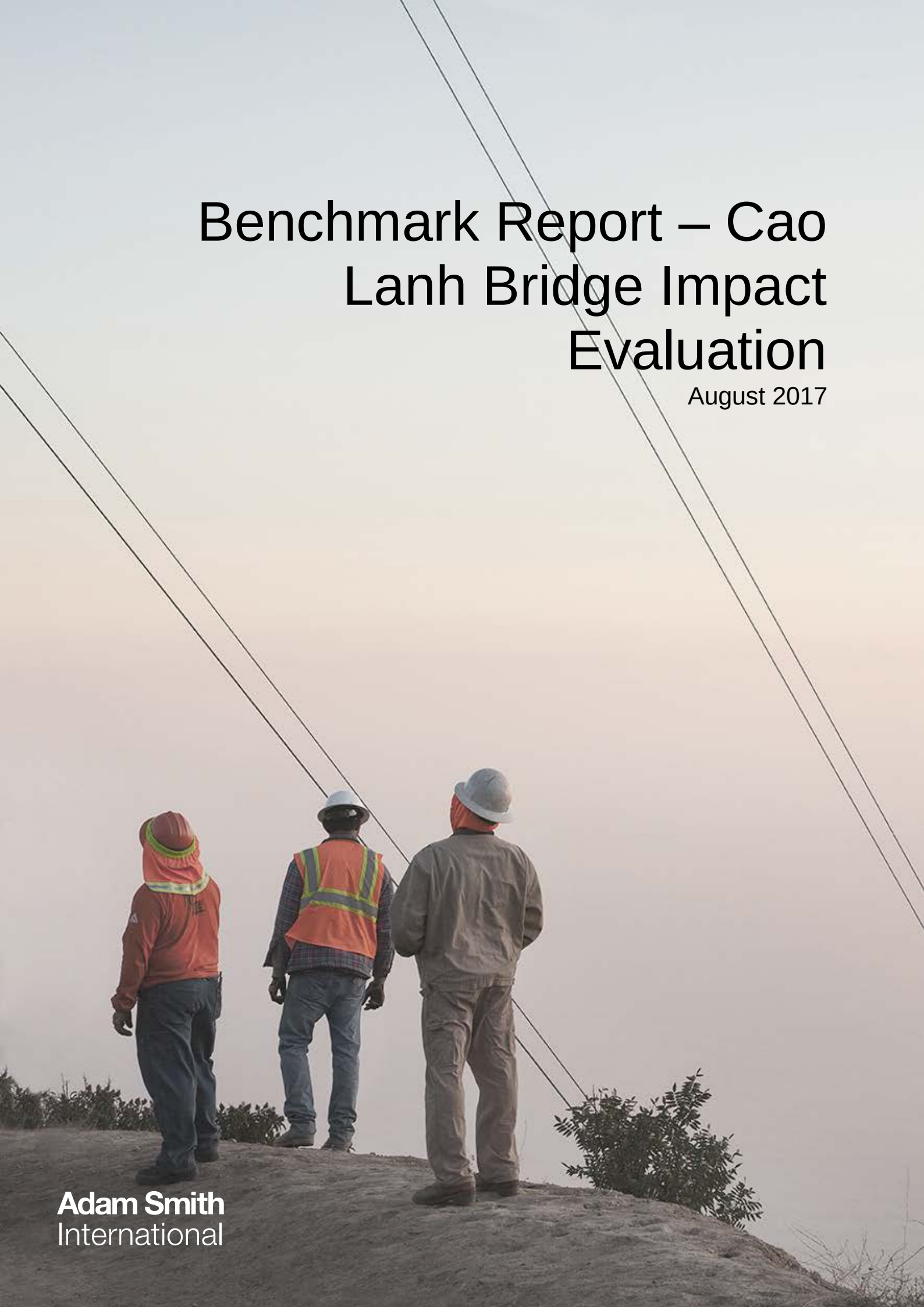
Benchmark Report – Cao Lanh Bridge Impact Evaluation

August 2017



Adam Smith International

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Executive Summary

Background

The Cao Lanh Bridge is part of the Central Mekong Delta Connectivity Project (CMDCP) in the Mekong Delta region of southern Vietnam. The project is located on the boundaries of Dong Thap province and Can Tho city. The Cao Lanh Bridge is one of the two major bridges (Cao Lanh and Vam Cong) that make up the CMDCP and is scheduled for completion in December 2017. The Project will improve road travel across and within the Central Mekong Delta, connecting Ho Chi Minh City (HCMC) to the Southern Coastal region. It will bring inclusive development to areas that are poorly connected to major population centres, improve access to social and health services, increase national food security by stimulating local agro-industry and boosting exports, facilitate private sector investment, and extend regional connectivity to neighbouring Cambodia and the Greater Mekong Sub-region, as well as to Vietnam's major inland ports in the Mekong Delta. An estimated 170,000 road users will benefit daily from the new bridges and the 5 million residents of An Giang, Can Tho, and Dong Thap provinces are expected to benefit from an improvement in living standards. The expected outcomes will be shorter road travel distances and increased average travel speeds across and within the Central Mekong Delta.

The Australian Department of Foreign Affairs and Trade (DFAT) has provided AUD 168 million for the Cao Lanh Bridge and related investments, this includes the design and construction of the bridge and approach roads. This builds on a history of Australian government support for road and bridge infrastructure in Vietnam. Through this evaluation, DFAT seeks to quantify the socio-economic impact of this project on beneficiaries in the target area. This is one of the largest and most complex impact evaluations undertaken by DFAT.

Objective

The objective of the impact evaluation is to estimate Cao Lanh Bridge's socio-economic impacts (both intended and unintended) on selected sub-populations in the impacted areas. It seeks to establish whether the bridge has made a difference in the lives of people in the target area by assessing the direct and indirect causal contribution of the Cao Lanh Bridge Project (CLBP) to change in people's lives. This includes an assessment of the positive and negative, intended and unintended, primary and secondary long-term impacts that result from the bridge.

This evaluation is designed to test the primary hypothesis that the CLBP:

1. *Will generate accessibility and mobility improvements that lead to wider socio-economic development benefits within and among the three provinces.*

There are seven additional hypotheses, which together inform the primary hypothesis, these are:

2. *The CLBP will generate additional socio-economic benefits for Cao Lãnh urban residents (including improved access to health, education and cultural facilities)*
3. *The CLBP will expand and deepen the labour market areas for Cao Lãnh residents, with improved road access to other provincial centres for additional employment opportunities*
4. *The CLBP will lead to growth in containerised road freight across all three provinces (achieving economies of scale, reduced numbers of individual small truck movements, and lower costs per unit of freight)*
5. *The CLBP will stimulate the development of Cao Lãnh as an intra-provincial and inter-provincial bus passenger transit centre, with increased tourism visitation and quicker access to/from HCMC*
6. *The CLBP will stimulate growth in transport and storage-related enterprise facilities and employment within all three provinces*
7. *The CLBP will strengthen the Dong Thap provincial economy, with the creation of demand for bridge/road building materials and the acquisition of additional building skills and opportunities*

8. *The CLBP is expected to improve the social welfare of the population within the three provinces and in relative road corridors, and be assessed as being an effective aid investment, yielding positive results and value for money.*

The primary hypothesis is an amalgamation of the above subsidiary hypotheses (2-8). The impact evaluation has been designed to test each of the hypotheses.

In order to test the above hypotheses a mixed-method evaluation was designed that integrates a range of evaluation methods at every stage of the evaluation process, drawing on both qualitative and quantitative data for contribution and attribution analyses. The evaluation design is based on the use of conventional benefit-cost analysis (BCA) and statistical techniques based on causal modelling (Diminishing Effects approach). Both approaches have been prepared as discrete forms of analysis. Time-series and Panel data will also be used to measure socio-economic benefits to which the Bridge contributes in the project's area of influence. Case studies and Focus Group Discussions are designed to obtain qualitative evidence and success/failure stories to facilitate learning about enabling and disabling factors to development as well as for public diplomacy. To assess impact a before and after approach was adopted. This includes the collection of benchmark data before the completion of the CLBP and associated Vam Cong Bridge and approach and connecting roads, with the subsequent collection of data in 2019 and 2021.

This baseline survey and qualitative research was conducted in March and April 2017. The aim was to collect data well in advance of the opening of the Cao Lanh and Vam Cong Bridges. In March 2019 a mid-line survey will be conducted that will collect data on the impacts of the bridges, this will be further supported by an end-line survey in March 2021.

Context

The Mekong Delta plays a key role not just within the wider national and regional economic context but also within the demographic fabric of Vietnam. Spreading over 12 provinces and one municipal city, the Delta is home to more than 17.5 million inhabitants, accounting for 19.2 percent of Vietnam's total population. With a total area of 40,576 square kilometres, the delta has a comparatively high population density of 434 inhabitants per square kilometre – compared to national average of 277.

64.3 percent of the Mekong Delta land area is used for agricultural production, compared to 30.9 percent for the whole country and 36.5 percent in the Red River Delta. The region contributes 19 percent of Vietnam's total GDP, of which GDP in agriculture constitutes 38.1 percent of the national GDP in agriculture. Industry is by far the least developed sector in the Mekong Delta; the regional GDP in industry only represents 15.6 percent of the national figure. The majority of employment is in the agricultural sector. According to the Labour Force Survey 2015, 47.8 percent of the work force support agricultural production, only 19.9 percent of the regional labour force participated in the industry sector.

Traditionally known as the rice bowl of Vietnam, the Mekong Delta is the country's largest rice producer with 4.3 million hectares of cultivable paddy area. In 2015, its rice production reached 25.7 million tonnes, making up 56.8 percent of the country's total rice production. Beside rice, the Mekong Delta is a major production area of aquaculture and fruits such as mango, longan, pineapple, and banana. According to the latest official statistics reported by the GSO, aquaculture production in the Mekong Delta accounts for 56.2 percent of the total country's production.

One of the central contradictions of socio-economic development in the Mekong Delta is that even though the Delta contributes one-fifth of the nation's GDP, it is lagging behind Vietnam's other regions in important socio-economic achievements like education, skills and poverty reduction. Poverty remains high in the region with 6.5% of total households living below the poverty line. The Mekong Delta region has failed to keep pace with the development of the country. As reported by the GSO, monthly average income per capita in the Mekong Delta in 2014 was 2,327 thousand VND, lower than the national average of 2,637 thousand VND. Between 1999 and 2014, average income per capita in Vietnam increased by 8.9 times, in the Mekong Delta it increased 6.8 times, only slightly higher than the Central Highland region.

Against this background, the Prime Minster has established a steering committee devoted to developing new ideas for strengthening the Delta's economic and social performance. The steering committee belongs to the party central committee and is supported by the Central Institute for Economic Management (CIEM). This

institute was assigned by the Prime Minister to design a regional development plan. The assessment of development opportunities identified the weaknesses and strengths of the Mekong Delta. Together with issues to do with education and strong regulation of the agricultural sector, transport infrastructure is seen as a major impediment to socio-economic development, which makes this connectivity initiative highly relevant to development in the Delta.

Characteristics of the Beneficiaries

Commune and household level surveys were undertaken to better understand the socio-economic conditions of the targeted beneficiaries in the provinces of Don Thap, An Giang and Can Tho. 117 communes were surveyed, of which 48 are in Dong Thap, 35 are in An Giang and 34 are in Can Tho. On average, the population of each commune is 16,000 people and the average number of households per commune is 3790.

2,011 households were sampled across the three provinces. The total number of household members in these households was 7,824. Household heads are predominantly male, and accounted for around two-thirds of those households surveyed. The average age of a household head is 54.4, and the average income per household is VND 26,988,000 per year (AUD 1,572). Most people do not receive unemployment subsidies or social pensions and 98.7% of people are in the labour force; 22% of those are self-employed in the agricultural sector. The richest 20% of people tend to have a larger income share from non-farm business, while low income households have a larger share of income from remittances and social allowances.

Access to infrastructure plays an important role in improving living standards and the social welfare of people in each of the provinces. Markets are the places people visit most frequently. People visit markets around 20 times per month in Dong Thap, 15 times in An Giang and 17 times in Can Tho. Primary schools are the places with the second highest frequency of visits. Hospitals at district levels also constitute a particularly important type of infrastructure. Projects which facilitate greater access to this type of infrastructure have the potential to significantly benefit households.

The average distance from the surveyed households to the nearest road to Cao Lanh Bridge and Highway is 28.7 km in Dong Thap, 96.3 km in An Giang and 67.1 km in Can Tho. Motorbike is by far the most popular means of transportation. The regression analysis conducted in Section four shows that households who live further from the Cao Lanh Bridge are less likely to be poor. In other words, poor households tend to live closer to the bridge. As a result, in the impact evaluation, this difference in the distance to the bridge between households must be taken into account and will be when conducting the Diminishing Effects analysis. It is likely that those poorer people living closer to the Cao Lanh Bridge may derive greater benefit from its construction than the richer people who live further away, which is a positive result from an inclusive development perspective but one that needs to be confirmed.

Efficiently crossing the Tien and Hau Rivers is of paramount importance to the local and regional economy. At present 28,266 people per day use the Cao Lanh ferry to cross the Tien River and 52,395 people use the Vam Cong ferry to cross the Hau River. After the construction of the Cao Lanh and Vam Cong Bridges, the Cao Lanh ferry services will be drastically reduced and the Vam Cong ferry service will be cancelled. Millions of pedestrians, motorcyclists, cars and trucks will then use these bridges.

There will be widespread benefits for the different populations of beneficiaries, the nature and degree of which will be confirmed after the collection of mid-line and end-line data. Waiting times, which are up to 20 minutes will be cut, which will enable people to travel to work, and to access education and health facilities more efficiently. The waiting times for trucks and buses will be drastically cut as well, which will support local and regional economic productivity. Those who cross the two rivers will benefit the most, these include large trucks, who are transporting goods long distances and local people who have to cross the rivers to travel to work. Benefits may also accrue to bus companies and this may stimulate local tourism. Women, who are typically undertaking more local but frequent travel across the Tien River are also likely to benefit significantly.

However, the effects of the two bridges will be quite different. As the results of the user surveys show, the Cao Lanh ferry, with around half of the passengers and a sixth of the freight volume of the Vam Cong ferry, plays a more local role than the latter. As a result one may expect the impact of the Cao Lanh Bridge to be much more local in nature. Since the Vam Cong ferry caters to longer distance car, bus and truck traffic it can be expected that the completion of the entire Connectivity Project, of which the Cao Lanh Bridge is a part, would provide

significant regional connectivity benefits as planned. The impact of the project as a whole will be quantified after future surveys are conducted.

Provisional analysis of the impact hypotheses

The evaluation design proffers a number of hypotheses regarding the potential impact of the connectivity project on the lives of beneficiaries, the discussion below provides an overview of what the qualitative research has uncovered with regards to the validity of those hypotheses. These provisional insights must be corroborated through additional data collection at later phases but it points to some interesting issues which will be followed up in later research.

Hypothesis 1: The Project investment will generate accessibility and mobility improvements, leading to wider socio-economic development benefits within and among the three provinces

The Cao Lanh Bridge is seen by transport industry stakeholders as a crucial part of the forthcoming new route to Ho Chi Minh City (HCMC). This new route is regarded as a better traveling option and supplements the nearly overloaded route through My Thuan Bridge to HCMC, by connecting Cao Lanh Bridge to the N2 NR. While reduced travel time and travel costs are widely perceived as the main benefits of Cao Lanh Bridge, transport operators noted that the magnitude of those benefits will depend on whether or not a toll will be collected from using the bridge, and how much that toll will be. This has yet to be determined.

From the viewpoint of manufacturing enterprises in industrial parks, the impact of Cao Lanh Bridge, and whole Connectivity Project, may be felt in two important phases of their operations, namely the transport of raw materials and the transport of the finished product. Similar to the transport operators, manufacturing enterprises reap the benefits of infrastructure projects when those projects are linked to their operations. Driving higher performance in the agriculture sector is clearly important from an economic perspective and can help improve local competiveness and productivity. However, some manufacturing enterprises in industrial zones were cautious about the presumed benefits suggesting that due to the fact the majority of their finished goods are transported by inland waterway, which has the advantages of low cost and high loading capacity, the benefits will be minimal. Further investment into the road network from Cao Lanh to N2 NR is crucial to bring about more significant impact for the manufacturing enterprises in industrial zones.

Householders identified decreased travel as the most important outcome of the Cao Lanh Bridge construction. The bridge is expected to enable greater flexibility in terms of travel time than using the ferry. Given their multiple gender roles and time poverty, reduced travel time and greater flexibility in travel time will certainly bring significant benefits for women. Although some of those surveyed (particular local shopkeepers) highlighted that the ferry may reduce their business turnover and increase travel time across the river.

Hypothesis 2: The Project will generate additional socio-economic benefits for Cao Lanh urban residents (improved access to health, education and cultural facilities).

Upwards of 80,000 people use the ferries to travel to work and to access health and education facilities on a daily basis, once both bridges are complete accessing these facilities is expected to become much easier. According to the affected households, improvements are expected to be felt in the access to healthcare, education, cultural facilities and other public services. These benefits are not limited to Cao Lanh urban residents. Rather, residents in Dong Thap districts who are located on the far bank of the Tien River are also expected to enjoy similar benefits. In the area of healthcare there is expected to be a number of benefits including: access to a broader range of healthcare facilities, reduced travel time to healthcare facilities, which has implications for maternal and infant mortality rates, and ease in transporting patients between hospitals in the region. With regards to education, householders were broadly in agreeance that the Cao Lang Bridge will improve access, except those who travel to Don Thap University which is located quite close to the Cao Lanh ferry. If that ferry is cancelled then there will be longer travel times for these people.

Hypothesis 3: The Project will expand and deepen the labor market areas for Cao Lanh residents, with improved road access to other provincial centres for additional employment opportunities.

Householders had mixed feelings regarding whether the project would expand labor markets and lead to employment benefits for Cao Lanh residents. Most beneficiaries were of the view that improved mobility will lead to increased trade between locations, improve transportation system efficiency, boost competitiveness, and attract new businesses. It was thought that the Cao Lanh Bridge will only promote labour market expansion

under two conditions, namely: increased investment and a more developed tourism sector. Local shopkeepers remained pessimistic about the employment benefits. The income levels of shopkeepers and hawkers near the Cao Lanh Ferry is expected to significantly decrease, even if the Cao Lanh Ferry remains under operation. Shopkeepers and hawkers are expected to receive some support from the project once the bridges are opened, the effect of this support will be assessed during subsequent research. Some beneficiaries noted that the bridge may open up more job opportunities by bringing back workers who have migrated to industrial zones in Binh Duong (many of whom are women who have left their family behind). Providing local women with more local job opportunities may improve their position in the family and reduce their vulnerability.

Industrial enterprises were sceptical that the bridge would facilitate a level of reverse migration away from the larger industrial zones such as Binh Duong. These zones are renowned labour hubs and offer higher salaries than local zones. They did suggest however that the Cao Lanh bridge would facilitate more efficient access for workers to the Sa Dec industrial zone which may expand labor market opportunities for local residents but this needs to be confirmed in subsequent research. In general, those in industrial zones were of the view that Cao Lang Bridge serves as a premise for increased local infrastructure investment and once that further investment is forthcoming Don Thap will attract more investment.

Hypothesis 4: The Project will lead to the growth in containerized road freight across the three provinces

Transport operators were of the view that, while important, the Cao Lanh Bridge will do little to address the significant constraints to containerized road transport in the region. There are a number of reasons for this including the fierce competition transport operators face from inland waterway transport companies, the comparative advantage of logistics companies from HCMC, and the low authorized loading capacity which sees local companies always running below capacity. Rather than a project that sets out to promote growth in containerized road freight, transport operators instead believe that Cao Lanh Bridge and the Connectivity Project will promote growth in the number of trucks.

Even though containerized road freight remains limited across all three provinces, manufacturing enterprises believe that Cao Lanh and Vam Cong Bridges are important elements to the improvement of the transport network to HCMC. The Cao Lanh – My An project connecting to N2 NR will be the next step, and is expected to promote growth in containerized road freight. Having this system in place will lead to lower under-capacity rates, which is about 40 percent as currently reported. In other words, the system will enable containerize freight to achieve economy of scale, which may lead to lower costs per unit of freight.

Hypothesis 5: The Project will stimulate the development of Cao Lanh as an intra-provincial and inter-provincial bus passenger transit centre, with increased tourism visitation and quicker access to/from HCMC

The survey results from the transport operators suggest that Cao Lanh has a low potential to become an inter-provincial bus passenger transit centre. Instead, Cao Lanh Bridge might facilitate more travel demand for intra-provincial bus passengers. There are many prerequisites to be met in order to turn Cao Lanh into an inter-provincial bus passenger transit centre. At the present time, even An Giang and Kien Giang, which are the more developed provinces, hardly meet the prerequisites to become inter-provincial bus passenger transit centres themselves. Tourism development and improved infrastructure stand out as two critical conditions. Land allocation and investment attraction policies are important preconditions to be met. Cao Lanh Bridge nonetheless plays a very important role in connecting the two parts of the province itself, which has long been separated by the Tien River. There are currently very limited bus routes running between the two parts of Dong Thap. Therefore, Cao Lanh Bridge is literally “bridging” these two parts.

Hypothesis 6: The Project will stimulate the growth in transport facility and employment in transport sector within all three provinces

Can Tho transport operators do not support this hypothesis. They believe that the project does not affect their operations because the preferred route to Dong Thap or An Giang currently does not bypass Vam Cong or Cao Lanh Bridge. An Giang transport operators remain uncertain about the impact of Cao Lanh Bridge and the Connectivity Project. In their view, the Connectivity Project will ease the travel through the Vam Cong Ferry, and facilitate quicker access to HCMC through the “traditional” route – Vam Cong – My Thuan Bridge to Trung Luong. However, its impact on their operations remains unknown. Dong Thap transport operators, on the other hand, have a clearer idea about how Cao Lanh Bridge and the Connectivity Project will promote growth in the

transport sector. For passenger transport services, the shortening of waiting time at Cao Lanh and Vam Cong Ferry is expected to boost travel demands to An Giang and Kien Giang.

Growth in freight transport operations related to combined consignment will be stimulated once Cao Lanh Bridge is completed. Freight transport services are very competitive and sensitive to transport price levels. Being more cost-efficient, transport operators will have a competitive advantage in approaching new customers who are willing to cooperate if the offered freight transport price is relatively low. Combined consignment freight services can also be provided for fruit, often viewed as the "less traditional commodity" for containers. This is because fruits require a tight schedule and short travel duration. This could be one very positive benefit for freight transport providers.

Hypothesis 7: The Project will strengthen the Dong Thap provincial economy, with the creation of demand for bridge/road building materials and the acquisition of additional building skills and opportunities.

Manufacturing enterprises agreed that Cao Lanh Bridge will stimulate the development of the Dong Thap provincial economy. However, the reason was not seen to be the creation of demand for bridge/road building materials and the acquisition of additional building skills and opportunities, as suggested in the hypothesis. Rather, the development of the Dong Thap provincial economy is expected to be attributed to increased trade and further potential investment attraction. Increased trade and lower transportation costs will lead to lower production costs. In turn, lower production costs may promote the comparative advantage of the province and attract more investment.

Hypothesis 8: The proposed project can be expected to improve the social welfare of the population within the three provinces and in relative road corridors, and be assessed as being an effective aid component, yielding positive results and value for money

The potential social welfare effects of the Bridge are many and varied. Key perceived positive social welfare-related outcomes from the Bridge identified by stakeholders, include:

- improved access and integration with north bank and south bank schools and education facilities, including cultural assets
- potential for time savings for ambulances/paramedics to bring patients to hospitals/medical facilities
- opportunities to rationalise various health facilities located on both sides of the river, and to allow for improved staff flexibility in rostering of staff
- possible increase in school enrolments from locations outside Cao Lãnh, stimulated by the commencement of new bus services connecting the north and south banks.

Making travel more convenient is one way to bring about social benefits. According to the affected households, improvements are expected to be felt in the access to healthcare, education, cultural facilities and other public services. These benefits are not limited to Cao Lanh urban residents. Rather, residents in Dong Thap districts who are located on the other bank of Tien River are also expected to enjoy similar benefits.

The results from the focus group discussions also show that improved access to healthcare was seen as the most significant benefit of Cao Lanh Bridge. Meanwhile, many people remained in doubt about the potential impact of Cao Lanh Bridge on improving access to cultural facilities and other public services.

While this may be the case, there was concern amongst some groups regarding the impact of the project on their livelihoods. The most affected household group includes businesses that operate in the immediate vicinity of each existing ferry terminal. Among the three severely affected household groups, this group seems to be the most vulnerable. This group faces a significant risk of losing their livelihood, as it relies heavily on activities of traffic embarking or disembarking from the ferries. Once Cao Lanh Bridge comes into operation, the traffic volume in Cao Lanh Ferry is expected to decrease drastically as a consequence.

At the present time, the income restoration program for this group has just been recently initiated following extensive consultations with shopkeepers and hawkers at the ferry terminal in Tan My commune and Ward 6, and after an assessments of their needs. According to focus group discussions with those from Ward 6, supporting activities for them will include a lending program (with a cap of 30 million VND), and the opening of

a new market place nearby where they will be prioritized if they plan to move their business activities there. Shopkeepers and hawkers of Tan My commune were consulted on the lending program. However, both groups said that they did not know when they would receive the support.

As emphasized in the Project's Social Action Plan, the timing of the implementation of mitigation measures will be crucial. It has been suggested that the planning process of support measures for this group needs to be accelerated and extended further by additional assistance. Currently, the interviewed shopkeepers appear to have little idea about how they can use their loans effectively.

For the groups of households who have lost their agricultural and residential lands, the income restoration program has already been implemented. Measures in the form of in-kind support have been implemented based on the assessment of needs conducted for this group. The majority of the interviewed households either received in-kind support for their agricultural activities or small business activities. The support measures have proven to be highly effective for small business operations, as the in-kind support has brought more value-added to these operations.

Beside the recommendations made above on improving the support measures for affected households, more attention should be placed on improving information provision about the Bridge to the public including information on the location of the approach road to Cao Lanh Bridge, the master development plan that further promotes the efficiency of transport system connecting to HCMC, and the future of ferry services.

Conclusion

Overarching hypothesis: The Connectivity project will generate accessibility and mobility improvements that lead to wider socio-economic development benefits within and among the three provinces

The connectivity project will no doubt generate improvements that will lead to wider socio-economic development benefits, but the nature and level of these benefits needs to be determined by future research. As noted above, the Mekong delta lags behind other parts of Vietnam in socio-economic terms. This project has the potential to address some of these issues if augmented by other sensible policy and investment decisions. For example, it may improve agricultural sector efficiency, which may contribute to increasing local competitiveness. This may induce investment provided other enabling environment issues are addressed. The project may also improve access to health services which, if realised, could improve maternal and child health statistics and other general health measurements. The discussion above suggests that women may benefit from this project in various areas, including reducing time poverty and increasing mobility. Growth in local economies may be stimulated through increased intra-provincial transport, and intra-provincial economic opportunities may be increased. Most importantly, as will be examined further through future surveys and the Diminishing effects analysis, it seems that poorer people, who happen to live closer to the Cao Lanh Bridge, may benefit disproportionally from the project, again this will be confirmed via subsequent analysis.

