ha	\$145	-\$116	\$864	\$506
Gross Margin per Family labour day	\$1.45		\$8.64	
Production (Mt)	0.80		2.50	
Production Cost (\$/Mt)	\$319	\$625	\$864	\$506
Incremental Public Sector Economic Costs (\$/ha) b/ c/		\$50		\$50
Total Production Cost (\$/Mt) b/		\$688		\$442
Irrigated Legumes	Financial	Economic	Financial	Economic
Total farm inputs	\$180	\$425	\$448	\$684
Gross Margin per ha	\$400	\$126	\$752	\$456
Gross Margin per Family labour day	\$4.00		\$7.52	
Production (Mt)	0.58		1.20	
Production Cost (\$/Mt)	\$310	\$733	\$373	\$570
Incremental Public Sector Economic Costs (\$/ha) b/		\$375		\$375
Total Production Cost (\$/Mt)		\$1,379		\$883
Irrigated Vegetables	Financial	Economic	Financial	Economic
Total farm inputs	\$573	\$799	\$2,609	\$2,771
Gross Margin per ha	\$1,828	\$1,489	\$2,192	\$1,805
Gross Margin per Family labour day	\$18.28		\$21.92	
Production (Mt)	1.60		3.20	
Production Cost (\$/Mt)	\$358	\$499	\$815	\$866
Incremental Public Sector Economic Costs (\$/ha) b/		\$375		\$375
Total Production Cost (\$/Mt)		\$734		\$983

a/ Based on growing the preferred mamramo variety and associated price premium.

b/ MAF budget of \$365,000 over 7,000 ha = \$50/ha; 10% return on investment in irrigation (\$10,000/ha) = \$500/ha (2 crops) and irrigation maintenance (2.5% of investment allocated over 2 crops = \$125/ha, total = \$375/ha.

c/ Rainfed production – only share of MAF's budget costs = \$50/ha.

Livestock Production Costs

Table 4.12 lists the same cost of production figures for the main livestock products raised in Oecusse, and as with food crops, the change in production costs under the “potential” situation varies, depending on the opportunity cost of family labor and family labor productivity. For example, if improved production systems are used, the farm-gate economic cost of producing beef would decline slightly (from \$7,700/Mt to \$6,700/Mt), whereas the cost of producing chicken would increase from \$4,800/Mt to \$6,200/Mt.

Table 4.12: Cost of Livestock Production in Oecusse

Fin/Econ Cost of Production (CS) a/		Fin/Econ Cost of Production (PS) b/	
Beef		Beef	
Saleable beef (kg/LSU)	1.1	Saleable beef (kg/LSU)	2.7
Number of LSUs	50	Number of LSUs	50
Total beef production (kg)	54	Total beef production (kg)	135
Fin Cost of beef production (\$/Mt)	\$300	Fin Cost of beef production (\$/Mt)	\$3,363
Returns per Family Labour Day	\$5.00	Returns per Family Labour Day	\$3.61
Opp Cost of Family Labour	\$150	Opp Cost of Family Labour	\$450
Cost of environmental damage c/	\$250	Cost of environmental damage (zero)	\$0
Econ Cost of beef production (\$/Mt)	\$7,707	Econ Cost of beef production (\$/Mt)	\$6,696
b/ Damage caused by free-grazing - \$50 per head			
Mutton		Mutton	
Saleable mutton (kg/LSU)	3.3	Saleable mutton (kg/LSU)	8.1
Number of LSUs	10	Number of LSUs	10
Total mutton production (kg)	33	Total mutton production (kg)	81
Fin cost of mutton production (\$/Mt)	\$300	Fin cost of mutton production (\$/Mt)	\$2,572
Returns per Family Labour Day	\$3.17	Returns per Family Labour Day	\$2.00
Opp Cost of Family Labour	\$150	Opp Cost of Family Labour	\$450
Cost of environmental damage c/	\$100	Cost of environmental damage (zero)	\$0
Econ Cost of mutton production (\$/Mt)	\$7,876	Econ Cost of mutton production (\$/Mt)	\$8,128
b/ Damage caused by free-grazing - \$10 per head			
Chicken		Chicken	
Saleable chicken (kg)	17	Saleable chicken (kg)	50
Fin cost of chicken production (\$/Mt)	\$424	Fin cost of chicken production (\$/Mt)	\$3,744
Returns per Family Labour Day	\$4.56	Returns per Family Labour Day	\$3.94
Opp Cost of Family Labour	\$75	Opp Cost of Family Labour	\$125
Cost of environmental damage (zero)	\$0	Cost of environmental damage (zero)	\$0
Econ Cost of chicken production (\$/Mt)	\$4,835	Econ Cost of chicken production (\$/Mt)	\$6,244
Pork		Pork	
Saleable pork (kg)	210	Saleable pork (kg)	338
Fin cost of pork production (\$/Mt)	\$500	Fin cost of pork production (\$/Mt)	\$1,548
Returns per Family Labour Day	\$33.25	Returns per Family Labour Day	\$19.60
Opp Cost of Family Labour	\$150	Opp Cost of Family Labour	\$450
Cost of environmental damage c/	\$175	Cost of environmental damage (zero)	\$0.00
Econ Cost of pork production (\$/Mt)	\$2,048	Econ Cost of pork production (\$/Mt)	\$2,881

a/CS = Current Situation b/PS = Potential Situation c/ Damage caused by free grazing - \$25 per head

Household Incomes and Poverty Reduction

An unpublished study that uses Oecusse's Tono scheme as a case study shows that farmer incomes can be trebled if known and proven improved production techniques and systems are used. In 2014 the Australian Department of Foreign Affairs and Trade (DFAT)⁶⁵ commissioned a study on rural incomes from Timor-Leste's farms which use rice-based farming systems (RBFs). The results were not published as DFAT decided not to proceed with further investigation of possible support programs for this sub-sector. However they are very relevant to Oecusse and ZEESM as the Tono River irrigation system was used as a case study. Table 4.13 summarizes the results from this informative exercise and shows (for five different models with varying combinations of different crop and livestock products) that:

- (i) under the current situation (Model 1) farmers with access to irrigation are probably earning about \$800 per year - a very small figure when family sizes are about five persons;
- (ii) earnings per year per family could increase to about \$1,630 (average for models 2 and 3 in Table 4.13) assuming partial adoption of improved technologies - a doubling of net income; and
- (iii) earnings per year per family could increase to about \$3,020 (average for models 4 and 5 in Table 4.13) assuming further adoption of improved technologies - more than a trebling of annual income through the adoption of known and proven agriculture production technologies.

The DFAT work did not design and analyze rain fed, upland cropping models based on maize production. However given that rain fed yields are generally much less than irrigated yields, and scavenging livestock have much less to eat on rain fed farms, it is not unreasonable to conclude that farm incomes from swidden-based rain fed farms would be about 50% of the incomes reported for farms using RBFs.

Note that the figures in Table 4.13 and Table 4.11 are not directly comparable as Table 4.11 is based on simple 1 ha individual crop models, whereas Table 4.13 is based on various combinations of crop and livestock models to form whole farm models.

Food Production and Nutrition

The study also showed that Oecusse farmers should be able to treble food production. The same modelling referred to above was also used to estimate how food production (and the mix of foods - staples, vegetables/legumes and livestock/fish) might change under the same scenarios. The results are shown in Table 4.14 and in summary show that for RBFs it should be possible for Oecusse's rural households to increase food production by more than three times, and at the same time to improve farm-level supplies of more nutritious food. Note however the need to balance this possibility against limited domestic demand for food in Oecusse and to avoid over-supply situations for commodities which cannot be exported - see later for more on this important proviso.

⁶⁵ Previously AusAID.

Table 4.13: Farm Gross and Net Values of Production for Rice-Based Farming System

Gross and Net Value of Production a/						
Model and Crop/Livestock Product			Farm Gross Value Prod. a/	Hired Labour	Farm Net Value Prod. a/	Inc.Net Value Prod.
Current Situation - Model 1		ha				
Paddy	Traditional (S 1)	1.00	\$304	18		
Maize	Traditional (S 1)	0.10	\$28	\$5.00		
Vegetables	Traditional (S 1)	0.10	\$190			
Non-ruminant	Traditional		\$360			
Farm Gross Margin and Net Income			\$882	\$90	\$792	zero
Potential Situation - Model 2 (SDP)		ha	Farm Gross Margin	Hired Labour	Net Farm Income	Inc.Net Farm Income
Paddy	Improved (S 1)	1.00	\$570	109		
Paddy	Improved (S 2)	1.00	\$570	\$5.00		
Vegetables	Traditional (S 3)	0.20	\$380			
Non-ruminant	Traditional		\$360			
Ruminant	Traditional		\$215			
Farm Gross Margin and Net Income			\$2,094	\$545	\$1,549	\$757
Potential Situation - Model 3		ha	Farm Gross Margin	Hired Labour	Net Farm Income	Inc.Net Farm Income
Paddy	Improved (S 1)	1.00	\$570	113		
Maize	Improved (S 2)	0.50	\$329	\$5.00		
Legumes	Improved (S 2)	0.50	\$419			
Vegetables	Traditional (S3)	0.20	\$380			
Non-ruminant	Traditional		\$360			
Ruminant	Traditional		\$215			
Farm Gross Margin and Net Income			\$2,272	\$565	\$1,707	\$915
Potential Situation - Model 4		ha	Farm Gross Margin	Hired Labour	Net Farm Income	Inc.Net Farm Income
Paddy	Improved (S 1)	1.00	\$570	217		
Maize	Improved (S 2)	0.50	\$329	\$5.00		
Legumes	Improved (S 2)	0.50	\$419			
Vegetables	Improved (S 2)	0.25	\$991			
Fish pond	Improved		\$344			
Non-ruminant	Improved		\$926			
Ruminant	Improved		\$540			
Farm Gross Margin and Net Income			\$4,117	\$1,085	\$3,032	\$2,240
Gross and Net Value of Production a/						
Potential Situation - Model 5 b/		ha	Farm Gross Margin	Hired Labour	Net Farm Income	Inc.Net Farm Income
Paddy	Improved (S 1)	0.58	\$328	86		
Paddy	Improved (S 2)	0.43	\$242	\$5.00		
Maize	Improved (S 2)	0.50	\$329			
Legumes	Improved (S 1)	0.40	\$335			
Vegetables	Improved (S 1)	0.03	\$99			
Vegetables	Improved (S 2)	0.08	\$297			
Fish pond	Improved	1.00	\$344			
Non-ruminant	Improved	1.00	\$926			
Ruminant	Improved	1.00	\$540			
Farm Gross Margin and Net Income			\$3,439	\$431	\$3,008	\$2,216

a/ Gross and net values (after cash costs) of production.

b/ Based on products selected by linear programming to generate maximum gross margin within constraint boundaries (land and labor)

Table 4.14: Increased Food Production and Food Mix for Rice-Based Farming Systems

Incremental Food Production - by Type of Food and Composition				
Model/ Food Production (1.0 ha)----->	Food (kg)	% of Total a/	Inc. Food (kg)	Percent Inc.
Current Situation - Model 1				
Staple	927	69%		
Vegetables/Legumes	160	12%		
Animal/ fish	249	19%		
Total Food (kg)	1,336			
Potential Situation - Model 2 (SDP)				
Staple	3,960	87%	3,033	327%
Vegetables/Legumes	320	7%	160	17%
Animal/ fish	249	5%	nil	nil
Total Food (kg)	4,529		3,193	239%
Potential Situation - Model 3				
Staple	3,030	77%	2,103	227%
Vegetables/Legumes	650	17%	490	306%
Animal/ fish	249	6%	nil	nil
Total Food (kg)	3,929		2,593	194%
Potential Situation - Model 4				
Staple	3,030	55%	2,103	227%
Vegetables/Legumes	1,600	29%	1,440	900%
Animal/ fish	894	16%	645	259%
Total Food (kg)	5,524		4,188	313%
Potential Situation - Model 5				
Staple	4,650	84%	3,723	402%
Vegetables/Legumes	880	16%	720	78%
Animal/ fish	894	16%	645	70%
Total Food (kg)	6,424		5,088	381%

Oecusse's Competitiveness for Agriculture Products

None of Oecusse's existing commodities can currently compete in the international export market.

Table 4.15 lists the cost of importing meat (beef, mutton, pork and chicken) and grain products (rice, maize and legumes [soybean]) into Oecusse (import parity price). These are CIF Pante Macassar prices based on current international FOB prices, plus the addition of estimated sea freight costs to determine approximate CIF prices landed Oecusse.

Table 4.16 lists calculated export parity prices for the same products for two scenarios: (i) Current Situation; and (ii) Potential Situation, with the latter based on assumed productivity increases following the application of known technologies. These figures are summarized in Figure 4.15 and Figure 4.16, and show that Oecusse cannot compete on the international export market for any of the seven existing agriculture products which were reviewed.

The simplest way to compare these figures is to consider the ratio of export to import prices (see column 8 in red font, Table 4.16 - for the current situation). The only product currently grown in Oecusse which is even marginally competitive is pork (ratio of 1.2:1). The equivalent ratios for all other products currently grown in Oecusse are in excess of 2:1 or about equal to 2:1, and confirm that it is currently impossible for Oecusse-grown agriculture products to compete on international markets.

Searching for Answers - Reduced Labor Costs and Increased Productivity

Cost of Labor

Even under the potential situation scenario (bottom half of Table 4.16) which assumes the application of improved production technologies, it seems that Oecusse would not be a competitive exporter of agriculture products, perhaps with the exception of soybean and maize (ratios of 1.5:1 and 1.3:1, respectively). However it is difficult to envisage a situation in which Oecusse could reduce the costs of production for these two commodities by between 50% and 30%, respectively.

One of the main reasons for this lack of competitiveness is the high cost of hired labor, the labor intensive nature of improved agriculture production systems, and the relatively high opportunity cost of family labor. The estimated Oecusse economic export prices listed in Table 4.16 are based on a farm family labor opportunity cost of \$2.50 per day, and a hired labor cost of \$5.00 per day. If the opportunity cost of family labor is increased to \$5.00 per day (about the current unskilled daily wage rate) then Oecusse's economic export prices for its agriculture products increase considerably, and make the Zone's agriculture products even more uncompetitive on international markets. However, if this cost is reduced to about \$1.50 per day (in line with potentially competing countries) Oecusse's agriculture sector would be more competitive - see Table 4.17 for details. However, this wage rate is well below half the legislated national minimum wage.

Productivity

Soybean and maize were selected for further tests of the productivity increases required for international competitiveness. Another way to "test" the potential competitiveness of Oecusse's agriculture sector is to calculate the productivity increases required for competitiveness (at the current US\$2.50 daily opportunity cost of family labor) and to then ask the question, *"given the current state of technology adoption in the Zone, and given that improved production packages are available from other parts of Timor-Leste (and nearby countries), is it realistic to assume that Oecusse might become competitive if the Zone introduced and farmers adopted these technical packages?"*

The analysis completed to test this "hypothesis" for soybean and maize (the two products listed in Table 4.16 which might have some chance of becoming internationally competitive with the adoption of improved technologies, and for which there are no health or quarantine issues, as is the case for livestock-based products [e.g. pork]), is summarized in Table 4.18.

However even if price competitive, product volumes may not be large enough for export. Price competitiveness is not the only criteria for export success - the other is export volumes and shipping efficiency. This means that even if Oecusse's export prices were competitive, it is doubtful if annual volumes of surplus product would be sufficient to enable (say) 5,000 Mt ships to operate out of a new port at Pante Macassar on (say) a monthly basis.

Considering the case of soybean - even if every ha of irrigated land in Oecusse (about 4,000 ha maximum potential (Table 4.2) grew irrigated legumes, total annual production might be about 5,000 Mt⁶⁶. If 50% is exported, this represents half a ship load, per year. This means that the stated ZEESM objective of *“filling empty container ships leaving a new port in Pante Macassar with surplus products”* needs to be revisited.

The same argument applies to the other “marginally” competitive crop product - maize. Current production is about 5,600 Mt per annum for a demand of about 6,300 Mt (see Table 4.24). In 10 years’ time production could be as high as 14,380 Mt for a demand (for human and livestock food) of about 11,530 Mt⁶⁷. This equates to a small surplus of about 2,850 Mt, or about half of one 5,000 Mt ship.

Table 4.15: Oecusse Import Parity Prices

Oecusse Import Parity Prices			
Product a/	\$/Mt (FOB)	Source Port	\$/Mt (CIF)
Chicken	2,500	Georgia, Usa	3,250
Pork	2,000	Iowa USA	2,750
Beef	5,500	Aust. & NZ	6,000
Mutton	3,000	London	4,000
Rice	350	Bangkok	500
Soybean	400	Argentina	750
Maize	200	US Gulf	450

a/ Source: indexmundi.com/commodities

⁶⁶ 4,000 ha at a yield of 1.2Mt/ha - with improved technology.

⁶⁷ Noting too that maize production in much of Oecusse is environmentally damaging and therefore areas of upland swidden-produced maize should not be increased.

Table 4.16: Oecusse Export Parity Prices - Opportunity Cost of Labor \$2.50 per day

Current Situation									
Product	\$/Mt Farm Gate	Domestic b/ Freight \$/Mt	Domestic: Pante Macassar (\$/Mt)	Domestic c/ Processing (\$/Mt)	Sub-Total (\$/Mt)	Domestic d/ Port Costs (\$/Mt)	Domestic Export Price (\$/Mt)	Domestic Export/ Inter. Export (%)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)		
Chicken	\$4,835	\$100	\$4,935	\$2,468	\$7,403	\$370	\$7,773	239%	
Pork	\$2,048	\$100	\$2,148	\$1,074	\$3,221	\$161	\$3,383	123%	
Beef	\$7,707	\$100	\$7,807	\$3,904	\$11,711	\$586	\$12,297	205%	
Mutton	\$7,876	\$100	\$7,976	\$3,988	\$11,964	\$598	\$12,562	314%	
Rice (grain)	\$754	\$50	\$804	\$402	\$1,206	\$60	\$1,267	253%	
Soybean	\$1,379	\$50	\$1,429	\$214	\$1,644	\$82	\$1,726	230%	
Maize	\$688	\$50	\$738	\$111	\$848	\$42	\$891	198%	
Potential Situation									
Product	\$/Mt Farm Gate	Domestic Freight \$/Mt	Domestic: Pante Macassar (\$/Mt)	Domestic Processing (\$/Mt)	Sub-Total (\$/Mt)	Domestic Port Costs (\$/Mt)	Domestic Export Price (\$/Mt)	Domestic Export/ Inter. Export (%)	
Chicken	\$6,244	\$100	\$6,344	\$3,172	\$9,516	\$476	\$9,992	307%	
Pork	\$2,881	\$100	\$2,981	\$1,491	\$4,472	\$224	\$4,696	171%	
Beef	\$6,696	\$100	\$6,796	\$3,398	\$10,194	\$510	\$10,704	178%	
Mutton	\$8,128	\$100	\$8,228	\$4,114	\$12,342	\$617	\$12,959	324%	
Rice (grain)	\$649	\$50	\$699	\$350	\$1,049	\$52	\$1,102	220%	
Soybean	\$883	\$50	\$933	\$140	\$1,072	\$54	\$1,126	150%	
Maize	\$442	\$50	\$492	\$74	\$565	\$28	\$594	132%	

a/ Product produced in Oecusse.

b/ Freight from farm-gate to Pante Macassar.

c/ 50% of farm gate price for meat and 15% for grains.