1. Introduction

1.1 Background

The Cao Lanh Bridge is part of the Central Mekong Delta Connectivity Project (CMDCP) in the Mekong Delta region of southern Vietnam. The project is located on the boundaries of Dong Thap province and Can Tho city. The Cao Lanh Bridge is one of the two major bridges (Cao Lanh and Vam Cong) that make up the CMDCP and is scheduled for completion around December 2017. The Project will improve road travel across and within the Central Mekong Delta, connecting Ho Chi Minh City (HCMC) to the Southern Coastal region. It will bring inclusive development to areas that are poorly connected to major population centres, improve access to social and health services, increase national food security by stimulating local agro-industry and boosting exports, facilitate private sector investment, and extend regional connectivity to neighbouring Cambodia and the Greater Mekong Sub-region, as well as to Vietnam's major inland ports in the Mekong Delta. An estimated 170,000 road users will benefit daily from the new bridges and the 5 million residents of An Giang, Can Tho, and Dong Thap provinces are expected to benefit from an improvement in living standards. The expected outcome will be shorter road travel distances and increased average travel speeds across and within the Central Mekong Delta.

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1.2 Objectives

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5. The CLBP will stimulate the development of Cao Lãnh as an intra-provincial and inter-provincial bus passenger transit centre, with increased tourism visitation and quicker access to/from HCMC
6. The CLBP will stimulate growth in transport and storage-related enterprise facilities and employment within all three provinces
7. The CLBP will strengthen the Dong Thap provincial economy, with the creation of demand for bridge/road building materials and the acquisition of additional building skills and opportunities

8. The CLBP is expected to improve the social welfare of the population within the three provinces and in relative road corridors, and be assessed as being an effective aid investment, yielding positive results and value for money.

In order to test the above hypotheses a mixed-method evaluation was designed that integrates a range of evaluation methods at every stage of the evaluation process, drawing on both qualitative and quantitative data for contribution and attribution analyses. The evaluation design is based on the use of conventional benefit-cost analysis (BCA) and statistical techniques based on causal modelling (Diminishing Effects approach). Both approaches have been prepared as discrete forms of analysis. Time-series and Panel data will also be used to measure socio-economic benefits to which the Bridge contributes in the project's area of influence. Case studies and Focus Group Discussions are designed to obtain qualitative evidence and success/failure stories to facilitate learning about enabling and disabling factors to development as well as for public diplomacy. To assess impact a before and after approach was adopted. This includes the collection of benchmark data before the completion of the CLBP and associated Vam Cong Bridge and approach and connecting roads, with the subsequent collection of data in 2019 and 2021.

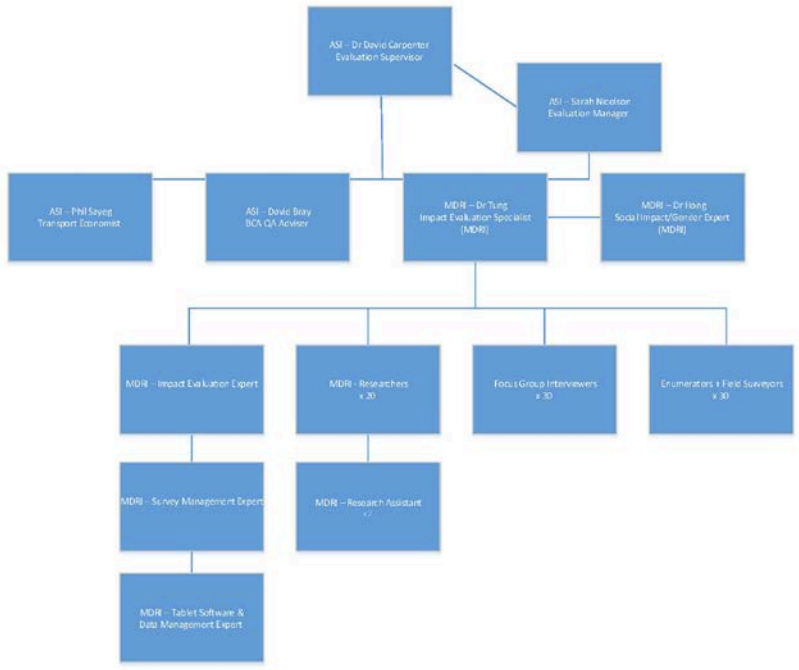
1.3 Timetable

This baseline survey and qualitative research was conducted in March and April 2017. The aim was to collect data well in advance of the opening of the Cao Lanh and Vam Cong Bridges. In March 2019 a mid-line survey will be conducted that will collect data on the impacts of the bridges, this will be further supported by an end-line survey in March 2021.

1.4 Evaluation Team

Adam Smith International (ASI) is implementing the project in association with the Mekong Development Research Institute (MDRI), who have carried out all the field work, longitudinal evaluation and impact assessment tasks. The Project team includes the two lead advisers from each organisation: Dr. David Carpenter from ASI and Dr. Phung Duc Tung from MDRI. The organogram below provides details of the project management structure.

Figure 1.1: Team Organogram



A multi-disciplinary Core Evaluation Team of seven experts leads the implementation of the Project. The core team has overall responsibility for the design and conduct of the impact evaluation, the analysis of data, report writing, stakeholder engagement and communication and quality assurance. The roles and responsibilities of each of the core team members is described in the table below.

Table 1.1: Core Team Members – Role and Responsibilities

POSITION	NAME	ROLES AND RESPONSIBILITIES
Evaluation Supervisor	Dr. David Carpenter	Supervise and coordinate the technical aspects of the evaluation, stakeholder engagement and communication, report writing and editing
Impact Evaluation Specialist	Dr. Phung Duc Tung	Supervise and coordinate the inputs of the MDRI team, lead the quantitative aspects of the impact evaluation including designing surveys, analysing survey data and conducting the Diminishing Effects Analysis, provide data inputs to BCA
Impact Evaluation Manager	Dr. Thuy Nguyen	Conduct training, supervise surveys, assist in survey design and analysis
Evaluation Manager	Ms. Sarah Nicolson	Provide overall coordination and management of the implementation, work closely with MDRI on project management tasks, oversee financial and human resource management
Transport Engineer	Dr. Nguyen Quoc Hien	Provide transport engineering support with regards to Origin-Destination and other technical aspects the evaluation
Transport Economist	Mr. Philip Sayeg	Support the BCA component including providing inputs to survey design, collating economic parameter values, conducting BCA, and communicating results
BCA Quality Assurance Adviser	Dr. David Bray	Provide an overarching BCA quality assurance function including reviewing BCA methodology, providing advice on refinements or modifications, reviewing data analysis methods, advising Transport Economist
Social Impact/Gender Expert	Dr. Khuat Thu Hong	Provide support for survey design, conduct qualitative research, train enumerators, lead social impact and gender assessment, provide data inputs to BCA.

1.5 Report Structure

The report begins with a review of current development and trends in transport infrastructure in the three provinces, this is provided in Chapter Two, it is important to understand these matters to ensure that the impact of the connectivity project can be discussed in the right context. Chapter Three outlines the methodology and provides details of the economic appraisal approach, the surveys and the qualitative research framework. Chapters Four, Five and Six present the results of the quantitative and qualitative baseline data collection. Chapter Seven provides a synthesis of the findings as they pertain the hypotheses introduced above. A number of technical appendices are provided.

2 Current Development and Trends

2.1 Setting

The Mekong Delta plays a key role not just within the wider national and regional economic context but also within the demographic fabric of Vietnam. Spreading over 12 provinces and one municipal city, the Delta is home to more than 17.5 million inhabitants, accounting for 19.2 percent of Vietnam's total population. With a total area of 40,576 square kilometres, the delta has a comparatively high population density of 434 inhabitants per square kilometre – compared to national average of 277.

64.3 percent of the Mekong Delta land area is used for agricultural production, compared to 30.9 percent for the whole country and 36.5 percent in the Red River Delta. The region contributes 19 percent of Vietnam's total GDP, of which GDP in agriculture constitutes 38.1 percent of the national GDP in agriculture. Industry is by far the least developed sector in the Mekong Delta; the regional GDP in industry only represents 15.6 percent of the national figure. The majority of employment is in the agricultural sector. According to the Labour Force Survey 2015, 47.8 percent of the work force support agricultural production, only 19.9 percent of the regional labour force participated in the industry sector.

Traditionally known as the rice bowl of Vietnam, the Mekong Delta is the country's largest rice producer with 4.3 million hectares of cultivable paddy area. In 2015, its rice production reached 25.7 million tonnes, making up 56.8 percent of the country's total rice production. Beside rice, the Mekong Delta is a major production area of aquaculture and fruits such as mango, longan, pineapple, and banana. According to the latest official statistics reported by the GSO, aquaculture production in the Mekong Delta accounts for 56.2 percent of the total country's production.

One of the central contradictions of socio-economic development in the Mekong Delta is that even though the Delta contributes one-fifth of the nation's GDP, it is lagging behind Vietnam's other regions in important socio-economic achievements like education, skills and poverty reduction. Poverty remains high in the region with 6.5% of total households living below the poverty line. The Mekong Delta region has failed to keep pace with the development of the country. As reported by the GSO, monthly average income per capita in the Mekong Delta in 2014 was 2,327 thousand VND, lower than the national average of 2,637 thousand VND. Between 1999 and 2014, average income per capita in Vietnam increased by 8.9 times, in the Mekong Delta it increased 6.8 times, only slightly higher than Central Highland region.

Against this background, the Prime Minster has established a steering committee devoted to developing new ideas for strengthening the Delta's economic and social performance. The steering committee belongs to the party central committee and is supported by the Central Institute for Economic Management (CIEM). This institute was assigned by the Prime Minister to design a regional development plan. The assessment of development opportunities identified the weaknesses and strengths of the Mekong Delta. Together with issues to do with education and strong regulation of the agricultural sector, transport infrastructure is seen as a major impediment to socio-economic development, which makes this connectivity initiative highly relevant to development in the Delta.

The Mekong River flows into the Mekong Delta through the Cambodian border in two major channels: Tien River and Hau River. This creates enormous potential for inland waterway transportation. The Mekong Delta has about 28,600 km of rivers and canals, of which 13,000 km consist of rivers and canals with a water depth greater than 1 meter and hence suitable for navigation; 6000 km of which are suitable for large ships with transportation capacity of 50 to 100 tonnes.

Dong Thap and An Giang province, lying on the riverhead of Mekong River, possess many resources for the development of agriculture, aqua-culture, industry, trade and tourism. Having reputable universities and hospitals, together with the municipal cities – Can Tho, Long Xuyen and Cao Lanh, are important centres of the region. Despite playing important roles in the development of the region, their economic potential has been constrained due to the poor road infrastructure. Currently, road transportation among the three provinces/cities relies heavily on National Highway 1A, the sole arterial link from the Mekong Delta to HCMC. Improved road

infrastructure is critical for the future progress of An Giang, Dong Thap and Can Tho in particular as well as for the whole region.

In An Giang, GDP grew by 6.5% in 2016, with an 8.72% increase in the industry and construction sector, 9.17% increase in the services sector and 2% increase in the agriculture sector. In common with many other provinces in Vietnam, An Giang is experiencing a gradual shift from the agriculture to the services sector. In 2016, the agriculture sector constituted 34.31% of GDP, while the services sector constituted 50.38%. GDP per capita in 2016 reached 33.986 million VND, an increase of 2.734 million VND compared with 2015. The province as a whole created jobs for over 30,667 people, achieving 102.22% of the year's employment target.

In Can Tho, GDP in 2016 reached 61,398 billion VND, rising by 7.55% over 2015, almost double that of An Giang. The agriculture sector accounted for 5,337.43 billion VND of GDP and grew by 0.53% for the year. Agriculture was affected by drought and saltwater intrusion in the early months of 2016, which year affected productivity. The trade and services sector contributed 20,456.01 billion VND to GDP, increasing by 7.89%. GDP from the Industry and Construction sector contributed 31,708 billion VND and increased by 9.7% over the year, outperforming services and contributing 3.2 percentage points to overall growth. Some high performing products included: frozen shrimp, which increased by 11.54%; milled rice, which increased by 17.59%; and medicine, which increased by 11.99%.

In 2016 the GDP of Dong Thap province grew by 6.38%, which was lower than the province's planned growth of 8.5%. The total value of GDP reached 44,918 billion VND, lower than Can Tho but higher than An Giang. The agriculture sector remains is particularly important to the economy of Don Thap, contributing 16,403 billion VND to GDP and growing by 3.3% over the year. As is the case across the Mekong, the trade and services sector plays a particularly important role in the economy, contributing 18,005 billion VND to the provincial economy and growing at 9.12% over the year. The industry and construction sector provided 10,510 billion VND to the economy and grew by 6.69% over the year.

As the above summary shows, agriculture remains an important sector in Don Thap and An Giang, but less so in Can Tho. Growth in agriculture is well below that of the industry and services sectors across all three provinces, and it is these sectors that are driving growth in the region.

2.2 Current Road Network

National Highway 1A (NH1A), which runs through Vietnam from north to south, is currently the only road artery that gives uninterrupted access to the Southern Coastal Region. This road extends from Ho Chi Minh City to the My Thuan Bridge (where it crosses the Tien River) and thence to Can Tho, where a bridge that was opened in 2010 crosses the Hau River and on to the southern Delta province of Min Hai. Both of these bridges are currently not tolled. Figure 2.1 shows the current and planned road network.

Two other highways diverge from NH1A at the My Thuan Bridge:

- National Highway No. 30, from My Thuan along the northern side of the Tien River, via Cao Lanh and a ferry crossing of the Tien River. Route 30 continues to the northeast edge of the Delta at the border with Cambodia; and
- National Highway No. 80 from My Thuan via Sa Dec and a ferry crossing at Vam Cong of the Hau River near Long Xuyen.

The Government's Expressways Development Plan[1] identifies the Second Southern Highway (SSH) as a key road network artery for the development of the Delta. The SSH connects HCMC through My An in the central Mekong Delta Region to the Southern Coastal Region and serves as an alternative to NH1A thus providing access to the south western provinces. It also links to the Greater Mekong Sub region (GMS) Southern Coastal Corridor at Rach Gia. The SSH is currently interrupted by the ferry crossings at Cao Lanh located 35 km upstream from the My Thuan Bridge, and at Vam Cong.

Two other existing bridges to the east of My Thuan provide connections between Tien Giang and Ben Tre Province, and Ben Tre City and the district of Mo Cay Bac in Ben Tre Province. Throughout the Delta there are

[1] Decision 1734/QD-TTg Approval of Vietnam's Expressways Development Plan up to 2020 and beyond.

several ferries providing connections across various river channels that mainly cater to local traffic. Bridges are currently under construction at Cao Lanh and Vam Cong (part of the current project) and Co Chien connecting Ben Tre Province to Tra Vinh Province to the east of My Thuan.

The absence of a high quality road connection between My An and the Southern Coastal Corridor and other key provincial towns such as Long Xuyen, the capital of Dong Thap Province, may constrain the development potential of the western part of the Delta. Reliance on a single artery (NH1A) will not enable development of a reliable core primary road network that can facilitate the orderly development of land use and the planning of supporting secondary roads and other infrastructure.

2.3 Cao Lanh Bridge and Overall Connectivity Project

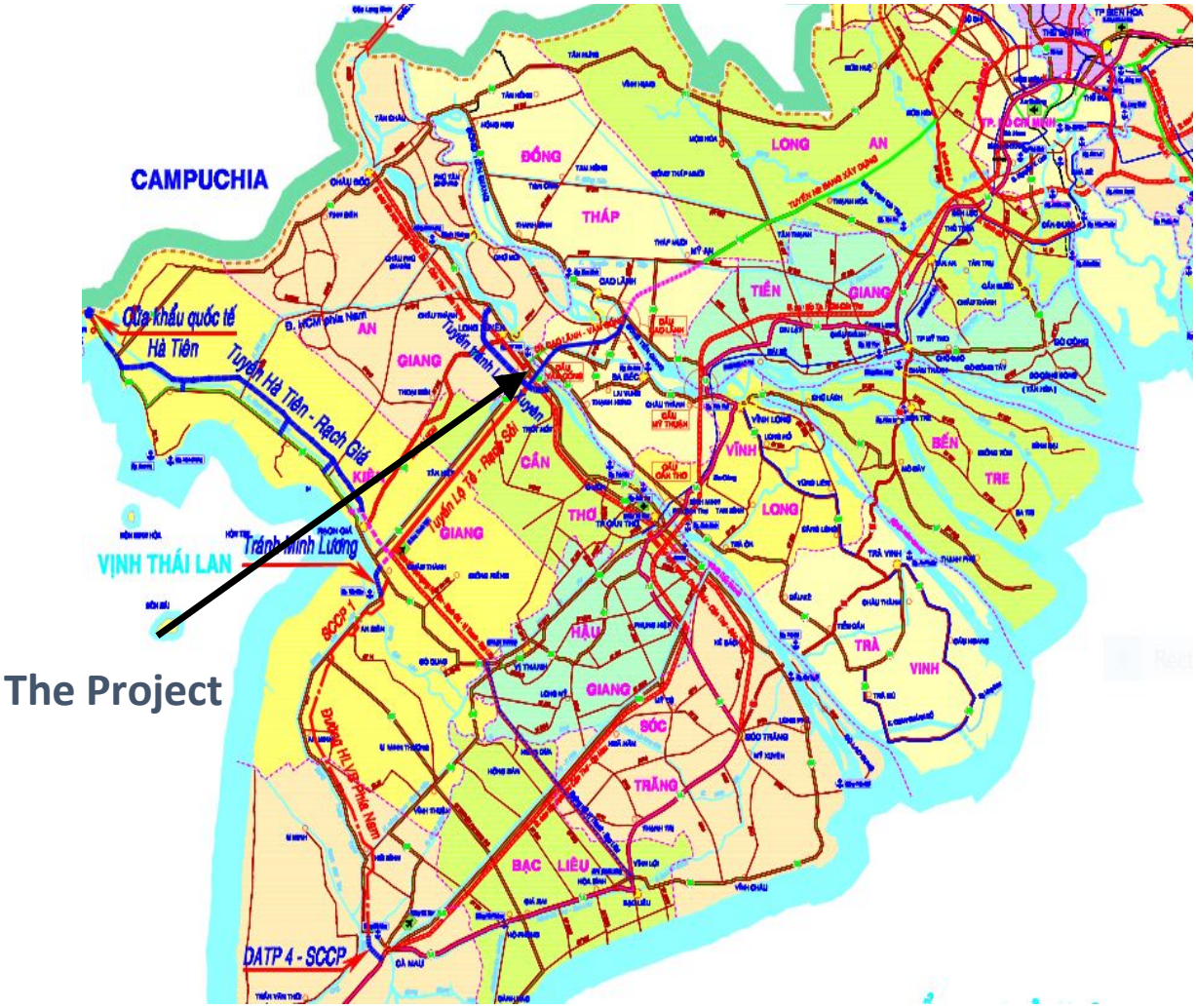
The Cao Lãnh Bridge Project (CLBP) is a part of the overall CMDCP. The CMDCP has three components:

- Component 1: the Cao Lãnh Bridge (2.0 kms) and approach roads (5.4 kms)
- Component 2: the interconnecting road (15.7 kms)
- Component 3: the Vam Cong Bridge (2.97 kms) and approach roads (4.08 kms)

Also proposed and under study by the Ministry of Transport is the bypass of Long Xuyen. A new road connection between My Anh and the Cao Lanh Bridge is also proposed. Although the CMDCP was conceived as one integrated project, the Australian Government financed the Cao Lanh Bridge and supporting activities.

The entire CMDCP was assumed to be tolled at appraisal. A subsequent decision was made to not toll the facility and toll collection facilities were not constructed. When an Operating and Maintenance Company is procured to manage the facility in 2018 a toll may be introduced but this remains to be determined.

Figure 2.1: Delta Provinces and Transport System



Source: Transport Masterplan

2.4 Road Conditions

The towns of Cao Lanh, Long Xuyen and Can Tho are connected by ferries and this travel option is presently the shortest route. However, the delays at ferries and ferry crossing times typically add 30 minutes or longer to journeys.

For medium distance traffic travelling between An Giang Province and the western part of Can Tho Province and areas north of My Thuan, the use of the Vam Cong ferry and provincial highways 54 and 851 that connect to the My Thuan Bridge is a convenient route. For traffic from the eastern parts of Cao Tho (or heavy trucks originating or destined for An Giang that are prevented from using Vam Cong ferry because of the current 18 tonne maximum load restriction) use of the Can Tho Bridge and then the My Thuan Bridge is the only feasible option.

The weighted road roughness for undivided provincial and local roads based on the study team's observations is considered to be 'fair' and corresponds to an international roughness index (IRI) of 5m/km with sections of road with poor horizontal and vertical alignments[2]. The combination of generally poor road conditions results in an average travel speed on provincial roads sections of between 45 and 50 kph. National Highway 1 has very heavy traffic volumes approaching 30,000 vpd with significant heavy truck use. Traffic on Highway 1 has

[2] An IRI of > 5.5 is used to signify road surfaces in poor condition.

been increasing by about 3.5 percent per year since 2011. At My Thuan Bridge traffic volumes increased by 10 percent from 2011 to 2014; and on Can Tho Bridge, traffic increased by 20 percent from 2012 to 2017, as shown in Table 2.1. Traffic volumes on other provincial highways (e.g. 30 and 91) is also growing fast (approaching 10% p.a.). While motorcycles have typically represented over 70 percent or more of traffic, the shares of other vehicle types is slowly increasing representing a shift towards cars and other vehicles.

The road injury rate on NH1 from HCMC to Can Tho in 2016 was estimated at 1.7 fatalities per 100 million VKT[3], a rate that is similar to roads in Australia. Highways 30 and 80 in Dong Thap province were estimated to have higher fatality rates at 1.95 and 3.24 fatalities per 100 million VKT respectively. Highway 91 in An Giang province showed a fatality rate of 2.1 per 100 million VKT. Given that crash data may be underreported actual fatality rates may be higher. The data reveals that provincial roads have higher fatality rates despite being less trafficked than Highway 1.

Table 2.1: Trends in Daily Use of Highway 1 and Provincial Highways

Locations	Car	Small truck	Medium Truck	Heavy truck (3 axles)	Heavy truck (>3 axles)	Small Bus	Large Bus	Motorcycle	Total (without motorcycle)	Year
Highway 1A	4,743	2,024	2,633	1,215	215	2,466	2,333	19,856	15,629	2011
(My Thuan bridge)	5,289	2,323	3,043	1,470	370	2,613	2,050	29,541	17,158	2014
Highway 1A	3,475	1,124	1,847	74	812	1,516	1,174	32,961	10,022	2012
(Cần Thơ bridge)	4,835	1,347	2,294	126	1,165	1,207	1,321	43,725	12,295	2017
Highway 30	826	888	723	133	113	832	471	9,544	3,986	2013
(An Huu Town)	746	1,023	696	239	144	821	644	10,023	4,313	2014
	1,419	1,345	944	352	100	1,074	985	11,647	6,219	2017
Highway 91	991	1,526	806	122	106	752	684	21,595	4,986	2013
(Long Xuyên City)	2,156	1,238	567	162	84	1,864	1,056	21,496	7,127	2017
Highway 91	795	877	394	163	7	664	625	7,703	3,539	2013
(Chau Doc Town)	1,134	987	402	124	22	756	589	10,553	4,030	2014
	1,423	1,278	359	268	55	1,254	1,167	12,985	5,804	2017

Source: MOT and other sources

2.5 Cao Lanh and Vam Cong Ferries

The Cao Lanh ferry company office is located four km to the south of the town of Cao Lanh and operates to the other side of the Tien Channel. The ferry company is operated by the Provincial Department of Transport. The Vam Cong ferry is located in the town of My Thanh on the southern bank of the Hau Channel seven kilometres to the west of Long Xuyen. It operates to the northern side of the southern arm of the Mekong River in Dong Tap Province. The Vam Cong ferry is operated by the national Ministry of Transport. Both ferries form part of the new National Highway 2 (Second Southern Highway) that provides an alternative to the existing National Highway 1A along which the My Thuan and Can Tho bridges are located. These ferries will be replaced by the Connectivity Project including Cao Lanh Bridge that are to open by early 2018.

Recent trends in the use of the two ferries and My Thuan and Can Tho bridges (and previous ferries) are shown in Table 2.2. As shown in Table 2.2 growth in the use of the Cao Lanh and Vam Cong ferries since 2008/9, when the ADB's original project preparation was conducted, has been modest to 2017. Growth in the use of the Cao Lanh ferry by vehicles with four or more wheels actually fell following the opening of the Can Tho Bridge in 2010. The volume of 4+ wheelers using the Cao Lanh ferry in 2017 is only slightly higher than observed in 2009. Contributing to the slow growth in vehicles with more than four wheels (of which 60% are trucks) is a 16 tonne Gross Vehicle Weight (GVW) limit that applies to the Cao Lanh ferry, an 18 tonne GVW limit that applies to the Vam Cong ferry, and a 12 tonne load limited bridge on the most direct route between the Cao Lanh and the Vam Cong ferries as shown in Figure 2.2. Use of the Cao Lanh ferry by motorcycles grew by 30% from 2009 to 2017.

[3] Project team analysis of traffic data from MOT.

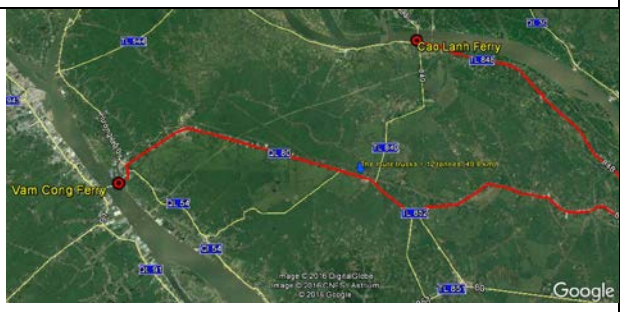
Similar trends were observed at Vam Cong ferry although 4+ wheelers grew by 26.6% from 2009 to 2017 in part because the GVW limit was higher than at the Cao Lanh ferry and vehicles traveling towards Ho Chi Minh City could continue directly to the My Thuan Bridge. Use of the Vam Cong ferry by motorcycles grew by 17.9% from 2009 to 2017.

Table 2.2: Trends in Daily Use of Key Bridges and Ferries by Vehicles with > 4 wheels/ Motorcycles

Year	Cao Lanh Ferry		Vam Cong Ferry		My Thuan Bridge/ ferry		Can Tho Bridge and ferry	
	4+ wheelers	2 /3 wheelers	4+ wheelers	2 /3 wheelers	4+ wheelers	2 /3 wheelers	4+ wheelers	2 /3 wheelers
2017	2,078	16,200	4,876	15,714	n.a.	n.a.	12,295	43,725
2016	1,751	14,205	4,932	12,223	n.a.	n.a.	n.a.	n.a.
2015	1,503	13,762	4,601	12,618	n.a.	n.a.	n.a.	n.a.
2014	1,201	12,497	4,202	12,346	17,158	29,541	n.a.	n.a.
2013	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
2012	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	10,022	32,961
2011	n.a.	n.a.	n.a.	n.a.	15,629	19,856	n.a.	n.a.
2010	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	*Bridge opens*	*Bridge opens*
2009	1,958	12,422	3,850	13,324	n.a.	n.a.	7,040	22,652
2008	2,049	11,842	2,256	n.a.	12,836	n.a.	6,868	20,218
2007	n.a.	n.a.	2,283	n.a.	12,278	n.a.	n.a.	n.a.
2006	n.a.	n.a.	1,990	n.a.	10,919	n.a.	n.a.	n.a.
2005	531	n.a.	2,708	n.a.	10,876	n.a.	n.a.	n.a.
2004	n.a.	n.a.	2,734	n.a.	10,232	n.a.	n.a.	n.a.
2003	342	4,455	2,382	n.a.	9,246	n.a.	n.a.	n.a.
2002	274	n.a.	2,138	n.a.	9,480	10,610	3,830	n.a.
2001	261	n.a.	1,907	n.a.	n.a.	n.a.	3,330	n.a.
2000	n.a.	n.a.	1,588	n.a.	Bridge opens	Bridge opens	2,550	n.a.
1999	n.a.	n.a.	1,348	n.a.	5,300	3,700	n.a.	n.a.