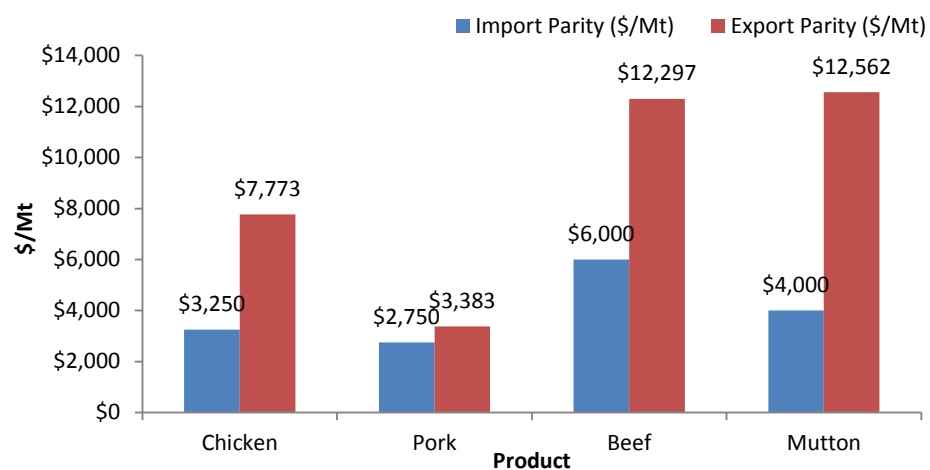
d/ 5% of value

Table 4.17: Oecusse's Agriculture Competitiveness for Varying Labor Opportunity Costs

Export Prices (CIF) - Current Situation (Labour \$2.50/day)				Export Prices (CIF) - Current Situation (Labour \$5.00/day)				Export Prices (CIF) - Current Situation (Labour \$1.50/day)			
Product a/	\$/Mt Farm Gate	Dom. Export (\$/Mt)	Dom. Export/ Inter. Export (%)	Product	\$/Mt Farm Gate	Dom. Export (\$/Mt)	Dom. Export/ Inter. Export (%)	Product	\$/Mt Farm Gate	Dom. Export (\$/Mt)	Dom. Export/ Inter. Export (%)
Chicken	\$4,835	\$7,773	239%	Chicken	\$9,247	\$14,722	453%	Chicken	\$3,071	\$4,994	154%
Pork	\$2,048	\$3,383	123%	Pork	\$2,762	\$4,508	164%	Pork	\$1,762	\$2,933	107%
Beef	\$7,707	\$12,297	205%	Beef	\$10,485	\$16,672	278%	Beef	\$6,596	\$10,547	176%
Mutton	\$7,876	\$12,562	314%	Mutton	\$12,421	\$19,721	493%	Mutton	\$6,058	\$9,698	242%
Rice (grain)	\$962	\$1,594	319%	Rice (grain)	\$1,299	\$2,125	425%	Rice (grain)	\$828	\$1,382	276%
Soybean	\$1,379	\$1,726	230%	Soybean	\$1,914	\$2,371	316%	Soybean	\$1,166	\$1,468	196%
Maize	\$688	\$891	198%	Maize	\$1,169	\$1,472	327%	Maize	\$495	\$658	146%
Export Prices (CIF) - Potential Situation (Labour \$2.50/day)				Export Prices (CIF) - Potential Situation (Labour \$5.00/day)				Export Prices (CIF) - Potential Situation (Labour \$1.50/day)			
Product	\$/Mt Farm Gate	Dom. Export (\$/Mt)	Dom. Export/ Inter. Export (%)	Product	\$/Mt Farm Gate	Dom. Export (\$/Mt)	Dom. Export/ Inter. Export (%)	Product	\$/Mt Farm Gate	Dom. Export (\$/Mt)	Dom. Export/ Inter. Export (%)
Chicken	\$6,244	\$9,992	307%	Chicken	\$8,744	\$13,929	429%	Chicken	\$5,244	\$8,417	259%
Pork	\$2,881	\$4,696	171%	Pork	\$4,215	\$6,796	247%	Pork	\$2,348	\$3,856	140%
Beef	\$6,696	\$10,704	178%	Beef	\$10,030	\$15,954	266%	Beef	\$5,363	\$8,604	143%
Mutton	\$8,128	\$12,959	324%	Mutton	\$13,683	\$21,709	543%	Mutton	\$5,906	\$9,459	236%
Rice (grain)	\$771	\$1,293	259%	Rice (grain)	\$1,017	\$1,681	336%	Rice (grain)	\$672	\$1,137	227%
Soybean	\$883	\$1,126	150%	Soybean	\$1,162	\$1,463	195%	Soybean	\$771	\$991	132%
Maize	\$442	\$594	132%	Maize	\$686	\$888	197%	Maize	\$344	\$476	106%

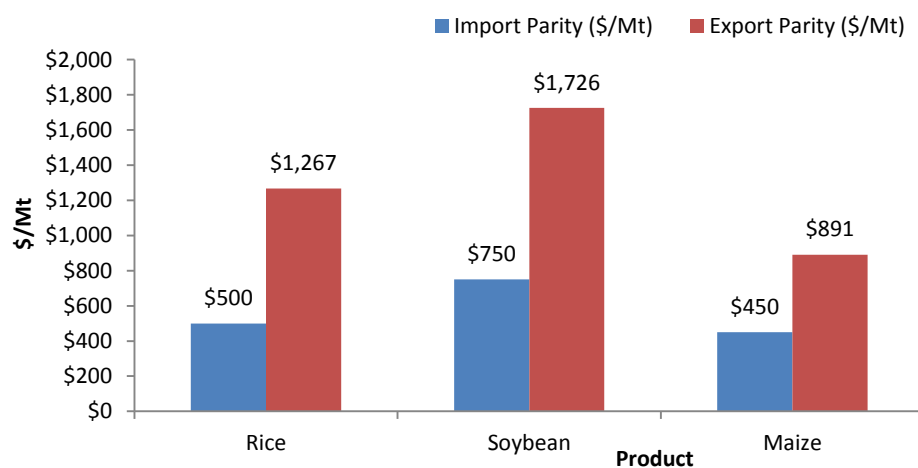
a/ Product produced in Oecusse.

Figure 4.15: Comparison of Current Oecusse Export Parity Prices, and Oecusse Import Parity Prices for Meat Products



Source: Staff Calculations and World Bank Pink Sheet

Figure 4.16: Comparison of Current Oecusse Export Parity Prices, and Oecusse Import Parity Prices for Grain Products



Source: Staff Calculations and World Bank Pink Sheet

Table 4.18: Productivity Improvement Required for Export Competitiveness

Product	Production increase for competitiveness a/
Chicken	3.1 times
Pork	1.7 times
Beef	1.9 times
Mutton	3.5 times
Rice (grain)	2.3 times
Soybean	1.5 times
Maize	1.4 times

a/ For potential situation models.

4.4 Constraints to Existing Production: What are the primary constraints to expansion of agriculture production in Oecusse?

Section 4.2 discusses constraints to increasing agriculture production in Oecusse. These vary from product to product. With a poor natural resource base being the over-riding issue, these constraints include: (i) poor and limited land and water resources; (ii) denuded and over-grazed forest resources; (iii) small farming households which face labor constraints; (iv) small livestock populations with low turn-off rates; (v) limited public sector resources and budgets; and (vi) poor connectivity. These “negatives” are to some extent offset by good support from civil society and strong social cohesion. This section, considers the cross-cutting issues which are affecting all types of agriculture production in Oecusse.

4.4.1 Agriculture Scale and Aggregation Problems

With the exception of irrigated paddy, agriculture production in Oecusse is widely scattered across diverse farming systems. This situation is not conducive to efficient collection and aggregation of marketable surpluses, and results in high freight costs and transit losses. There is an argument in support of some form of product zonation to address this constraint but poor and subsistence farmers are not attracted to such “formal” industry structures - and these farmers address risk and adversity by growing a diverse range of crop and livestock products. However MAF is currently trialing a “One-Village-One-Product” or Centur Dezenovimentu Comunidade Agrikola (CDCA) project in 40 sucos. If results are promising then this approach to agriculture production is an option worthy of consideration for Oecusse. In this event it would be important to heed lessons and results from this national trial.

4.4.2 Access to Land for “Commercial” Agriculture

In the absence of a land law, commercial agriculture production risks remain high and a major disincentive. All land in Oecusse is unofficially held by farmers under custodial laws and regulations. This means that even if local communities are amenable to (say) commercial investment in long-term forestry, there is no legal basis on which land can be leased or rented for this purpose. This situation is undoubtedly a constraint to agriculture sector investment on broader and more commercial scales, and probably means that: (i) at least in the short-term, investment will be based on small family-owned farms of about 1 ha; and (ii) investors are likely to be local farming communities and their members. In other words, Oecusse is faced with an inefficient and scattered agriculture development scenario for the time-being; unless an equitable Oecusse-specific land law can be promulgated as part of the Zone’s special circumstances.

4.4.3 Skills and Techniques

The primary constraint to increased agriculture production is a lack of knowledge of modern production techniques, and the technical capacity to use these techniques. The majority of farmers in Oecusse use traditional farming techniques, hence there is considerable room for improvement in terms of yields and product quality. In particular, slash and burn agriculture (swidden) is still the norm for non-irrigated areas (Figure 4.5). This results in significant soil erosion and fertility decline. Selective use of biological terracing and conservation agriculture techniques (as proven in the Raumoco watershed in Lautem, and elsewhere by FAO) are examples of improved agriculture production techniques which would increase productivity and protect Oecusse’s agriculture environment.

At present farmers in Oecusse rely on two main sources of improved production technology, from: (i) the Agriculture Administration's limited extension services; and (ii) NGOs and the Church - and there is scope for a more commercial approach. The Agriculture Administration is not functioning well (see Section 4.2.6) but it is unrealistic to assume that in the future (when ZEESM is being implemented) that civil society might be responsible for this vital service. Therefore there is a need for ZEESM planners to make a fundamental decision - should the Agriculture Administration be supported and resourced to the level where it is capable of servicing Oecusse's rural communities as mandated, or should Oecusse as a Special Economic Zone experiment with new approach: a farmer-driven and farmer-paid extension service, and production inputs supply system? This question will need to be resolved as the outcome will determine how Oecusse's agriculture sector is supported in the future⁶⁸.

4.4.4 Availability of Quality Inputs

An existing donor program can help distribute higher quality and improved varieties of seed and planting materials. Until recently a lack of access to high yielding crop varieties was a major constraint to increased agriculture production in Oecusse. However SoL has established a national seed system which now services the whole of Timor-Leste. Therefore there is no reason why Oecusse cannot access improved varieties of all the main food crops (rice, maize, cassava, sweet potato and peanut). The Agriculture Administration needs to organize the importation of seed and planting materials into Oecusse, and to then distribute these improved varieties as soon as possible. In addition, SoL will assist Oecusse to overcome Rice Tungro Bacilliform Virus (RTBV) which causes stunted growth in the preferred mamramo rice variety⁶⁹, by assisting with the importation of clean seed from Maliana in 2015.

Inorganic fertilizers are essential to boost production, although this will come at the cost of organic accreditation. The main required input which is in very short supply, and which is not provided by the Agriculture Administration, is inorganic fertilizer (N, P and K) for rice and maize production - the latter on the more fertile alluvial plains. Crop yields in Oecusse will remain well below international levels unless inorganic fertilizer is used on a commercial basis. The application of small tonnages (about 1 Mt/ha for paddy) of compost will make very little difference. Large scale organic crop production is not economically viable, simply because adequate supplies of organic fertilizer are not available. However if a "political" decision is made to declare Oecusse an "Organic Zone", such an outcome will condemn the Zone to low crop production forever⁷⁰.

4.4.5 On-farm Storage

An existing donor/MAF program to reduce post-harvest losses of maize can be expanded quickly. A lack of effective grain storage options often results in significant losses, particularly for maize. An International Fund for Agriculture Development (IFAD) funded study completed by the University of Timor Lorosae (UNTL) in 2013 and 2104 found that 30% of maize production is lost in storage due to weevils and

⁶⁸ Note: the ODAP outlined in Section 4.6 assumes that agriculture extension services will be provided by a strengthened and resourced Oecusse Agriculture Administration.

⁶⁹ Which sells for about \$1,000/Mt (grain) in Pante Macassar.

⁷⁰ Note: if the correct application of compost per ha (10 Mt/ha) was applied across all farming land in Oecusse, there would be an annual requirement for about 70,000 Mt of compost. And the use of animal manure in compost is impossible as ruminants are free-grazing. Therefore from an agronomic point of view it is not logical to consider declaring Oecusse as an "Organic Zone".

rats⁷¹. IFAD has supported the provision of airtight 200 liter fuel drums to households in five targeted districts in the east of the country and these reduce annual maize losses down to about 5%. To-date there are very few of these drums in Oecusse but there is no reason why ZEESM could not fund an Oecusse-specific Maize Storage Project. Ensuring that farmers can store produce, and therefore smooth-out consumption⁷², would significantly improve the amount of food available for consumption and/or sale. In summary, use of drums to store maize reduces the economic cost of producing maize grain from \$688/Mt to \$442/Mt.

4.4.6 Irrigation

The World Bank and Ministry of Finance recently undertook⁷³ pre-refurbishment appraisal evaluations of seven large irrigation schemes in Timor-Leste, including Tono in Oecusse. The conclusions are shown in Table 4.19. In summary, Timor-Leste's current irrigation strategy will not generate acceptable returns on investment in the sub-sector. There is a belief in Timor-Leste that increased irrigation is the key to producing rice at a competitive price and overcoming the need to import about 80,000 Mt of rice per year. In theory, and if cropping intensities and yields were sufficiently high as a result of increased and more reliable supplies of irrigation water, and there were good domestic markets for surplus paddy, this would be the case. However, this is currently not the case in Timor-Leste and therefore investment in irrigation rehabilitation is generating negative rates of return.

This result is because investment costs (\$/ha rehabilitated) are very high by world standards and marginal rates of return are low. The latter are due to low yields and cropping intensities, and low farm-gate prices - the latter reflecting limited domestic markets. The current approach of focusing exclusively on investments in irrigation hardware (river diversion weirs) and not on investments in complementary software (farmer services, production inputs and market support) is considered to be unsustainable. This approach will not result in the production of a sufficiently large volume of rice to justify the large investments in physical infrastructure, nor will it result in reduced dependency on imported rice to feed the nation.

The joint Infrastructure Public Expenditure Review report proposes an alternative hybrid irrigation strategy which builds on past investments in physical infrastructure, and at the same time generates high returns on marginal investment in tube-well irrigation systems, and in farmer support services and market development programs. For this strategy to succeed, Government will need to be prepared to redirect planned capital budgets for the rehabilitation of irrigation schemes to targeted increases in MAF and Ministry of Commerce Industry and Environment (MCIE) budgets to enable increased expenditure on: (i) two "software" packages - subsidized inputs and strengthened extension services; (ii) investment in TWSPs; and (iii) development of domestic rice markets.

⁷¹ This research was completed as part of the Timor-Leste Maize Storage Project (TLMSP), which is funded by IFAD and the Government of Timor-Leste (through MAF).

⁷² And allow farmers to take advantage of seasonal price variations.

⁷³ This section is based on the joint Ministry of Finance/World Bank Infrastructure Public Expenditure Review 2015 https://www.mof.gov.tl/wp-content/uploads/2015/03/A_Joint_Ministry_of_Finance_and_World_Bank_Report_on_Timor-Leste_Public_Expenditure_Review_Infrastructure.pdf

Implications for Oecusse

A policy change is required if the current rehabilitation of the Tono irrigation scheme in Oecusse is to be economically viable. Tube wells and small pumps need to be tested to supply incremental irrigation water when basal flows in the Tono River decline in the dry season - as shown in Figure 4.8.

Figure 4.17: Hydrogeology Map of Timor-Leste

is a hydrogeology map of Timor-Leste and shows that the Tono River (and the Natuka River in the west of Oecusse) both over-lie large aquifers (see Oecusse insert on the map). These areas are considered to have good potential for TWSPs irrigation systems which have potential to complement Weir-Based River Diversion (WBRD) irrigation systems.

Table 4.19: Summary of Pre-Refurbishment Appraisal of Seven Irrigation Schemes in Timor-Leste

Evaluation/Ranking Criteria Scheme--->	Proposed Irrigation Schemes							Total/ Av.
	Tono	Larisula	Buluto b/	Galata	Maukola	Dardau	Beikala	
Scheme/ road construction cost (\$'000)	\$16,885	\$6,102	\$14,725	\$7,774	\$21,999	\$4,350	\$18,056	\$89,891
Potential area irrigated (ha)	1,700	387	1,370	1,500	2,916	500	1,547	9,920
Current area irrigated (ha)	850	194	685	750	729	75	774	4,056
Construction cost (\$/ha) 2013 prices	\$9,932	\$15,766	\$10,748	\$5,183	\$7,544	\$8,700	\$11,672	\$9,935
No of households	4,545	237	960	1,287	106	351	1,007	8,493
Irrigated ha/household	0.37	1.63	1.43	1.17	27.51	1.42	1.54	1.17
No of people	20,952	1,024	4,539	6,287	489	1,657	4,642	5,656
Construction cost (irrigation/road) (\$/household)	\$3,715	\$25,745	\$15,339	\$6,041	\$207,537	\$12,393	\$17,931	\$10,584
1. Base EIRR (%): key assumptions (yields and cropping intensity) hold	11%	4%	8%	20%	18%	15%	9%	
2. EIRR (%): construction costs + 10% (two key assumptions hold)	10%	3%	7%	17%	16%	14%	7%	
3. EIRR (%): yield assumptions fail (cropping intensity assumptions holds)	6%	Negative	2%	13%	12%	10%	1%	
4. EIRR (%): cropping intensity assumptions fail (yield assumptions hold)	Negative	Negative	Negative	3%	5%	3%	Negative	
5. EIRR (%): incremental yield and cropping intensity assumptions both fail	Negative	Negative	Negative	Negative	Negative	Negative	Negative	
6. EIRR (%): grain price falls by 20%, two key assumptions hold	4%	Negative	1%	11%	10%	7%	2%	
7. EIRR (%): most probable outcome	Negative	Negative	Negative	Negative	Zero	Negative	Negative	
Benefit/Cost Ratio (Scenario 1) a/	1.07	0.67	0.90	1.80	1.57	1.36	0.92	
Benefit/Cost Ratio (Scenario 2)	0.97	0.61	0.83	1.65	1.43	1.25	0.84	
Benefit/Cost Ratio (Scenario 3)	0.74	0.46	0.63	1.20	1.15	1.01	0.54	
Benefit/Cost Ratio (Scenario 4)	0.40	0.25	0.34	0.56	0.70	0.63	0.34	
Benefit/Cost Ratio (Scenario 5)	0.20	0.12	0.17	0.19	0.43	0.42	0.12	
Benefit/Cost Ratio (Scenario 6)	0.66	0.42	0.56	1.05	0.98	0.85	0.57	
Benefit/Cost Ratio (Scenario 7 - most probable outcome)	0.29	0.18	0.42	0.42	0.50	0.45	0.25	

a/ Discount rate of 10%. b/ Construction costs as announced by JICA in late 2013.

Source: Prepared for Ministry of Finance and World Bank Public Expenditure Review of Investment in Irrigation.

Hydrogeology Map Of Timor Leste:
Aquifer Types

Draft Map compiled November 2010
by Geoscience Australia
for DIOCIS and AuSALD
1:1,000,000

Legend

Aquifer Type and Potential Yield

- Intergranular Aquifer (Alluvial) - High
- Intergranular Aquifer (Alluvial) - Low
- Fractured Aquifer (Karst) - High
- Fractured Aquifer (Karst) - Low
- Localised Aquifer (Fractured) - High
- Localised (Confining Units) - Low

Lithology

- Unknown
- Basalt
- Clay
- Conglomerate
- Fractured Basalt
- Fractured Basalt
- Karst
- Marble
- Mylonitic
- Sedimentary
- Sedimentary
- Thin Clay
- Ultra Metic
- Volcanic, Chert

Oecussi
1:1,000,000

0 50 Kilometers

Tube-Wells and Small Pumps

Figure 4.18: Marginal Returns from Supporting Irrigation Infrastructure with Supplementary TWSPs



Conclusions on Irrigation

ZEESM proponents will need to take these findings into account when planning agriculture investment programs. The approach should be a “balanced one” in which any additional investment in irrigation hardware (WBRD systems) is complemented with investment in all three essential “software” packages: (i) TWSPs; (ii) market development and support; and (iii) provision of extension and production input packages.

4.4.7 Roaming Livestock

Oecusse’s livestock need to be tethered as current free grazing causes major damage to all crops (and regenerating forests, and planted seedlings) and is frequently cited as a significant problem by farmers. Culturally, there is a view in Oecusse that fences and other barriers should not be required. Additionally, existing efforts to construct fences around large gardens have resulted in accelerated deforestation. An alternative approach therefore should be to shift towards zero-grazing systems in which cattle/buffalo and goats/sheep are tethered and provided with basic shelter and water, and fed using cut-and-carry agro-forestry fodder management systems. This would substantially reduce the need for fencing and reduce the damage caused by free roaming ruminants.

Moving away from this practice will be challenging but there are some good examples in Oecusse and other parts of Timor-Leste where small communities (with assistance from NGOs and donors) have promulgated local *tara bundu* which govern where and how livestock can be grazed. Caritas has some good examples of this management system in Oecusse, and another (larger) example can be found in seven sucos in the sub-district of Raumoco in Lautem where all forms of livestock grazing have been banned⁷⁴. The result has been a substantial increase in crop and livestock production - the former because of reduced crop damage, and the latter because under-nourished livestock are no longer required to use most of their daily energy intake for mobility, meaning that productivity (weight gain, etc.) increases.

4.4.8 Lack of Reliable Planning Data

The Oecusse administration should consider strengthening the collection of agricultural statistics, possibly with an agricultural census. Oecusse (and all of Timor-Leste) suffers from a lack of reliable agriculture statistics and planning information. The foregoing comments on areas of agriculture potential for Oecusse’s major crops are good examples. In the short-term, and until an agriculture census is conducted, little can be done to counter this major issue, other than to work from first principles and base production estimates on family labor profiles and the constraints associated with this resource which determine cropped areas. Alternatively, and in the interest of an efficient ZEESM planning process for Oecusse’s agriculture sector, it may be logical to conduct an Oecusse-specific agriculture census.

4.5 Factor Costs: How hard is it for Oecusse to be competitive?

Factor costs are a key determinant of the competitiveness of any region and the success of SEZs. In South East Asia most prospective foreign investors have a number of different locations to choose from. Special Economic Zones are also increasingly common in many countries – there are over 3,000 SEZs

⁷⁴ Assisted by SoL through DFAT.

worldwide – so whilst infrastructure and fiscal incentives can play a part, basic factor costs will always be a key element of any investment decision.⁷⁵ Timor-Leste as a whole has high factor costs relative to its neighbors. As Table 4.21 indicates, Timor has higher labor, capital, transport, and power costs than Vietnam and Indonesia.

The main factor costs for the agriculture sector are labor and inputs (seed and fertilizer) as land is virtually free. In addition, rain and oxygen are free inputs for plant growth, and although the cash cost of hired farm labor is high (\$5.00 per day) the opportunity cost of family labor is quite low. This means that in order to compete, farmers and possibly private sector investors will need to use “smarter” and more modern farming systems and techniques, such as fertilizer micro-dosing and selection of higher-value products which store well and can be exported in bulk.

Given the importance of agriculture for employment in Oecusse, further analysis of export competitiveness is worthwhile. Even though the foregoing indicates that Oecusse’s current main agriculture products are not internationally competitive, there are new crops worthy of consideration and analysis, and which might be included in the OADP. One of the main reasons for this continued focus on possible exports is that Oecusse’s agriculture sector is currently (and will be in the future) the main source of employment for the majority of the population - irrespective of whether ZEESM is implemented or not.

The detailed crop and livestock production models underpinning this chapter’s analysis illustrate how important rural employment is in Oecusse. For example, and as shown

⁷⁵ Africa, Industrial Policy and Export Processing Zones: Lessons from Asia, Howard Stein, 2009.

Table 4.20: Crop Production Labor Requirements in Oecusse

, one ha of improved irrigated paddy requires 244 person days of labor for all production activities. The equivalent figure for 1 ha of intensive vegetable production is 329 person days, or more than one person year.

Table 4.20: Crop Production Labor Requirements in Oecusse

1 ha Models Cropping Operation and Labour Requirement (person day)	Current Situation				Potential Situation			
	Trad. Paddy	Trad. Maize	Trad. Legumes	Trad. Vegies	Impr. Paddy	Impr. Maize	Impr. Legume	Impr. Vegies
Clearing grass/burning	10	10	10	10	10	10	10	10
Fencing	10	10	10	10	10	10	10	10
Preparing nursery	5				5			
Ploughing (tractor)	2	2	2	2	2	2	2	2
Harrow (tractor)	2	2	2	2	2	2	2	2
Pulling weeds & bunding	10	5	5	5	10	5	5	5
Planting	35	10	10	10	35	10	10	35
Maintaining borders	10	5	5	5	10	5	5	5
Irrigating crops	10	5	5	5	10	5	5	25
Maintaining irrigation system	10	5	5	5	10	5	5	15
Weeding	30	50	30	30	30	50	20	50
Spraying chemicals					5	5	5	5
Applying fertilizer					5	5	5	10
Staking				5				15
Harvesting	30	20	10	20	50	50	15	50
Carrying to thresher	5	5	5		10	10	10	
Drying	5	5	5		5	5	5	
Bundling/bagging	5	5	5	5	10	5	5	20
Marketing	5	5	5	5	10	15	5	20
Transporting	5	5	5	5	10	15	5	20
Other crop management	5	5	5	5	5	5	5	30
Total Labour (person days/ha)	194	154	124	129	244	219	134	329
Farm Labour	100	100	100	100	100	100	100	100
Hired Labour	94	54	24	29	144	119	34	229

Source: Ministry of Agriculture and Staff Calculations

Labor costs in particular are worth highlighting, given that Timor-Leste has very high labor costs relative to competitors, underpinned by a high legislated minimum wage. The average wage in Timor-Leste is \$503 per month⁷⁶. The minimum wage in Timor-Leste is set at \$115 per month across the country. Oecusse is therefore required to abide by the same minimum wage laws. Today some companies do not pay this wage rate. However any major investor at the scale aimed for by ZEESM will be unable to avoid the law in the same way. In short, all companies operating in Oecusse will have to pay at least \$115 per month (13 times per year) and the competitive wage may be higher still. As of 2009 this minimum wage was 207% of GDP⁷⁷ per capita. This is far higher relative to GDP than in Indonesia, where the minimum wage for East Java is 25% of GDP per capita; and in Malaysia, Cambodia and Vietnam where the minimum wage is approximately 34% of GDP per capita for workers for which there is a set minimum wage. Today the minimum wage in West-Timor, the most obvious direct competitor for investment, is approximately \$98 per

⁷⁶ Timor-Leste Labour Force Survey, 2013

⁷⁷ Non-oil GDP

month at today's exchange rate. This is paid 12 times per year. This is substantially less in absolute and relative terms than in Timor-Leste.

Productivity in Timor-Leste does not justify such high wages. Notably, in Oecusse 52% of the working age population has not attended school.⁷⁸ Labor-intensive industries are unlikely to choose Timor-Leste (or Oecusse as there is no regional variation in the minimum wage) given the high labor costs relative to its neighbors.

Transport costs are a second notable problem for production in Oecusse (and Timor-Leste). For Timor-Leste in general the cost and time to import and export are substantially higher than regional competitors. The time to export for Timor-Leste is 28 days compared with just 17 days in Indonesia and 21 days in Vietnam.⁷⁹ This is for exports primarily from Dili. Exporting from Oecusse directly is currently even more difficult, with the port unable to take large ships and without international port status to allow direct exports.

High factor costs do not mean it is impossible to attract investors. However it does suggest two things. Firstly, that economic development should focus on sectors where the use of the most expensive factors is relatively low. For example, labor intensive manufacturing industries are unlikely to succeed with high labor costs. Similarly industries with significant transportation of both inputs and outputs (such as garment production) are unlikely to succeed. Instead, sectors which: (i) use locally available assets (such as agricultural products or the natural beauty); (ii) produce light products for nearby markets; and (iii) require lower-intensity labor use, are more likely to succeed. Secondly, that policies for the SEZ focus where possible on improving factor costs – such as time and cost to export - without engaging in financially unsustainable subsidy regimes.

4.6 The potential of agriculture and how to capture it

4.6.1 Agriculture Potential

Estimating agricultural production potential in Oecusse is inherently challenging given the lack of available data and information. However it is possible to come to some general conclusions using the land uses detailed in Table 4.1. In summary, Oecusse has:

- (i) 24,420 ha classified as forests, of which half, or 12, 210 ha, are severely degraded and therefore represent a large-scale opportunity for communal and commercial re-forestation programs which would employ large numbers of rural people;

Table 4.21: Factor Cost Comparison for Timor-Leste

Factor cost comparison for Timor-Leste

Regional factor costs comparison, \$ per month			
Cost area	Timor-Leste	Vietnam	Indonesia
Labor	Ave wage	174	153
	Ave manufac wage	285	142
	Minimum wage	115	98-162
Capital	Lending rate	12.4	11.6
Transport	Cost to export	750	615
	Cost to import	755	660
Power	Price per kWh	0.20	0.06-0.09

Timor-Leste is the most expensive on most major factor costs
Minimum wage in West-Timor is just \$98 compared to \$115 (13 times) in Timor-Leste

Source: Wage information for Timor-Leste from LFS survey 2010 for Vietnam and Indonesia from World Bank and CIEC for 2011 and 2013 respectively. Lending rates from World Development Indicators for 2013, Cost to Export and Import for World Development Indicators, 12
Power from Ministry websites

⁷⁸ Timor-Leste Census 2010

⁷⁹ World Development Indicators, 2013

- (ii) 12,500 ha are “officially” suitable for maize production (with only about 2,500 ha currently being used (see Table 4.7) leaving an additional potential of 10,000 ha) - assumedly this is flat land with alluvial soils which the Agriculture Administration considers can be used for mechanized maize production (based on free cultivation services) and not the upland swidden areas covered below in (iv);

5,700 ha which are suitable for irrigated agriculture - with only 2,140 ha currently being used, (

Table 4.9: Paddy Potential Production (ha), Cropped Area (ha) and Cropped Area (ha/hh) by District

- (iii)) leaving an additional 3,560 ha available for development; and
- (iv) 33,780 ha of swidden farming and free grazing land area, which whilst by far the largest “potential agriculture development area” in Oecusse, is also fraught with difficulties and constraints because of entrenched destructive agriculture production practices and a severely degraded environment. Achieving fundamental changes in current land use practices on this class of land is difficult, and if successful, takes many years - up to a generation.

In addition, Oecusse has small livestock herds and flocks which could form the basis of a strengthened livestock sector.

4.6.2 Strategic Approach to Agriculture Development

It is suggested that the Administration should fast-track key agriculture development initiatives, and to not rely on an expanded “business as usual” approach to sectoral development. Oecusse’s uniqueness in terms of its geographic location, history, and relative isolation in terms of its share of Timor-Leste’s national development budget means that it lags behind the national average. In the past, reliance on MAF’s extension services has achieved limited results, and donors (with the exception of some national NGO’s) have tended to “ignore” the enclave, relative to their support for other districts.

This situation warrants a “smart and efficient” approach to agriculture development in Oecusse, based on the following initiatives:

- (i) **A strong focus on rural poverty reduction and rural nutrition.** This should be the core objective as poor and under-nourished farmers and their families are often not receptive targets for programs which promote economic development.
- (ii) **Leverage-in increased support from Timor-Leste’s agriculture sector donors.** This should commence with the detailed OADP planning process referred to below, plus engagement with ongoing projects (such as TLMSP) which could respond quickly and efficiently in terms of supporting Oecusse’s farmers with maize storage drums. Other donor-funded projects which could be “fast-tracked” into Oecusse include the FAO- and USAID-funded Conservation Agriculture Project. The World Bank has a data base of all current and relevant projects in Timor-Leste and this could be used as a check-list to ensure that all potentially cooperative donors are actively engaged in the OADP planning process. In addition, the recently announced Global Agriculture Food Security Program (GAFSP) grant of \$21 million (to be managed by MAF for agriculture development throughout Timor-Leste) is also an opportunity for the “fast-tracking” of proven development interventions into Oecusse⁸⁰.
- (iii) **Input support:** Ensure that all farmers have access to all, now readily available, improved food and cash crop cultivars - in this regard SoL has made commendable progress but it is likely that some of the poorer and more isolated farmers have not yet accessed this fundamental resource.
- (iv) **Build on current successes:** Work “faster, smarter and better”, i.e. (i) build on Caritas’s communal approach to watershed management); (ii) introduce locally-proven technologies such as

⁸⁰ The Tono watershed in Oecusse will be one of four target watersheds supported by a World Bank agriculture project currently under preparation, funded by the Global Agriculture and Food Security Program (GAFSP).

improved cattle feeding using multi-purpose legumes (as proven by ACIAR in West Timor and Eastern Indonesia); and (iii) be the first in Timor-Leste to test TWSPs for supplementary irrigation.

- (v) **“Leapfrog in” new agriculture production systems and practices**, such as the use of barbed wire for fencing using live posts, the use of smothering legumes for weed control in maize crops, and fertilizer micro-dosing for maize production. This is the same as “demonstrating that Oecusse can do it”.
- (vi) **Foster a “rural communal learning culture”** which is supported, as required, by OADP resources and budgets. This could involve a new and innovative approach to agriculture extension based on farmers’ demand, rather than an Agriculture Administration-determined, top down approach to planning and implementation. Many valuable lessons on how to design and implement such a program can be learned from Raumoco in Lautem; and from the now-completed *“From Hunger to Health; Strengthening Community Capacity and Resilience for Food Security in Oecusse, Project, Timor-Leste”* - funded by the EU⁸¹
- (vii) **Prepare to build on possible synergies which might develop as ZEESM is implemented**, particularly in terms of supplying fresh vegetables and locally-produced livestock products. In addition, an expanding Pante Macassar work force (mainly immigrants) would require more rice as a staple, plus other, non-staple foods. These products, and additional fresh vegetables, can be grown on Oecusse’s irrigated land if irrigation systems are repaired and then operate more efficiently in terms of increased cropping intensity and yields. In the longer-term there may be some opportunities for the agriculture sector to supply food to an emerging mining industry, subject to further assessment of this sector.
- (viii) **Current land use in Oecusse “mandates” that any future sectoral development strategy should include a strong element of forestry and agro-forestry**, provided forest-based products are internationally competitive. Such a program would increase rural incomes and employ large numbers of rural people. This is because by far the largest area of “unused” land is presently classified as “swidden farming and free grazing”. This land is highly eroded and in some places, destroyed following generations of inappropriate land use practices. Change is essential if about 42% of Oecusse’s total land mass is to “survive and be of use to future generations”.

***This represents an opportunity for “Oecusse to do something different”.** To-date no district in Timor-Leste has decided to focus on forestry and/or agro-forestry, even though forest products have a strong comparative advantages (high value, storable, exportable, and can be value-added), large areas of land with a zero opportunity cost are available, and astutely planned reforestation programs can employ large numbers of rural people, including rural youth. Furthermore there are a number of perennial tree cash crops and timber species which have considerable potential to increase farm incomes and generate high returns to family labor inputs.*

The challenge is to ensure that the right mix of agriculture products is selected for support under an OADP, given the foregoing conclusion that none of the current products are competitive in international export markets, and therefore cannot provide essential increases in rural household incomes from export sales (with the possible exception of live cattle). Therefore there is a need to:

⁸¹ The project was implemented by World Neighbors (www.wn.org) between January 2007 to 30 June 2011, in cooperation with four local NGOs. *“The behaviour changes and achievements were due to mutual learning and good cooperation amongst all stakeholders”* - Pak Wayan Tambun, Project Coordinator.