Sources: (1) Data to and including 2008 from AusAID (2010). "Economic Advisory Report to Joint Fact Finding Mission: Central Mekong Delta Connectivity Project" Oct 2010, originally reported in University of Economics Ho Chi Minh City, Vietnam/ Economic and Policy Services Pty Ltd (2003), "Final Report: My Thuan Bridge Monitoring Program." Prepared for AusAid; (2) 2009 for Cao Lanh Ferry (January 5, 2009) and Vam Cong Ferry (one day December 2009) as reported in AusAID (2010) from ferry companies – includes estimate of effect of monthly ticket holders' use; (3) annual figures for Cao Lanh Ferry and Vam Cong Ferry for 2014-2016 from ferry companies. My Thuan Bridge opened 21 May 2000 and Cao Tho Bridge opened 24 April 2010. 2017 figures for Cao Lanh and Vam Cong for March 14 and 15, 2017 respectively including effect of monthly ticket holders from ferry company data. These dates were the same day as the surveys conducted for the current study. Data for My Thuan Bridge, Can Tho Bridge and Can Tho Ferry from MoT.

Figure 2.2: Main Routes between Cao Lanh and Vam Cong Ferries

Route for vehicles less than 12 tonnes	Route for vehicles greater than 12 tonnes
	
Distance: 25km – travel time = 33 mins	Distance: 47km – travel time = 62 mins

Source: Study Team

2.6 Current Ferry Operations

Current ferry tariffs are shown in Table 2.3. Tariffs are similar at each ferry except for walk-on passengers and cyclists who travel gratis on the Cao Lanh ferry at present. Vam Cong has a tariff for trucks of up to 18 tonnes GVW with the maximum at Cao Lanh applying to 16 tonne GVW trucks.

Table 2.3: Cao Lanh and Vam Cong Ferry Tariffs

Cao Lanh		Vam Cong	
Type	**Tariff (VND)**	**Type**	**Tariff (VND)**
Pedestrian	nil	Pedestrian	1,000
Bicycle	nil	Bicycle	2,000
Motorcycle	5,000	Motorcycle	5,000
Three-wheeler and other	6,000	Three-wheeler and other	6,000
Car less than 12 seats and auto rickshaw	25,000	Car less than 12 seats and auto rickshaw	25,000
Bus from 12 to 15 seats	35,000	Bus from 12 to 15 seats	30,000
Bus from 15 to 30 seats	50,000	Bus from 15 to 30 seats	50,000
Bus from 30 to 50 seats	60,000	Bus from 30 to 50 seats	60,000
Bus with more than 50 seats	n.a.	Bus with more than 50 seats	70,000
Truck less than 3 tonnes	25,000	Truck less than 3 tonnes	25,000
Truck from 3 to less than 7 tonnes	35,000	Truck from 3 to less than 5 tonnes	35,000
Truck from 7 tonnes to less than 10 tonnes	60,000	Truck from 5 tonnes to less than 10 tonnes	60,000
Truck from 10 tonnes to less than 16 tonnes	70,000	Truck from 10 tonnes to less than 15 tonnes	90,000

Cao Lanh		Vam Cong	
Type	**Tariff (VND)**	**Type**	**Tariff (VND)**
		Truck from 15 tonnes to less than 18 tonnes, 20 foot container	120,00
		Truck with more than 18 tonnes, 40 foot container	130,000

Source: Ferry Companies

Current features of vessels, facilities and operations are shown in Table 2.4. Waiting times at ferries are presented in Section 5. Due to the higher traffic volumes at Vam Cong waiting times are generally longer than for Cao Lanh. For example, the average delay for cars at Cao Lanh is about 11 minutes compared to 18 minutes at Vam Cong. Since motorcycles have their own queue at both ferries and priority boarding, waiting times are shorter than for other vehicles. Ambulances and the vehicles of government staff are also given priority but face the same delays. Ferry crossing times are about 10 minutes year round except during periods of high river flows when crossing times are longer.

Table 2.4 shows that the previous single pontoon terminals at Vam Cong were duplicated on the North Side in 2011 and on the South side in 2013 when terminal usage had reached around 13,000 passenger car equivalent (pcus) per day. At Cao Lanh, with single pontoon terminals, the volume of traffic in pcus in March 2017 was below the threshold for terminal expansion. Hence, the information on the current use of ferries differs slightly from the official data on ferry use on the same days from the ferry companies shown in Table 2.2[4].

Table 2.4: Cao Lanh and Vam Cong Ferry Facilities

Facilities/ characteristics	**Cao Lanh Ferry**		**Vam Cong Ferry**	
Vessels/ age	• 2 x 60 tonnes (12 passenger car unit pcu equivalent) • 5 x 100 tonnes (20 passenger car unit pcu equivalent) • All aged 10-30+ years		• 2 x 100 tonnes (20 passenger car unit pcu equivalent) • 8 x 200 tonnes (40 passenger car unit pcu equivalent) • All aged 10-30+ years	
Operating shifts per day/ hours/ day	3 (8 hours) when 6 – 7 vessels operate. Third shift between 9am-5am normally only 1-2 vessels operating		2 (12 hours) – 6-8 vessels operate	
Crew per ferry/ shift	4		4	
Terminals	**North Side**	**South Side**	**North Side**	**South Side**
	1 (4 berths) + 1-way access ramp and 2-way road	1 (4 berths) + 1-way access ramp and 2-way road	1 (4 berths) + 1-way access ramp 1 (4 berths) + 1-way access	1 (4 berths) + 1 (4 berths) + 1 way access ramp and 2-way road developed in

[4] The main differences between our surveys and the official data are in the volumes of walk-on and cyclists that our surveys picked up comprehensively but are not counted at all at Cao Lanh and only partially counted at Vam Cong by ferry companies and on our counts of motorcycles at Vam Cong that are 89% of the official data. The official counts reported in Table 2.5 include our estimates of use by 724 monthly ticket holders that were each assumed to use the ferry 6 times per day. If the monthly ticket holders actually used the ferry 4 times per day on average the counts would be 98% of the motorcycle volumes shown in Table 2.5.

Facilities/ characteristics	Cao Lanh Ferry		Vam Cong Ferry	
			ramp (added 2013) 1 x 2-way road common for both terminals	2011 at Ben Du Phong 400 metres to east
Terminal staff per shift	5	5	5	5
Staffing				
Total operational staff (ferries + terminals)	93		127	
Management and administration staff	9		29	
Total staff	102		156	
Management and administration staff/ vessel	0.8		2.9	

Source: Ferry companies

Table 2.5: Cao Lanh and Vam Cong Ferry Traffic Volumes and PCUs 2017

Location	Walk-on/Cycle	Motorcycle	4 wheelers	Buses	Trucks	Total
Vehicles						
Cao Lanh	952 (514 walk-on and 438 bicycles)	16,666 (including 37 trishaws)	818 (including 13 ambulances)	87	1,152	19,675
Vam Cong	663 (358 walk-on and 305 bicycles)	13,975 (including 7 trishaws	1,882 (including 57 ambulances)	1,189	2,205	19,914
PCUS (passenger car equivalent units)						
Cao Lanh	N.S.	4,166	1,636	174	2,304	8,280
Vam Cong	N.S.	3,494	3,764	2,378	4,410	14,046

Source: Surveys March 14, 2017 at Cao Lanh; and March 15, 2017 at Vam Cong; volume of walk-on was estimated based on relative number of interviews compared to bicycle since it could not be counted directly as many passengers walk-on even that use vehicles. Passenger Car Equivalents (PCUs) = 0.25 for motorcycle; 2.0 for other vehicles on average from JICA Strada model used by TEDI in Delta previously.

Ferry terminals are served by mainly passing bus services operating several times per hour. Significant changes in bus route structures and services will be monitored following the opening of the Connectivity Project.

Information on ferry incidents involving the Cao Lanh and Vam Cong ferries since 2010 are shown in Table 2.6. There were four incidents including one with a fatality at Vam Cong.

Table 2.6: Cao Lanh and Vam Cong Ferry Traffic Accidents 2010 - 2017

No.	Location	Accident	Time	Fatality	Cost
1	Vam Cong Ferry	Collision between ferry (200 Ton) and ferry (100 Ton)	1:00 am, September 23rd, 2010	0	Sinking of ferry (100 Ton) included 60 passengers, 3 coach (16 seats), 1 car (7 seats), 1 coach (50 seats) and 1 truck
2	Cao Lanh Ferry	Truck with 7.5 Ton (waste product)	7:15 pm, July 7th, 2011	0	destroyed bridge access way, > 2 hour congestion
3	Vam Cong Ferry	Car (7 seats) without breakes system hits the safety fence of ferry, plunged into the river	12:30 am, July 12th, 2013	1	Salvage cost
4	Cao Lanh Ferry	Truck without breakes system hitt the safety fence of ferry, plunged into the river	12:00 am, November 1st, 2013	0	80,000,000 VND

Source: Ferry companies

2.7 Current proposals After the Connectivity Project Opens

Available information suggests that most staff of the Cao Lanh ferry will be transferred to other activities within the Provincial Government including operation of local ferries at other parts of the river. There is a proposal to retain the two 60 tonne ferries, possibly acquire others, and operate them with staff being paid only the basic salary. Whether the operations will be retained depends on ferry user demand and whether revenue is sufficient.

From current information, the operations at Vam Cong will cease entirely. Vessels will be relocated to other sites, as happened after the My Thuan and Can Tho Bridges opened. The office facilities will be handed over to An Giang Province. About 62 staff are planned to be transferred to other ferry operations. The balance of staff have not yet been allocated to new positions.

2.8 Up/ Down River Traffic

Transportation in the Mekong Delta is dominated by inland waterway transportation. In 2015, waterway transport represented 73.3 percent of the whole regional volume of freight traffic[5]. Road freight transport only accounted for 26.7 percent of the regional figure. Important road links connecting the Mekong Delta with other regions outside the Delta, but also within the Delta itself, have been insufficient or in bad shape thus contributing to the dominance of waterway transport for bulk goods along the Mekong corridor. Roads are also needed for the local distribution of goods. The main goods transported are vegetables, fruit and dried products. Specialized vessels transport fuels, fertilisers and livestock[6].

There are eight major ports in operation in the Delta, and five more are planned that can accommodate ocean-going vessels as shown in Table 2.7.

[5] Government Statistics Office.

[6] Mekong River Commission 2015. "Design of a Masterplan for Regional Waterborne Transport in the Mekong River Basin, Final Report, Volume 1."

Table 2.7: Existing and Planned Major Seaports on Mekong River

No.	River	Name of port	Capacity	Existing Condition	Location
1	Hau	Cai Cui	4 million	in Operation	Can Tho City
2	Hau	Hoang Dieu	2 million	in Operation	Can Tho City
3	Hau	Tra Noc	2.5 million	in Operation	Can Tho City
4	Hau	My Thoi	3.5 million	in Operation	An Giang Province
5	Hau	Binh Minh	0.8 ~ 1 million	in Operation	Vinh Long Province
6	Hau	Minh Phu	0.8 ~ 1 million	Planning	Hau Giang Province
7	Hau	Tra Cu	1 million	Planning	Tra Vinh Province
8	Hau	Dinh An	1 ~ 2.5 million	Planning	Tra Vinh Province
9	Hau	Soc Trang (Dai Ngai)	1 million	Planning	Soc Trang Province
10	Hau	Vinalines Hau Giang	0.8 ~ 1 million	in Operation	Hau Giang Province
11	Tien	Dong Thap (Cao Lanh, Sa Dec)	1.6 million	in Operation	Dong Thap Province
12	Tien	Dong Thap (Lap Vo)	0.8 ~ 1 million	Planning	Dong Thap Province
13	Tien	Vinh Long (Vinh Thai)	0.8 million	in Operation	Vinh Long Province

Source: MoT

3 Methodology

3.1 Impact Hypotheses

This evaluation is a systematic, empirical investigation of the impacts of the DFAT-funded Cao Lanh Bridge Project (CLBP). It seeks to establish whether the bridge has made a difference in the lives of people in the target area by assessing the direct and indirect causal contribution of the CLBP to change in people's lives. This includes an assessment of the positive and negative, intended and unintended, primary and secondary long-term impacts that result from the bridge.

This evaluation is designed to test the primary hypothesis that the CLBP:

1. Will generate accessibility and mobility improvements that lead to wider socio-economic development benefits within and among the three provinces.

There are seven additional hypotheses, which together inform the primary hypothesis, these are:

2. The CLBP will generate additional socio-economic benefits for Cao Lãnh urban residents (including improved access to health, education and cultural facilities)
3. The CLBP will expand and deepen the labour market areas for Cao Lãnh residents, with improved road access to other provincial centres for additional employment opportunities
4. The CLBP will lead to growth in containerised road freight across all three provinces (achieving economies of scale, reduced numbers of individual small truck movements, and lower costs per unit of freight)
5. The CLBP will stimulate the development of Cao Lãnh as an intra-provincial and inter-provincial bus passenger transit centre, with increased tourism visitation and quicker access to/from HCMC
6. The CLBP will stimulate growth in transport and storage-related enterprise facilities and employment within all three provinces
7. The CLBP will strengthen the Dong Thap provincial economy, with the creation of demand for bridge/road building materials and the acquisition of additional building skills and opportunities
8. The CLBP is expected to improve the social welfare of the population within the three provinces and in relative road corridors, and be assessed as being an effective aid investment, yielding positive results and value for money.

3.2 Evaluation Design

In order to test the above hypotheses a mixed-method evaluation was designed that integrates a range of evaluation methods at every stage of the evaluation process, drawing on both qualitative and quantitative data for contribution and attribution analyses. The evaluation design is based on the use of conventional benefit-cost analysis (BCA) and statistical techniques based on causal modelling (Diminishing Effects approach). Both approaches have been prepared as discrete forms of analysis. Time-series and Panel data will also be used to measure socio-economic benefits to which the Bridge contributes in the project's area of influence. Case studies and Focus Group Discussions are designed to obtain qualitative evidence and success/failure stories to facilitate learning about enabling and disabling factors to development as well as for public diplomacy. To assess impact a before and after approach was adopted. This includes the collection of benchmark data before the completion of the CLBP and associated Vam Cong Bridge and approach and connecting roads, with the subsequent collection of data in 2019 and 2021.

In March 2017 benchmark surveys in a number of areas were undertaken in subsectors of the economy expected to benefit from the improved road infrastructure, these sub-sectors include:

- Households likely to be affected by ferry traffic changes

- Producers and sellers of vegetables, fruits, and food items
- Transport operations (freight and passenger services)
- Prices of consumer items
- Prices for agricultural inputs and transport services
- Markets for products (agricultural and manufactured)
- Access to employment opportunities
- Access to educational, medical and cultural facilities
- Development/upgrading of the feeder road network
- Increased containerised road freight transport, including transfers of freight from water transport to roads (chemicals, fertilisers, and grain).

The benchmark surveys will provide a baseline that can be used to measure the direct effects of the CLBP once it is completed. Such direct effects include:

- Improved access to employment opportunities
- Improved access to health, education and cultural facilities
- Improved access to local markets
- Increased road freight imports and exports.

The benchmark surveys also provide a baseline which can be used to measure the indirect and induced effects of the project, including through:

- Improvements in household quality of life
- Induced investment in commercial assets, as dependent on improved transport access
- Induced developments in tourism enterprises, with improvements in road transport
- Reduction in the levels of poverty with improved access to employment (increased incomes), social development (health and education services), and reduced time burdens, especially for women.

3.3 Economic Appraisal Framework

A key component of the evaluation design is the economic appraisal of the CLBP using Benefit Cost Analysis (BCA). This economic evaluation is the primary means of determining the Value for Money of the project in accordance with Australia's Aid Policy. The economic appraisal will take into account capital, maintenance and operating costs for the provision of the project, the Mekong Connectivity Project (including Cao Lanh Bridge) and connecting roads, compared to the continued operation of ferries in the base case. Differences in transport user and other costs between the base case and the project case constitute the (incremental) costs and benefits (or dis-benefits). The effects of changes in use of routes such as other bridges or modes (up-down river ferries) are taken into account by the methodology.

3.3.1 Assumptions

The general features of the economic appraisal are set out below and summarised in Table 3.1. There are a number of assumptions that underpin the analysis, including:

- An appraisal period comprising the implementation period 2014-2017 followed by 20 years of operation will be adopted as for the economic evaluation undertaken at appraisal (2010 and 2013)

- Allowance has been made for the residual value of assets only at the end of the evaluation period, in recognition of their capacity to generate benefits beyond the end of the appraisal period[7]
- A central discount rate of 12% real is used for the principal evaluation (as for the evaluation at appraisal[8]), with discount rates of 3% and 10% adopted for sensitivity testing
- The evaluation will be conducted in USD as was the economic evaluation undertaken at appraisal (2010 and 2013), using constant 2017 price units
- All monetary values will exclude taxes, excises and duties, which are transfer payments and hence do not reflect the real value of resources
- Sources of monetary values used in the evaluation will be provided in various price units (i.e. at different years). All values at other years would be converted to early 2017 prices by applying relevant indices published by the Vietnam National Statistics Office or by making suitable assumptions for projections
- The Benefits of the project will be calculated for 2019 (at the end of the first year of operation) based on actual surveyed demand and travel patterns (e.g. Origin-Destination) by comparison with the estimated base case demand (based on survey of ferry passengers in 2017 updated to 2019). Benefits in future years will be based on projections of demand and supporting assumptions.

Table 3.1: Features of the Economic Appraisal

Feature	Description
Implementation period	2014-2017 (4 years)
Year of Opening	2019
Evaluation period (duration of operations evaluated)	2019-2038
Year in which residual value realised	2039
Central discount rate (real)	12.0% pa

Source: Study Team

3.3.2 Key guidelines

The appraisal of the merits of the case includes quantification of the net benefits to the community in a manner consistent with standard economic evaluation – cost benefit analysis. It compares the incremental costs and benefits of the project. The appraisal has been conducted in a manner consistent with accepted guidelines and standards, as indicated in:

1. Infrastructure Australia (2010) *Better Infrastructure Decision-Making: Guidelines for making submissions to Infrastructure Australia's infrastructure planning process, through Infrastructure Australia's Reform and Investment Framework.* Sydney.
2. Australian Transport Council (various years) *National Guidelines for Transport System Management in Australia.* Commonwealth of Australia, Canberra (in particular Volume 3: Appraisal, Volume 4: Urban Transport and Road Parameter Values [PV2] 2015).
3. Transport and Infrastructure Council (2015) *2015 National Guidelines for Transport System Management in Australia. Road Parameter Values [PV2*].

[7] Residual values would be calculated for capital items such as structures, major civil works and ferries.

[8] ADB 2013. Economic and Financial Appendix to RRP.

4. Transport for New South Wales (2013) updated March 2015. *Principles and Guidelines for Economic Appraisal of Transport Investment and Initiatives,* Sydney.
5. Austroads (2008) *Guide to Project Evaluation Part 4: Project Evaluation Data* AGPE04/08. Sydney.
6. Asian Development Bank (1997). *Guidelines for the Economic Analysis of Projects.*

3.3.3 Economic Benefits

Economic benefits estimated for the appraisal follow conventional economic theory as set out in the relevant guidelines referred to above. The key economic benefits that can be estimated as a result of the direct impact of a transport project are:

- Consumer surplus[9] for passengers, or firms that ship commodities, and make use of the project; and
- Producer surplus (or equivalent) for passengers and firms.

Allowing for the effect of externalities and changes in road crashes, the general form of benefits equation for deriving the expected improvement in economic welfare of a transport project can be written as:

$$(A\text{: } Consumer\ Surplus) + (B\text{: } Producer\ Surplus) + (C\text{: } Change\ in\ value\ of\ externalities + D\text{: } Change\ in\ value\ of\ road\ injuries\ and\ other)$$

The first two terms, consumer surplus (A) and producer surplus (B), need to be calculated for each type of passenger and freight transport impacted by the project, mainly existing land based modes using any part of the road network (and connecting ferries), but also including switching from up/down water transport, in the Mekong Delta.

Term C is the changes in externalities (lower air pollution i.e. improved health, and reduced greenhouse gas emissions) and Term D is the change in safety and other impacts (e.g. fatalities and serious injuries, reductions in road damage etc.), for each mode. Table 3.2 provides further definition of the components of consumer surplus and producer surplus.

Table 3.2: Type of Project Benefits Addressed

	A		B	C	D
Description	Consumer Surplus or Shipper Surplus (taking account of time, reliability, opportunity cost of value of freight in transit, tariffs, and qualitative factors)		Producer Surplus	Δ Externalities	Δ Other (e.g. road crashes and congestion)
Equivalent to	Existing user benefits	New user benefits (e.g. benefits to induced users e.g. tourists, those that change routes or modes e.g. inland waterway goods vessels)	Δ (Toll revenues - resource costs of transport operation)	Δ Externalities	Δ Other (e.g. road crashes and congestion)

Source: Study Team

[9] Occurs when improved travel results in connectivity and accessibility gains and a reduction in perceived travel costs.

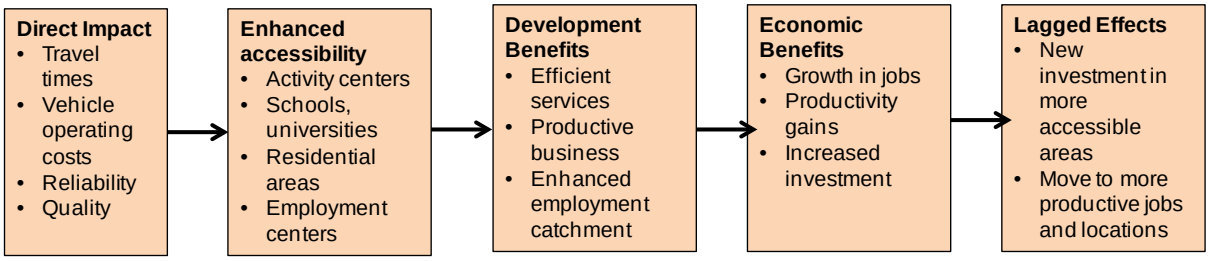
Consumer surplus is commonly referred to as the travel time benefit although more correctly it is calculated as the change in perceived costs (e.g. that for passenger travel includes the value of time, fares/ tolls paid and other out-of-pocket costs such as fuel). Producer surplus is commonly referred to as the change in unperceived vehicle operating costs for transport evaluations.

The evaluation may also account for:

- Road users who gain through reduced road traffic congestion;
- Potential efficiency gains in logistics;
- Shadow pricing of labour if there is sufficient evidence of under-employment.

The direct impacts of transport projects flow-on to land use and assist to improve the productivity of labour and firms. There may be other manifestations or indirect impacts of these economic impacts such as on changes in real estate value and new investment as illustrated in Figure 3.1. The former is a flow-on consequence of a reduction in travel time and vehicle operating costs. It is also a measure of the change in accessibility and connectivity. Inclusiveness and affordability are social impacts that deserve special treatment but are not additional economic benefits. If there is evidence of indirect impacts derived from the household, business and commune surveys they will be separately described but not included as additional economic benefits in the economic evaluation.

Figure 3.1: From Travel Efficiency to Economic Benefits



Source: Study Team

This approach is consistent with the current state of good practice in Australia and in other jurisdictions (e.g. New Zealand, UK, and Europe). It is also consistent with the approach set out in the Impact Design Study[10] except that the creation of new jobs, productivity increases of non-transport firms, and new investment defined as benefits to be included in the economic evaluation on page 28 of the Impact Design while they are economic benefits are a subsequent manifestation of the direct transport impacts. As such, if they were to be included in the economic evaluation there would be a double counting of the economic benefits.

[10] DFAT (2016). Design For Impact Evaluation Of Cao Lanh Bridge Project, Vietnam

3.4 Survey Instruments

3.4.1 Household Surveys

In addition to the BCA, the impact evaluation also incorporates the Diminishing Effects approach in order to correlate socio-economic changes at household levels with the distance from the Bridge. The approach is specified in the Design of Cao Lanh Impact Evaluation.

The impact of the Project on households can be examined by looking at different outcomes which are specified in the Theory of Change. For example, outcomes of interest could be: household income, poverty status, household assets, health and access to health care, education, production, access to infrastructure, living conditions, and sanitation. Data on these variables needs to be collected in the benchmark, mid-term and end-line surveys using comparable survey instruments.

Results from the benchmark survey will be analysed to provide the current situation of beneficiaries of the Project and to test the Diminishing Effect approach, specifically whether being close to the road and Bridge have an impact on households' welfare.

The Household questionnaire was based on the given list of indicators provided in page 44-46 of the Design of Cao Lanh Impact Evaluation. The list of indicators is proposed to be used to measure the impacts of the Project based on the Theory of Changes as well as the available data from VHLSS 2012. These include indicators to measure the income of the households, poverty status, household assets, health and access to health care, education, production, access to infrastructure, living conditions, and sanitation. The list of indicators is provided in Table 3.3.

Table 3.3: List of indicators for household survey

No	Indicator groups	Specific indicators

1	Household Characteristics	• Structure of population of each group (types of households, ethnic groups, income quintile, sex, and age of household head) by:
		  • Sex
		  • Ethnicity
		  • Age
		  • Education
		  • Occupation
		  • Poverty status

2	Education and access to education	• Enrolment rate at every educational level by age, types of households, ethnic groups, income quintile, sex, and age of household head. • Distance and time between household and school by types of households, types of school, ethnic groups, income quintile, sex, and age of household head.
3	Health and access to healthcare	• Sickness rate in the past 12 months by types of households, ethnic groups, income quintile, sex, and age of household head. • Types of health care services used (i.e. illness, family planning, child birth) by types of households, ethnic groups, income quintile, sex, and age of household head, region. • Reasons for using health care services (classified by types of medical services) by types of households, ethnic groups, income quintile, sex, age of household head, and region.