- (i) **focus on products which have good potential to create high levels of rural employment**, plus if possible, the potential to contribute to improved human nutrition;
- (ii) **focus on import replacement⁸² products** - and rice is the obvious one, with the local mamramo variety selling for about \$1,000/Mt in Pante Macassar;
- (iii) **focus on products which are likely to increase in demand as ZEESM develops**, and the domestic and migrant population grows - such as fresh meat, and fresh fruit and vegetables;
- (iv) **select new products which are at least reasonably competitive internationally**, and which are complementary in terms of environmental protection - such as a range of tree crops including timber and shorter-term tree cash crops;
- (v) **be cautious of agro-processing**: heed the above analyses in terms of potentially competitive export products - do not make the mistake of assuming that if processing facilities (such as an abattoir⁸³) are constructed, raw product volumes will increase and therefore processing will be financially viable, particularly when unskilled labor rates are so high; noting that the exception could be value-added wood-based products;
- (vi) **ensure that the wishes and aspirations of Oecusse's rural communities, and of women's groups, are factored into the OADP** - this means that a planning process which is much longer than this ZEESM review will be required to ensure stakeholder engagement and commitment, plus gender equity;
- (vii) **build on Oecusse's reputation for cohesion and self-supporting rural communities**, use the foundation laid by the "From Hunger to Health" Project, and rural communities' experience with earning their livelihoods in a very difficult agriculture environment with poor natural resources, and which requires large commitments of family labor;
- (viii) **decide how to deliver agriculture development support services (public or civil society role)**, and then ensure that such services are resourced adequately over the life of the OADP;
- (ix) **identify how to target and train local farmers** with the objective of improving their production skills for existing and new products, including an engagement policy which engenders communal cooperation and willingness, and women's involvement, to participate in their OADP;
- (x) **ensure that the local policy and regulatory environments (e.g. for live cattle exports) are in place and supported by government**; this will require some revision and adjustment to current policies, and the promulgation of local regulations and guidelines;
- (xi) **identify essential agriculture infrastructure**, such as refurbished or up-graded irrigation systems with support from TWSPs, and access roads;
- (xii) **identify other (non-agriculture) support** required for the sector to grow and prosper, such as local ports, access roads to enable forest-based products to be moved efficiently, and possibly local wood processing plants ; and

⁸² See Footnote 48

⁸³ Assuming that 25% of the annual cattle turn-off of about 1,960 head are slaughtered (490 head) = 10 head per week = 2 head per day; means that an abattoir in Pante Macassar has no chance of being financially viable. Irrespective of where abattoirs are located there are some good "rules of thumb" which determine viability - the main one being reliable and regular throughputs of at least 10 head per day for a \$1.0 million investment (international standards). Note too that modern agro-processing requires technical engineers, food technicians, and moderately skilled workers.

- (xiii) **cost the OADP**, and then analyze the impact of individual product outcomes in terms of financial, economic and social (employment) impacts⁸⁴.

It is important to note the point made in (vi) and (vii) above - communal engagement in the OADP planning process. Past experience in Oecusse and in other parts of Timor-Leste (and in other parts of the developing world) indicates that it is essential that targeted rural communities are engaged in the planning process. Normally this process needs to be implemented over about 12 months, as reported by World Neighbours⁸⁵. It is apparent from field visits undertaken as part of this review, that Oecusse's rural communities have not been sufficiently engaged in the ZEESM (agriculture) planning process. And, at the time of preparing this report, these communities had not been consulted about the possible content of an OADP. This means that there will need to be further OADP planning missions in 2015 and 2016 if this vital step in development planning is to be inclusive and therefore sustainable.

4.6.3 The Future for Oecusse's Agriculture Sector

Agriculture should be at the heart of the "Social Market Economy" philosophy in ZEESMs. This is because Oecusse's agriculture sector could be: (i) the main employer of the Zone's population for the foreseeable future (irrespective of whether ZEESM proceeds or not); (ii) increasingly responsible for producing sufficient healthy food to avoid the need to import; (iii) (continue to be) responsible for environmental protection and improvement; and (iv) the foundation on which the majority of the population experience increased incomes and improved livelihoods.

However Oecusse's development rests on an agriculture sector with significant factor cost and environmental challenges. Overcoming these constraints will require considerable support and persistence, given the low base from which the sector is emerging, and the current degraded state of Oecusse's agricultural resources. In addition the ZEESM Administration will need to recognize that it is responsible for an agriculture sector which is: (i) high cost (in terms of casual farm labor and the opportunity cost of farm family labor); (ii) (currently) very unproductive; and (iii) in danger of causing irreparable environmental destruction if changes to production systems are not made, and tree planting increased. This "triple negative" will be difficult to deal with and address, and will require innovation and fast-tracking of improved production techniques, plus a substantial increase in public expenditure for sector support.

The suggested OADP responds to these challenges. The remainder of this section:

- (i) **Outlines initial thoughts on the scope and scale of an OADP**, with the objective of completing an initial analysis of how the Plan might impact on Oecusse's rural sector - keeping in mind that the foregoing analyses on costs of production and competitiveness were based on "current" and "potential situations" with the objective of identifying potential export commodities. This showed that there are no "standout" commodities on which future development of Oecusse's agriculture sector might depend, hence the need for an OADP.

⁸⁴ To some extent this review has completed a pre-design appraisal of an OADP concept, but there is considerable and more detailed planning and analytical work required before the OADP is finalized, and presented for funding.

⁸⁵ Pak Wayan Tambun, pers. com.

- (ii) **Outlines the OADP in terms of targeted agriculture products and the number of potential beneficiaries.** The OADP is presented in the form of a program framework which could be expanded as the foundation of a detailed planning exercise referred to above;
- (iii) **presents initial OADP costings and implementation time-frames;** and
- (iv) **summarizes initial estimates of possible social, financial and economic benefits** from an OADP, noting that the suggested OADP composition in terms of priority products is based on: (a) import replacement, (b) staple and nutritious food for foreign workers, (c) improved nutrition for Oecusse's population, and (d) new perennial cash crop and tree crop products (timber) which have some comparative advantages, even in isolated Oecusse.

It should be noted that the OADP outlined below proposes Zone-wide support for agriculture development that goes well beyond the 50 ha of agroforestry and limited operational budgets discussed in the current ZEESM plans.

4.6.4 Possible OADP

A possible OADP is summarized in Table 4.22. The plan is conservative in that estimated increases in cropped areas are less than those reported by MAF and the Agriculture Administration, in terms of the sector's "official" potential. This is because land ownership and distribution constraints within rural communities are likely to limit expansion of farmed areas. Even if there were no constraints related to local land ownership, growth of the Zone's agriculture economy will continue to be constrained by a poor natural resource base (with the exception of small areas of irrigation), and low rainfall and productivity. Similarly, because the current rain fed, swidden maize farming system is unsustainable, it has been assumed that the area farmed in this way would remain constant rather than grow. Domestic limitations and market sizes were used to determine food and annual cash crop areas in the OADP. However there are no land management constraints which might limit the areas planted to a range of tree and timber crops, or for more intensive livestock raising.

The suggested OADP focuses on four core agriculture sub-sectors: (i) irrigated and rain fed crops; (ii) perennial cash crops; (iii) commercial forestry; and (iv) livestock. This is a logical selection of target products which reflects the foregoing analyses and the recommended strategic approach to sector development. The OADP's structure (in terms of priority products) reflects the need for Oecusse to produce sufficient rice to avoid increasing imports, and to meet the demand for maize noting that maize is not a viable export crop. The final structure and content of the OADP was "driven" by the staple food demand and supply balances shown in Table 4.24. This shows that future demand for rice will be met (with a small surplus) if the development plans in Table 4.22 are implemented over a 10-year period. There will also be a small domestic surplus of maize, even taking into account increased demand for non-ruminant livestock feeding.

Possible OADP Phasing

The phasing of a an OADP plan is summarized in Table 4.23, and is conservative given that it will take some time to build and strengthen Oecusse's Agriculture Administration's extension services, and to organize cooperative programs with Development Partners, and local and international NGOs. Note that the suggested OADP is based on a "hybrid extension service" in which Oecusse's Suco Extension Officer (SEOs) work in partnership with NGO networks and communal groups. This approach

was selected because of the recommendation from staff engaged on the completed “From Hunger to Health; Strengthening Community Capacity and Resilience for Food Security in Oecusse” Project. In fact one staff member provided the World Bank team with the quotation below, which is good evidence that the “hybrid” approach should be successful.

Table 4.22: Possible OADP

				Unit	Current Units a/	Current hhs b/	Potential Inc. Units c/	Potential Inc. hhs c/	Inc. Units in OADP d/	Inc. hhs in OADP
Category	System	Land Type	Product/s							
Agriculture	WBRD Irrigation and	Irrigated	Paddy	ha	2,000	4,000	1,000	6,000	1,000	2,000
	Tube-Wells/Small Pumps		Vegetables e/	ha	200	4,000	200	4,000	0	0
	Rainfed annual crops	Flat coastal land	Maize with smother legumes g/	ha	2,000	2,000	2,000	2,000	0	0
	Rainfed annual crops f/	Swidden/eroded land	Maize with smother legumes g/	ha	5,000	10,000	5,000	10,000	0	0
	Perennial cash crops	Swidden/eroded land	Coffee Cloves Cashew	ha ha ha	Very small areas	Very small no. of hhs	No limit, except hh labour, ability of farmers to adopt, and level of support			
Forestry	Timber	Denuded forest	Teak	ha	Very small areas	Very small no. of hhs	No limit, except hh labour, ability of farmers to adopt, and level of support			
	Sandalwood	Denuded forest	Sandalwood	ha						
	Mahogany	Denuded forest	Mahogany	ha						
	Agro-forestry h/	Denuded forest	Multi-purpose spp. i/	ha						
Livestock	Cattle/buffalo	Swidden/eroded	Beef (5 head)	nos	18,500	6,697	No limit, except hh labour, ability of farmers to adopt, and level of support			
	Sheep/goats	grazing land	Mutton (10 head)	nos	14,500	5,038				
	Pigs	Free range	Pork (1 sow)	nos	25,000	10,009				
	Poultry	Free range	Chicken (12 chickens)	nos	46,000	10,241				

a/ Approximate estimate - based on MAF's estimates and local opinions.

b/ Estimate based on 2010 census results, plus logical estimates based on hh numbers and family labour availability.

c/ Current estimates of potential reduced to reflect land ownership constraints to expansion.

d/ Increase in area limited to that required to satisfy domestic market.

e/ On same irrigated land as paddy.

f/ Assumes no change in area as the current swidden farming system is unsustainable.

g/ Use of velvet bean to smother end of season weeds, oversown, not separate crop.

h/ For ruminant livestock production (cut and carry) and fuel wood production.

i/ Mixed perennial tree legumes and grasses, for fodder and fuel-wood

Table 4.23: Possible OADP Phasing

Product Model	Unit	Oecusse Agriculture Development Plan - Approximate Planned Development									
		Yr 1 a/	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10
Current Irrigation (paddy)	ha	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
New Irrigation (paddy) (inc.)	ha	(plan)	(cont.)	(build)	250	250	250	250			
Total paddy area	ha	2,000	2,000	2,000	2,250	2,500	2,750	3,000	3,000	3,000	3,000
Current Irrigation (vegies)	ha	200	200	200	200	200	200	200	200	200	200
New Irrigation (vegies) (inc.)	ha				0	0	0	0			
Total vegetable area	ha	200	200	200	200	200	200	200	200	200	200
Current Rainfed Annual Crops - flat land											
flat coastal land - maize/legume	ha	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
New Rainfed Annual Crops (inc.)											
flat coastal land - maize/legume	ha		0	0	0	0	0				
Total maize area (flat land)	ha	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Current Rainfed Annual Crops											
swidden - maize/legume	ha	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
New Rainfed Annual Crops (inc.)											
swidden - maize/legume	ha		0	0	0	0	0				
Total maize area (swidden)	ha	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
New Perennial Cash Crops											
Coffee	ha		200	200	200	200	200				
Cloves	ha		100	100	100	100	100				
Cashew	ha		200	200	200	200	200				
Total Coffee area	ha		200	400	600	800	1,000	1,000	1,000	1,000	1,000
Total Clove area	ha		100	200	300	400	500	500	500	500	500
Total Cashew area	ha		200	400	600	800	1,000	1,000	1,000	1,000	1,000
New Forestry											
Teak	ha		200	200	200	200	200				
Sandalwood	ha		200	200	200	200	200				
Mahogany	ha		200	200	200	200	200				
Agro-Forestry, multi-purpose spp.	ha		400	400	400	400	400				
Total Hardwoods area	ha		400	800	1,200	1,600	2,000	2,000	2,000	2,000	2,000
Total Sandalwood area	ha		200	400	600	800	1,000	1,000	1,000	1,000	1,000
Total Agro-Forestry area	ha		400	800	1,200	1,600	2,000	2,000	2,000	2,000	2,000
New Livestock Production											
Beef Production	unit		100	100	100	100	100				
Mutton Production	unit		25	25	25	25	25				
Pork Production	unit		100	100	100	100	100				
Chicken Production	unit		500	500	500	500	500				
Total Beef Units			100	200	300	400	500	500	500	500	500
Total Mutton Units			25	50	75	100	125	125	125	125	125
Total Pork Units			100	200	300	400	500	500	500	500	500
Total Chicken Units			500	1,000	1,500	2,000	2,500	2,500	2,500	2,500	2,500

Table 4.24: Current Demand for and Supply of Rice and Maize in Oecusse

Product	Current Demand/Supply			Predicted (in 10 years) b/		
	Prod'n (Mt)	Demand (Mt)	Balance a/	Prod'n (Mt)	Demand (Mt)	Balance
Rice	2,882	8,400	-5,518	14,850	12,020	1,830
Maize	5,600	6,300	-700	14,375	11,529	2,846
Total	8,482	14,700	-6,218	29,225	24,549	4,676
					"Surplus"	16%

a/ About 6,000 of rice imported per year to balance deficit.

b/ Assumes demand for rice grows at 5% compound.

b/ Assumes demand for maize (mainly for livestock feed) grows at 7% compound.

"The wonderful achievements were obtained due to good coordination and support from the District Administrator (Sr. Jose Tanesib Anunu), the District Development Officer (Sr. Domingos Maniquin), the MSS (Sr. Jimmy then continued by Sr. Gido), and the DHS (Sr. Manuel da Cunha). From MAF, the support and cooperation in the field was mostly provided by SEOs and Sub-District Extension Coordinators. There was mutual learning and support from Oxfam and Caritas Australia as well. The cooperation and support from Suco Chiefs and local leaders was also great. In conclusion, the wonderful behaviour changes and achievements were due to mutual learning and good cooperation amongst all stakeholders⁸⁶".

Preliminary Costings and Time-frames

Implementation of an OADP would raise the level of investment in Oecusse's agriculture sector considerably over the next 10 years, and result in significant reallocation of resources, to four core sub-sectors⁸⁷. Table 4.26 summarizes the preliminary costs and timing for the OADP. In summary, the first preliminary estimates indicate that the financial cost of an OADP would be about \$47.5 million over a 10-year implementation period, involving an increase, in relation to current operational costs, of about \$43.5 million⁸⁸. About 65% of the cost would be associated with structural improvements to Tono, improvements in terms of TWSPs for Tono, and the "greenfields" development of an additional 1,000 ha of irrigated land. Note that even though the foregoing analyses indicates that Oecusse cannot compete on international markets for the export of rice (or maize) it is logical to focus on domestic production of import replacements⁸⁹ for these products - particularly rice (6,000 Mt of grain or 11,000 Mt of paddy, equivalent to an additional 2,000 ha of irrigated land producing about 5 Mt paddy/ha from two crops per year). The remaining \$16.25 million has been allocated to the four core agriculture sub-sectors referred to above, plus additional transport and operations costs.

⁸⁶ Pak Wayan Tambun, pers. com.

⁸⁷ In the context of overall investment planned by Government in ZEESM, the allocation of about \$43.5 million to Oecusse's agriculture sector is very small in comparison.

⁸⁸ Including \$10 million for the current upgrade of the Tono irrigation scheme.

⁸⁹ Import replacement does not suggest protection for domestic producers, but rather a focus on products with a significant domestic market and the prospect for greater efficiency in production.

4.6.7 Preliminary Analyses

Economic Analysis

Preliminary analysis suggests an OADP EIRR of 10%. Table 4.27 details an initial and approximate Economic Analysis of the OADP. Note however that this plan has not been developed in cooperation with the wide range of stakeholders who are interested in the development of Oecusse's agriculture sector. Therefore readers are reminded that this is a preliminary and indicative analysis which is almost certain to change once more detailed and cooperative plans are developed.

Sensitivity Analyses

The OADP EIRRs are very sensitive to labor cost assumptions. Results from sensitivity analyses of the impact on the estimated OADP's EIRR are shown in Table 4.25, for four different labor cash costs and family labor opportunity cost rates (from \$1.50 to \$5.00 per day). Key conclusions are:

- (i) if the \$10 million to upgrade Tono is included as an OADP cost (as it should be) then the OADP would only be economically viable if labor costs (farm household and hired) were about \$2.50 per day, or less;
- (ii) if the cost of labor is the current minimum wage rate (about \$4.15 per day) the OADP would be marginally viable; and
- (iii) these results show just how sensitive agriculture development in Oecusse is to local labor costs.

Table 4.25: Sensitivity Analyses

Opp Cost of HH Labour, and Cost of Hired Labour (\$/day)			
\$2.50	\$5.00	\$1.50	\$4.15 a/
EIRR			
10%	3%	13%	6%

a/ minimum wage.

Table 4.26: Summary of Preliminary Economic Analysis of OADP

Cost Item	ECONOMIC ANALYSIS, OADP PLAN (\$'000)									
	Yr 1 a/	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10
Current Irrigation (ha) a/	2,000									
ha/yr		500	500	500	500					
\$/ha	\$2,000	\$5,000	\$6,000	\$1,000	\$1,000	\$1,000	(Includes cost of Tono, \$10 million)			
New Irrigation (ha) b/	1,000									
ha/yr		250	250	250	250					
\$/ha	\$12,000	\$3,000	\$3,000	\$3,000	\$3,000					
Irrigation Total (investment)	\$5,000	\$9,000	\$4,000	\$4,000	\$4,000					
Cumulative Investment		\$14,000	\$18,000	\$22,000	\$26,000	\$26,000	\$26,000	\$26,000	\$26,000	\$26,000
Return on Investment (5%) c/		\$700	\$900	\$1,100	\$1,300	\$1,300	\$1,300	\$1,300	\$1,300	\$1,300
Annual Irrigation Ops and Mtce (2.5%)		\$350	\$450	\$550	\$650	\$650	\$650	\$650	\$650	\$650
Subtotal Irrigation Operations		\$1,050	\$1,350	\$1,650	\$1,950	\$1,950	\$1,950	\$1,950	\$1,950	\$1,950
Total Irrigation Costs	\$5,000	\$10,050	\$5,350	\$5,650	\$5,950	\$1,950	\$1,950	\$1,950	\$1,950	\$1,950
MAF Oecusse Current Budget	\$400	\$400	\$400	\$400	\$400	\$400	\$400	\$400	\$400	\$400
Incremental MAF Budget d/										
Vehicles e/	\$313				\$313					\$313
Vehicle operations f/	\$31	\$31	\$31	\$31	\$31	\$31	\$31	\$31	\$31	\$31
Annual Crop Program g/	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500
Perennial and Timber Crop Program g/	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500
Livestock Program g/	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500
Sub-Total Crop, Timber, Livestock Costs	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500
Total MAF Operation Costs	\$2,244	\$1,931	\$1,931	\$1,931	\$2,244	\$1,931	\$1,931	\$1,931	\$1,931	\$2,244
Total OADP Costs	\$7,244	\$11,981	\$7,281	\$7,581	\$8,194	\$3,881	\$3,881	\$3,881	\$3,881	\$4,194
Incremental OADP Costs	\$6,844	\$11,581	\$6,881	\$7,181	\$7,794	\$3,481	\$3,481	\$3,481	\$3,481	\$3,794
Incremental FINANCIAL costs	\$6,844	\$10,881	\$5,981	\$6,081	\$6,494	\$2,181	\$2,181	\$2,181	\$2,181	\$2,494

a/ TWSPs, and including the refurbishment cost of the current upgrade of Tono irrigation scheme.