No	Indicator groups	Specific indicators
4	Production	• Productivity (tonnes per hectare) by types of main crops and by types of households, ethnic groups, income quintile, sex, and age of household head. • Investment value (million VND per 1 hectare) by main crops by types of households, ethnic groups, income quintile, sex, and age of household head. • Agriculture production cost (million VND per hectare) by main crops and main livestock by types of households, ethnic groups, income quintile, sex, and age of household head. • Agriculture profit (million VND per hectare) by main crops and main livestock by types of households, ethnic groups, income quintile, sex, and age of household head. • The change of agricultural production activities from low-productivity (measured by profit per hectare for crop, and profit per cost of kg of production for livestock) to high-productivity by types of households, ethnic groups, income quintile, sex, and age of household head. • Transformation of labor from agriculture into non-agriculture sectors by types of households, ethnic groups, income quintile, sex, and age of household head. • Migration and non- farm job opportunities by types of households, ethnic groups, income quintile, sex, and age of household head.
5	Income	• Average monthly income per capita classified by types of households, ethnic groups, income quintile, sex, and age of household head. • Source of Income (from agriculture, self-employment in non-agriculture, wage, other sources including remittances, public transfer) by types of households, ethnic groups, income quintile[11], sex, and age of household head. • Agricultural income structure (annual crop, livestock, perennial crop, forestry, aquaculture, agricultural service) by types of households, ethnic groups, income quintile, sex, and age of household head.
6	Poverty Rate	• Poverty rate measured by income by types of households, ethnic groups, income quintile, sex, and age of household head.
7	Infrastructure	• Distance and time to the nearest market for goods purchase by types of households, ethnic groups, income quintile, sex, and age of household head. • Value of households' agriculture products sold in the market in the past 12 months by types of households, ethnic groups, income quintile, sex, and age of household head. • Value of households' non-agriculture goods sold in the market by types of households, ethnic groups, income quintile, sex, and age of household head.

[11] Real income in VND reported as quintiles for the surveyed population

No	Indicator groups	Specific indicators
		• Distance and time to the nearest container carrier road by types of households, ethnic groups, income quintile, sex, and age of household head. • Distance and time to the nearest public transportation by types of households, ethnic groups, income quintile, sex, and age of household head. • Distance and time to the nearest connection point with Cao Lanh Bridge and highway by types of households, ethnic groups, income quintile, sex, and age of household head.
8	Assets	• Land (area by land types including annual crop land, perennial crop land, forestry land, residential land, area of irrigation) by types of households, ethnic groups, income quintile, sex, and age of household head. • Types of housing by types of households, ethnic groups, income quintile, sex, and age of household head. • Living area per capita by types of households, ethnic groups, income quintile, sex, and age of household head. • Land area per capita by types of households, ethnic groups, income quintile, sex, and age of household head. • Ownership of the key livestock and poultry (buffalo, cow, pig) by types of households, ethnic groups, income quintile, sex, and age of household head. • Ownership of valuable assets (car, motorbikes, truck, tv, other production asset) by types of households, ethnic groups, income quintile, sex, and age of household head.
9	Living condition	• Source of water used by types of households, ethnic groups, income quintile, sex, and age of household head. • Source of lighting used by types of households, ethnic groups, income quintile, sex, and age of household head. • Living area per capita by types of households, ethnic groups, income quintile, sex, and age of household head.
10	Sanitation	• % of households using toilet (classified by types of toilet) by types of households, ethnic groups, income quintile, sex, and age of household head. • % of households using water (classified by source of water) by types of households, ethnic groups, income quintile, sex, and age of household head.

Sources: Design of Cao Lanh Impact Evaluation

The household questionnaire was designed based on the above list of indicators. It includes seven sections as follows:

- Section 1: List of household's members – collecting indicators from Indicator Group 1
- Section 2: Education – collecting information related to educational education and access to education of all household members (Indicator Group 2)

- Section 3: Health and healthcare – collecting all indicators from Indicator Group 3 about the household members' health and access to healthcare
- Section 4: collecting information on all livelihood activities of the household. All indicators from Indicator Group 4 to 6 about production, income and poverty will be calculated based on information collected in Section 4. Several indicators in Indicator Group 7 with regards to the value of households' productions sold in the market are also be drawn from information collected in Section 4. Land and livestock asset in Indicator Group 8 will also be collected in this section.
- Section 5: Access to infrastructure provides information to calculate the remaining indicators from Indicator Group 7 including distance and time to basic infrastructure such as the nearest market, public transportation, education and healthcare establishment.
- Section 6: Household asset aims to collect the indicator of household ownership of valuable assets (car, motorbikes, truck, television, other production asset) specified in Indicator Group 8.
- Section 7: Housing collects all information for Indicator Group 9 and Indicator Group 10 with regards to the living and sanitation conditions.

Important information to assess the impact of the Project to household welfare is the distance from the households to the Project. This information is incorporated in the design of data collection form for the tablet PC. In particular, the GPS location of the household was recorded by the tablet PC, the data analysis team then used this information to calculate the distance from the households to the project. This is the most precise way to estimate distance.

3.4.2 Commune Surveys

Information collected at the commune level plays an important role in identifying the impact of the Project on household welfare. An impact evaluation must take into account all external factors in the socio-economic conditions of the household. In addition, the commune questionnaire also aims to collect information that is quite homogenous at household level including price information for common inputs and outputs for production and the average land price for different purposes.

The commune survey was conducted in all 117 communes in An Giang, Can Tho and Dong Thap. The commune survey included five sections:

- Section 1 collects data on the commune demographic characteristics such as the population, poor households, migration situation
- Section 2 collects data on the commune's economic situation such as main livelihoods, change in economic situation and the incidents of epidemic/natural disasters in the commune for the last five years
- Section 3 collects information on the non-farm opportunities in the commune such as number enterprises/firms/factories/traditional occupation villages accessible to the commune residents
- Section 4 collects data on the commune's land area, area of land by different purposes and average land prices
- Section 5 collects information on the price of common inputs for production and the price of agricultural output observed at commune level.

3.4.3 Ferry User Surveys 2017

During the course of the baseline study it was necessary to modify certain elements of the evaluation design to better account for the effects of the Cao Lanh Bridge and the connectivity project more generally. The following section provides a rationale for these modifications.

The Impact Design Study (page i) states that the overall evaluation design is based on the use of conventional benefit-cost analysis (BCA) also known as economic appraisal (as discussed above). It defines (page v) Value for Money (VFM) as an Australian Government requirement under the Public Governance, Performance and Accountability Act (2013) and the Commonwealth Government Procurement Rules. It also states that VFM is usually measured by the economic appraisal criteria (Economic Internal Rate of Return, Net Present Value, and Benefit Cost Ratio).

To conduct the BCA, the Impact Design's first assumption (page 21) was that "travel time and travel cost savings can be reliably estimated from household, commercial enterprises and transport industry personnel (trucking and bus operators)" surveys. These are the direct effects proposed to be measured by the proposed surveys[12].

The surveys proposed by the Impact Design were as follows:

A total of 2,460 households distributed as follows: "…1,000 households from Dong Thap, comprising 500 from urban areas within the Cao Lanh boundary and 500 from rural areas outside the Cao Lanh boundary to identify the range of urban and rural users/potential beneficiaries…In addition, 500 households in An Giang and 500 household in Can Tho will be surveyed…"[13]

500 interviews of Cao Lanh Ferry users stratified by vehicle type.

A minimum of transport operators, distributed among bus services (local, provincial), freight/ and trucking operators.

The targeted sample of 2,460 households represents a population of 9,840 persons assuming the 2016 average household across the three provinces or 0.17% of the total population of 5.89 million people in these provinces in 2015. Although household surveys would be carried out for a variety of purposes, apart from quantifying transport movements a sample of this size is insufficient to give quantitative information on movements in the three provinces or those that use the Cao Lanh ferry.

Based on actual ferry use in 2017 it was calculated that the sample size of Cao Lanh ferry users should be at least 1,270 for a 95% confidence level and 5 point confidence interval. Hence, the sample of 500 ferry users proposed by the Impact Design is less than 40% of that needed to reliably assess movements of ferry users. Surveys of six transport companies would provide useful general data but would not assist in reliable quantification of the use of the Cao Lanh ferry by buses and trucks.

It was also concluded that the most efficient means of quantifying use of the Cao Lanh ferry was to increase the sample size of the proposed ferry surveys to give statistically reliable information as described below.

Further analysis of recent trends and field work showed that the use of the Cao Lanh ferry by cars, buses and trucks has remained much the same since 2009. Motorcycle use grew by 30.4% from 2009-2017. Cars and other four wheeled vehicles tend to be making longer trips than motorcycles. Contributing to slow growth in use by four wheelers is the 16 tonne maximum load limit for trucks on the ferry, the 12 tonne load limit on nearby local roads, the 18 tonne maximum load limit for trucks on the Vam Cong ferry, and the incomplete highway connection between Cao Lan and My An on Highway 2.

From 2009 – 2017, the use of the Vam Cong ferry has changed as follows: (i) car use grew by 62%; (ii) bus use grew by 7.6%, (iii) truck use declined by 44%; and (iv) motorcycle use grew by 53%. The decline in use of the Vam Cong ferry by trucks is likely to be due to the Can Tho Bridge that opened in 2010.

It was concluded that with the opening of the entire Connectivity Project including the Cao Lanh Bridge, the Vam Cong Bridge and the connecting expressway, trucks that have diverted to the Can Tho Bridge would likely be attracted back to the new facility.

It was therefore recognized that the benefits of the individual components of the entire Connectivity Project would be jointly created. To some extent the Vam Cong bridge alone could attract some of the heavy truck traffic from the Can Tho bridge because of its convenient connection to the My Thuan bridge that has driven growth in cars and buses since 2009 in contrast to use at Cao Lanh ferry. That is, the Cao Lanh Bridge appears to be more reliant on the Vam Cong Bridge (and expressway) than vice versa.

It was therefore considered essential that direct surveys of Vam Cong ferry users also be undertaken to comprehensively define the baseline. Due to the higher use of the Vam Cong ferry in 2017 the targeted sample size was estimated to be 1,550 for a 95% confidence level and 5 point confidence interval.

Ferry user interview surveys were carried out on Tuesday 14 March 2017 at Cao Lanh and Wednesday 15 March 2017 at Vam Cong. From ferry company data for the same dates in 2016, and their data on usage on

[12] Page 11, Table 11 of Impact Design

[13] Page 31 of Impact Design

those days and for the whole of 2016, the factors to derive annual estimates of traffic from daily data were estimated as shown in Table 3.4. Conversion factors could not be derived for walk-on passengers and cyclists as the Cao Lanh ferry company does not require tickets for these users and the official data at Vam Cong understates actual walk-on and cycle use considerably. The appropriate daily-to-annual conversion factor for walk-on passengers and cyclists is likely to be similar to that for motorcyclists who are also making local trips.

Table 3.4: Derivation of Daily to Annual Conversion Factor

	Day in 2016		Annual use 2016	
	Motorcycles	All vehicles with 4 or more wheels	Motorcycles	All vehicles with 4 or more wheels
Cao Lanh*	17,126	1,793	5,188,404	639,271
Vam Cong	14,944	4,898	4,461,410	1,800,135
Annual-to-daily factor Cao Lanh				
Motorcycles	302.9			
4+ wheels	356.5			
Annual-to-daily factor Vam Cong				
Motorcycles	298.5			
4+ wheels	367.5			

Note: at Cao Lanh, motorcycles include 3 wheelers; for both locations estimates of daily use by monthly ticket holders is also accounted for.

Source: Study Team

Note on sample sizes

An initial estimate of the sample size for a 95% confidence level and 5 point confidence interval was made progressively during the detailed survey design. Actual data on use of the Cao Lanh and Vam Cong ferries was available from ferry companies for several days from December 2016 to the first week of March 2017. The Cao Lanh data did not distinguish cars, buses and trucks since there were sub-types of these vehicles that shared the same tariffs. Instead the total number of vehicles that paid a particular toll was reported. Further, at Cao Lanh tariffs for walk-on passengers and cyclists have not been applied since around 2011, so no data were available on these movements until the actual surveys were carried out.

For the purposes of presentation, using the actual observed traffic and other movements at ferries on the survey days the desirable sample size for a 95% confidence level and 5 point confidence interval is set out in Table 3.5 along with the actual sample achieved during the surveys in Table 3.6.

Table 3.5: Cao Lanh and Vam Cong Ferry Traffic Volumes as surveyed, 2017

Location	Walk-on/Cycle	Motorcycle	4 wheelers	Buses	Trucks	Total
Cao Lanh	952 (514 walk-on and 438 bicycles)	16,666 (including 37 trishaws)	818 (including 13 ambulances)	87	1,152	19,675

Vam Cong	663 (358 walk-on and 305 bicycles)	13,975 (including 7 trishaws	1,882 (including 57 ambulances)	1,189	2,205	19,914

Source: Surveys March 14, 2017 at Cao Lanh; and March 15, 2017 at Vam Cong; volume of walk-on was estimated based on relative number of interviews compared to bicycle since it could not be counted directly as many passengers walk-on even that use vehicles.

Table 3.6: Targeted and Achieved Sample Sizes at Cao Lanh and Vam Cong Ferries

Location	Walk-on/Cycle	Motorcycle	4 wheelers	Buses	Trucks	Total
Cao Lanh						
Targeted sample size	274	376	262	71	288	1,271
Achieved sample size	238	328	284	41	311	1,202
Vam Cong						
Targeted sample size	243	374	319	291	327	1,554
Achieved sample size	73	454	410	367	435	1,739

Source: Study Team

3.4.4 Project User Surveys 2019 and 2021

It will be necessary to conduct surveys of users of the Connectivity Project in March 2019 to obtain similar information to that obtained in the baseline surveys of ferry users. This information include should include origin and destination, trip purpose and other information by vehicle and movement type.

The ideal data collection method would be roadside surveys at the five on-ramps on the Connectivity Project that would count traffic by type, and intercept vehicles to ensure desirable sample sizes and safety. Police control of traffic movements would be required. This method was used for the monitoring study of the My Thuan Bridge in 2002[14].

However, until and Operating and Maintenance Company is procured to operate the Connectivity Project, it is unlikely the team will be able to obtain permission for a roadside survey. Further, DFAT officers have expressed concern about possible traffic delays during the surveying process, although roadside surveys are common in Vietnam and delays and minimisation of inconvenience to motorists is a key concern. A major obstacle to the conduct of these surveys is that they were not considered in the Impact Design Study.

A practical but limited alternative to the surveys of all users, is to target particular movements such as heavy vehicles that are now using the Can Tho Bridge due to load limit restrictions on the Cao Lanh and Vam Cong ferries. To intercept these movements on the south to north direction, after the Connectivity Project is opened, it would be possible to survey them at one ramp for traffic originating in Cambodia, An Giang Province or the western part of Can Tho Province.

Alternatives to the full interview survey are available but have limitations:

- Observation of number plates of vehicles entering and leaving the survey area on the ramps of the Connectivity Project simultaneously. This method can provide information on entering and leaving

[14] University of Economics Ho Chi Minh City, Vietnam/ Economic and Policy Services Pty Ltd (2003), "Final Report: My Thuan Bridge Monitoring Program." Prepared for AusAID.

movements but does not provide detailed origin and destination, trip purposes, vehicle occupancies and loads, and other important trip characteristics.

- Similarly, the use of readers to observe the passing of MAC addresses in smart phones held by occupants of vehicles entering and leaving the Connectivity Project could be feasible but even if individual vehicles could be differentiated by type, the method has the same information limitations as number plate surveys. Data would also need to be anonymised.
- It may be possible to obtain information on vehicles within the Delta from one or more telephone company providers. Information would have to be anonymised and sufficiently accurate to provide relative trip patterns by vehicle type. However, until discussions were held with the telephone company the cost of providing the information and limitations on its accuracy are unknown. Further, even if it provided useful information on the use of roads, this method would not provide origin and destination and trip purpose data.

Additional questions proposed for the interview of users of the Connectivity Project would include modification to the question on the use of routes to cover questions such as:

- Did you make the same or a similar trip before the project? If not, is this a new trip never made before?
- For passengers: did you change your mode of travel for this or a similar trip before?
- For freight transport vehicles: did you change your route (and river crossing) or did this cargo formerly use another mode (e.g. waterway transport)?

In addition, attitudinal questions could be added at the close of the survey to assess perceptions on:

- Changes in reliability since the opening of the Connectivity Project
- Changes in safety since the opening of the Connectivity Project
- Overall satisfaction.

For 2021, O-D surveys are not justifiable as described below in the section on economic appraisal. Monitoring of traffic volumes by vehicle type is the main requirement.

3.4.5 **Results Measurement**

The Mekong Connectivity Project Design and Monitoring Framework (DMF), developed by ADB, is contained in Appendix A. Outcome indicators will be measured using the results of the Impact Study's surveys. Impact indicators will be measured using the results of the Impact Study's surveys or other published sources. The impact indicator on project road roughness will be measured using project owner reporting.

3.5 Qualitative Research

3.5.1 Research Approach

The qualitative study is grounded in three complementary approaches: (i) a rights-based approach, (ii) a gender-sensitivity approach and (iii) a participatory approach. These are discussed, in turn, below.

Rights-based approach

This approach assists with the assessment of:

(i) the current situation of people in the community (especially women, people with disabilities, the poor and ethnic minority groups) that are affected by the project

(ii) trends in socio-economic changes that affect target groups

(iii) the level of socio-economic impact on groups and the variance in impact between the groups mentioned under (i)

(iv) implications to maximize the impact of the project on different groups, along with lessons learned when implementing similar projects in the future.

This approach is based on the right to affirm the legitimate rights and interests of marginalised groups, including women, the poor, ethnic minorities and people with disabilities.

Gender-sensitivity approach

Gender issues are of central concern to this project. The gender-sensitivity approach is used to supplement the rights-based approach. Women are often more marginalized because of gender issues (gender needs, gender stereotypes, gender roles etc.) compared to men. Therefore, the impacts of the CLBP on women will be different to those experienced by men. To capture this differential impact a gender-sensitivity approach must be applied.

The use of a gender-sensitivity approach in the Vietnam context is based on following rationale: (1) Women are expected to undertake family responsibilities, and as such, the pressure applied to them from within the family is higher than men and their tasks within the family are different. (2) Women have specific biological characteristics, and are responsible for giving birth and parenting. (3) Women in Vietnam tend to have less opportunities to communicate, and to be less confident than men which may make them more vulnerable. (4) Women in Vietnam are also more likely to live in solitude than men, and may not be as active in social and community activities.

Participatory approach

This approach enhances the participation of beneficiaries and related stakeholders. It encourages the participation of women in the following activities (i) support for access to lending, (ii) vocational training (iii) support for resettlement and (iv) information campaign about HIV and human trafficking.

3.5.2 Research Methodology

Three separate qualitative methods were used to collect data on the projects impact on women and other groups affected by the project these included: structured interviews, focus group discussions and observation.

In-depth personal interview

In-depth personal interview is an effective method to collect individual perspectives on project impact. Through this approach informants opinions, perspectives, and experiences are captured and used to explore the many issues associated with the project. An in-depth interview guide was developed to provide structure for interviews with the various classes of informant (see Appendix C). This included open-ended questions that are designed to collect information in flexible way. In-depth personal interviews were conducted with (1) industrial park representatives; (2) business representatives; (3) local authorities; (4) households directly affected by the project.

Focus group discussion (FGD)

FGD is another important data collection method used in this study. It is a form of qualitative research that consists of asking similar groups of people questions about their common experience. Questions are asked in an open-ended interactive group way and participants are free to talk with other group members. The FGD method was used to collect data from those directly affected by the project, these included: (1) Households living near relocated area (not required for land donation); (2) Households losing land for production; (3) Vendors living near the ferry area (including street vendors) and (4) Local employees hired for construction work. Question guides were used to structure FGDs for the four different groups (see Appendix C).

Observation method

Observation is an important method used to collect data on the local socio-economic context. In this study, changes in socio-economic wellbeing, living standards, and transportation options, access to employment, capital, and medical treatment were observed in the field. The impact of changes on different groups (especially women group) were observed and recorded in a check list. The results collected from the observations are lessons learned for choosing strategic investment priorities and for understanding the implications of the project. This method is also used to record the individual expressions, reactions and behaviors of the respondents. It assists in corroborating the findings of the in-depth personal interview and FGDs.

3.5.3 Information Matrix

The design for the Cao Lanh impact evaluation has identified 8 hypotheses regarding project impacts on citizens and enterprises in the three provinces under the project's area of influence. Case studies and Focus Group Discussions were used to obtain qualitative evidence and success/failure stories to facilitate learning about the enabling and disabling factors to development as well as for public diplomacy. The following table details the type of information collected from each of the target groups and the methods used.

Table 3.7 – Information Matrix

Informant group	Method	Information collected
Transport operator (including bus and freight operator)	In-depth interview	General information of the company Their opinion of potential impacts of the project on the company according to the following hypotheses: Hypothesis 1: The project investment will generate accessibility and mobility improvements, leading to wider socio-economic development benefits within and among the three provinces Hypothesis 3: the CLBP will expand and deepen the labour market areas for Cao Lãnh residents, with improved road access to other provincial centres for additional employment opportunities. Hypothesis 4: The CLBP will lead to the growth in containerized road freight across all three provinces (achieving economies of scale, reduced numbers of individual small truck movements, and lower costs per unit of freight). Hypothesis 5: the CLBP will stimulate the development of Cao Lãnh as an intra-provincial and inter-provincial bus passenger transit centre, with increased tourism visitation and quicker access to/from HCMC. Hypothesis 6: the CLBP will stimulate the growth in transport and storage-related enterprise facilities and employment within all three provinces. Hypothesis 7: The CLBP will strengthen the Dong Thap provincial economy, with the creation of demand for bridge/road building materials and the acquisition of additional building skills and opportunities. Other potential impacts/changes brought about by the project (size, service type, number of employees etc. Recommendations for the project to inform similar transportation projects and strategic investment choices
Enterprises in industrial park	In-depth interview	General information of the company Their opinion regarding the potential impacts of the project on the company according to the following hypotheses: Hypothesis 1: The Project investment will generate accessibility and mobility improvements, leading to wider socio-economic development benefits within and among the three provinces Hypothesis 3: the CLBP will expand and deepen the labour market areas for Cao Lãnh residents, with improved road access to other provincial centres for additional employment opportunities. Hypothesis 4: The CLBP will lead to the growth in containerized road freight across all three provinces (achieving economies of scale, reduced numbers of individual small truck movements, and lower costs per unit of freight). Hypothesis 6: the CLBP will stimulate the growth in transport and storage-related enterprise facilities and employment within all three provinces. Hypothesis 7: The CLBP will strengthen the Dong Thap provincial economy, with the creation of demand for bridge/road building materials and the acquisition of additional building skills and opportunities. Other potential impacts/changes will be brought about by the project (size, service type, number of employees etc.

Informant group	Method	Information collected
		Recommendations for the project to inform similar transportation projects and strategic investment choices
Representative of industrial park	In-depth interview	General information about the industrial park Their opinion of potential impacts of the project on the enterprises and the industrial park according to the following hypotheses: Hypothesis 1: The Project investment will generate accessibility and mobility improvements, leading to wider socio-economic development benefits within and among the three provinces Hypothesis 3: the CLBP will expand and deepen the labour market areas for Cao Lãnh residents, with improved road access to other provincial centres for additional employment opportunities. Hypothesis 4: The CLBP will lead to the growth in containerized road freight across all three provinces (achieving economies of scale, reduced numbers of individual small truck movements, and lower costs per unit of freight). Hypothesis 6: the CLBP will stimulate the growth in transport and storage-related enterprise facilities and employment within all three provinces. Hypothesis 7: The CLBP will strengthen the Dong Thap provincial economy, with the creation of demand for bridge/road building materials and the acquisition of additional building skills and opportunities. Other potential impacts/changes will that may be brought about by the project (size, service type, number of employees etc. Recommendations for the project to inform similar transportation projects and strategic investment choices.
Commune PPC	In-depth interview	Commune socio-economic characteristics Awareness and participation of local authority in project's activity Their opinion of potential impacts of the project on the local community according to the following hypotheses: Hypothesis 2: The CLBP will generate additional socio-economic benefits for Cao Lãnh urban residents (improved access to health, education and cultural facilities). Hypothesis 8: The proposed project can be expected to improve the social welfare of the population within the three provinces and in relative road corridors, and be assessed as being an effective aid component, yielding positive results and value for money. Other impacts of the project Community activity to support affected households of the project Commune's socio-economic development plan Recommendations for the project to inform similar transportation projects and strategic investment choices.
G1. Households that have been resettled G2. Households that lost agricultural land G3. Households who were not affected by resettlement or the loss of agricultural land	In-depth interview and focus group discussion	Awareness about the Project Participation of households (in planning and support of the activity) Their opinion of potential impacts of the project on the households according to the following hypotheses: Hypothesis 1: The Project investment will generate accessibility and mobility improvements, leading to wider socio-economic development benefits within and among the three provinces Hypothesis 2: The CLBP will generate additional socio-economic benefits for Cao Lãnh urban residents (improved access to health, education and cultural facilities). Hypothesis 3: the CLBP will expand and deepen the labour market areas for Cao Lãnh residents, with improved road access to other provincial centres for additional employment opportunities.

Informant group	Method	Information collected
		Hypothesis 8: The proposed project can be expected to improve the social welfare of the population within the three provinces and in relative road corridors, and be assessed as being an effective aid component, yielding positive results and value for money. Other impacts of the project.
Shop-keepers and venders near the ferry	In-depth interview and focus group discussion	Awareness about the project Participation of households in planning supporting the activity Their opinion of potential impacts of the project on businesses according to the following hypotheses: Hypothesis 1: The project investment will generate accessibility and mobility improvements, leading to wider socio-economic development benefits within and among the three provinces Hypothesis 2: The CLBP will generate additional socio-economic benefits for Cao Lãnh urban residents (improved access to health, education and cultural facilities). Hypothesis 3: the CLBP will expand and deepen the labour market areas for Cao Lãnh residents, with improved road access to other provincial centres for additional employment opportunities. Hypothesis 8: The proposed Project can be expected to improve the social welfare of the population within the three provinces and in relative road corridors, and be assessed as being an effective aid component, yielding positive results and value for money. Other impacts of the project.

The data gathered in accordance with the information matrix is presented in Section Six.

4 Results – Baseline Surveys of Households, Communes and Businesses

4.1 Results of Household Surveys

4.1.1 Demography and education

2,011 households were sampled across three provinces: An Giang, Can Tho and Dong Thap. The number of household members in these households was 7,824. Table 4.1 presents the demographic characteristics of the individuals in the sample. The average household size is 3.89. Regarding household composition, 7.8% of individuals are children below 6, and 13.8% of individuals are children aged from 6 to 14. The share of working age people is 63.9%. We use the definition of working age provided by the General Statistics Office of Vietnam, i.e., 15-55 years old for females and 15-60 years old for males. Household heads are predominantly male, accounting for around two-thirds of those households surveyed. The average age of household heads is 54.4. The household size and composition are quite similar in the three provinces.

Table 4.1. Demographic characteristics

Indicators	Dong Thap	An Giang	Can Tho	All
Population by age group				
Under 6 years old (%)	7.72	7.73	7.90	7.77
From 6 to under 15 years old (%)	13.67	15.36	12.51	13.79
Working age (%)	64.32	61.39	65.65	63.94
Over working age (%)	14.28	15.52	13.93	14.49
Population by ethnic group				
Kinh/Hoa (%)	99.87	94.79	97.82	98.12
Ethnic minority (%)	0.13	5.21	2.18	1.88
Gender of household head				
Male (%)	72.10	71.97	67.52	70.91
Female (%)	27.90	28.03	32.48	29.09
Age of household head				
Under 30 years old (%)	1.30	0.60	0.59	0.94
From 30 to under 45 years old (%)	24.30	21.27	22.64	23.12
From 45 to under 60 years old (%)	46.90	41.55	45.28	45.15
Over 60 years old (%)	27.50	36.58	31.50	30.78
Average age of household head (years old)	53.19	56.00	55.16	54.39
Percentage of employed population (%)	78.10	74.41	77.00	76.96
Size of household	3.95	3.78	3.89	3.89
Proportion of dependent household members (%)	38.64	42.71	39.13	39.78

Source: Baseline survey of Cao Lanh Impact Evaluation

Table 4.2 presents the net enrolment rates of children at different grade levels. The estimates of gross enrolment rates are very similar and presented in Appendix B. 55.8% of children are attending kindergarten. The enrolment rate at primary school level is very high, at 96%. At the lower-secondary and upper-secondary education the enrolment rates are 81% and 37% respectively.

The enrolment rate is quite similar between boys and girls and between provinces. The enrolment rate at the primary school level is also similar among sub-population groups. However, there is a difference in enrolment rate at the kindergarten level, lower-secondary education, and especially upper-secondary education among different sub-population groups. Children in rural areas, households with lower income, and those households

lead by people with lower education standards have significantly lower school enrolment than households in urban areas, households with higher income, and those led by well-educated household heads.

Table 4.2. Net enrolment rate of children (%)

Sub-population groups	Kinder-garten (aged 3-5)	Primary (aged 6-10)	Lower-Secondary (aged 11-14)	Upper-secondary (aged 15-17)
General	55.83	96.04	81.09	37.12
Dong Thap	53.17	94.50	83.49	37.14
An Giang	47.58	98.19	79.46	33.28
Can Tho	69.51	96.73	77.03	40.73
Gender				
Male	55.53	95.98	81.08	36.72
Female	56.11	96.11	81.10	37.52
Urban/Rural				
Urban	60.55	96.70	84.81	43.95
Rural	51.51	95.35	77.94	30.98
Household head's gender				
Male	56.28	96.49	81.38	36.97
Female	54.75	94.96	80.30	37.57
Education level of household head				
No degree	49.40	95.73	74.04	29.79
Primary education	55.84	96.93	84.66	32.97
Lower-Secondary education	48.74	95.99	84.45	48.28
Upper-secondary education	73.68	93.48	83.01	37.70
Post-secondary (college, university or above)	80.18	94.84	89.80	64.77
Vocational education	75.00	100.00	86.76	39.47
Household head's age				
Under 30 years old	69.57	100.00	50.00	-
From 30 to under 45 years old	64.05	95.10	86.13	28.27
From 45 to 60 years old	47.89	94.04	77.16	44.91
Over 60 years old	60.05	99.12	77.48	36.21
Poverty Status				
Non-Poor	57.52	96.82	81.50	40.10
Poor	46.86	92.24	79.15	21.73
5 groups of income				
Lowest income quintile	45.49	93.01	75.56	31.60
Near lowest income quintile	48.91	96.66	81.63	30.60
Middle income quintile	56.43	98.71	85.97	34.71
Near highest income quintile	67.14	97.47	77.21	43.78
Highest income quintile	68.72	94.20	85.03	49.87

Source: Baseline survey of Cao Lanh Impact Evaluation

4.1.2 Healthcare services

The number of annual healthcare contacts per individual is 17.6 (see Table 4.3). The healthcare contacts include visits to any health care provider, from hospitals to traditional doctors and health pharmacies (see Tables 4.3 and 4.4). People in An Giang have a higher number of healthcare visits than those in Dong Thap and Can Tho. It should be noted that poor and lower education households have higher healthcare contacts than non-poor and higher education households.

Table 4.3. Annual healthcare contacts by provinces

Sub-population groups	Dong Thap	An Giang	Can Tho	All
General	17.07	20.68	16.09	17.67
Urban/Rural				
Urban	15.28	19.05	17.00	16.33
Rural	18.72	21.40	14.25	18.91
Gender				
Male	16.26	20.27	15.53	17.02
Female	17.79	21.04	16.55	18.23
Women and Children				
Children (under 6 years old)	14.52	14.24	17.00	15.00
Pregnant women	10.85	8.60	7.59	9.67
Education level of household head				
No degree	21.84	23.86	19.62	21.98
Primary	15.42	20.04	14.63	16.18
Lower-Secondary	15.84	15.06	14.71	15.42
Upper-secondary	15.04	11.70	13.67	14.16
Post-secondary (college, university or above)	11.15	9.87	8.60	10.65
Vocational education	16.55	9.38	12.31	14.59
Household head's age				
Under 30 years old	7.04	30.25	16.25	12.93
From 30 to under 45 years old	15.36	18.77	14.43	15.83
From 45 to 60 years old	16.56	20.37	13.31	16.62
Over 60 years old	19.78	21.83	21.32	20.68
Poverty Status				
Non-Poor	16.14	19.75	14.35	16.53
Poor	22.32	24.58	25.93	23.65
5 groups of income				
Lowest income quintile	20.14	22.49	14.90	19.99
Near lowest income quintile	19.74	21.95	24.85	21.11
Middle income quintile	16.27	21.54	13.41	16.93
Near highest income quintile	14.16	16.18	14.29	14.57
Highest income quintile	14.20	18.35	13.69	14.73

Source: Baseline survey of Cao Lanh Impact Evaluation

Table 4.4. Annual healthcare contacts by healthcare providers

	Commune clinic	District hospital	Provincial hospital	National hospital	Other hospital	Private Health Facility	Pharmacy	Other
General	1.08	2.82	1.62	0.41	0.35	3.18	7.20	1.01
Urban/Rural								
Urban	0.59	2.75	2.30	0.56	0.39	2.49	7.51	1.07
Rural	1.47	2.88	1.08	0.29	0.32	3.72	6.95	0.96
Gender								
Male	1.20	2.84	1.61	0.44	0.32	3.14	7.02	1.11
Female	0.98	2.81	1.63	0.38	0.38	3.21	7.35	0.93
Women and Children								
Children (under 6 years old)	0.80	5.39	4.96	0.35	1.53	4.20	0.10	0.35

Pregnant women	1.40	1.89	1.49	0.26	0.25	5.31	6.73	0.34
Education level of household head								
No degree	1.35	2.55	1.08	0.40	0.32	3.54	7.52	0.91
Primary	0.92	3.23	1.62	0.29	0.25	3.17	7.09	1.10
Lower-Secondary	0.62	3.07	2.42	0.72	0.30	2.65	6.46	1.43
Upper-secondary	0.44	2.55	3.27	0.17	0.45	2.04	8.36	0.39
Post-secondary (college, university or above)	0.64	2.89	2.98	0.55	1.04	2.83	6.05	0.69
Vocational education	2.62	1.95	2.06	0.67	1.22	2.01	5.18	1.95
Household head's age								
Under 30 years old	0.43	0.96	2.08	0.03	0.28	2.42	8.48	2.98
From 30 to under 45 years old	0.74	2.19	1.16	0.45	0.23	3.76	8.59	0.55
From 45 to 60 years old	0.98	2.57	1.75	0.49	0.35	3.17	7.36	1.00
Over 60 years old	1.40	3.50	1.74	0.30	0.43	2.86	6.19	1.25
Poverty Status	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Non-Poor	0.90	2.81	1.72	0.37	0.44	3.25	7.04	1.13
Poor	1.72	2.85	1.25	0.55	0.03	2.90	7.77	0.59
5 groups of income								
Lowest income quintile	1.88	3.39	1.03	0.31	0.19	3.27	6.83	0.77
Near lowest income quintile	0.79	2.66	1.56	0.36	0.12	3.05	8.30	0.83
Middle income quintile	0.69	2.99	1.46	0.39	0.30	3.42	7.47	0.95
Near highest income quintile	0.75	2.55	1.83	0.62	0.52	2.81	7.09	1.50
Highest income quintile	1.28	2.28	2.70	0.45	0.96	3.34	5.38	1.28

Source: Baseline survey of Cao Lanh Impact Evaluation

4.1.3 Access to Infrastructure

Access to infrastructure plays an important role in improving living standards and the social welfare of people. Markets are the places people visit most frequently. Table 4.5 shows that people visit markets around 20 times per month in Dong Thap, 15 times in An Giang and 17 times in Can Tho. Primary schools are the places with the second highest frequency of visits. Hospitals at district levels constitute a particularly important type of infrastructure. The average distance from households to the nearest district-level hospital is 5.98 km in Dong Thap, 8.17 km in An Giang and 5.03 km in Can Tho.

The average distance from households to the nearest road to Cao Lanh Bridge and Highway is 28.7 km in Dong Thap, 96.3 km in An Giang and 67.1 km in Can Tho.

Table 4.5. Average distance, time and frequency of traveling from households to infrastructure by type

Infrastructure	Đồng Tháp			An Giang			Cần Thơ		
	Distance	Time	Number of travels (last 30 days)	Distance	Time	Number of travels (last 30 days)	Distance	Time	Number of travels (last 30 days)
Markets	1.37	0.15	19.98	1.35	0.17	15.09	1.41	0.18	17.15
Fairs	1.45	0.19	3.88	1.15	0.13	8.75	2.04	0.16	1.25
Wholesale market/Wholesaler	19.18	0.66	6.88	12.03	0.53	6.10	7.79	0.36	8.17
Post office	2.58	0.18	5.40	3.40	0.23	1.60	2.66	0.22	4.63
Bank/Bank branch	4.75	0.26	4.43	5.46	0.31	1.75	3.77	0.27	2.82
Nearest coach station	5.08	0.27	5.07	5.63	0.31	1.75	6.59	0.31	2.58
District hospital	5.98	0.30	3.21	8.17	0.43	0.84	5.03	0.33	1.12
Nearest primary school	1.10	0.13	15.90	1.08	0.13	7.77	1.28	0.17	11.26
Can Tho University	84.27	2.34	0.17	89.81	2.56	0.04	25.59	0.83	2.81
Dong Thap University	21.13	0.75	2.04	48.56	2.31	1.67	32.00	0.83	0.00
Cao Lanh City	24.65	0.84	3.55	49.04	1.94	0.62	60.59	2.07	0.26
Long Xuyen City	43.07	1.85	0.44	28.05	1.01	2.91	37.67	1.14	1.98
Can Tho City	73.06	2.14	0.40	82.87	2.53	0.22	23.82	0.78	3.43
HCM City	155.30	3.59	0.42	210.98	5.36	0.20	186.46	4.10	0.30
Nearest road to Cao Lanh bridge and Highway	28.76	0.88	2.25	96.33	2.52	0.22	67.14	1.86	0.43

Motorbike is the most popular means of transport. However, the means of transport used for any given trip depends on the distance and the infrastructure that individuals seek to reach. Motorbike, bicycle and walking are the most common ways to go to the markets. If people want to go to HCMC or other cities, coach (bus) and car are the more popular means of transportation. Table 4.6 shows that the ferry is the least frequently chosen means of transportation compared to other transport modes.

Table 4.6. Common means of transportation by infrastructure (%)

Infrastructure	Coach	Car	Motorcycle	Ferry	Bicycle	On foot	Other	Total
Markets	0.16	0.05	54.92	0.47	19.78	24.41	0.21	100
Fairs	0.00	0.00	70.00	0.00	5.00	25.00	0.00	100
Wholesale market/Wholesaler	5.09	3.24	84.72	1.39	4.17	1.39	0.00	100
Post office	0.28	0.38	80.89	0.19	10.45	7.82	0.00	100
Bank/Bank branch	1.12	0.00	86.13	0.37	6.70	5.68	0.00	100
Nearest coach station	5.68	1.84	83.03	0.24	4.56	4.24	0.40	100
District hospital	2.94	0.48	87.11	0.08	6.13	3.18	0.08	100
Nearest primary school	0.19	0.00	54.56	0.00	23.75	21.44	0.06	100
Can Tho University	12.12	2.16	82.68	0.00	1.73	1.30	0.00	100
Dong Thap University	4.53	2.40	89.60	0.27	2.40	0.80	0.00	100
Cao Lanh City	13.03	2.45	82.97	0.65	0.77	0.13	0.00	100
Long Xuyen City	14.64	4.04	79.64	0.70	0.70	0.28	0.00	100
Can Tho City	16.94	4.39	76.70	0.30	0.76	0.91	0.00	100
HCM City	81.50	6.88	11.50	0.13	0.00	0.00	0.00	100
Nearest road to Cao Lanh bridge and Highway	23.13	7.46	67.16	0.00	2.24	0.00	0.00	100

Source: Baseline survey of Cao Lanh Impact Evaluation

Table 4.7. Frequency and purpose of Cao Lanh ferry crossings by provinces

	Dong Thap	An Giang	Can Tho
Frequency of Cao Lanh ferry crossings (past 30 days)	1.36	0.16	0.03
Main purpose (%)			
Working	21.72	23.53	50.00
Schooling	4.04	0.00	0.00
Medical care visits	8.59	11.76	0.00
Merchandising	1.01	0.00	10.00
Household utensils/Production materials purchasing	5.05	11.76	0.00
Other	59.60	52.94	40.00

Source: Baseline survey of Cao Lanh Impact Evaluation

Table 4.8. Frequency and purpose of Vam Cong ferry crossings by provinces

	Dong Thap	An Giang	Can Tho
Frequency of Vam Cong ferry crossing (past 30 days)	0.44	0.32	0.15
Main purpose (%)			
Working	16.83	22.45	13.79
Schooling	0.00	2.04	0.00
Medical care visits	11.88	18.37	17.24
Merchandising	0.00	0.00	0.00
Household utensils/Production materials purchasing	6.93	2.04	13.79
Other	64.36	55.10	55.17

Source: Baseline survey of Cao Lanh Impact Evaluation

4.1.4 Housing conditions

Table 4.9 presents data on the living conditions of sampled households. The results are quite similar in the three provinces. The average living area per capita is around 21 square meters. Nearly 10% of households are living in a permanent house, while 74% of them live in a semi-permanent house. The remaining households, accounting for 16.1%, reside in a temporary house.

Almost all the sampled households have access to electricity from the national grid. Compared with the national average, households in these provinces enjoy better sanitation conditions, with 81% of them having access to hygienic latrines and 81% of them with access to safe water sources.

Table 4.9. Housing and living conditions by provinces

Living Conditions	Dong Thap	An Giang	Can Tho	All sample
Average living area per capita (m2)	20.48	20.40	22.45	20.96
Housing conditions				
Household with permanent house (%)	10.40	8.75	9.06	9.65
Household with semi-permanent house (%)	75.90	64.21	80.91	74.24
Household with temporary house ((%)	13.70	27.04	10.04	16.11
Access to electricity				
Household connecting to national power grid (%)	99.60	99.40	100.00	99.65
Household using electric generator (%)	0.10	0.00	0.00	0.05
Household without electricity (%)	0.30	0.60	0.00	0.30
Sanitation condition				
Household having hygienic latrine (%)	79.00	86.28	81.10	81.35
Household having unhygienic latrine (%)	17.80	3.98	12.01	12.88
Household without latrine (%)	3.20	9.74	6.89	5.77
Water source				
Household accessing to safe water source (%)	83.20	79.72	79.53	81.40
Household accessing to unsafe water source (%)	16.80	20.28	20.47	18.60

Source: Baseline survey of Cao Lanh Impact Evaluation

4.1.5 Employment

The working rate of people in Vietnam is very high, because a large proportion of people work in informal sectors. Most people do not have unemployment subsidies or social pensions. Table 4.10 shows that 98.7% of people in the labour force are currently working, either as employees or self-employed. In other words, the unemployment rate is less than 2 percent. The working rate is very similar among different sub-population groups.

Table 4.10. Percentage of working people by provinces

Sub-population groups	Dong Thap	An Giang	Can Tho	All
General	99.22	98.56	97.72	98.68
Urban/Rural				
Urban	99.07	98.19	97.35	98.34
Rural	99.36	98.74	98.61	99.05
Gender				
Male	99.09	98.40	97.36	98.48
Female	99.39	98.80	98.24	98.97
Education level				
No degree	99.51	99.32	98.60	99.24
Primary	99.36	100.00	98.03	99.14
Lower-Secondary	99.41	96.77	95.60	97.78

Upper-secondary	98.36	100.00	98.85	98.76
Post-secondary (college, university or above)	98.68	95.00	97.08	97.80
Vocational education	100.00	93.94	100.00	98.52
Age				
Under 30 years old	97.88	94.95	92.80	95.92
From 30 to under 45 years old	99.34	99.40	99.25	99.33
From 45 to 60 years old	100.00	100.00	99.39	99.85
Poverty status				
Non-Poor	99.16	98.46	97.81	98.64
Poor	99.61	99.15	96.97	98.94
5 groups of household income				
Lowest income quintile	100.00	96.84	96.64	98.45
Near lowest income quintile	98.78	97.67	95.24	97.73
Middle income quintile	98.69	99.48	98.49	98.84
Near highest income quintile	100.00	100.00	98.37	99.51
Highest income quintile	98.82	98.61	98.72	98.75

Source: Baseline survey of Cao Lanh Impact Evaluation

According to Table 4.11, 51 percent of people in the labour force have waged jobs or are employed. Among the self-employed people, nearly half of them are working in the agricultural sector. Males and people in urban areas are more likely to be employed and enjoy higher wages than females and those in rural areas. As expected, there is a positive correlation between education levels and wages. Can Tho and Dong Thap have higher proportions of people with waged jobs than An Giang. The wage of labourers in Can Tho and Dong Thap is also higher than that in An Giang.

Table 4.11. Percentage of employed people

Sub-population groups	Employed	Self-employed in agricultural production	Self-employed in non-agricultural production	Average working days	Average wage/salary (1000VND)
All	51.38	21.53	27.29	226.60	39419.13
Dong Thap	50.24	22.72	27.14	224.64	41411.55
An Giang	49.76	21.46	29.27	208.01	31171.46
Can Tho	55.08	19.17	25.85	244.76	42215.36
Urban/Rural					
Urban	55.15	13.19	31.82	244.82	45147.98
Rural	47.34	30.45	22.43	203.85	32266.62
Gender					
Male	54.48	24.31	21.30	223.38	43174.24
Female	47.07	17.67	35.59	231.78	33372.42
Education level					
No degree	49.23	26.10	25.00	191.39	26927.15
Primary	43.71	27.58	28.79	220.02	32999.44
Lower-Secondary	47.73	21.06	31.36	226.98	36808.24
Upper-secondary	45.60	17.30	37.74	234.96	40697.55
Post-secondary (college, university or above)	81.39	4.91	13.70	265.62	60673.78
Vocational education	54.14	11.28	34.59	257.56	53441.89
Age					
Under 30 years old	69.74	11.97	18.30	220.46	33731.16
From 30 to under 45 years old	53.18	19.05	27.91	238.43	43201.44

From 45 to 60 years old	37.23	30.62	32.52	215.22	40386.51
Poverty status					
Non-Poor	67.52	22.46	28.75	233.25	42188.30
Poor	49.01	15.17	17.31	193.65	25695.94
5 groups of household income					
Lowest income quintile	41.58	37.19	21.93	137.04	13433.50
Near lowest income quintile	50.14	24.59	25.27	196.14	23984.39
Middle income quintile	57.98	15.84	26.44	237.20	34741.47
Near highest income quintile	55.09	15.88	29.03	255.76	46563.70
Highest income quintile	49.43	18.66	32.03	264.18	66734.75

Source: Baseline survey of Cao Lanh Impact Evaluation

4.1.6 Land and agricultural production

As mentioned, around 22% of the labour force are self-employed in the agricultural sector. The average number of land plots is 1.7 in these provinces (Table 4.12). The average land area of annual crops per household is 3426 m2. The area for perennial crops is smaller, at 505 m2. The forestry land and livestock land areas are 47.7 and 19.7 m2, respectively. Most households use their lands for agricultural production. Around 16% of lands are rented.

Table 4.12. Agricultural lands by provinces

	Dong Thap	An Giang	Can Tho	All sample
Number of agriculture land plot per household	1.81	1.50	1.61	1.69
Distribution of plot by using purposes				
Use (%)	81.30	81.92	83.23	81.92
Rental / lend (%)	16.27	15.80	14.07	15.62
Do not use (%)	2.42	2.28	2.71	2.46
Average land area of annual crops per household (m2)	3951.74	3620.61	2198.45	3426.02
Average land area of perennial crops per household (m2)	593.42	339.46	496.48	505.41
Average surface land area per household (m2)	62.19	11.95	54.86	47.77
Area of livestock land per household (m2)	20.07	9.97	28.67	19.72

Source: Baseline survey of Cao Lanh Impact Evaluation

Table 4.13 presents the agricultural productivity in the three provinces. The productivity of rice is 4.62 tonnes/hectare. The productivity of sticky rice is a bit higher at 4.88 tonnes/hectare. An Giang has higher rice productivity than Can Tho and Dong Thap. Other important annual crops include maize and sesame. Important perennial crops in these provinces are mango and banana. Most crops are sold out, and the location for selling activities is mainly the household. Traders buy outputs at the households' areas.

Table 4.13. Agricultural productivity by provinces

	Dong Thap	An Giang	Can Tho	All sample
Productivity of annual crops (tonne/ha/year)				
Rice	4.38	5.01	4.75	4.62
Sticky rice	4.42	5.32	5.17	4.88
Special rice	4.64	-	-	4.64
Maize	7.15	5.96	-	6.65
Sesame	0.74	-	0.89	0.82
Productivity of perennial crops				
Mango (tonne/ha/year)	14.57	9.25	6.61	12.12
Banana (tonne/ha/year)	29.39	15.24	21.10	24.55

	Dong Thap	An Giang	Can Tho	All sample
Percentage of sold/exchanged annual crop product (%)				
Rice	88.88	94.23	90.24	90.39
Sticky rice	99.88	99.89	100.00	99.89
Special rice	95.35	-	-	95.35
Corn	99.77	99.92	-	99.83
Sesame	99.87	-	100.00	99.94
Percentage of sold/exchanged fruit (%)				
Mango	97.23	97.50	77.37	94.98
Banana	83.99	95.63	81.21	84.34
Percentage of sold/exchanged livestock product (%)				
Pork	55.30	52.87	70.86	60.28
Cattle	19.22	22.08	26.57	20.70
Poultry	21.34	16.95	35.20	24.05
Percentage of fishery sold/exchanged (%)				
Aquaculture	91.53	65.96	88.93	87.10
Capture fishery	78.10	90.96	84.50	83.10
Selling/Exchanging location for annual crop (%)				
Buyer coming to household	91.27	96.04	94.51	93.18
Selling at the buyer's place	5.44	1.44	2.20	3.71
Selling at communal market	2.47	2.16	2.56	2.42
Other	0.82	0.36	0.73	0.69
Selling/Exchanging location for fruit production (%)				
Buyer coming to household	75.00	78.38	84.81	78.57
Selling at the buyer's place	13.97	5.41	2.53	9.13
Selling at communal market	9.56	13.51	11.39	10.71
Other	1.47	2.70	1.27	1.59
Selling/Exchanging location for livestock (%)				
Buyer coming to household	83.44	85.07	88.37	85.13
Selling at the buyer's place	5.52	1.49	3.49	4.11
Selling at communal market	10.43	11.94	5.81	9.49
Other	0.61	1.49	2.33	1.27
Selling/Exchanging location for fishery production (%)				
Buyer coming to household	83.44	85.07	88.37	85.13
Selling at the buyer's place	5.52	1.49	3.49	4.11
Selling at communal market	10.43	11.94	5.81	9.49
Other	0.61	1.49	2.33	1.27

Source: Baseline survey of Cao Lanh Impact Evaluation

4.1.7 Household income

The average per capita income of households is 26,988.5 thousand VND/person/year. Can Tho has a higher average per capita income than Dong Thap and An Giang. Urban households have higher income than rural ones, and the urban-rural gap is largest in An Giang.

There is an association between per capita income and the characteristics of household heads. Households with heads who are self-employed in non-farm business have higher income than other households. Households with heads who are not working have the lowest income. Male-headed households have higher income than female-headed households in Dong Thap and Can Tho. However, in An Giang male-headed households have

lower income than female-headed households. There is a strong and positive correlation between education level of household heads and per capita income.

Table 4.14. Per capita average income ('000 VND/person/year) by province

	Dong Thap	An Giang	Can Tho	Total
General	27,019.8	24,281.6	29,606.9	26,988.5
Urban/Rural				
Urban	29,647.4	30,919.9	30,902.6	30,277.0
Rural	24,392.3	21,433.9	26,788.8	23,742.2
Main type of occupation of household heads				
Wage/salary work	27,385.3	19,590.4	27,346.3	25,555.2
Self-employed in agriculture	23,937.3	20,179.6	28,484.0	23,927.6
Non-agricultural household business	29,571.7	36,936.1	37,668.1	33,454.7
Not working	22,656.7	15,152.6	13,586.2	17,595.1
Gender of household head				
Male	27,943.6	23,743.7	30,395.8	27,467.3
Female	24,632.6	25,662.5	27,966.9	25,821.3
Education level of household head				
No degree	16,770.4	20,557.0	23,064.7	19,592.8
Primary	25,027.2	29,133.8	28,123.6	26,749.9
Lower secondary	31,209.9	25,355.9	33,222.4	30,539.4
Upper-secondary	32,201.3	20,651.7	30,089.3	29,437.9
Post-secondary (college, university or above)	44,573.8	39,305.6	61,377.2	47,078.6
Vocational education	48,600.6	26,604.5	40,065.2	42,731.6
Household head's age				
Under 30 years old (%)	34,879.6	18,190.3	23,005.2	30,369.5
From 30 to under 45 years old (%)	24,708.9	21,035.9	26,953.9	24,418.9
From 45 to 60 years old (%)	29,214.3	32,488.4	33,018.3	30,931.5
Over 60 years old (%)	24,947.8	16,946.6	26,733.6	23,031.0

Source: Baseline survey of Cao Lanh Impact Evaluation

Table 4.15 presents the income structure by the share of income sources. Wages account for 40.3% of the total income of households. The share of non-farm income is around 23%. Non-farm income sources such as remittances account for 21% of total income. Agricultural production only accounts for 16%, mainly from crop production. The income structure is quite similar among the three provinces.

Urban households have a higher income share from wages and non-farm business than rural ones. Households with heads having post-secondary education have a very high income share of wages, while households with heads having vocational training have a very high income share of non-farm business. Interestingly, rich people who are in the top quintile tend to have a larger income share from non-farm business. Low income households have a large share of income from other non-farm business such as remittances and social allowances.