EIRR 10%

b/ New/repared infrastructure and TWSPs. Area limited to that required to satisfy domestic demand.

c/ Opportunity cost of invested funds - an economic cost, not a financial cost.

d/ No additional staff required, current staffing cadre of 137 is adequate.

e/ Five vehicles at \$50,000 and 25 motor-bikes at \$2,500.

f/ 10% of investment cost per year.

g/ Incremental MAF costs, other incremental costs included in the production models.

Costs are for improved extension services and SEO/farmer training, plus support for local NGOs and civil society.

Table 4.27: Preliminary OADP Analysis

Product			Economic Benefits (\$/ha)	Incremental Economic Benefits (\$'000)									
				Yr 1 a/	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10
Irrigation - paddy		ha											
Current area ("WO" OADP) a/	1 crop	2,000	\$100	\$201	\$201	\$201	\$201	\$201	\$201	\$201	\$201	\$201	\$201
Current area ("W" OADP) b/	2 crops	2,000	\$325	\$650	\$650	\$650	\$650	\$650	\$650	\$650	\$650	\$650	\$650
Net inc. benefits - current area				\$450	\$450	\$450	\$450	\$450	\$450	\$450	\$450	\$450	\$450
New area ("W" OADP)	2 crops	1,000	\$325				250	250	250	250			
Net inc. benefits - new area							\$81	\$163	\$244	\$325	\$325	\$325	\$325
Total paddy net increment				\$450	\$450	\$450	\$531	\$612	\$694	\$775	\$775	\$775	\$775
Irrigation - vegetables													
Current area ("WO" OADP)	1 crop	200	\$1,489	\$298	\$298	\$298	\$298	\$298	\$298	\$298	\$298	\$298	\$298
Current area ("W" OADP)	1 crop	200	\$1,805	\$361	\$361	\$361	\$361	\$361	\$361	\$361	\$361	\$361	\$361
Net inc. benefits - current area				\$63	\$63	\$63	\$63	\$63	\$63	\$63	\$63	\$63	\$63
New area ("W" OADP)	1 crop	0	\$1,805				0	0	0	0			
Net inc. benefits - new area							\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total vegetable net increment				\$63	\$63	\$63	\$63	\$63	\$63	\$63	\$63	\$63	\$63
Rainfed (flat land) - annual crops (maize and drums)				0%	25%	50%	65%	75%					
Current area ("WO" OADP)		2,000	-\$116	-\$232	-\$232	-\$232	-\$232	-\$232	-\$232	-\$232	-\$232	-\$232	-\$232
Current area ("W" OADP)		2,000	\$506	\$0	\$253	\$506	\$658	\$759	\$759	\$759	\$759	\$759	\$759
Net inc. benefits - current area				-\$232	\$485	\$738	\$890	\$991	\$991	\$991	\$991	\$991	\$991
New area ("W" OADP)		0	\$506		0	0	0	0	0				
Net inc. benefits - new area				\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total rainfed (flat land) net increment - maize & drums				-\$232	\$485	\$738	\$890	\$991	\$991	\$991	\$991	\$991	\$991
Rainfed (swidden) - annual crops (maize and drums)				0%	25%	50%	65%	75%					
Current area ("WO" OADP)		5,000	-\$116	-\$580	-\$580	-\$580	-\$580	-\$580	-\$580	-\$580	-\$580	-\$580	-\$580
Current area ("W" OADP) c/		5,000	\$380	\$0	\$474	\$949	\$1,233	\$1,423	\$1,423	\$1,423	\$1,423	\$1,423	\$1,423
Net inc. benefits - current area				-\$580	\$1,054	\$1,529	\$1,813	\$2,003	\$2,003	\$2,003	\$2,003	\$2,003	\$2,003
New area ("W" OADP)		zero											
Net inc. benefits - new area		zero		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total rainfed (swidden) net increment - maize & drums				-\$580	\$1,054	\$1,529	\$1,813	\$2,003	\$2,003	\$2,003	\$2,003	\$2,003	\$2,003
Total incremental benefits (annual crops)				-\$299	\$2,052	\$2,780	\$3,297	\$3,670	\$3,751	\$3,832	\$3,832	\$3,832	\$3,832

Table 37 - continued

Product			Incremental Economic Benefits (\$'000) (cont.)									
			Yr 1 a/	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10
Perennial cash crops	New area ("W" OADP)											
	Coffee	1000		200	200	200	200	200				
			phased (\$/ha)	-\$95	-\$135	-\$140	-\$119	-\$75	\$65	\$150	\$199	\$223
	Cloves	500		100	100	100	100	100				
			phased (\$/ha)	-\$36	-\$50	-\$63	-\$75	-\$52	\$7	\$54	\$110	\$175
Cashews	1000		200	200	200	200	200					
		phased (\$/ha)	-\$48	-\$56	-\$68	-\$73	-\$75	-\$24	-\$9	\$15	\$36	
Total incremental benefits (perennial tree crops)			\$0	-\$179	-\$241	-\$271	-\$268	-\$201	\$48	\$195	\$324	\$434
Forestry	New area ("W" OADP)											
	Teak	1,000	ha	200	200	200	200	200				
			phased	-\$90	-\$130	-\$165	-\$195	-\$223	-\$158	\$134	\$145	\$151
	Sandal wood	400	ha	200	50	50	50	50				
			phased	-\$855	-\$958	-\$1,060	-\$1,163	-\$1,218	-\$418	-\$370	-\$323	-\$275
	Mahogany		ha	200	200	200	200	200				
			phased	-\$80	-\$113	-\$145	-\$175	-\$203	-\$148	-\$149	\$110	\$366
	Agro-forest (multi-purpose)	2,000	ha	400	400	400	400	400				
		phased	-\$95	-\$135	-\$155	-\$175	-\$180	-\$75	-\$5	\$65	\$155	
Total incremental benefits (forestry)			\$0	-\$1,040	-\$1,223	-\$1,380	-\$1,533	-\$1,620	-\$650	-\$242	-\$113	\$30
Livestock Products	New Units ("W" OADP)											
	Beef	500	unit	100	100	100	100	100				
			phased	\$2	\$4	\$5	\$7	\$9	\$9	\$9	\$9	\$9
	Mutton	125	unit	25	25	25	25	25				
			phased	-\$3	-\$6	-\$10	-\$13	-\$16	-\$16	-\$16	-\$16	-\$16
	Pork	500	unit	100	100	100	100	100				
			phased	\$123	\$247	\$370	\$493	\$616	\$616	\$616	\$616	\$616
	Chicken	2,500	unit	500	500	500	500	500				
		phased	\$5	\$10	\$15	\$20	\$25	\$25	\$25	\$25	\$25	
Total incremental benefits (livestock)			\$0	\$127	\$254	\$381	\$507	\$634	\$634	\$634	\$634	\$634
Total inc. ben. (perennial crops, forestry and livestock)			\$0	-\$1,092	-\$1,210	-\$1,270	-\$1,293	-\$1,187	\$32	\$588	\$845	\$1,098
TOTAL INCREMENAL BENEFITS			-\$299	\$960	\$1,570	\$2,027	\$2,377	\$2,564	\$3,865	\$4,420	\$4,677	\$4,931
INCREMENTAL OADP COSTS			\$6,844	\$11,581	\$6,881	\$7,181	\$7,794	\$3,481	\$3,481	\$3,481	\$3,481	\$3,794
NET OADP BENEFITS			-\$7,143	-\$10,621	-\$5,311	-\$5,154	-\$5,417	-\$917	\$383	\$939	\$1,196	\$1,137
10% NPV --->-\$406												
EIRR---->10%												

Incremental Food Production

Rice production will increase about five times over ten years, to a limit determined by satiating domestic, rather than export demand; and maize production will increase by 2.6 times over the same period. Table 4.28 summarizes the estimated increase in food production in Oecusse under the OADP and should be considered in conjunction with Table 4.24 which is a staple food supply budget. It is estimated that rice (grain) production would increase by about 12,000 Mt per year (by year 10) and that maize production would increase by about 8,780 Mt over the same time period. Note that these figures do not reflect Oecusse's maximum potential, but the limit imposed by the lack of international competitiveness in grain markets and the size of Oecusse's domestic markets. The OADP is therefore designed so that areas of paddy and maize are limited to the area required to meet domestic demands.

Meat production is estimated to increase by about 22% over the 10-year period and this is one area where the scale of development could be further increased when preparing the final plan, not only because of growing domestic and international markets (for beef in West Timor) but also because of Oecusse's potential to grow more maize for livestock feeding. Note that the ODAP does not include any increase in the maize production area, but does assume increased production from existing areas, and reduced storage losses.

Table 4.28: Estimated Incremental Food Production

Food Crops		Current Situation			With OADP			Inc.
System	Crop	ha cropped	Mt/ha	Prod'n (Mt)	ha cropped b/	Mt/ha	Prod'n (Mt)	Prod'n (Mt)
Irrigation	Paddy - Existing Area	2,000	2,620	5,240	4,000	4,500	18,000	12,760
	Rice (grain)			2,882			9,900	7,018
	Paddy - New Area				2,000	4,500	9,000	9,000
	Rice (grain)						4,950	4,950
	Total Inc. Rice Prod'n	2,000		5,240	6,000	5.2	27,000	11,968
	Vegetables - Existing Area	200	1,600	320	200	3,200	640	320
	Total Inc. Vege Prod'n							320
Rainfed	Maize - flat land (existing) a/	2,000	800	1,600	2,000	2,500	5,000	3,400
	Maize - flat land (new)				0	2,500	0	0
	Maize - swidden (existing) a/	5,000	800	4,000	5,000	1,875	9,375	5,375
	Maize - swidden (new)				0			
	Total Inc. Maize Prod'n			5,600		9.0	14,375	8,775
Livestock		Current Situation			With OADP			
System	Product	Unit	Kg/unit	Prod'n (Mt)	Unit	Inc. Kg/unit	Inc. Prod'n (Mt)	
Livestock	Beef			268	500	81	41	
	Mutton			41	125	48	6	
	Pork			549	500	128	64	
	Chicken			17	2,500	33	83	
Total Meat Production (Mt)				875			193	22%

a/ Includes improved maize storage; assumes swidden yield is 70% of flat land yield.

b/ Two crops of paddy per year - "with OADP".

Beneficiary Households

The majority of households currently earning rural livelihoods in Oecusse (about 12,000) are expected to benefit from various activities in the OADP, noting that some families will benefit from increased production of more than one product. Table 4.22 lists the number of expected beneficiary households if an OADP is implemented. In summary this is expected to be: (i) the current 4,000 households with access to existing irrigated land, plus an additional 2,000 households who would benefit from access to newly developed irrigation land; (ii) the current 4,000 households (not mutually exclusive from those listed in (i)) who would benefit from improved vegetable production; (iii) the current 2,000 households who grow rain fed maize on flat land; and (iv) the current 10,000 households who grow rain fed maize on swidden land. Note that many of these households have been “double-counted” as most farming families in Oecusse grow a wide range of crops on irrigated and rain fed land. In addition, about 5,000 households would benefit from investment in forestry products, and 2,500 from investment in perennial cash crops. And about 3,625 households would participate in improved livestock production activities- see Table 4.23 for details.

Livelihoods Analysis

An important determinant of whether a program such as the suggested OADP produces sufficient benefits to warrant investment is the impact on farmers’ incomes (financial returns) and the financial returns to family labor invested in agricultural production. This is the contribution of the OADP to poverty alleviation. These figures are determined by incremental crop and livestock production which is expected to be an outcome from increased support to Oecusse’s farmers. The farm incomes (gross margins) and returns to family labor figures are detailed in Table 4.11 and Table 4.12, and summarized in

Table 4.29: Financial Return for Farmers

Generally gross margins (financial returns) per cropped ha and per livestock production unit increase with OADP funded support, but this is not always the case for returns to family labor. This is because the “potential with OADP scenario” models require considerably more family labor than the “current situation” models, and these additional inputs are not offset by sufficiently high increased crop yields or livestock productivity. The conclusion from this analysis is that rural families’ standard of living from crop and livestock production would improve under an OADP as farm incomes would increase.

Table 4.29: Financial Return for Farmers

does not include farmer financial returns for perennial cash crops or forestry products. This is because returns per family day are not relevant due to the time taken for these crops to mature and to come into production. However another way to express financial returns from these longer-term crops is to include a reasonable financial cost (\$5.00 per day) for family labor in the calculation of Financial Internal Rates of Return (FIRRs).

**Table 4.30: FIRR for Perennial Cash Crops
and Forestry Products**

contains the estimated FIRRs for these crops and shows that with the exception of coffee and agro-forestry⁹⁰, these non-food crops are attractive investment propositions for Oecusse's farmers with access to suitable land. And teak and mahogany (tropical hardwoods) appear to be particularly attractive with approximate FIRRs of 38% and 23%, respectively.

⁹⁰ For which the only benefits are small quantities of fuel-wood; benefits from trees legumes are attributed to the ruminant livestock production models.

Table 4.29: Financial Return for Farmers

Crop (1 ha model)	CS b/	PS & with OADP c/
Irrigated Paddy	Financial	Financial
Crop production (Mt) - 1 crop a/	2.62	4.50
Gross Margin per ha	\$970	\$1,471
Gross Margin per Family labour day	\$9.70	\$14.71
Rainfed Maize (WP includes storage)		
Crop production (Mt)	0.80	2.50
Gross Margin per ha	\$145	\$864
Gross Margin per Family labour day	\$1.45	\$8.64
Irrigated Legumes		
Crop production (Mt)	0.58	1.20
Gross Margin per ha	\$400	\$752
Gross Margin per Family labour day	\$4.00	\$7.52
Irrigated Vegetables		
Crop production (Mt) - 1 crop	1.60	3.20
Gross Margin per ha	\$1,828	\$2,192
Gross Margin per Family labour day	\$18.28	\$21.92
Livestock (1 unit)		
Beef		
Beef production (kg)	54	135
Gross Margin per unit	\$300	\$650
Gross Margin per Family labour day	\$5.00	\$3.61
Mutton		
Beef production (kg)	33	81
Gross Margin per unit	\$190	\$360
Gross Margin per Family labour day	\$3.17	\$2.00
Pork		
Beef production (kg)	210	338
Gross Margin per unit	\$1,995	\$3,528
Gross Margin per Family labour day	\$33.25	\$19.60
Chicken		
Beef production (kg)	17	50
Gross Margin per unit	\$137	\$197
Gross Margin per Family labour day	\$4.56	\$3.94

Note: forestry and tree crop models not included.

a/ Net of losses and retained seed -if applicable.

b/ CS = current situation.

c/ PS = potential situation and "with OADP".

Table 4.30: FIRR for Perennial Cash Crops and Forestry Products

Product (1ha)	FIRR(%)a/
Coffee	2
Clove	23
Cashew Nut	7
Mahogany	23
Teak	38
Sandal Wood	15
Agro-forestry	0

a/Labour costed at \$5/day for family and hired labour.

4.7 Conclusions

The analyses completed as part of this ZEESM review indicate that in the future the development of Oecusse's agriculture sector should focus on:

- (v) growing sufficient staple and nutritious food for its indigenous population (and an expected increase in migrant workers) plus ensuring that the Zone is self-sufficient in rice by increasing rice production by about 12,000 Mt per year;
- (vi) increasing farm incomes from annual and perennial crops (food and cash) through the promotion of improved production and storage technologies, and a small increase in the area of irrigated land (1,000 ha);
- (vii) protecting remnant forests and restoring over-grazed and denuded hills (the latter through no expansion of swidden farming) by controlling free livestock grazing and introducing more intensive livestock production systems; and
- (viii) “being ambitious” - setting out to prove that Oecusse's Government and its rural people have the determination to convert the Zone into a world-class and best-practice example of how to restore large areas of degraded land into productive (and financially and economically viable) farming systems based on: (a) perennial tree crops, (b) mixed hardwood species, and (c) agro-forestry species.

The starting point should be the detailed design and analysis of an OADP, ensuring that the participative approach outlined above is followed carefully. This step in the overall development and implementation of ZEESM needs to be completed as soon as possible, because (and as elaborated in other Parts of this report) to-date Oecusse's rural population has not been well-briefed on ZEEM's plans or its implications for this section of the community; and nor does there seem to be any direct investment planned for Oecusse's agriculture sector under ZEESM, with the exception of 50 ha of agro-forestry.

CHAPTER 5: Transport Corridor

5.1 Introduction

This chapter analyzes characteristics, in terms of procedures, time and cost, of transporting goods and people overland between Dili and Oecusse and West Timor and Oecusse.

Oecusse is an isolated coastal enclave of the Democratic Republic of Timor-Leste surrounded by Indonesia (West Timor in Nusa Tenggara Timur, or NTT Province). While there are limited ferry and air options that require no border crossings, transporting people or cargo over land between Dili and Oecusse requires crossing national borders twice each way. The most direct overland route assessed in this report involves first leaving Timor-Leste at the Batu Gade border post and entering Indonesia. Then exiting Indonesia and entering Timor-Leste through the Sakato crossing into Oecusse. This chapter also reviews which routes between Oecusse and major trading posts are the most efficient, in terms of time and costs.

The report is based on the experience of a World Bank team that travelled over land from Dili to Oecusse, complemented by a desk review and information gathered from interviews with the authorities, traders and transport firms.

The rest of the chapter is structured as follows: Section 2 briefly describes the de jure and de facto border crossing procedures for people and vehicles. Section 3 analyzes the transport time and costs for different routes between Oecusse and trading posts. Section 4 provides recommendations. Annex 1 presents a mapping of the processes for border crossing procedures, Annex 2 presents the timeline for travel between Dili and Oecusse via Sakato, and Oecusse to Dili via Oesilo.

Box 5.1: Infrastructure at Timor-Leste's border posts

The border post infrastructure at Oecusse is generally good with the exception of the post at Oesilo.