Table 4.15. Household income structure (%)

	Crop	Livestock	Forestry	Fishery	Farm service	Nonfarm business	Wage	Other
General	11.97	1.62	0.05	1.00	0.90	23.01	40.37	21.09
Dong Thap	12.23	1.46	0.08	0.91	0.93	23.01	40.65	20.72
An Giang	12.76	2.04	0.03	1.55	0.98	22.98	36.04	23.61
Can Tho	10.66	1.51	0.00	0.62	0.75	23.03	44.11	19.32
Urban/Rural								
Urban	6.64	1.01	0.00	0.44	0.24	27.76	45.61	18.31

	Crop	Livestock	Forestry	Fishery	Farm service	Nonfarm business	Wage	Other
Rural	17.20	2.22	0.09	1.55	1.54	18.35	35.24	23.82
Gender of household head								
Male	14.15	1.85	0.06	1.17	1.24	23.86	39.61	18.05
Female	6.64	1.05	0.02	0.58	0.06	20.93	42.22	28.50
Education level of household head								
No degree	10.84	1.51	0.00	1.48	0.97	16.83	42.72	25.65
Primary	14.41	2.08	0.13	1.21	0.89	23.28	37.84	20.16
Lower secondary	11.44	1.63	0.03	0.46	1.47	30.56	37.24	17.16
Upper-secondary	12.95	2.32	0.00	0.05	0.25	34.62	32.26	17.55
Post-secondary (college, university or above)	6.92	0.22	0.00	0.04	0.00	19.70	56.70	16.41
Vocational education	13.14	0.00	0.00	0.10	1.37	42.94	27.57	14.88
Household head's age								
Under 30 years old (%)	3.83	0.23	0.00	0.99	0.00	33.19	40.68	21.08
From 30 to under 45 years old (%)	11.48	1.52	0.10	1.41	1.81	26.04	46.47	11.17
From 45 to 60 years old (%)	12.04	1.85	0.05	0.99	0.84	23.87	42.95	17.42
Over 60 years old (%)	12.48	1.40	0.00	0.71	0.32	19.15	31.96	33.99
Status								
Non-Poor	13.37	1.71	0.05	0.91	0.93	24.42	38.33	20.28
Poor	3.73	1.10	0.02	1.51	0.72	14.76	52.33	25.84
5 groups of income								
Lowest income quintile	13.86	1.16	0.02	1.61	0.70	16.58	32.07	33.98
Near lowest income quintile	10.62	1.86	0.00	1.51	0.69	21.21	43.27	20.83
Middle income quintile	8.28	2.64	0.09	0.79	0.53	22.23	48.29	17.15
Near highest income quintile	11.49	0.65	0.00	0.51	1.31	26.05	45.40	14.59
Highest income quintile	15.62	1.78	0.11	0.58	1.24	28.89	32.72	19.05

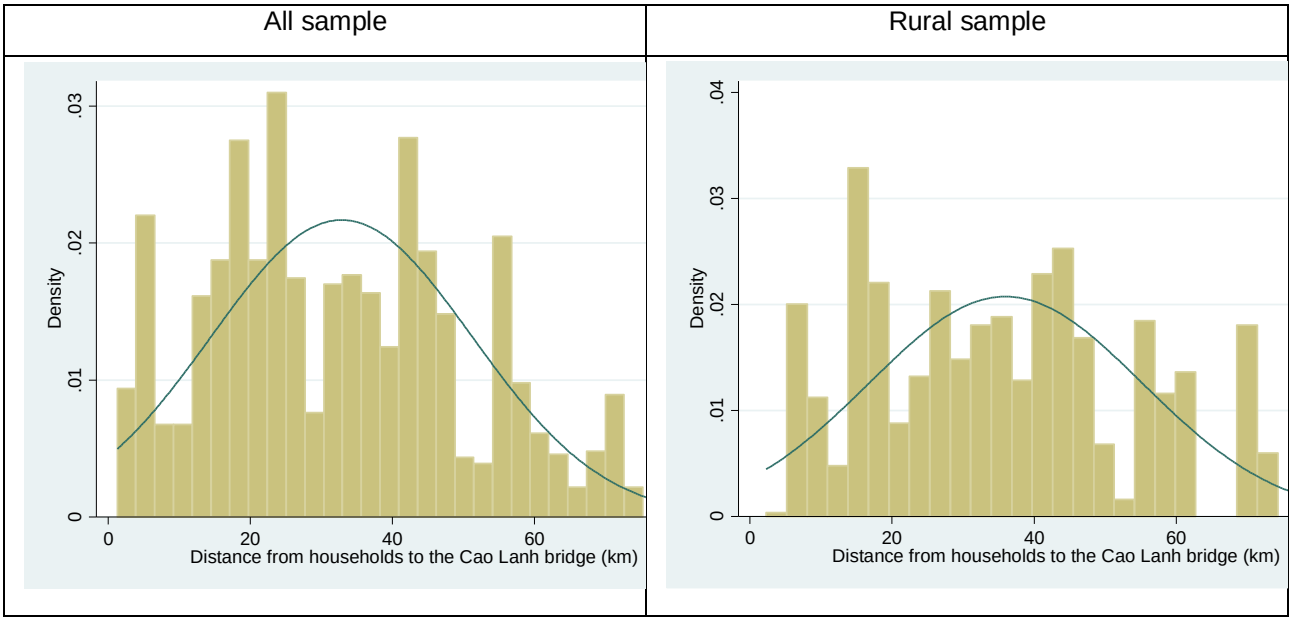
Source: Baseline survey of Cao Lanh Impact Evaluation

4.1.8 Regression of household outcomes and distance to the bridge

An important issue for the impact evaluation is the endogeneity of the distance from households to the bridge. Simple comparisons of outcomes between households who live close to the bridge and those who live far from the bridge is a biased estimate for the impact of the bridge on household outcomes. As such, we have to control the difference in outcomes between these groups prior to the bridges construction. This estimator is quite similar to the difference-in- difference and fixed-effects estimators.

Figure 4.1 presents the distribution of households' distance to Cao Lanh Bridge in the three provinces in the full sample and the rural sample.

Figure 4.1. Distance from households to the Cao Lanh Bridge



Source: Baseline survey of Cao Lanh Impact Evaluation

To test the exogeneity of the distance from households to the bridge location, we ran a regression for household outcomes on this distance. Table 4.16 reports the regression of poverty status and log of per capita income on the distance from households to the bridge in the rural sample of households. We also tried the log of distance instead of distance. The results are very similar. We use the variable 'distance' when interpreting the results. The analysis shows that households who live further from the bridge are less likely to be poor. In other words, the poor households tend to live closer to the bridge. The distance is negative and significant in the regression of log of per capita income. However, when control variables are added to the model, this coefficient of the distance is not significant.

Table 4.16. Regression of poverty status and income of households

Explanatory variables	Poverty (Poor=1; Non-poor=0)	Poverty (Poor=1; Non-poor=0)	Log of per capita income	Log of per capita income
Distance from household to the bridge	-0.0024***	-0.0019**	-0.0035*	-0.0024
	(0.0008)	(0.0008)	(0.0021)	(0.0020)
Household size		0.0116		0.0001
		(0.0080)		(0.0211)
Head is male		0.0630*		0.1085
		(0.0331)		(0.0806)
Age of household head		0.0121		0.0399**
		(0.0076)		(0.0190)
Age of household head squared		-0.0001		-0.0004**
		(0.0001)		(0.0002)
No degree	Reference			
Primary		0.1510***		0.3415***
		(0.0298)		(0.0771)
Lower secondary		0.2004***		0.5337***
		(0.0329)		(0.1088)

Upper-secondary		0.1642***		0.3478**
		(0.0494)		(0.1644)
Post-secondary education		0.2509***		1.0659***
		(0.0265)		(0.1080)
Vocational education and training		0.2321***		0.9574***
		(0.0279)		(0.1948)
Can Tho	Reference			
An Giang	0.0029	0.0138	-0.1561*	-0.0570
	(0.0350)	(0.0347)	(0.0849)	(0.0827)
Dong Thap	0.0481	0.0315	0.0396	0.0340
	(0.0337)	(0.0330)	(0.0980)	(0.0942)
Constant	0.9142***	0.3468	9.8161***	8.5352***
	(0.0256)	(0.2232)	(0.0737)	(0.5465)
Observations	865	865	849	849
R-squared	0.017	0.090	0.015	0.135

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Baseline survey of Cao Lanh Impact Evaluation

Next we tried regressions for each province. In Table 4.17, we report only coefficients of the distance from households to the bridge in the regression of the poverty status and log of per capita income. Like the previous model, for each outcome we tried one model with and without control variables, respectively. In the model with control variables, the distance is significant, in the regression of poverty status in Can Tho, but not significant in An Giang and Dong Thap. In the regressions of income, the distance is not statistically significant.

Table 4.17. Regression of poverty status and income of households by provinces

Explanatory variables	Poverty (Poor=1; Non-poor=0)		Log of per capita income	
	Without control variables	With control variables	Without control variables	With control variables
Can Tho	-0.0024**	-0.0017*	-0.0026	-0.0008
	(0.0010)	(0.0010)	(0.0025)	(0.0024)
An Giang	-0.0025*	-0.0023	-0.0058	-0.0049
	(0.0014)	(0.0014)	(0.0039)	(0.0037)
Dong Thap	-0.0017	-0.0019	0.0043	0.0017

Note: The control variables are the same as the previous table.
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1.

Source: Baseline survey of Cao Lanh Impact Evaluation

Table 4.18 reports the regression of employment outcomes of individuals on the distance from their households to the bridge in the rural sample. The distance variable is statistically significant for four regressions. People who live far from the bridge tend to have a higher number of working hours and higher wage.

Table 4.18. Regression of employment of individuals

Explanatory variables	Number of working days during the past year	Number of working days during the past year	Have wage job (yes=1, no=0)	Have wage job (yes=1, no=0)	Log of annual wage (for employed individuals)	Log of annual wage (for employed individuals)
Distance from household to the bridge	0.2987*	0.3842**	-0.0004	-0.0008	-0.0095***	-0.0110***
	(0.1594)	(0.1581)	(0.0007)	(0.0007)	(0.0026)	(0.0024)
Household size		5.5747***		-0.0073		0.0366
		(1.7610)		(0.0076)		(0.0271)
Male (male=1; female=0)		-13.7999***		0.1205***		0.4188***
		(5.2886)		(0.0222)		(0.0780)
Age		5.3385***		-0.0058		0.0719***
		(0.9277)		(0.0038)		(0.0163)
Age squared		-0.0488***		-0.0001		-0.0009***
		(0.0103)		(0.0000)		(0.0002)
No degree	Reference					
Primary		22.4631***		-0.1688***		0.1400
		(6.5334)		(0.0273)		(0.1020)
Lower secondary		36.8073***		-0.1803***		0.3160**
		(8.2902)		(0.0348)		(0.1267)
Upper-secondary		31.6088***		-0.2293***		0.4418**
		(11.7614)		(0.0514)		(0.1821)
Post-secondary education		52.4773***		0.0912**		1.3503***
		(8.2283)		(0.0422)		(0.0904)
Vocational education and training		49.4899***		-0.2367***		0.7188***
		(12.9233)		(0.0648)		(0.2239)
Can Tho	Reference					
An Giang	4.6530	6.6634	-0.0260	-0.0125	0.1756*	0.2586***
	(7.2632)	(7.1839)	(0.0314)	(0.0293)	(0.1063)	(0.0992)
Dong Thap	17.2965**	12.9341*	-0.0380	-0.0174	0.2324**	0.1466
	(7.2112)	(6.9558)	(0.0330)	(0.0311)	(0.1112)	(0.0996)
Constant	224.8339***	57.6536**	0.5212***	0.9564***	9.9434***	7.9899***
	(5.5505)	(24.0501)	(0.0253)	(0.0979)	(0.0844)	(0.3816)
Observations	1,806	1,806	1,806	1,806	893	893
R-squared	0.007	0.056	0.002	0.136	0.020	0.196

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Baseline survey of Cao Lanh Impact Evaluation

Table 4.19 presents estimates of the distance to the bridge in the regression of outcome variables for the three provinces. The distance variable is significant in regressions of working time and wages in Can Tho and Dong Thap. This provides clear evidence that the distance from households to the Cao Lanh Bridge is not random. As a result, in the impact evaluation of the bridge, this difference in the distance to the bridge between households must be taken into account.

Table 4.19. Regression of employment of individuals by provinces

Explanatory variables	Number of working days during the past year		Have wage job (yes=1, no=0)		Log of annual wage (for employed individuals)	
	Without control variables	With control variables	Without control variables	With control variables	Without control variables	With control variables
Can Tho	0.3811**	0.5166***	0.0009	-0.0002	-0.0117***	-0.0137***
	(0.1941)	(0.1913)	(0.0009)	(0.0008)	(0.0032)	(0.0030)
An Giang	-0.0432	-0.0333	-0.0021*	-0.0014	-0.0066	-0.0068
	(0.2941)	(0.2978)	(0.0012)	(0.0011)	(0.0046)	(0.0043)
Dong Thap	1.9095**	1.8095**	-0.0078**	-0.0045	0.0080	-0.0154
	(0.7375)	(0.7798)	(0.0036)	(0.0037)	(0.0127)	(0.0121)

Note: The control variables are the same as the previous table.
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1.

Source: Baseline survey of Cao Lanh Impact Evaluation

4.2 Results of Commune Surveys

In addition to the household survey, we also conducted a commune survey to collect basic information on commune characteristics. The number of communes in the commune survey is 117, of which 48 are from Dong Thap, 35 from An Giang and 34 from Can Tho. Table 4.20 presents the basic characteristics of the sampled communes. On average, the population of a commune is around 16,000 people. The average number of households per commune is 3790.

Table 4.20. Population characteristics at commune level

	Dong Thap	An Giang	Can Tho	All
Number of households (permanent residence)	3532	4165	3792	3790
Population (permanent residence)	15110	17162	16247	16035
Number of poor / near poor (permanent residence)	460	515	280	422
Number of new registration (permanent residence)	902	468	228	578
Number of new registration (temporary residence)	199	73	160	151

Source: Baseline survey of Cao Lanh Impact Evaluation

Table 4.21 reports the percentage of communes which have experienced natural disasters and epidemics. 17.4% of communes reported typhoon storms with the frequency of 20 times in the past five years. Dong Thap has experienced a remarkably higher frequency of storms than An Giang and Can Tho. Droughts and landslides are also more likely to happen in Dong Thap than other two provinces.

Table 4.21. Natural disasters/epidemics in the last 5 years

Types of disaster and epidemics	Percentage of communes with natural disasters, epidemics in the last 5 years				Number of natural disasters, epidemics in the last 5 years			
	Dong Thap	An Giang	Can Tho	All	Dong Thap	An Giang	Can Tho	All
Epidemics (human)	6.25	0.00	11.76	6.09	3	0	4	7
Pest disease/ epizooty	12.50	3.03	8.82	8.70	6	1	3	10
Flood	6.25	0.00	0.00	2.61	3	0	0	3
Typhoon storm	31.25	3.03	11.76	17.39	15	1	4	20
Drought	8.33	0.00	14.71	7.83	4	0	5	9
Landslide	18.75	0.00	0.00	7.83	9	0	0	9
Others	2.08	3.03	2.94	2.61	1	1	1	3

Source: Baseline survey of Cao Lanh Impact Evaluation

Table 4.22 presents the non-farm employment opportunities in the communes. The average number of firms and business establishments is 21, of which eight are located within communes. Communes in Can Tho have a higher number of firms and business establishments, at 40. However An Giang communes report a higher number of firms and business establishments located within communes.

Table 4.22. Average number of enterprises and business establishments in commune

	Dong Thap	An Giang	Can Tho	All
Average number of enterprise and business establishments that commune citizens can go to work within a day	14	13	40	21
Average number of enterprise and business establishments based on commune	6	12	9	8

Source: Baseline survey of Cao Lanh Impact Evaluation

The land areas are presented in Table 4.23. An Giang has the largest area for annual croplands, while Can Tho has the largest area for perennial cropland.

Table 4.23. Average area by purpose of use at commune level

	Dong Thap	An Giang	Can Tho	Total
Annual crop land (1000 m2)	245.71	220.87	147.23	209.43
Perennial crop land (1000 m2)	34.08	20.05	41.91	32.40
Water surface (1000 m2)	15.70	7.28	6.06	10.44
Forestry land (1000m2)	14.59	16.81	0.01	10.90
Residential land (m2)	33.62	18.62	25.34	26.89
Nonfarm business land (m2)	12.39	16.63	12.87	13.74

Source: Baseline survey of Cao Lanh Impact Evaluation

Additional data on income and agricultural issues is presented in Appendix B.

5 Results – Ferry User Surveys

5.1 Overview of Ferry Surveys

A description of the rationale and scope of the ferry user surveys was presented in Section 3. The surveys were conducted for 24 hours on March 14, 2017 at Cao Lanh and March 15, 2017 at Vam Cong. Control traffic counts were also conducted in both directions at each ferry to enable the ferry interview sample to be correctly expanded.

5.2 Total Persons using Ferries

Total daily person movements for Cao Lanh and Vam Cong bridges are presented in Tables 5.1 and 5.2 respectively. Due to the heavy use of the Vam Cong Ferry by buses and cars compared to Cao Lanh (which is more reliant on motorcycles), the volume of daily persons estimated to use Vam Cong ferry is almost twice that at Cao Lanh. This is consistent with Vam Cong's greater role in serving non-local trips (that is not confined to the immediate provinces in the Delta) as further elaborated on below.

Table 5.1: Daily Person Movements at Cao Lanh Ferry

Vehicle/ Movement	Total Persons	Driver/ head of group	Passengers/ members of group
Walk-on/bicycle	1,142	1,142	0
Motorbike	21,666	16,666	5,000
Car with less than 7	1,030	429	601
Car with 7-11 seats	1,206	389	817
Bus with 12 to 30 seats	861	79	782
Bus with over 30 seats	188	8	180
Truck < 3 tonnes	540	300	240
Truck from 3 to 6 tonnes	894	447	447
Truck from 7 to 9 tonnes	365	192	173
Truck from 10 to 18 tonnes	306	170	136
Truck > 18 tonnes	69	43	26
Total	**28,266**	**19,865**	**8,401**

Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

Table 5.2: Daily Person Movements at Vam Cong Ferry

Vehicle/ Movement	Total Persons	Driver/ head of group	Passengers/ members of group
Walk-on/bicycle	663	663	-
Motorbike	18,168	13,975	4,193
Car with less than 7	1,943	694	1,249
Car with 7-11 seats	4,514	1,188	3,326
Bus with 12 to 30 seats	7,470	644	6,826
Bus with over 30 seats	15,696	545	15,151

Truck < 3 tonnes	493	290	203
Truck from 3 to 6 tonnes	1,006	559	447
Truck from 7 to 9 tonnes	621	345	276
Truck from 10 to 18 tonnes	709	394	315
Truck > 18 tonnes	1,111	617	494
Total	**52,395**	**19,914**	**32,481**

Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

5.3 Gender

53.1% of Cao Lanh ferry users were male. Major gender gaps were found by vehicle type. The proportion of female users was the highest for vehicles considered to be collective and light. By bus, female users accounted for 55.8% in those with 12 to 30 seats, and 52.8% in those with 30 seats and above. By motorbike, the female proportion was also relatively high at 46.2%. For heavy vehicles, female users were by proportion found to be considerably less than male users. For instance, by truck of less than 9 tonnes and above 18 tonnes, the male proportion was as high as 88%. By truck, the female proportion was the highest for those less than 3 tonnes, at 27.8%, and interestingly for those weighting between 10 and 18 tonnes, at 23.5%.

According to Table 5.4, the gender gaps were wider by vehicle driver. The male proportion was as high as 75% compared with the female proportion at 25%. Female drivers were well-represented by the relatively light vehicle types, especially by walk-on/bicycle at 58.4%. Despite the high female proportion among total Cao Lanh ferry users by motorbike (46.2% from Table 5.1), only 25.5% of those female users were driving the motorbike themselves. Similarly, all bus drivers were male drivers, despite the relatively higher female proportion of total Cao Lanh ferry users by bus (55.8% by bus with 12 to 30 seats, and 52.8% by bus with 30 seats and above, from Table 5.3).

Table 5.3: Proportion Gender of Total People at Cao Lanh Ferry

	Male	***Female***
Motorbike	53.8%	46.2%
Car with less than 7 seats	61.0%	39.0%
Car with 7-11 seats	67.2%	32.8%
Bus with 12 to 30 seats	44.2%	55.8%
Bus with over 30 seats	47.2%	52.8%
Truck less than 3 tonnes	72.2%	27.8%
Truck from 3 to 6 tonnes	80.0%	20.0%
Truck from 7 to 9 tonnes	88.2%	11.8%
Truck from 10-18 tonnes	76.5%	23.5%
Truck with more than 18 tonnes	87.5%	12.5%
Total	53.1%	46.9%

Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

Table 5.4: Gender of Vehicle Driver/Group Head at Cao Lanh Ferry

	Male	***Female***
Walk-on/bicycle	41.6%	58.4%
Motorbike	74.5%	25.5%
Car with less than 6 seats	97.7%	2.3%
Car with 7-11 seats	97.6%	2.4%
Bus with 12 to 30 seats	100.0%	0.0%
Bus with over 30 seats	100.0%	0.0%
Truck less than 3 tonnes	99.6%	0.4%
Truck from 3 to 6 tonnes	99.5%	0.5%
Truck from 7 to 9 tonnes	97.1%	2.9%
Truck from 10-16 tonnes	100.0%	0.0%
Truck with more than 16 tonnes	94.7%	5.3%
Total	75.0%	25.0%

Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

Table 5.5 shows that the Vam Cong Ferry is less male dominant than the Cao Lanh Ferry with female ferry users accounting for 53.6% of all users. One possible explanation is the high rate of female users in collective and light vehicles. In particular, female users accounted for 52.1% in those vehicles with 12 to 30 seats, and as high as 61.3% in those with 30 seats and above. By motorbike, the female proportion was 48%. However, car and truck travel seems to be more male dominant than the Cao Lanh Ferry. By heavy vehicle types, such as car, the female proportion of Vam Cong ferry users was considerably lower than the Cao Lanh ferry. By car with less than 7 seats, Vam Cong female users accounted for 27.4% compared to 39% among Cao Lanh female ferry users. By truck of various tonnes, the male proportion ranged from 80% to 100%.

Table 5.6 shows that the gender gap for Vam Cong vehicle drivers was found to be more profound than both Vam Cong total ferry user and Cao Lanh vehicle driver. Female drivers were most represented by the light vehicle types, especially by walk-on/bicycle with a share of 60.3%. Similar to Cao Lanh ferry users, despite the high female proportion among total Vam Cong ferry users by motorbike (at 48%, Table 5.3), only 26.8% of female motorbike users were found to be driving the motorbike themselves. Moreover, the female proportion of bus drivers ranged between 0% to 1.7%, despite the relatively higher female proportion of total Vam Cong ferry users by bus (52.1% by bus with 12 to 30 seats, and 61.3% with 30 seats and above, from Table 5.6).

Table 5.5: Gender of Total People at Vam Cong Ferry

	Male	***Female***
Motorbike	52.0%	48.0%
Car with less than 7 seats	72.6%	27.4%
Car with 7-11 seats	81.8%	18.2%
Bus with 12 to 30 seats	47.9%	52.1%
Bus with over 30 seats	38.7%	61.3%
Truck less than 3 tonnes	83.9%	16.1%
Truck from 3 to 6 tonnes	88.2%	11.8%
Truck from 7 to 9 tonnes	65.6%	34.4%
Truck from 10-18 tonnes	90.0%	10.0%
Truck with more than 18 tonnes	100.0%	0.0%
Total	46.4%	53.6%

Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

Table 5.6: Proportion of Different Gender of Vehicle Driver/Group Head at Vam Cong Ferry

	Male	*Female*
Walk-on/bicycle	39.7%	60.3%
Motorbike	73.2%	26.8%
Car with less than 6 seats	98.8%	1.2%
Car with 7-11 seats	97.6%	2.4%
Bus with 12 to 30 seats	100.0%	0.0%
Bus with over 30 seats	100.0%	0.0%
Truck less than 3 tonnes	98.3%	1.7%
Truck from 3 to 6 tonnes	100.0%	0.0%
Truck from 7 to 9 tonnes	100.0%	0.0%
Truck from 10-18 tonnes	100.0%	0.0%
Truck with more than 18 tonnes	99.6%	0.4%
Total	76.2%	23.8%

Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

5.4 Age of Drivers or Representatives of Walk-on Groups

Table 5.7 presents the age distribution of drivers (or group representatives) at Cao Lanh and Vam Cong ferries. Older users of the Cao Lanh ferry travelled most frequently in buses with over 30 seats, which had an average age of 49.5. Other vehicle types with relatively high average ages were buses with 12 to 30 seats (an average age of 41), and cars with 7 to 11 seats (an average age of 39.3). Meanwhile, younger users of Cao Lanh ferry travelled most frequently by the relatively light vehicle types, such as trucks from 3 to 6 tonnes (with an average age of 33.3), and walk-on/bicycle (with an average age of 33.6).

In contrast to Cao Lanh ferry users, older users of Vam Cong ferry travelled most frequently by walk-on/bicycle, which had an average age of 44.3. Other vehicle types with relatively high average age levels include buses with 12 to 30 seats (an average age of 42.3), buses with over 30 seats (an average age of 40.9), and cars with 7 to 11 seats (an average age of 39). Meanwhile, younger users of Vam Cong ferry travelled most frequently by truck of 3 to 6 tonnes (an average age of 35.1), and motorbike (an average age of 36.2).

Table 5.7: Average Age of Driver or Group Representatives by Vehicle Type

	Cao Lanh Ferry	*Vam Cong Ferry*	*Total*
Walk-on/bicycle	33.6	44.3	37.6
Motorbike	37.7	36.2	37.0
Car with less than 7 seats	38.5	38.4	38.5
Car with 7-11 seats	39.3	39.7	39.6
Bus with 12 to 30 seats	41.0	42.3	42.2
Bus with over 30 seats	48.5	40.9	40.9
Truck less than 3 tonnes	38.4	38.9	38.6
Truck from 3 to 6 tonnes	33.3	35.1	34.3
Truck from 7 to 9 tonnes	33.8	37.3	36.1
Truck from 10-18 tonnes	38.5	37.6	37.9
Truck with more than 18 tonnes	39.2	36.7	36.8

Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

Table 5.8 presents information on the average number of occupants or group members by vehicle type. In Cao Lanh, the more collective vehicle types were on average found to be carrying the highest number of Cao Lanh ferry users. Buses with over 30 seats carried on average the highest number of Cao Lanh ferry users, with an average of 23.5 users. Meanwhile, more individual vehicle types such as walk-on/bicycle (an average of 1.2 users), and motorbike (an average of 1.3 users), carried on average the lowest number of Cao Lanh ferry users. The more collective vehicle types were, on average, found to be carrying the highest number of Vam Cong ferry users. Buses with over 30 seats carried the highest number of Vam Cong ferry users, with an average of 28.8 users. Meanwhile, more individual vehicle types such as walk-on/bicycle (an average of 1.2 users), and motorbikes (an average of 1.3 users) carried on average the lowest number of Vam Cong ferry users.

Table 5.8: Average Number of Occupants by Vehicle Type

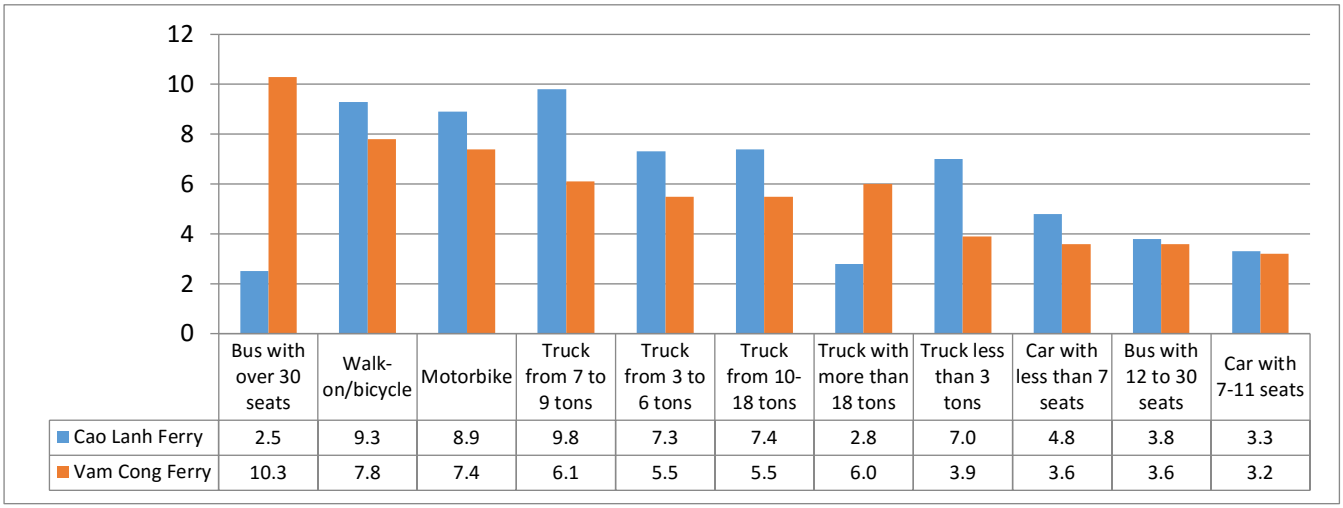
	Cao Lanh Ferry	*Vam Cong Ferry*	*Total*
Walk-on/bicycle	1.2	1.0	1.2
Motorbike	1.3	1.3	1.3
Car with less than 7 seats	2.4	2.8	2.6
Car with 7-11 seats	3.1	3.8	3.6
Bus with 12 to 30 seats	10.9	11.6	11.6
Bus with over 30 seats	23.5	28.8	28.8
Truck less than 3 tonnes	1.8	1.7	1.7
Truck from 3 to 6 tonnes	2.0	1.8	1.9
Truck from 7 to 9 tonnes	1.8	1.8	1.8
Truck from 10-18 tonnes	1.8	1.8	1.8
Truck with more than 18 tonnes	1.6	1.8	1.8

Source: Cao Lanh Impact Evaluation Ferry-user Survey 2017

Frequency of Use

Figure 5.9 shows the absolute frequency of ferry crossings in the seven days before the survey for both ferries. In Cao Lanh, trucks weighting 7 to 9 tonnes were the vehicles that used Cao Lanh ferry most frequently. This type used the Cao Lanh ferry 9.8 times across the seven days, which was more frequent than the 6.1 times witnessed at the Vam Cong ferry. Other vehicle types with a relatively high frequency of ferry use included walk-on/bicycle and motorbike at 9.3 times and 8.9 times respectively. On the other hand, buses with 30 seats and above were the least frequently observed vehicle type while this vehicle was the most frequently ferry user (2.5 times compared to 10.3 times at Vam Cong ferry). Other vehicle types with relatively low frequency of ferry use included trucks of more than 18 tonnes (2.8 times compared to 6.0 times at Vam Cong ferry), and cars with 7 to 11 seats (3.3 times compared to 3.2 times at Vam Cong ferry).

Figure 5.9: Frequency of Use in Last 7 days: Cao Lanh and Vam Cong Ferries Compared



	Bus with over 30 seats	Walk-on/bicycle	Motorbike	Truck from 7 to 9 tons	Truck from 3 to 6 tons	Truck from 10-18 tons	Truck with more than 18 tons	Truck less than 3 tons	Car with less than 7 seats	Bus with 12 to 30 seats	Car with 7-11 seats
Cao Lanh Ferry	2.5	9.3	8.9	9.8	7.3	7.4	2.8	7.0	4.8	3.8	3.3
Vam Cong Ferry	10.3	7.8	7.4	6.1	5.5	5.5	6.0	3.9	3.6	3.6	3.2

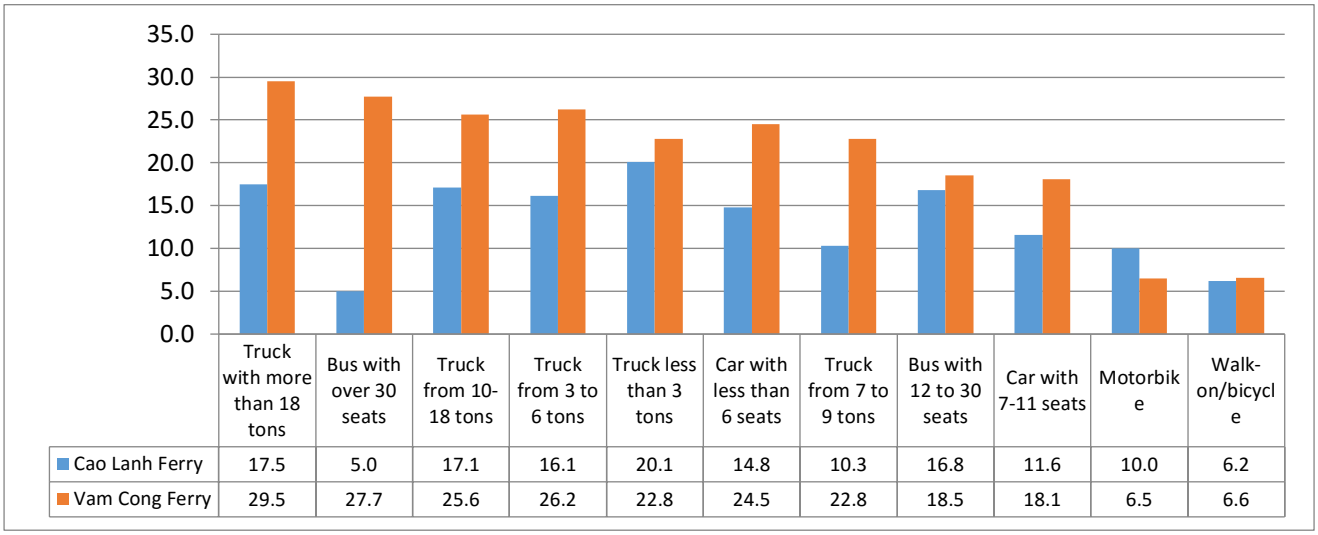
Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

Figure 5.10 presents the average waiting time at the ferry for the last North to South ferry crossing. For Cao Lanh, buses with over 30 seats were found to be spending the shortest waiting time (5 minutes, which is considerably shorter than 27.7 minutes at Vam Cong ferry). However, it is noted that the number of buses with over 30 seats that crossed Cao Lanh was fairly low (only 8 buses with over 30 seats crossed on the Cao Lanh ferry during the survey day). Only 2 buses with over 30 seats were interviewed and this might lead to a bias in the result. Other vehicle types with relatively short waiting times included walk-on/bicycle (6.2 minutes compared to 6.6 minutes at Vam Cong ferry), and motorbikes (10 minutes, which is longer than the 6.5 minutes at Vam Cong ferry) since they receive priority boarding. Similarly, ambulances and vehicles of government officials are

given priority when boarding. Meanwhile, trucks of all types were found to be waiting the longest, with trucks of less than 3 tonnes found to be spending the longest waiting time (20.1 minutes, but still slightly shorter than 22.8 minutes at Vam Cong ferry).

For the Vam Cong ferry, motorbikes were found to be spending the shortest waiting time. Other vehicle types with relatively short waiting times included walk-on/bicycle of 6.6 minutes. Meanwhile, trucks of more than 18 tonnes spent the longest waiting time, which was 29.5 minutes, considerably longer than 17.5 minutes at Cao Lanh ferry. Buses with over 30 seats also spent a long time waiting for the ferry.

Figure 5.10: Waiting Time for last Ferry Crossing from North to South: Cao Lanh and Vam Cong ferries Compared

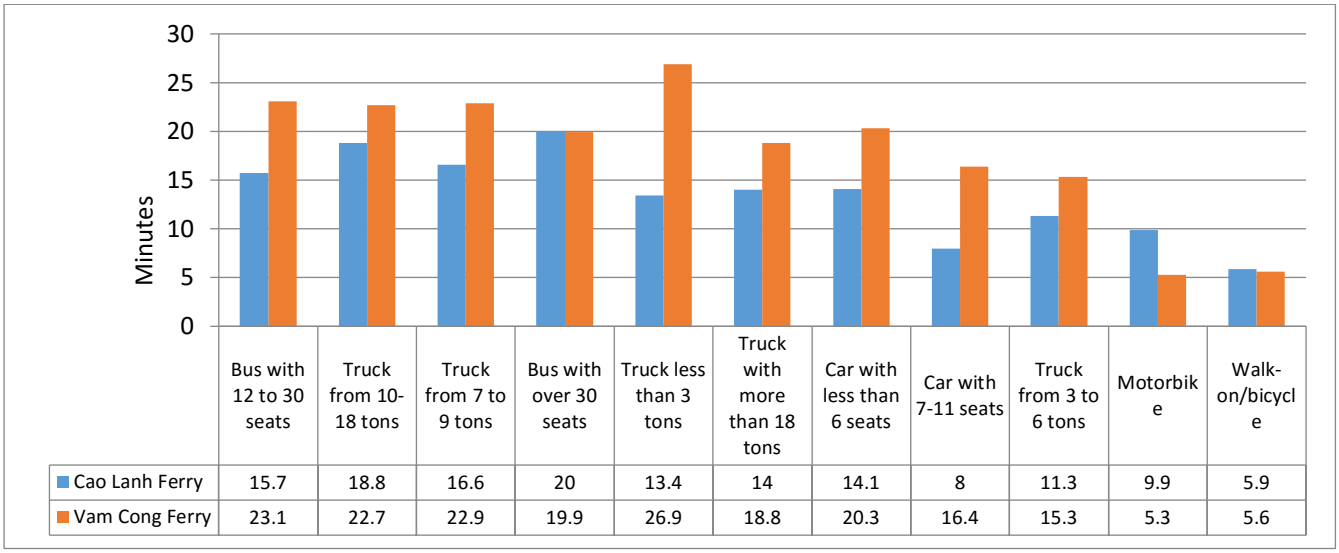


	Truck with more than 18 tons	Bus with over 30 seats	Truck from 10-18 tons	Truck from 3 to 6 tons	Truck less than 3 tons	Car with less than 6 seats	Truck from 7 to 9 tons	Bus with 12 to 30 seats	Car with 7-11 seats	Motorbike	Walk-on/bicycle
Cao Lanh Ferry	17.5	5.0	17.1	16.1	20.1	14.8	10.3	16.8	11.6	10.0	6.2
Vam Cong Ferry	29.5	27.7	25.6	26.2	22.8	24.5	22.8	18.5	18.1	6.5	6.6

Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

As shown in Figure 5.11, the waiting time for the direction from South to North was slightly lower than that observed in the opposite direction for almost all vehicle types. Walk-on/bicycle was still the vehicle type which spent the shortest waiting time. In particular, it was 5.9 minutes and 5.6 minutes respectively for Cao Lanh and Vam Cong ferries. Motorbikes also had relatively short waiting times at 9.9 minutes at Cao Lanh ferry and 5.3 minutes at the Vam Cong ferry. At Vam Cong, trucks of less than 3 tonnes spent the longest waiting time of 26.9 minutes, compared to 13.4 minutes at Cao Lanh ferry. Other vehicle types with relatively long waiting times included buses with 12 to 30 seats (23.1 minutes compared to 15.7 minutes at Cao Lanh ferry), and trucks of 7 to 9 tonnes (22.9 minutes compared to 16.6 minutes at Cao Lanh ferry).

Figure 5.11 Waiting Time for last Ferry Crossing from South to North: Cao Lanh and Vam Cong Ferries Compared



	Bus with 12 to 30 seats	Truck from 10-18 tons	Truck from 7 to 9 tons	Bus with over 30 seats	Truck less than 3 tons	Truck with more than 18 tons	Car with less than 6 seats	Car with 7-11 seats	Truck from 3 to 6 tons	Motorbike	Walk-on/bicycle
Cao Lanh Ferry	15.7	18.8	16.6	20	13.4	14	14.1	8	11.3	9.9	5.9
Vam Cong Ferry	23.1	22.7	22.9	19.9	26.9	18.8	20.3	16.4	15.3	5.3	5.6

Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

5.5 Purpose of Trips

Table 5.12 illustrates the trip purpose by vehicle type at the Cao Lanh ferry. It shows that 30.5% of Cao Lanh ferry users cited "going to work" as the main purpose for using the ferry. For the purpose of going to work, motorbike was the most frequently used vehicle type (32.1%), followed by car with less than 6 seats (17.9%) and walk-on/bicycle (14.6%). Other important purposes included "during work" (25.1%), in which cars with less than 6 seats and with 7 to 11 seats were the most frequently used types for this purpose (51.7% and 48.9%, respectively), and "going home" (20.7%), in which walk-on/bicycle was the most frequently used type for this purpose (34.4%). Education, shopping and medical visit was among the least chosen purpose for using the ferry.

Table 5.12: Trip Purpose by Vehicle Type at Cao Lanh Ferry

	Walk-on/bicycle	***Motorbike***	***Car with less than 6 seats***	***Car with 7-11 seats***	***Total***
During work	8.6%	24.8%	51.7%	48.9%	25.1%
To work	14.6%	32.1%	17.9%	15.3%	30.5%
To education	24.2%	2.0%	0.9%	0.0%	3.1%
To shopping	3.7%	3.7%	0.2%	0.0%	3.5%
Visit friends/relatives	8.2%	7.2%	5.4%	7.8%	7.2%
Emergency/Medical visit	0.6%	3.6%	0.7%	3.8%	3.4%
Tourism	4.1%	3.7%	8.2%	8.9%	4.0%
Go home	34.4%	20.4%	11.2%	13.4%	20.7%
Others	1.5%	2.6%	3.7%	1.9%	2.5%

Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

The information provided in Table 5.13 shows that 28.7% of Vam Cong ferry users cited "going home" as the main purpose for using the ferry. For this purpose, motorbike was the most frequently used vehicle type (30.4%), followed by walk-on/bicycle (29.4%) and car with 7 to 11 seats (16%). Other important purposes included travelling "during work" (23.5%), in which cars with less than 6 seats and 7 to 11 seats were the most common vehicle types (36.3% for both car types), and "going to work" (22.7%), in which motorbike and walk-on/bicycle were the most common vehicle types (24.1% and 21.5%, respectively). Interestingly, tourism was a quite popular trip purpose for cars using the Vam Cong ferry, only slightly lower than travelling "during work".

Table 5.13: Trip Purpose by Vehicle Type at Vam Cong Ferry

	Walk-on/bicycle	***Motorbike***	***Car with less than 6 seats***	***Car with 7-11 seats***	***Total***
During work	9.4%	22.4%	36.3%	36.3%	23.5%
To work	21.5%	24.1%	15.4%	10.9%	22.7%
To education	4.1%	1.3%	0.0%	0.0%	1.3%
To shopping	8.0%	4.7%	2.2%	0.3%	4.4%
Visit friends/relatives	10.1%	7.4%	5.2%	3.7%	7.1%
Emergency/Medical visit	10.1%	1.8%	1.3%	5.5%	2.3%
Tourism	1.6%	5.4%	18.2%	23.0%	7.0%
Go home	29.4%	30.4%	15.9%	16.0%	28.7%
Others	5.7%	2.6%	5.5%	4.2%	2.9%

Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

5.6 Usage of Other River Crossings as Part of the Trip

Table 5.14 shows the use of other bridge/ferry for Cao Lanh ferry users. In general, it was not popular among Cao Lanh ferry users to cross other bridges/ferries, as demonstrated by the low proportion of vehicles crossing the Vam Cong ferry, Can Tho and My Thuan Bridge. The Vam Cong ferry was the most common ferry/bridge crossed by Cao Lanh ferry users. For those who additionally used the Vam Cong ferry, 21.6% were identified as travelers by truck of 7 to 9 tonnes. Other vehicle types with frequent additional use of the Vam Cong ferry included cars with 7 to 11 seats (13.1%), and cars with less than 6 seats (11%). Light vehicle types, especially motorbike (3.8%), walk-on/bicycle (0%) either marginally or did not at all additionally use the Vam Cong ferry.

Can Tho Bridge was the least frequent ferry/bridge crossing for Cao Lanh ferry users. My Thuan Bridge was fairly popular with trucks over 18 tonnes (31.6%) and trucks from 7 to 9 tonnes (18%), and cars with less than 6 seats (10.7%). Light and collective vehicles, especially motorbike (0.9%), walk-on/bicycle (0%), and buses with 12 to 30 seats and over 30 seats (0% for both), either marginally or did not at all additionally use My Thuan Bridge.

Table 5.14: Other Bridge/ferry crossing for Cao Lanh Ferry Users

	Vam Cong	***Can Tho***	***My Thuan***
Walk-on/bicycle	0.0%	0.0%	0.0%
Motorbike	3.8%	0.3%	0.9%
Car with less than 6 seats	11.0%	2.1%	10.7%
Car with 7-11 seats	13.1%	2.4%	4.0%
Truck less than 3 tonnes	9.4%	2.2%	1.3%
Truck from 3 to 6 tonnes	10.2%	3.4%	7.9%
Truck from 7 to 9 tonnes	21.6%	3.6%	18.0%
Truck from 10-16 tonnes	4.1%	2.5%	6.6%
Truck with more than 16 tonnes	10.5%	0.0%	31.6%
Total	**4.30%**	**0.50%**	**1.50%**

Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

Table 5.15 provides information about other bridge/ferry crossings by Vam Cong ferry users. My Thuan Bridge was the most common choice to combine trips. In particular, 73.1% were identified as travelers by truck of more than 18 tonnes. Other vehicle types with relatively high frequent use of the bridge included cars with 7 to 11 seats (61%), and for most other truck types. Vehicle types which were either marginally or were not at all using the bridge included motorbike (8.6%), walk-on/bicycle (0%), and all bus types (0%). As Vam Cong ferry is often combined with My Thuan for the trip to HCMC, it was fairly understandable that Can Tho was the least frequent choice for trip combinations for the Vam Cong ferry user. Cao Lanh ferry was fairly common with smaller vehicles including trucks of less than 3 tonnes (8.2%). Other vehicle types with frequent additional use of the Cao Lanh ferry included cars with 7 to 11 seats (6.2%), and trucks of 3 to 6 tonnes (5.9%). Trucks of more than 18 tonnes were among the types which only marginally used the Cao Lanh ferry (2.4%), followed by those types which did not at all additionally use Cao Lanh ferry, such as walk-on/bicycle (0%) and all bus types (0%).

Table 5.15: Other Bridge/ferry crossing for Vam Cong Ferry Users

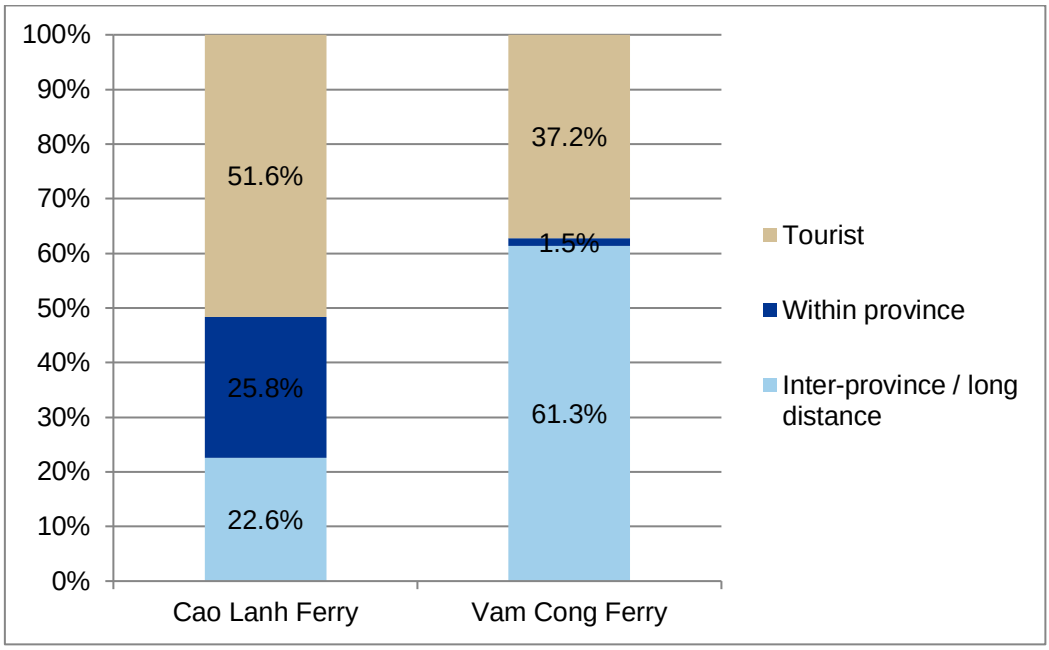
	Cao Lanh	***Can Tho***	***My Thuan***
Walk-on/bicycle	0.0%	0.0%	0.0%
Motorbike	4.9%	0.6%	8.6%
Car with less than 6 seats	2.5%	3.6%	41.2%
Car with 7-11 seats	6.2%	1.8%	61.0%
Truck less than 3 tonnes	8.2%	2.2%	19.7%
Truck from 3 to 6 tonnes	5.9%	3.8%	33.3%
Truck from 7 to 9 tonnes	5.4%	3.8%	41.8%
Truck from 10-18 tonnes	4.3%	6.5%	45.7%
Truck with more than 18 tonnes	2.4%	3.0%	73.1%
Total	**4.40%**	**1.00%**	**15.80%**

Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

5.7 Types of Bus

Figure 5.1 illustrates the type of buses using both Cao Lanh and Vam Cong ferries. Tourist buses were the most common bus type using the Cao Lanh ferry (51.6%), while long-distance/inter-province buses were less frequent, accounting for 22.6% of total buses crossing via the ferry. In contradistinction, for Vam Cong, inter-provincial/long distance buses were the most frequently observed type of bus (61.3%), while tourist buses only accounted for 37.2% of buses.

Figure 5.1: Type of Bus Used for Cao Lanh and Vam Cong ferries Compared



Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

5.8 Motorcycles Role in Goods Transport

Table 5.16 shows the proportion of motorbikes carrying commodities. The proportions were quite similar for both ferries. At Cao Lanh ferry, 25.1% of motorbikes carried commodities, this share was slightly lower for the Vam Cong ferry, at 23.6%. However, those motorbikes which carried commodities at Vam Cong ferry carried a relatively larger load, on average 108.4 kilograms, compared to motorbikes at Cao Lanh ferry with an average load of 89.3 kilograms.

Table 5.16: Proportion of Motorcycles Carrying Commodities

	Proportion	***Average load (kg)***
Cao Lanh Ferry	25.1%	89.3
Vam Cong Ferry	23.6%	108.4

Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

Table 5.17 shows the distribution of various commodities carried by motorbike. The distribution is fairly similar among motorbikes at each ferry. 'Other' commodities were the most predominant category by motorbike at both ferries. However, this category accounted for a relatively larger share of total commodities by motorbike at Vam Cong ferry (42.2%) compared to Cao Lanh ferry (28.9%). Agricultural products were the second-most frequently carried commodity category, accounting for 33.2% at Cao Lanh ferry and 36.7% at Vam Cong ferry, respectively. Fresh food also accounted for a considerable share of total commodities carried by motorbike, most significantly at Cao Lanh ferry (30.4%) compared to Vam Cong ferry (17.5%).

Table 5.17: Type of Commodity Carried by Motorcycles at Each Ferry

	Cao Lanh Ferry	***Vam Cong Ferry***	***Total***
Agricultural products	33.2%	36.7%	34.7%
Building materials	1.3%	0.1%	0.8%
Fertilizer	0.1%	1.2%	0.6%
Industrial material	3.8%	1.2%	2.6%
Petroleum products	0.0%	1.2%	0.5%
Fresh food (i.e. fish, animal...)	30.4%	17.5%	24.7%
Frozen food	2.3%	0.0%	1.3%

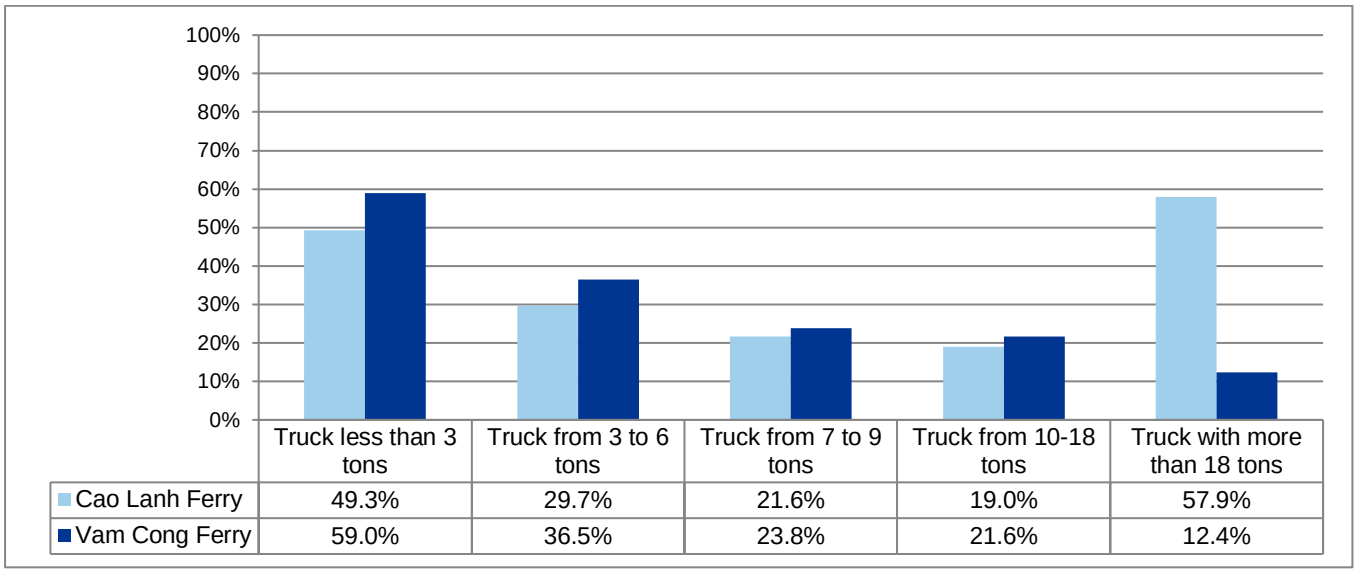
Other commodity	28.9%	42.2%	34.8%

Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

5.9 Trucks and Goods Transport

Figure 5.2 shows the proportion of observed trucks with no load by truck type. At the Cao Lanh ferry, due to restrictions on loading capacity for trucks using its ferry services, it is by no surprise that those of more than 18 tonnes were the most predominant truck type carrying no load, with a share of 57.9%. A common practice for trucks of this weight is to use a different route of transportation for delivering loads to clients, and then return by Cao Lanh ferry services with no load carried. Trucks of less than 3 tonnes were the second most predominant type for carrying no load at Cao Lanh ferry, with a share of 49.3%. At Vam Cong ferry, by contrast, trucks of more than 18 tonnes were the least predominant type for carrying no load, with a share of 12.4%. Meanwhile, trucks of less than 3 tonnes were the most predominant type for carrying no load at this ferry with a share of 59%.