General cargo arrives in Oecusse from West Timor principally through Oesilo and the new Integrated Border Post (IBP) at Sakato. A small amount of trade also arrives by Passabe. Oesilo has increased in importance as an entry point since the beginning of 2013.

At Oesilo the border post is primitive but the government intends to build a new post in 2015. The IBP at Sakato is under-utilized, and is mainly used for transit goods from Dili.

On current plans, all border crossings will have internet by the end of 2015 under a contract with Timor Telecom. Once connected the entire district Customs officers will have real time access to the Customs server anywhere in the Country.

Management of the Oecusse posts has long been neglected, with poor record keeping on volumes and values of goods imported, most likely leading to underreporting and poor duty collections. Recording of imports, and hence duty collections is set to improve with the planned classification by APORTIL, the autonomous ports authority, of Oecusse port as a full international port. This move also coincides with an initiative with the World Customs Organisation to introduce a harmonized system for classification and valuation of goods in Timor-Leste as a whole.

5.2 Procedures and Practical Experience.

Overland travel between Oecusse and Dili is cumbersome. Established formal procedures are subject to change and delays. Visa and permit processes for persons and vehicles must be initiated several days in advance of travel, and are only valid for specific periods

5.2.1 Visa procedure to visit Indonesia

Timor-Leste is one of many countries eligible for its citizens to obtain a visa on arrival when entering Indonesian territory. However, this is only available at airports or seaports, not at land borders. Thus, to cross the land border at Batu Gade, Passabe, Bobometo (Oesilo), Sakato and Citrana⁹¹, a Timor-Leste passport holder needs to apply for a visa at the Indonesian Embassy in Dili or the Indonesian Consulate office in Oecusse. When applying for a visa, an applicant needs to complete a form, fulfill the following requirements and pay USD45 for a 30-day visa:

- Present a valid passport
- Enclose two photos
- Demonstrate ticket or any proof regarding means of transportation to the destination country
- Demonstrate sufficient funds for period of stay
- Demonstrate accommodation arrangements.

5.2.2 Visa procedure to visit Timor-Leste

Unlike Indonesia, Timor-Leste applies a visa on arrival policy at every frontier – not only sea and airports – including land borders at Batu Gade, Oesilo, and Citrana. Generally, visitors from any country can easily obtain a 30 day tourist and business visa on arrival by filling a simple form, paying USD30 in cash, and enclosing all document requirements.

5.2.3 Practical experience of obtaining a visa to Indonesia

Regular passport holders receive their visas on time, while diplomatic passport holders may experience delays. For general passport holders, visas are normally issued in the required 3 days. For UN passport (Laissez Passer) holders, it should take only one day to get a visa from Indonesian Embassy. In practice it takes 3 days to get the visa.

The absence of a visa on arrival facility at Indonesian land borders provides room for negotiation between people travelling without a visa and border officers. There is anecdotal evidence that when a person has not applied for a visa prior to crossing the border, officers have opened the option of negotiation. It is said to be common to get a clearance from Indonesia border officers, which may involve illegal fees.

⁹¹ These are the five Timor-Leste border posts for crossings to Indonesia that connect Oecusse to the other part of Timor-Leste. The Indonesian posts at these locations are, respectively: Motaain, Haumeniana, Napan, and Haumusuc/Wini and Oepoli, respectively. There are also other Timor-Leste border posts for crossing to Indonesia in 'mainland' Timor-Leste, namely: Salele, Belulikleten, Tanubibi, and Meme.

5.2.4 Procedures for obtaining a vehicle permit

See Annex 1 for a diagram of the procedures

Before departure

A vehicle registered in Timor-Leste is allowed to enter into the Republic Indonesia after obtaining a US\$20 Certificate of Carrying Vehicle (SKMK), issued by the Indonesian Embassy or Consular Office in Timor-Leste. This applies to all vehicles, both private and government/diplomatic/international organization vehicles. The fee to obtain the SKMK is USD20 per car.

The procedure to get the SKMK certificate is as follows:

- I. The applicant requests a domestic travel certificate to be issued by the National Directorate of Land Transport, Ministry of Transport and Communication of Timor-Leste, which under Timorese law gives permission for a vehicle to travel once to Oecusse through the territory of Indonesia. The document also serves as a replacement for the original Timorese Vehicle Registration Certificate which must be temporarily deposited at the Ministry of Transport and Communication for the duration of the trip to Oecusse.
- II. After obtaining this certificate, the applicant needs to request the Certificate of Carrying Vehicle (SKMK) from the Indonesian Embassy or Consular Office. The application should contain:
 - a. *For government/ diplomatic/ international organizations:* An application letter from the institution,
 - b. *For private vehicles:* A statement that the vehicle will be returned back to Timor-Leste and not to be traded;
 - c. A copy of Vehicle Registration Certificate (STNK);
 - d. A certificate issued by National Directorate of Land Transport, Ministry of Transport Communication of Timor-Leste; and
 - e. A copy of driving license and passport of the driver who will drive the vehicle.

At the borders

When crossing borders, the certificate (SKMK) must be presented to officers at both the Timor-Leste and Indonesian borders. On the Timor-Leste side, both Customs and Traffic Post officers stamp and sign the certificate. The document is then presented again to the officers in the Indonesian border for signature. The Indonesian border officers issue two documents namely: (i) Document for an Incoming Vehicle to the Territory of the Republic Indonesia, which is issued by Customs, and (ii) Report Certificate which is issued by the National Police. The customs document serves as the Customs clearance document. No official fees apply in order to obtain these document/certificate. However, this step does create an opportunity for illicit payments.

In addition, since the final destination is Oecusse, there is also information in the Customs document that the vehicle passing into Indonesian territory is doing so only for transit purposes.

Upon return to Timor-Leste

Once the vehicle has completed its roundtrip journey and returned to Timor-Leste, the stamped certificate and documents received at the borders should be submitted to the Indonesian Embassy. Only then can the owner take back the Vehicle Registration Certificate from the Ministry of Transport and Communication of Timor-Leste, who has been keeping it.⁹²

5.2.5 Practical experience of vehicle crossing

Despite having the necessary documentation, clearance delays occurred at the Indonesian border points. There are more agencies and hence clearances required at the Indonesian border points than on the Timorese side. On the Indonesian side, clearance was required from four institutions, namely: customs, military, immigration, and police. Moreover, at the police station in Wini there are two different police officers, namely *Brimob* – a specific corp under the National Police of Republic of Indonesia, and the regular police. At the Timor-Leste Border, the clearance process only involved Immigration, Police and the Customs.

Unofficial payments were solicited to accelerate the clearance process. An additional payment was required to obtain the certificates from Indonesian Customs and Police at the Motaain Border. When the customs office at the border issued the certificate for 'Incoming Vehicle to Territory of the Republic Indonesia', the customs officers at the border asked 'what we thought the cost was of typing and printing the certificate'. The Police officer made the same request. A total of US\$40⁹³ was requested in ad hoc additional payments at just one border point (Motaain). This is additional to the official US\$20 per car paid in advance per car at the Indonesian Embassy in advance of travel.

This experience of soliciting additional payments was validated by traders located in Atambua, Indonesia. They reported that to deliver cargo to Oecusse, they have to make payments to officers at the Indonesian border points, in addition to the regular cost components, such as tax and import duty. They estimate the total costs for these components ranging from 1 million – 4 million rupiah (USD 77 – USD300)⁹⁴.

No customs inspection was undertaken at the crossings, possibly since the mission vehicles used for this survey carry diplomatic license plates. The officers checked and recorded the vehicle certificate and travel documents, without performing any inspection activities. The customs officer only asked verbally about goods being transported inside the cars. A private car or truck containing goods is likely to face a fuller inspection, which would imply longer time for crossing than the Bank team experienced.

In accordance with the 2004 Timor-Leste custom code (see Box 5.2) inspection was not performed for transit goods. Interviews with customs officers at the Timor-Leste border point in Batu Gade suggest that they do not normally perform inspections for any goods being taken out of Timor-Leste. Inspection may take place at entry at the Indonesian border, subject to Indonesian customs rules and regulations. However, Indonesian customs officers confirmed that inspection is not performed for *transit cargo*, i.e. cargo from Dili

⁹² As already explained in the section 6.2.4 point I

⁹³ US\$10 for the Police + US\$10 for customs, per car, for two cars.

⁹⁴ Traders were reluctant to reveal the share of this that was paid in additional requests at the border.

to Oecusse which is certified in advance to cross the territory of the Republic of Indonesia⁹⁵. The officer will just check the list of the cargo as stated in the manifest document. Indonesian Customs officials may then place a seal on the truck or offer escort services for security assurance. There is a fee for this escort service.

Despite the report from Indonesian officers that inspection does not take place, there are no binding reciprocal agreements in place to enforce such practice.

Box 5.2: Timor-Leste 2004 Customs code

**Decree-Law 11/2004,
Article 112
Internal and External Transit of goods**

1. The internal transit regime allows that national goods be transported from one point to another within the national customs territory, crossing through a third country, without any alteration to its status.
2. The external transit procedure shall allow the movement of foreign goods between two points of the national customs territory without such goods being subject to import duties and other charges or to commercial policy measures.
3. Foreign goods moving between two customs warehouses or between customs, as well as goods intended for exportation, shall be liable to external transit procedure.
4. In case the transportation of goods under the external transit procedure is made by sea, the vessel shall not suspend the navigation between the port of departure and the port of arrival.
5. The customs authorities may set a mandatory itinerary in relation to land transports, as well as require the provision of a guarantee and set a time limit for the discharge of the transit procedure.
6. Whenever they deem it necessary, customs authorities shall determine the permanent supervision of the goods to be transported under the present customs procedures.
7. Goods circulating under a transit procedure shall be accompanied [by] the 1/3 copy of the Single Administrative Document.

5.2.6 A partial legal basis exists for a Transit Corridor solution

The Timor-Leste 2004 customs code (Decree law 11/2004, Article 112) provides a good basis for a transit corridor between ‘mainland’ Timor-Leste and Oecusse, but is not yet formally reciprocal. A formal transit corridor could reduce the time and procedures to move goods between Dili and Oecusse. Timor-Leste’s 2004 customs code, article 112 has several provisions that facilitate the transit of goods between Dili and Oecusse via land borders and oversea. For instance article 112: (i) exempts transit goods from import duties upon reentry to Timor-Leste; (ii) exempts transit goods from inspection procedures upon exit and reentry; and (iii) seeks to avoid the diversion of goods during transit either by land or sea. The team could not verify the reciprocity within the Indonesian legal system. Thus, a formal agreement and a legal recognition by the Timor-Leste and the Indonesian Governments may secure the lawful and timely transit of goods from Dili to Oecusse, via land and sea borders. This would lower costs and create greater certainty for traders. Strong enforcement procedures would prevent smuggling, e.g. of goods with high Indonesian excise tax, such as alcohol.

⁹⁵ Timor Leste Customs Code No 11 of 2004, Article 112, paragraph 1

5.2 Analysis of Time and Costs of Delivery based on Routes

In addition to Dili overland and oversea, there are a number of Indonesian overland sources of goods to Oecusse, such as Kupang, Atambua, Kefamenahu and Wini. The following approaches to sourcing were reported by Oecusse importers and Indonesian exporters (see Annex 3 for legal process):

- i. Goods from Indonesia (Atambua, Kupang, Wini or Kefamenahu):
 - The seller normally arranges the truck, cleared for export, and delivers the goods to the buyer's premises.
 - The buyer will then pay the transportation costs to the seller.
 - The buyer will arrange the labor and pay the unloading costs from truck to the buyer's premises.
- ii. Goods from Dili by ferry
 - The seller arranges the ferry from loading until the cargo is delivered to the destination port in Oecusse.
 - The buyer will then pay the transportation costs to the seller.
 - Transportation costs is normally calculated per unit of cargo (per sack or per box).
 - The buyer will pick the cargo up in the port in Oecusse using his own truck.
- iii. Goods from Dili by truck
 - The seller arranges the truck to deliver the cargo to the buyer's premises.
 - The truck being used is normally an Indonesian registered truck which uses the empty backhaul⁹⁶ from Dili to Indonesia. The truck loaded with goods from Dili then travels through Oecusse on its way back to Indonesia. The truck is considered in transit when crossing the territory of Indonesia, and is hence subject to the lighter transit inspection procedures described above.

Table 5.1 below summarizes the time and costs of sourcing goods by various routes.

In terms of costs per km, it is clear that the lowest transportation cost is from Kupang, NTT as source or origin of the goods. As the capital of NTT province, Kupang can be considered as the main source of goods in East Timor, as it has ports and an airport. Kupang can also provide the full range of goods needed for Oecusse including from fruits, vegetables, food products, electronics, spareparts, and construction materials.

In terms of time to deliver the goods, Wini is the most efficient. Based on traders' experience in Oecusse, it only takes 1 to 2 days to receive the goods after ordering as Wini is closer to Oecusse – about 25 km distance to Pante Makassar. Although in terms of costs per-km this route has the highest costs, it is still a better option to get the goods faster. Wini also a good source of goods as there is a port in Wini which could also receive cargo from the other part of Indonesia.

No security issues claimed by traders in both Oecusse and Atambua. All interviewed traders confirmed that there is no security issue during the delivery of goods to Oecusse, regardless of the source.

Oecusse's traders consider Indonesian goods from Dili to be lower in price than sourcing directly from Indonesia, as tax and transit advantages from Dili may offset the lower transport costs from

⁹⁶ Given the lack of exports from Timor to Indonesia, nearly all trucks importing goods from Indonesia return empty.

Indonesia. For example, comparing goods originating in Kupang and arriving directly in Oecusse, to goods from Indonesia arriving via Dili, shows that the cost per km for goods from Dili is almost twice the cost of those from Kupang. It takes on average 3 days to bring goods by land from Kupang, which is less than the 4 days it takes from Dili. However, traders in Oecusse (notably traders in construction materials) reported a lower price of goods from Dili, than from any location in West Timor, NTT (Atambua, Kupang, etc.). Two factors may help to explain this.

Dili based importers are sourcing goods directly from *producers*, avoiding 10% Indonesian VAT, whereas Oecusse based importers are sourcing from Indonesian *wholesalers*. Goods imported from Indonesia to Dili are more likely to be sourced directly from producers not from wholesalers. This saves both on the wholesaler's markup, and the 10% Indonesian value added tax, since Indonesian producers are exempt from 10% value added tax when they export directly to Timor-Leste. On the other hand, goods from Kupang for example, are coming from traders in Kupang – not the original Indonesian producers – and are therefore subjected to 10% value added tax.

Furthermore, goods travelling through Indonesia from Dili face no disadvantage in terms of export/import clearance costs, in relation to goods imported from Kupang. The cargo from Dili is considered as transiting Indonesian territory, in Timor-Leste Customs Code No 11 of 2004⁹⁷.

Table 5.1: Time and Costs to deliver goods to Oecusse

Origin of Goods	Kupang	Atambua	Wini	Dili by Truck	Dili by Ferry	Note
Time to receive after ordering	3 days	3 days	1-2 day	4 days	Depends on Ferry schedule	
Costs of delivery	USD 500	USD 230	USD 154	USD 750	USD 250-1000	Transport Cost is \$0.25 per box or \$0.5-1 per sack of rice
Cost of labor (unloading)	USD 70	USD 70	USD 70	USD 70	USD 70	For 5-7 laborers
Type of goods	Construction Materials, Rice, Food Products	Construction Materials, Rice, Food Products	Construction Materials, Rice, Food Products	Rice, Food Products	Rice, Food Products	
Tonnage	25 tons	25 tons	25 tons	25 tons	25 tons (1000 sacks)	Depends on space in the ferry
Distance	300 km	90 km	25 km	208 km		
Average time	7.5 hrs	1.5 hrs	1 hr	10 hrs	13 hours	
Transport Cost per km	USD 1.7	USD 2.6	USD 6.2	USD 3.6		
Security issue	No	No	No	No	No	No
VAT/Sales Tax applies	10%	10%	10%	2.5%	2.5%	

⁹⁷ Article 112, point 1, Timor-Leste customs code 2004: The internal transit procedure shall allow the movement of national goods from one point to another point of the national customs territory, passing through the territory of a third country, without changing their customs status. Article 112, point 2: The external transit procedure shall allow movement of foreign goods between two points of the national customs territory without such goods being subject to import duties and other charges or to commercial policy measures.

Source: Interviews, processed by author.

Nevertheless, connectivity constraints may restrict the potential of Dili as a major source of goods for Oecusse, especially as demand increases:

- Poor road infrastructure between Oecusse and the rest of Timor-Leste raises transport times.
- Limited capacity of the ferry to transport cargo, and a ferry schedule limited to two trips per week. Limited capacity of the ferry terminal to land cargo, no container infrastructure, as well as no international port status in Oecusse.
- There is a tonnage limitation for a vehicle travelling on Indonesian roads. The maximum weight of a vehicle and its cargo should not be more than 5 tons. In contrast, there is no such limitation for Indonesian registered vehicles to access the territory of Timor-Leste.

Furthermore, Oecusse transport businesses complain that unenforced regulations on Indonesian vehicle weight and direct Indonesian sales to the Oecusse households, prevents them from growing. Indonesian trucks travelling in Indonesia should weigh no more than 5 tons when loaded. However, Indonesian agents are regularly sending 25 ton trucks into Oecusse, where no weight restrictions apply. Furthermore, they are expanding sales directly to households in Oecusse. These sellers might hold an export license from Indonesia, but they are not supposed to be retailers in Oecusse. This practice may undermine the potential of Oecusse traders to develop as wholesalers, as well as a retailers.

5.3 Recommendations

1. Strengthening the role of ports and sea transport to support the development of the Oecusse is important, as the Oecusse people could get better access for goods directly from Indonesia as the closest neighbor or from Dili. Any expansion should consider the predicted scale of long term trade, notably exports, beyond the current acceleration in construction:
 - a. Build the infrastructure of ports in Oecusse which can provide services for larger vessels, including container vessels, such as adequate berth area, depth of port, port cranes, Container Yard, etc.
 - b. Improve and upgrade the status of port in Oecusse to become an international port
 - c. Increase number of ferries and vessels.
 - d. Prepare adequate soft infrastructure to support flow of goods, including export, import and transit.
2. The Oecusse authority should assess the options for trade policy with a view to developing distribution services in Oecusse (wholesalers, retailers, etc) and the role of local players in the Oecusse.
 - a. Prepare trade policy which could clearly define the role of trade agents, such as wholesaler, retailer, importer, exporter, etc. including the coverage of business for each trade agent.
 - b. Enforce the policy and monitor the implementation.
3. It is a challenge to develop the corridor which connects the eastern part of Timor-Leste (Dili, etc) and Oecusse over land, as it would cross the territory of Indonesia. Besides improving the infrastructure, it is essential to have a special agreement between the government of Timor-Leste/Oecusse and the government of Indonesia to have a better connectivity in the corridor.

- a. As a first step, the Government of Timor-Leste should consider the prospect of expanding the provisions for transit traffic between Dili and Oecusse, currently captured in the 2004 Customs Code, and engage with the Government of Indonesia to assess the possibility of mirroring this legislation and facilitating transit traffic.
 - b. A study into the logistical and technological requirements of a transport corridor, could be undertaken.
4. Granting the newly expanded Mahata port International Port Status, and establishing strong port management may bring down import costs. International Port Status will allow contractors to source from a wider set of overseas suppliers, including Surabaya, enabling direct Indonesian exports into Oecusse and activating the advantage from the VAT exemption. It can also shorten travel time and avoid transaction costs at the Oesilo crossing. Shippers are said to already be willing to add Mahata to an existing Surabaya - Wini – Dili route. Establishing strong port management can ensure certain, and low release times, thereby reducing clearance costs.
5. Assess the costs and benefits of revising Decree-Law No. 19/2003 to include a waiver of relevant port fees relating to import of construction materials to Oecusse. Decree-Law No. 19/2003 of 13 November 2003 currently regulates the port fees and charges that APORTIL (the Timor-Leste port Authority) levies.

CHAPTER 6: Migration

6.1 Introduction

As an enclave region, Oecusse's migration dynamics⁹⁸ are quite unique when compared to other municipalities in Timor-Leste. The first purpose of this report is to highlight the key features of Oecusse's current migration dynamics in relation to internal (i.e. within Timor-Leste) and international migration. Shaping these dynamics are a variety of legal and local specificities relating to the status of Oecusse and its proximity to Indonesia. We will also examine the available data on remittances to Oecusse and the impact these funds are having on families and local development. The report will then provide a brief overview of the plans for the Special Social Economic Market Zone of Oecusse (ZEESM). Based on this evidence plus what is known about migration dynamics in Oecusse and Timor-Leste more generally, this report will provide three potential migration scenarios relating to the development of Oecusse through the implementation of the ZEESM – the 'best case' scenario, the 'worst case' scenario and the 'business as usual' scenario. Taking elements of each of these scenarios, the report will conclude by providing a snapshot of the likely migration outcome of the development and implementation of the Oecusse ZEESM.

6.2 Current Migration Dynamics

6.2.1 Internal Migration

The most recent census⁹⁹ indicates that internal migration both to and from Oecusse is very low. Oecusse has a net internal migration rate of -5.85 (see Table 6.1) - the third lowest in the country after Aileu (-4.85) and Liquiça (-5.06). The net migration rate describes the net effect of in-migration and out-migration on an area's population, expressed as an increase or decrease per 1,000 people in a given area (i.e. a municipality) in a given year. This low number shows that there is relatively little migration to or from Oecusse; and a negative figure indicates that more people are currently leaving Oecusse than arriving.¹⁰⁰ A negative net migration rate is not unusual in Timor-Leste – the only municipality currently showing a positive net migration rate is Dili (37.27), indicating a strong trend in internal migration to the capital (see Figure 6.1). This trend is strongly confirmed in the case of Oecusse, where 83.5% of all internal out-migration is to Dili. A total of 3,846 Oecusse natives live in Dili. The capital is also the main source of internal migrants moving to Oecusse, making up 29.1% total flows to the enclave. Migration flows from Manufahi and Bobonaro are also at significant levels totaling 12.6% and 9.4% respectively.

⁹⁸ This chapter builds on a background note prepared in collaboration with the IOM Timor-Leste.

⁹⁹ Unless otherwise stated, figures in this report are taken from the Timor-Leste Population and Housing Census 2010, *Analytical Report on Migration and Urbanization*, NSD and UNFPA, 2012

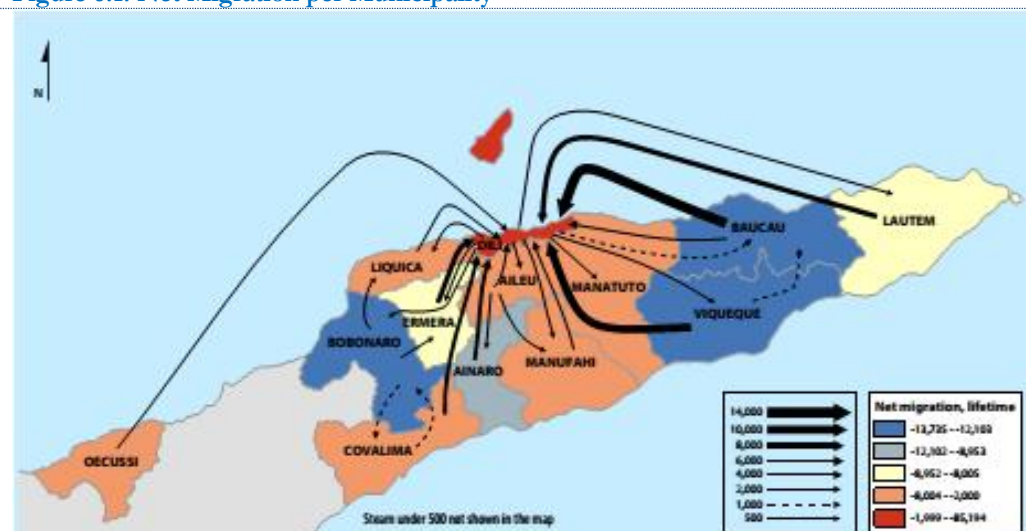
¹⁰⁰ Oecusse's out-migration rate is 7.26, whereas its in-migration rate is 1.4. Both figures are significantly lower than the national average out-migration and in-migration rates which are 13.69 and 7.25 respectively.

Table 6.1: Lifetime In-Migration, Out-Migration and Net Migration: estimated according to Place of residence by Place of Birth, 2010

Municipality	In-Migration	Out-migration	Volume of Migration	Net Rate
Ainaro	1,742	10,695	-8,953	-15.40
Aileu	5,229	7,229	-2,000	-4.58
Baucau	4,637	18,372	-13,735	-12.47
Bobonaro	3,708	16,353	-12,645	-13.87
Covalima	2,535	6,936	-4,401	-7.45
Dili	94,349	9,155	85,194	+ 37.27
Ermera	3,614	11,947	-8,333	-7.13
Liquiça	3,266	6,461	-3,195	-5.06
Lautem	1,427	9,432	-8,005	-13.39
Manufahi	2,893	6,051	-3,158	-6.50
Manatuto	1,971	6,920	-4,949	-11.87
Oecusse	891	4,608	-3,717	-5.85
Viqueque	1,880	13,983	-12,103	-17.42

Source: Timor-Leste Population and Housing Census 2010, Analytical Report on Migration and Urbanization, NSD and UNFPA, 2012

Figure 6.1: Net Migration per Municipality



Source: A Country on the Move: A Profile of Internal Migration in Timor-Leste, ACP Observatory on Migration, IOM and ACP, 2014

The first and most obvious reason for Oecusse's low levels of both in- and out-migration is its geographical separation from the other municipalities of Timor-Leste, which is further compounded by expensive and erratic transportation between Oecusse and mainland Timor-Leste. Currently there are two ways to reach mainland Timor-Leste from Oecusse – by sea or road. The ferry connecting Pante Makassar, the capital of Oecusse, to Dili operates twice-weekly, takes thirteen hours to reach its destination and costs \$40 one-way. By road the journey to Dili can take 4-5 hours but requires all passengers to apply for a visa from the

Indonesian consulate in Pante Makassar at least three days in advance, at a cost of \$50 per visa. The cost of both methods is prohibitive to the majority of Oecusse residents.

Another potential barrier to internal migration to and from Oecusse is related to social and kinship linkages. In Timor-Leste, migration is facilitated and to some extent driven by existing social networks, often composed of familial and kinship relationships. Most internal migrants travelling to Dili from the municipalities will already know or will find many members of *their* network within the city. Even if they do not find members of *their* network, they will likely be able to integrate with another ethnic network which share similar socio-linguistic traits, and who may be able to smooth their transition into urban living. This is an option that is not so readily available for Oecusse residents who, despite being proud citizens of Timor-Leste, nonetheless share strong socio-linguistic, cultural and economic links with the people of West Timor.¹⁰¹

6.2.2 International migration

As an enclave region with close links to the people and economy of Nusa Tenggara Timur (NTT), the Indonesian region bordering Oecusse, it is perhaps unsurprising that international rather than internal migration plays a more prominent role in Oecusse society. According to the most recent census, 1.5% or approximately 960 Oecusse citizens are classified as living abroad. Oecusse is also host to an estimated 779 international migrants, a share of 4.83% of the total stock of international migrants in Timor-Leste. There is no available data on the composition of Oecusse's international migrant community; however 50% of all international migrants in Timor-Leste are from Indonesia, around 10% are from China and 7% are from the Philippines. This composition is likely replicated in Oecusse, with even more dominance of Indonesian nationals.

Again, there is no specific data on destination countries for migrants from Oecusse; however datasets from other countries indicate that major destination countries for people of Timorese origin¹⁰² include the U.K. (14,000),¹⁰³ Australia (10,750),¹⁰⁴ and Portugal (1,776).¹⁰⁵ International migration from Oecusse likely follows these trends. Large-scale economic migration from Oecusse to Indonesia is not likely due to wage differentials between Timor-Leste and Indonesia.

One factor encouraging small-scale, high frequency migration between Oecusse and NTT, however, is the Border Crossing Pass system. This system was established in 2009 subsequent to an agreement between the

¹⁰¹ "Public sentiment in favour of some form of Special Status for Oecusse was initially expressed at community workshops held in each sub-district during May/June 2001 and subsequently at hearings of the Constitutional Commission in Oecusse. While people in Oecusse identify strongly with the nation of East Timor they also want to be free to exercise their traditional social and economic links with West Timor...The Constitution of the Democratic Republic of East Timor was adopted on 22 March 2002 and recognizes the special status of Oecusse. Section 5.3- Decentralization 'Oecusse Ambeno ... shall enjoy special administrative and economic treatment.' Section 71.2- Administrative Organization 'Oecusse Ambeno shall be governed by a special administrative policy and economic regime.'" District Profile – Oecusse Enclave – Democratic Republic of East Timor, available at <http://www.estatal.gov.tl/Documents/District%20Development%20Plans%20and%20Profiles/Oecusse/District%20Profile%20Oecussi%202002.pdf>, accessed 30.9.14

¹⁰² Many international migrants from Timor-Leste have dual Portuguese-Timorese citizenship, accurate estimates on international migration from Timor-Leste can only be found from countries that collect data on 'Country of Origin' as well as 'Nationality'.

¹⁰³ Foreign and Commonwealth Office, *The South-East Asia Diaspora in the UK*, 2014

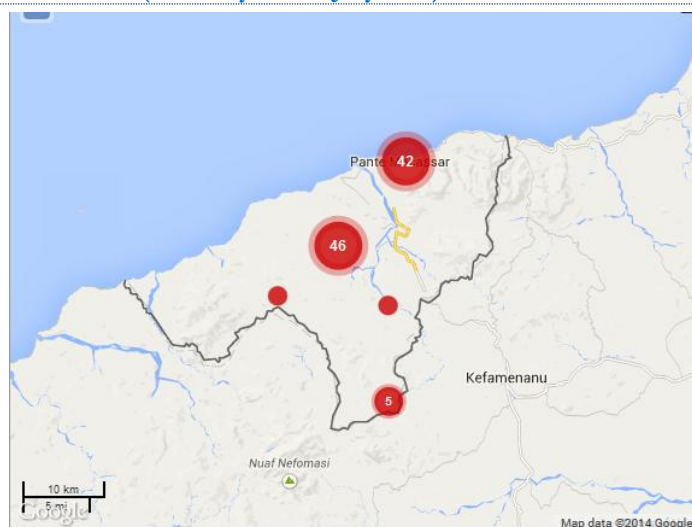
¹⁰⁴ Australian Bureau of Statistics, *Estimated Resident Population by Country of Birth - 1992 to 2014*, 2015

¹⁰⁵ Instituto Nacional de Estadística, *Census - Final results. Portugal – 2011*, 2012

governments of Indonesia and Timor-Leste. According to Resolution 21/2009 of the National Parliament of Timor-Leste approving this bi-lateral agreement, all Oecusse residents are entitled to a 'Border Crossing Authorization Card' which allows them entry and unhindered travel within delineated border areas of NTT for

'traditional or customary practices' as well as some regulated business activities for up to 10 days.¹⁰⁶ The idea behind this agreement was to facilitate and regularize already well-established irregular migration practices practiced by communities on both sides of the border in order to trade, conduct customary practices and maintain kinship and familial links. The agreement was also designed to reduce the use of irregular migration and smuggling routes known as *jalan tikus* ('mouse paths'). These jungle footpaths crisscrossing the border, bypassing official border posts, are used by communities on both sides of the border for family visits as well as to smuggle kerosene and other household goods.¹⁰⁷ This trade is subject to periodic disruptions and restrictions often as a result of disputes relating to farmland on or near the border - land which remains contested territory for communities on both sides of the border (see Figure 6.2).¹⁰⁸

Figure 6.2: Map Showing Incidents of Conflict and Violence in Oecusse (February 2012 – July 2014)



Source: NGO Belun's Early Warning Response Mapping System, <https://belun.crowdmap.com/>, accessed 24.10.14

6.2.3 Remittances

Remittances are becoming increasingly important for Timor-Leste¹⁰⁹ - measured by the value of inward remittances, labor is Timor-Leste's second biggest export after coffee.¹¹⁰ Despite this, few studies have been conducted on the pattern or usage of remittances in Timor-Leste, and these funds remain an untapped resource in terms of community development. In a survey conducted for AusAid (now DFAT) on remittances and microfinance in Timor-Leste in 2007, it was found that in terms of remittance behavior the

¹⁰⁶ See RDTL Resolution 21/2009, <http://www.jornal.gov.tl/laws/TL/RDTL-Law/RDTL-Resolutions/ResPar%20%2021-2009.pdf>, accessed 20.10.14

¹⁰⁷ International Crisis Group, *Timor-Leste: Oecusse and the Indonesian Border*, Policy Briefing No. 104, 20th May 2010, pp. 14-15

¹⁰⁸ East Timor Law and Justice Bulletin, *EWER Situation Review October 2013: Border conflict in Oecusse; severe violence fueled by alcohol consumption; attacks by unidentified perpetrators*, <http://www.easttimorlawandjusticebulletin.com/2014/07/ewer-situation-review-october-2013.html#sthash.O0fXIAwl.dpuf>, accessed 24.10.14

¹⁰⁹ The Government-to-Government labor migration program between Timor-Leste and South Korea is reporting bi-annual remittance figures of \$2.6 million, while Western Union has reported quarterly remittance figures as much as \$1.2 million. Source: <http://sepfop.blogspot.com/2014/03/sepfop-sending-people-overseas.html>, accessed 24.10.14. The World Bank estimates that \$33.6 million was received in the form of personal remittances to Timor-Leste in 2013. Source: <http://data.worldbank.org/indicator/BX.TRF.PWKR.CD.DT/countries/TL?display=graph>

¹¹⁰ Shuaib, Fikreth, 'Timor-Leste Country Report', in Shaw, Judith and Eversole, Robyn (eds.), *Leveraging Remittances with Microfinance: Synthesis Report and Country Studies*, AusAid: 2007, p. 195

majority of households receiving remittances receive small but frequent amounts (see Table 6.2)¹¹¹ In terms of remittance usage and impact, the study states:

*“It is clear that remittances have contributed to improved living standards and financial security for many households. Nearly a half of respondents reported spending more money on education as a result of receiving remittances, 29 per cent reported spending more on food, 27 percent on housing improvements and 24 percent on clothing. Nearly a quarter reported increasing their monthly savings allocations as a result of receiving remittances.”*¹¹²

Despite these gains, many challenges remain in harnessing remittances for development including transaction fees far above the international average,¹¹³ remittance behavior further increasing the transaction costs (i.e. small, frequent remitting), and limited outreach of financial services to peri-urban and rural communities with implications for penetration and competition.

An Oxfam food security baseline study also conducted in 2007 discovered that 37% of surveyed households in Oecusse practiced some form of income diversification.¹¹⁴ The same study also found however that “remittance was not common among households surveyed, with 7% (N=21) reporting receiving remittances, mainly under USD50”.¹¹⁵ Compared with remittance behavior nationally, this suggests that the vast majority of migrants from Oecusse are engaged in low-skill, low-wage labor migration and are unable to remit large amounts.

Table 6.2: Usual Size of Remittance

Remittance value	Percent
50 – 300	53
301 – 600	31
601 – 1000	10
1000	6
Total	100

Source: Shuaib, Fikreth, ‘Timor-Leste Country Report’, in Shaw, Judith and Eversole, Robyn (eds.), Leveraging Remittances with Microfinance: Synthesis Report and Country Studies, AusAid: 2007

6.3 Oecusse Special Social Economic Market Zone Migration Scenarios

Law no. 3/2014 passed on the 18th June 2014 legally established the Special Administrative Region of Oecusse and Atauro, and the Special Zone of Social Market Economy therein. It is clear from this law and from the plans that have been released that the ZEESM will include a significant upgrading of Oecusse’s infrastructure, tourism sector and industrial activities. The authority of the Special Administrative Region (SAR) has also been given vast powers to enact policies, regulations and executive orders in relation to the administration of the region and in order to attract and facilitate investment.

Increased economic activity and opportunity will certainly provide an impetus for domestic and international migration to the region at all stages of ZEESM implementation. However, from the publically available documentation it is unclear how the government or SAR authority plans to manage such migration. In light of this information vacuum, this report will now provide three possible migration scenarios in relation to the implementation of the ZEESM in Oecusse.

¹¹¹ *Ibid.*, p. 208

¹¹² *Ibid.*, p. 209

¹¹³ Transaction costs associated to official remittance channels charge constitute around 20% of the total sent.

¹¹⁴ Oxfam Australia, *Timor-Leste Food Security Baseline Survey Report*, Oxfam Australia: 2007, p. 5

¹¹⁵ *Ibid.*, p. 6

6.3.1 Scenario 1 – Best case

- Central government and SAR authority clearly delineates respective powers in terms of migration management in Oecusse.
- SAR authority conducts a human resources review and projection establishing currently available human resources in Oecusse and predicted human resource needs in relation to implementation of the ZEESM.
- Central government or SAR authority conducts regular monitoring and analysis of Oecusse labor market.
- Based on this analysis the government or SAR authority establishes a clear immigration policy for Oecusse, facilitating the regular migration of skilled and semi-skilled migration as necessary and appropriate.
- Well-managed labor migration contributes to the development of Oecusse, the well-being and skills development of its residents and the protection of immigrants.
- Investments and improvements are made to basic services, particularly health and social security, to account for any increased burden as a result of migration to Oecusse. Companies involved in hiring migrant workers provide adequate insurance and measures to promote health and safety.

6.3.2 Scenario 2 – Worst case

- Central government and SAR authority fail to delineate respective responsibilities and powers in terms of migration management in Oecusse. SAR authority is forced to use unofficial channels to facilitate the required levels of migration leading to overall degradation of the established immigration system.
- No analysis of Oecusse's human resources capacity or needs is conducted.
- No immigration policy is established for Oecusse. Regular labor migration to the enclave is not facilitated.
- There is large-scale irregular migration to Oecusse. Labor migrants work without the correct documentation and are subject to abuse and exploitation.
- Trafficking networks are established and thrive, trafficking women, men, girls and boys to Oecusse for the purpose of labor and sexual exploitation.
- Conflict erupts between locals and migrants (international and internal) as a result of tensions and resentments relating to local exclusion from the labor market, community disruption, cultural differences, and/or historical tensions (between Indonesians and Timorese and between eastern and western Timorese).
- No benefit of labor migration is accrued by Oecusse residents or migrants.
- No investments or improvements are made to basic services in Oecusse leads to overstretch and migrant exclusion.

6.3.3 Scenario 3 – Business as Usual

- Central government retains overall responsibility for migration management. SAR Authority facilitates the regularization of individual skilled and semi-skilled migrants with no significant impact on the integrity of the established immigration system.
- Data on Oecusse's labor market dynamics remains under-utilized in the formulation of employment and immigration policies.
- Immigration policy, where apparent, remains ad hoc and on the basis of popularly-held beliefs rather than economic data and analysis.
- There will be medium-to-high levels of irregular migration to Oecusse, with associated levels of labor exploitation, particularly of migrants at the lower end of the skills spectrum.
- There will be some trafficking of men, women, girls and boys for the purpose of labor and sexual exploitation.
- There will be low-level tensions and resentments between local community and migrants, occasionally resulting in sporadic, localized outbursts (fights, xenophobia, intimidation etc.).
- There will be limited gains resulting from migration for migrants and host communities. Companies involved in construction will gain from labor exploitation of irregular migrant workers.
- Limited investment and improvement of basic services. Pressure on existing services will be somewhat relieved by provision of some services by employers, NGOs and/or private service providers.

6.4 Conclusions

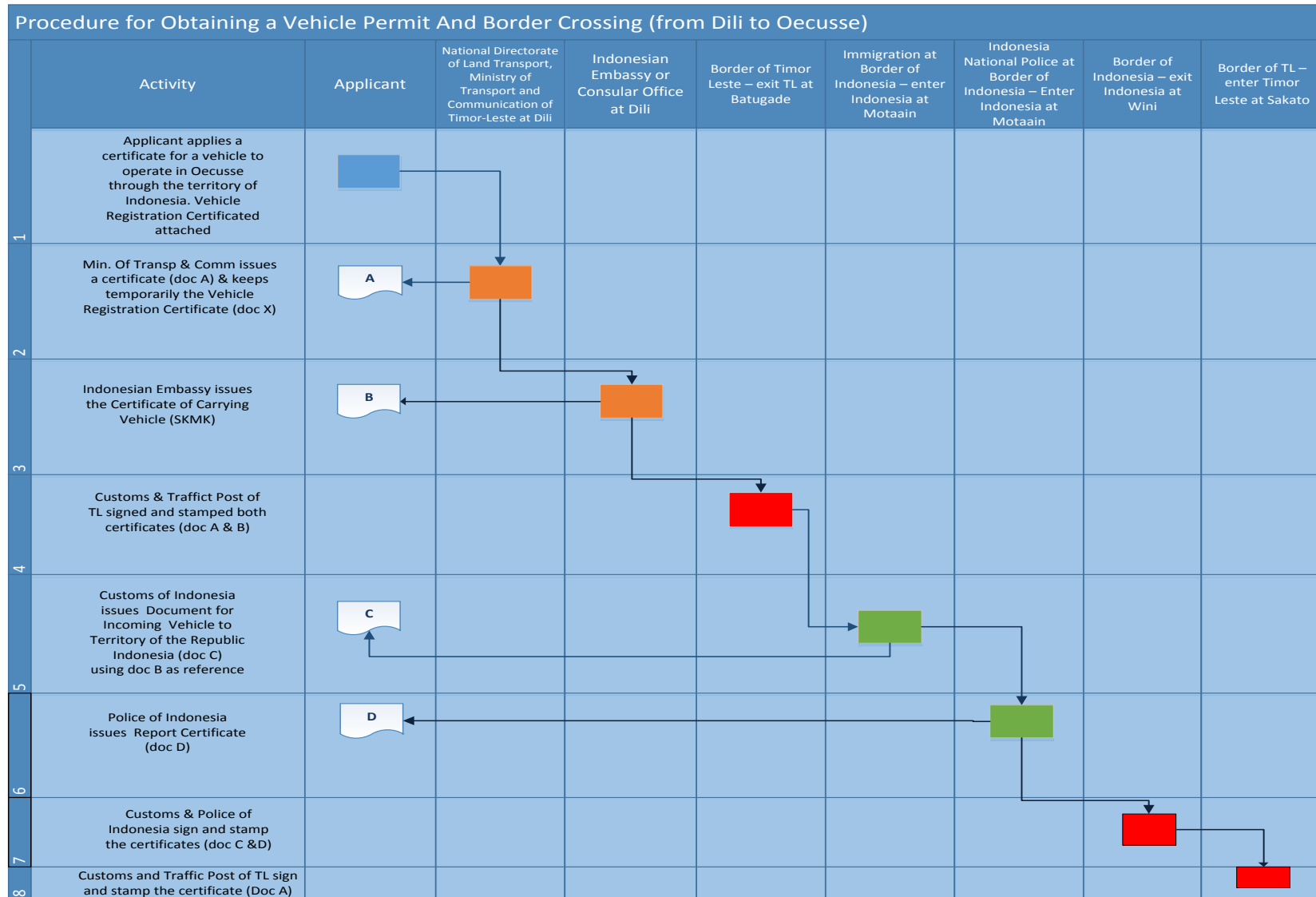
From the analysis of migration to and from Oecusse as well as each of these possible scenarios, we can draw some conclusions as to the likely impact of migration as a result of ZEESM development. Firstly, it is likely that the central government will retain overall control of migration management, including to Oecusse. However, SAR authority involvement obtaining correct documentation for specific groups of migrants may confuse the overall chain of command in terms of immigration controls in Oecusse. Some data has been collected on the Oecusse labor market; however this will likely be under-utilized in the development of immigration policies. Given Oecusse's relatively porous border controls and history of irregular migration routes, we can expect to see relatively high-levels of irregular migration, fueled by a demand for skilled and semi-skilled workers as a result of ZEESM development. Human trafficking is a phenomenon Timor-Leste is still getting to grips with;¹¹⁶ therefore without additional measures there will likely be low-to-medium levels of trafficking of men, women, boys and girls to Oecusse for the purpose of labor and sexual exploitation. Some sporadic, localized inter-communal tensions should be expected by the SAR authority as a result of perceived inequalities in treatment and pay between local and migrant workers. These tensions will likely be lessened thanks to the close cultural links between residents of Oecusse and Indonesians; however there may be no such mediating factor in relations between locals and migrants from other countries (e.g. Chinese and Filipinos). Given the scale and sophistication of many of the projects planned as part of the ZEESM, construction companies will rely heavily of the expertise of skilled and semi-skilled migrants. SAR officials have stated that they will try and ensure a 3:1 Timorese-foreign worker ratio at construction sites; however it

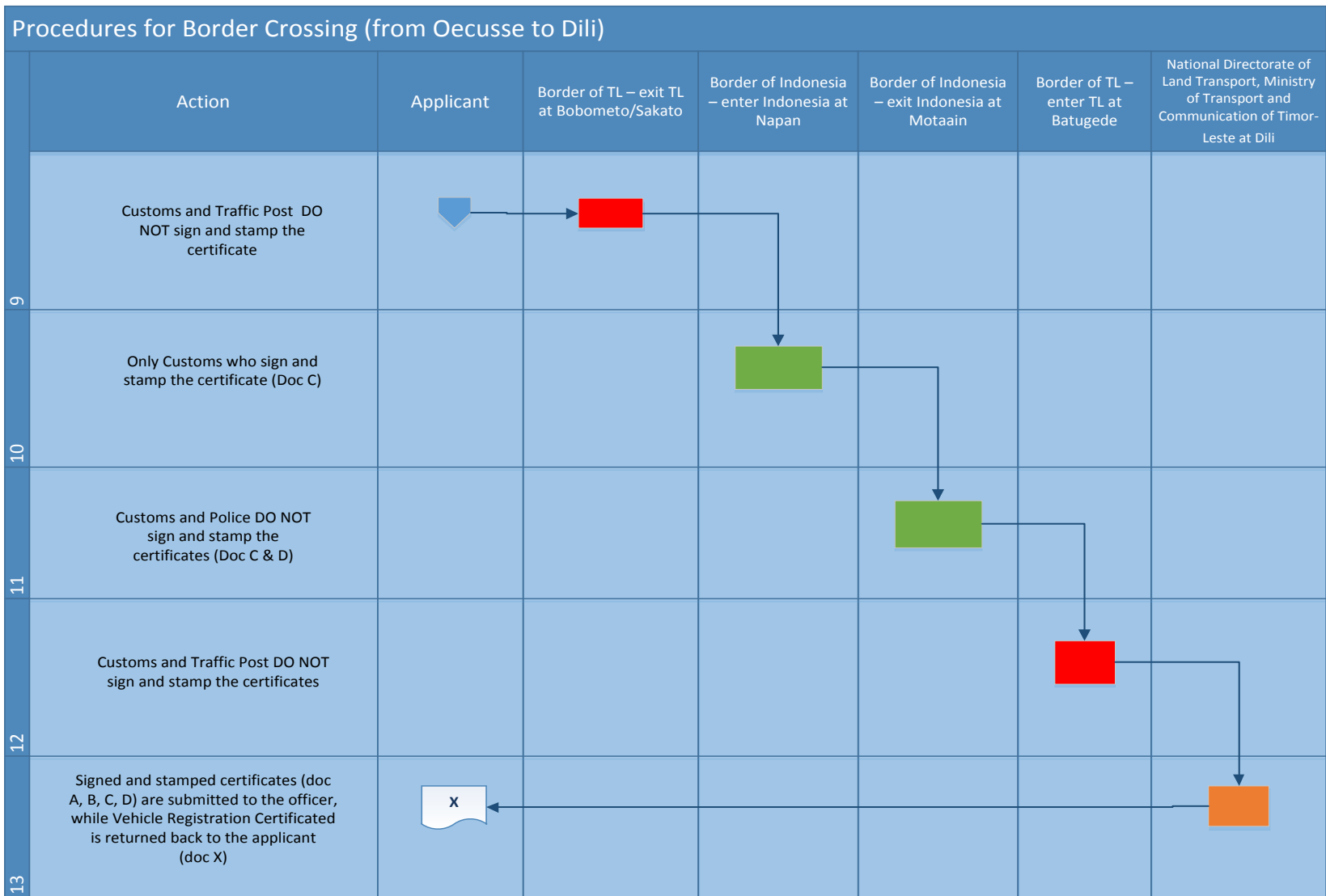
¹¹⁶ See U.S. State Department, *Trafficking in Persons 2015 Report*, 2015 <http://www.state.gov/documents/organization/243562.pdf> for more information

remains to be seen how this will be monitored and enforced. Given the influx of migrant workers to Oecusse, basic services will likely be strained. Representatives of the SAR authority stated that there were plans to build a new clinic for migrant workers, but it is likely that local public hospitals and other services will be nonetheless relied on especially in emergency situations.

Overall, the SAR authority must strike a careful balance between the need to complete the projects on time and to an acceptable standard, with the expectations of local people in terms of employment and skills development. The SAR authority should also not try to bypass existing immigration or border control systems, but should instead use its influence to improve the transparency and efficiency of existing systems. Finally, special efforts should also be made to prevent and combat human trafficking – a crime which not only ruins the lives of the affected individuals, but has the potential to derail the entire ZEESM initiative.

ANNEX 1 – Mapping procedures for obtaining permits and crossing borders





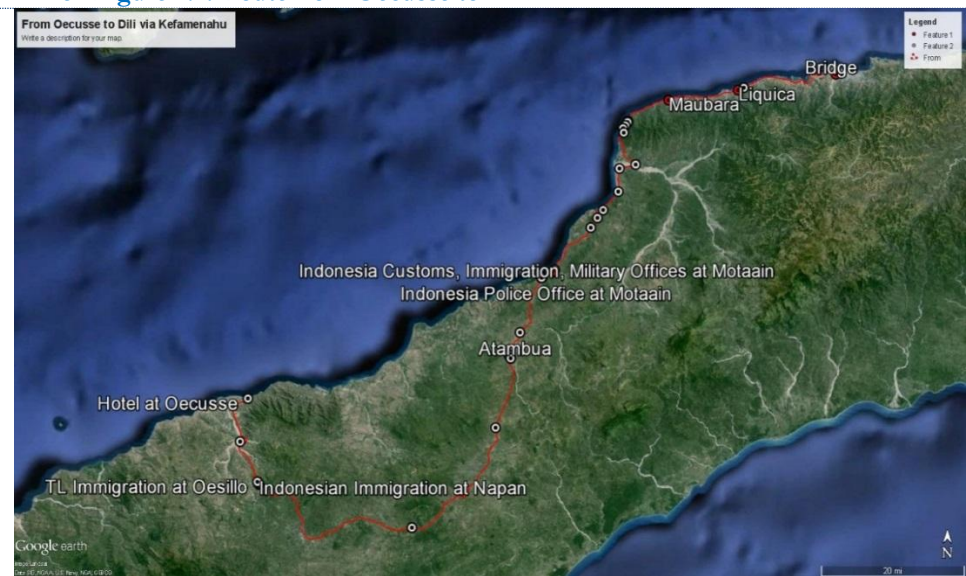
ANNEX 2 - Details on time recording when traveling over land from Dili to Oecusse and Oecusse to Dili

Annex Figure 2.1: Route from Dili to Oecusse



Source: GoogleEarth

Annex Figure 2.2: Route from Oecusse to Dili



Source: GoogleEarth

Annex Table 2.1: Time recording Dili-Oecusse

Location	Time	Duration	Note
Timor Plaza to Liquica	10.20 – 11.05	45m	Poor road condition toward Liquica. The road is quite narrow especially for trucks with no asphalt.
Liquica to the border	11.05 – 12.50	1h45m	Roads in some area are in good condition, due to ADB project. However it was limited in certain area.
Border of TL in Batugade	12.50 – 13.00	10m	Procedures: We filled in the form and then gave it to immigration official. There was an X-ray machine available in immigration office for cargo. We were managed to talk to the customs official which explained that normally they do not do inspection for cargo passing the border with Oecusse as final destination. The official believed that inspection may be done in the border of Indonesia in Motaain.
Border of Indonesia in Motaain	13.00 – 13.55	55m	Procedures: For people: there are 3 desks to get clearance, which are quarantine, immigration, and ABRI. They didn't do any inspection, but only administrative checking. They just record information as stated in the passports. For cars: we need to have clearance from the customs, military, the police, and immigration. All is only administrative procedures. After finished the process in the immigration, we went to police office, not far from immigration office. No inspections. Unofficial payment was required to speed up the process for the customs and the police.
Motaain to Atambua	13.55 – 14.30	35m	The road condition is better than in TL, but there were some area which are very narrow and may fit only for one truck.
Lunch	14.30 – 15.18	47m	
Atambua to Wini (Border)	15.18 – 16.20	1h2m	
Border of Indonesia at Wini	16.20 – 16.40	20m	We firstly came to Military, then Immigration, and the Police. In the police desk, there are two officials on behalf of Brimob and the Police. Those two officials recorded our information based on the passport for their perusal. The procedures are all administrative process, without any inspection. The official said that the customs official will be available at the border once the One stop Service would be operated.
Border of TL at Oecusse	16.40 – 16.56 (TL Time)	16m	The procedure only involved immigration and visa on arrival.
Border of TL – Hotel	16.56 – 17.30	34m	The road is quite bad without asphalt.
TOTAL		7h9m	

Annex Table 2.2: Time Recording Oecusse - Dili

Location	Time	Duration	Note
Oecusse to Border of TL	09.30 – 11.55	2hr50m	Lack of road rehabilitation
Border of TL	10.55 – 11.04	9m	There were two desks for clearance process, namely: Immigration and Customs
Border of Indonesia	11.15 – 11.41	26m	We firstly went to Immigration, then followed by to the customs, military and police.
Border of Indonesia to Insana for lunch	11.41 – 13.01	20m	Good road condition
Lunch	13.01 – 13.28	27m	
Insana to Hotel at Atambua	13.28 – 14.50	1hr32m	Good road condition
Hotel to Border of Indonesia (Motaain)	09.36 – 10.18	42	Good road condition
Border of Indonesia	10.18 – 10.40	22	Administrative process and without any payment
Border of TL (Batugade)	10.40 – 10.55	15	Administrative process and without any payment, except visa on arrival.
Batugade to Dili	10.40 – 13.51	3h11m	
TOTAL		10h14m	

ANNEX 3 – Export procedures from Indonesia to Oecusse directly from Indonesia to Oecusse, or transiting via Dili.

Requirements for exporter from Indonesia to Oecusse:

1. Exporter should meet the requirements:
 - a. Established as a legal entity
 - b. Has a tax identification number (NPWP)
 - c. Has business license or export license
 - d. Has Customs Identification Number (NIK), or NIK of customs broker
2. Exporter submits Export Declaration to the Customs, including information of: invoice, packing list, and other export permit documents, if it is required.
3. Exporter pays export tax, if it is required.
4. After examining export declaration documents, the Customs may do inspection process for certain export goods¹¹⁷.
5. A transporter/truck submits Outward Manifest to the Customs, after pay the manifest fee to the bank

Requirements for receiving imports in Oecusse:

1. Obtain a certificate for business from Ministry of Tourism, Industry and Trade
2. Tax Identification Number from National Directorate of Revenue
3. Organise a customs broker
4. Pay duties, namely: import duty is 2.5% of the customs values of the goods and sales tax is 2.5% of the customs value of the goods imported into Timor-Leste
5. [for Food] Obtain additional import permit documents/certificates, i.e. Sanitary and phytosanitary certificates, as well as certificates of quality and others, or other certificates from the Quarantine department.
6. Importer submits the Import declaration and completes import clearance process.

¹¹⁷ To be re-imported, to be re-exported, those received government facilities, when export tax applied, those indicated of violation.