Figure 5.2. Proportion of Empty Trucks by Type

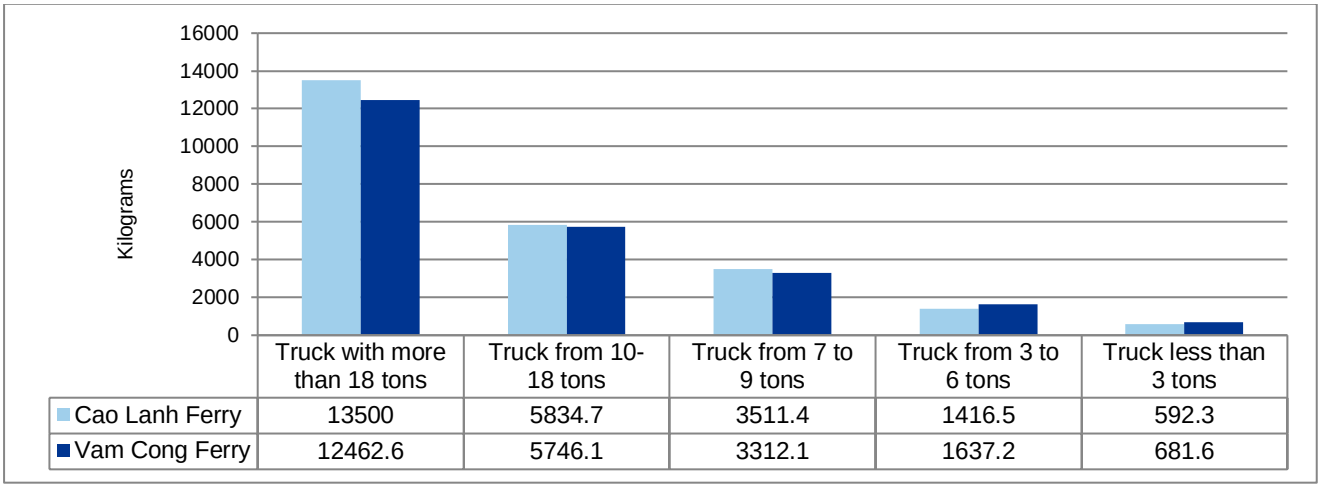


	Truck less than 3 tons	Truck from 3 to 6 tons	Truck from 7 to 9 tons	Truck from 10-18 tons	Truck with more than 18 tons
Cao Lanh Ferry	49.3%	29.7%	21.6%	19.0%	57.9%
Vam Cong Ferry	59.0%	36.5%	23.8%	21.6%	12.4%

*Only 11 trucks of more than 18 tonnes were interviewed out of a total of 307 truck interviews for Cao Lanh Ferry. Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

Figure 5.3 shows the average weight for loaded trucks by truck type. The figures suggest that the heavier the trucks are by weight, the more they utilize their loading capacity. Trucks of more than 18 tonnes carried the heaviest loads among all truck types at both ferries, on average around 13,500 kilograms at Cao Lanh ferry and 12,460 kilograms at the Vam Cong ferry. Meanwhile, trucks of less than 3 tonnes carried the least amount of load at both ferries, on average 592 kilograms at the Cao Lanh ferry and 682 kilograms at the Vam Cong ferry.

Figure 5.3: Average Loading Weight by Truck Type and Capacity (calculated for truck carrying load only) (unit: kg)



Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

Table 5.18 shows the proportion of actual load over the maximum load for trucks at each ferry. The table is calculated only for trucks that carried loads. All Cao Lanh ferry trucks were found to be carrying loads below capacity. Trucks more than 18 tonnes utilized their maximum loading capacity the most, with an actual coverage of 89%. Trucks between 10 and 18 tonnes utilized their capacity the second-most, with an actual coverage of 80.7%. Trucks of less than 3 tonnes utilized the least capacity, with an actual coverage by 61.8%. Similar observations are found at the Vam Cong ferry; all Vam Cong ferry trucks carried loads below their capacity. Trucks of more than 18 tonnes utilized their maximum loading capacity the most, with an actual coverage by 86.8%. Trucks between 10 and 18 tonnes utilized their capacity the second-most, with an actual coverage by 80.5%. Trucks of 3 to 6 tonnes utilized the least of their capacity, with an actual coverage by 66.9%.

Table 5.18: Proportion of Actual Load over Maximum Load by Truck Type at each Ferry (calculated for truck carrying load only)

	Cao Lanh Ferry	***Vam Cong Ferry***	***Total***
Truck less than 3 tonnes	61.8%	76.3%	67.4%
Truck from 3 to 6 tonnes	62.7%	66.9%	65.0%
Truck from 7 to 9 tonnes	80.5%	71.2%	74.5%
Truck from 10-18 tonnes	80.7%	80.5%	80.6%
Truck with more than 18 tonnes	89.0%	86.8%	86.8%

Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

Table 5.19 shows the proportionate distribution of various commodities carried by trucks. The distribution is fairly similar among trucks at each ferry. 'Other' commodities were the predominant category by trucks at both ferries, accounting for 43.4% and 40.8% of total commodities at Cao Lanh ferry and Vam Cong ferry, respectively. Agricultural products were the second-most frequently carried commodity category for trucks, accounting for 20.5% at Cao Lanh ferry and 16.9% at Vam Cong ferry, respectively. Other important categories include building materials, fresh food (i.e. fish, animals), and industrial materials.

Table 5.18: Type of Commodity Carried by Truck at Each Ferry

	Cao Lanh Ferry	*Vam Cong Ferry*	*Total*
Agricultural products	20.5%	16.9%	18.0%
Building materials	9.9%	11.8%	11.2%
Fertilizer	7.7%	3.1%	4.5%
Industrial material	6.7%	9.4%	8.6%
Petroleum products	0.7%	0.9%	0.8%
Fresh food (i.e. fish, animal...)	6.6%	13.2%	11.2%

Frozen food	4.5%	3.9%	4.1%
Other commodity	43.4%	40.8%	41.6%

Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

Table 5.20 shows that total daily trucks at Vam Cong ferry was twice that for Cao Lanh ferry. Furthermore, the proportion of larger trucks was more pronounced at Vam Cong. For example, trucks with more than 10 tonnes accounted for 45.8% of total trucks compared to 18.5% at Cao Lanh, reflecting Vam Cong ferry's more dominant role in goods transport. It is estimated that although loads of each type of truck were similar taking into account the numbers and sizes of trucks, total goods volumes using the Vam Cong ferry were almost six times higher than the Cao Lanh ferry, at 8885.6 tonnes per day compared to 1,506.8 tonnes per day using the Cao Lanh ferry.

Table 5.20: Number of Daily Truck and Total Freight by Truck Size at Cao Lanh and Vam Cong Ferries

Truck size	***Cao Lanh Ferry***		***Vam Cong Ferry***	
	Number of vehicles	Total volumes carried (tonnes)	Number of vehicles	Total volumes carried (tonnes)
Truck less than 3 tonnes	300	64.6	290	51.1
Truck from 3 to 6 tonnes	447	379.7	559	546.8
Truck from 7 to 9 tonnes	192	382.7	345	659.1
Truck from 10-18 tonnes	170	571.8	394	1,459.5
Truck with more than 18 tonnes	43	108.0	617	6,169.0
Total	**1,152**	**1,506.8**	**2,205**	**8,885.6**

Source: Cao Lanh Impact Evaluation Ferry-user survey 2017

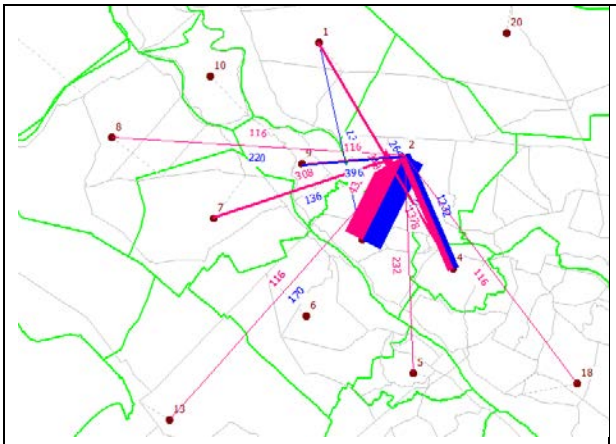
5.10 Observed Trip Patterns

Information on the origin and destination of daily vehicle trips was also undertaken and the results were expanded to be representative of daily vehicle use (by type) for each ferry. This information is summarized for the Cao Lanh survey in Figure 5.4 and for Vam Cong in Figure 5.5. The results for each ferry are presented for: (i) motorcycle; (ii) cars; (iii) trucks and buses. The top 10 origin to destination movements in each direction are presented. Table 5.21 provides the definition of the adopted traffic zones used in Figures 5.4 and 5.5.

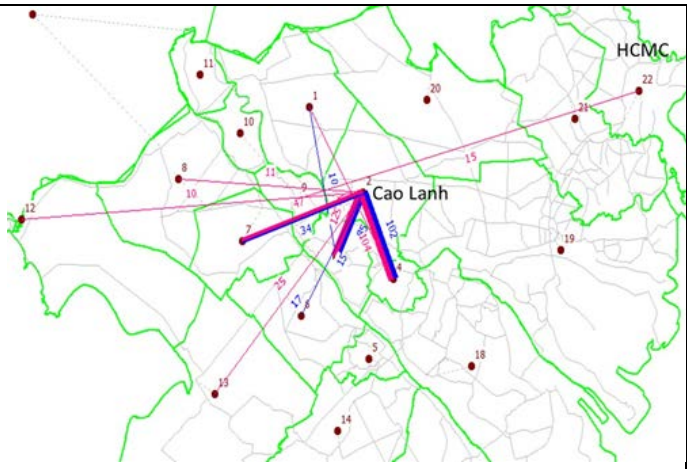
As from can be seen from Table 5.20 motorcycles dominate vehicle movements at Cao Lanh and almost all motorcycle trips are travelling within the immediate location in the vicinity of the ferry. Other vehicle types are mainly travelling within the Delta also.

Table 5.21 also shows that motorcycles dominate vehicle movements and are mainly making local trips. However, Vam Cong has a higher volume of cars, buses and truck trips that in addition are making longer distance trips often involving another river crossing. As shown in Table 5.15, vehicles using Vam Cong Ferry are about three and half times are likely to make use of another river crossing as part of their journey compared to those at the Cao Lanh ferry.

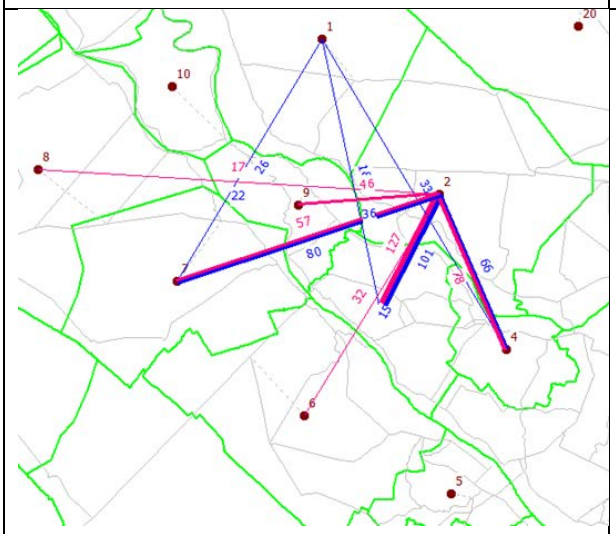
Figure 5.4: Top 10 Origin-Destinations for Daily Vehicle Trips by Vehicle Type Observed at Cao Lanh Ferry



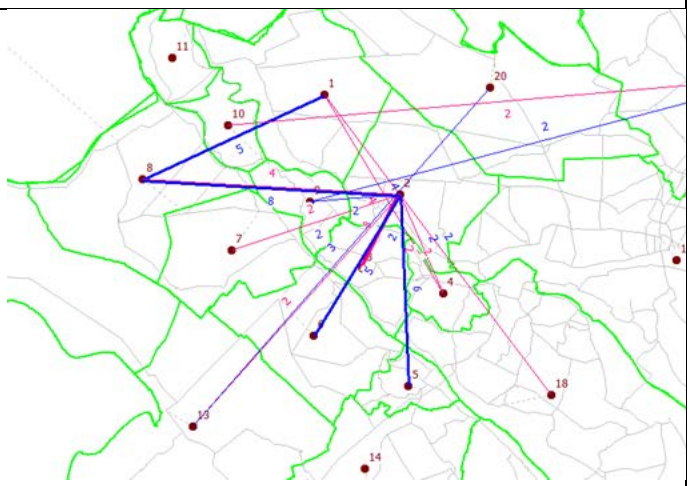
Daily motorcycle trips between Origin and Destinations



Daily car trips between Origin and Destinations



Daily truck trips between Origin and Destinations

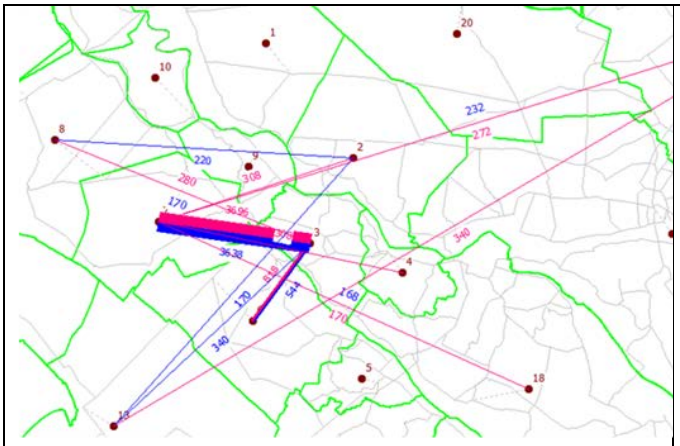


Daily bus trips between Origin and Destinations

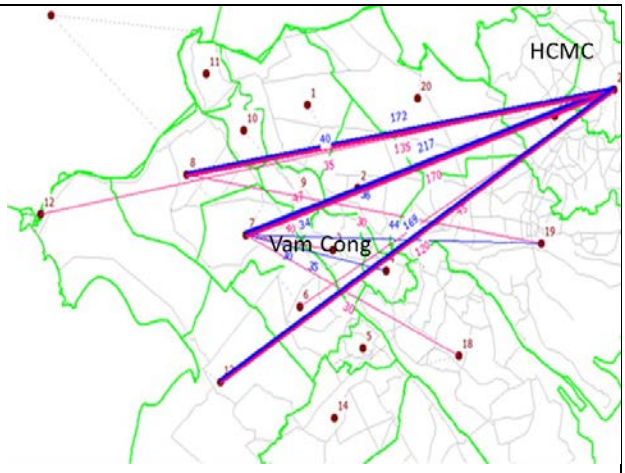
Legend: Brown numbers: zone codes shown in Table below; Red and Blue Lines and numbers: number of daily vehicle trips by direction

Source: Baseline survey of Cao Lanh Impact Evaluation

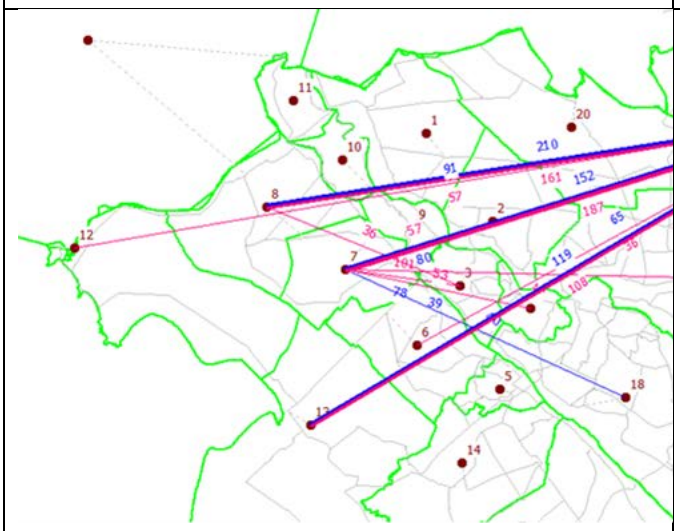
Figure 5.5: Top 10 Origin-Destinations for Daily Vehicle Trips by Vehicle Type at Vam Cong Ferry



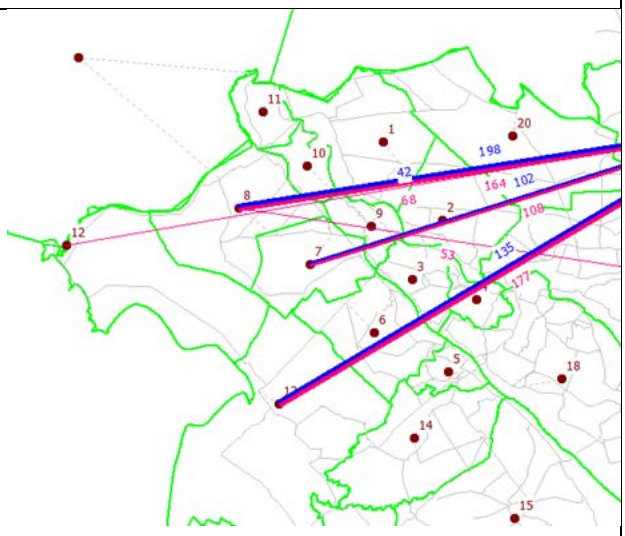
Daily motorcycle trips between Origin and Destinations



Daily car trips between Origin and Destinations



Daily truck trips between Origin and Destinations



Daily bus trips between Origin and Destinations

Legend: Brown numbers: zone codes shown in Table below; Red and Blue Lines and numbers: number of daily vehicle trips by direction

Source: Baseline survey of Cao Lanh Impact Evaluation

Table 5.21: Zones used in Traffic Analysis by Province and District

Zone		Province	Code	District
1	DT1	Dong Thap	1	Thanh Bình, Tam Nông, Tân Hồng, Hồng Ngự, Tx Hồng Ngự
2	DT2	Dong Thap	1	Cao Lãnh, Tp Cao Lãnh, Tháp Mười
3	DT3	Dong Thap	1	Lấp Vò, Lai Vung
4	DT4	Dong Thap	1	Sa Đéc, Châu Thành
5	CT2	Can Tho	2	Bình Thủy, Ninh Kiều, Cái Răng, Phong Điền
6	CT1	Can Tho	2	Thốt Nốt, Vĩnh Thạnh, Cờ Đỏ, Ô Môn, Thới Lai
7	AG1	An Giang	3	Châu Thành, Thoại Sơn, Tp Long Xuyên
8	AG2	An Giang	3	Tri Tôn, Tịnh Biên, Châu Phú, TP Châu Đốc
9	AG3	An Giang	3	Chợ Mới
10	AG4	An Giang	3	Phú Tân
11	AG5	An Giang	3	An Phú, Tx Tân Châu
12	KG 2	Kien Giang	4	Hà Tiên, Hòn Đất, Kiên Lương, Giang Thành, Phú Quốc
13	KG1	Kien Giang	4	Rạch Giá, Tân Hiệp, Giồng Riềng, Châu Thành, Gò Quao, An Biên, Vĩnh Thuận, An Minh, U Minh Thượng, Kiên Hải
14	HG	Hau Giang	5	All
15	ST	Soc Trang	6	All
16	BL	Bac Lieu	7	All
17	CM	Ca Mau	8	All
18	VL&TV	Vinh Long - Tra Vinh	9	All
19	TG&BT	Tien Giang - Ben Tre	10	All
20	LA2	Long An	11	Tân Hưng, Vĩnh Hưng, Mộc Hóa, Thạnh Hóa, Tân Thạnh, Tx Kiến Tường
21	LA1	Long An	11	Đức Huệ, Đức Hòa, Thủ Thừa, Bến Lức, Tp Tân An, Tân Trụ, Châu Thành, Cần Đước, Cần Giuộc
22	EXT1	HCM	12	All và các tỉnh liên kết phía Bắc
23	EXT2	Tay Ninh - Cambodia	13	Cambodia phia Bac (giao Dong Thap, Long An, Tay Ninh)
24	EXT3	Cambodia	14	Cambodia phia Nam (giap An Giang, Kien Giang)

Source: Baseline survey of Cao Lanh Impact Evaluation

5.11 Conclusion

The results of the user surveys show that the Cao Lanh ferry, with around half of the passengers and a sixth of the freight volume of the Vam Cong ferry, plays a more local role than the latter. Since the Vam Cong ferry caters to longer distance car, bus and truck traffic it can be expected that after the completion of the entire Connectivity Project significant regional connectivity benefits will ensue as planned.

6 Results – Qualitative Research

The qualitative study has employed the research approach outlined in the Design of Cao Lanh Impact Evaluation. Three respondent groups were consulted including (i) Transport operators; (ii) Manufacturing enterprises in industrial zones; and (iii) Affected households, to obtain insights into the range of development impacts generated by the CLBP. The hypotheses contained in the design are an important guideline for the conduct the qualitative research as explained in Section 4. Findings are presented for the three groups of respondents separately; only relevant hypotheses are discussed.

6.1 Transport operators

The research team conducted interviews with 13 transport operators across the three provinces. Having diverse characteristics in their type of activities, their locations and scale of operations, findings from the interviews have enabled the research team to get a more solid understanding regarding the perceived impact of Cao Lanh Bridge on the transport sector.

Hypothesis 1: The Project investment will generate accessibility and mobility improvements, leading to wider socio-economic development benefits within and among the three provinces

Accessibility refers to the ability of people and businesses to reach desired goods, services and activities, while mobility can be understood as the ability and level of ease of moving goods and services. From the transport operators' viewpoint, improvements in accessibility and mobility are mainly delivered through shorter travel time and lower travel costs.

Improvement of accessibility and mobility between the North and the South bank of Tien River

Reduced travel time is usually the primary user benefit from a transportation project. Cao Lanh Bridge is no exception. The project is highly regarded by Dong Thap transport operators, as it is seen to potentially alleviate congestion at the Cao Lanh Ferry site, which may lead to travel time being significantly reduced between the North and the South bank of the Tien River. While it usually only takes 10 to 30 minutes (depending on the river flow) for the ferry to cross the river, the waiting time at the ferry can at times last much longer. Occasionally, it takes up one to two hours for buses and trucks to wait in the queue before they get on board. Once in full operation, Cao Lanh Bridge will allow buses and trucks to reduce most of their waiting time at the ferry. In particular, shorter travel time will be most significantly felt by heavy trucks and containers, which at the present time are types not being allowed to use the services at Cao Lanh Ferry. The ferry regulates that trucks above 16 tonnes cannot use the ferry services. Instead of taking a shortcut through Cao Lanh Ferry, those types of vehicles have to rather travel further down through My Thuan Bridge. In such cases, the travel distance is twice as long as the distance if they could cross the ferry or the bridge.

Box 1: Reduced travel time between the North and the South bank of Tien River

In the Mekong River Delta, the network of rivers and canals provides the region with plenty of livelihood resources while also acting as an important inland transport waterway. On the other hand, it also separates the region; many places are unreachable if there is no ferry service or bridge to cross the many rivers and canals.

Dong Thap is the typical example for this. On the North bank of Tien River, there are Hong Ngu Town (a part of the two districts Hong Ngu and Thanh Binh), the districts of Tan Hong, Tam Nong, Cao Lanh, and Cao Lanh City. Located in the South of Tien River consists a part of the two districts Hong Ngu and Thanh Binh, the districts of Lap Vo, Lai Vung, Chau Thanh, and Sa Dec City. There are two main available routes to travel between the North and the South Bank of Tien River. The first option is to cross via the Cao Lanh ferry, while the second option is to cross via the My Thuan Bridge and turn back toward the Cao Lanh direction by NR30. Sa Dec and Cao Lanh city are the two main centres of Dong Thap Province, where the business activities of the province mainly takes place. The distance between these two destinations, by taking the first option, is much shorter compared to the second option (i.e. only 30-35 km by the first option

versus 70 km by the second option). However, the travel duration of those two options are not significantly different, as the waiting time at the ferry is more or less equal to the time it takes to travel by the longer distance.

The Hiep Phat Loi company, which has the largest containers in Dong Thap, revealed that about 30 to 40 percent of their freight shipments require them to combine consignments in both Cao Lanh and Sa Dec. In such circumstances, their containers have to take the longer route by crossing My Thuan Bridge in order to combine consignments at these two places. This takes about 12 hours including the loading time. Once Cao Lanh Bridge comes into operation, Hiep Phat Loi estimates that the travel time between Sa Dec and Cao Lanh will be about 6 hours, which is half of the current travel time, and therefore certainly lead to lower transport costs and expanded operational capacity.

Source: Qualitative study of Cao Lanh Impact Evaluation 2017

Traffic congestion at the Cao Lanh Ferry is often more severe in rush hours. Buses and trucks often try to avoid the rush hours in order to minimize delays at the ferry. However, it remains unpredictable as to when and how severely traffic congestion takes place in other periods of the day. This leads to high variability in travel time. For freight transportation, on-time delivery is one of the most important criteria, as the opportunity costs resulting from late delivery can be substantial. *"In case of urgency, we have to pay for the ferry operators or middle-man at the ferry so that we can go faster. We might have to pay about 300 to 500 thousand dong, depending on the situation, as we do not want to pay for the fine due to late delivery. Late delivery also harms our reputation. When Cao Lanh Bridge comes into operation, we don't have to pay that fee, which is a relief for us."* – said Sa Dec Transport Cooperative manager. In addition to reduced travel time, another important implication of Cao Lanh Bridge is hence less travel time variability.

For transport operators who run the route between the North and South bank of Tien River, lower travel costs will mainly occur by the two features of shorter distances and reduced travel time; and less travel time variability. The prospects of substantial reductions in travel time will certainly allow for transport operators to curtail their direct costs including driver wages and benefits, and fuel costs. *"As a container carrying more than 20 tonnes cannot use Cao Lanh ferry, the container has to instead cross My Thuan Bridge. The cost will substantially decrease if we can use Cao Lanh Bridge"* – said the Cao Lanh Transport Cooperative manager. *"From Cao Lanh to Sa Dec and vice versa, we need half a day to combine consignments in these two places. The costs per trip are about 950 thousand dong for fuels and driver wages. If we now are able to use Cao Lanh Bridge, these costs will only be 425 thousand dong, meaning reduced more than a half"* – said Hiep Phat Loi Transport Director.

Though reduced travel time and travel costs are widely perceived as the main benefits of Cao Lanh Bridge, the transport operators added that the magnitude of those benefits will also depend on whether or not a toll will be collected from using the bridge, and how much that toll will be. While the Dong Thap Department of Transport has assured stakeholders that the Cao Lanh Bridge will be toll free, this information is not widely known by local transport operators.

Improvement of accessibility and mobility to other provinces

When discussing the improvement of accessibility and mobility to other provinces, it is crucial to take into account the whole Connectivity Project. It is generally appreciated by both Dong Thap and An Giang transport operators that the Connectivity Project will generate improvement in accessibility and mobility from Dong Thap to An Giang and Kien Giang and vice versa. Similar to the case of traveling between the North and the South bank of Tien River, the Connectivity Project will significantly reduce the travel time to other provinces. At present, the duration of travel to other provinces is considerably affected by the waiting time at the Cao Lanh and Vam Cong Ferries. Although traffic congestion at Cao Lanh Ferry is severe, the traffic congestion at Vam Cong Ferry is much worse in terms of waiting time and travel time variability.

Can Tho transport operators also agree that the Connectivity Project will yield improvements for travel from Dong Thap to An Giang and Kien Giang and vice versa. However, the project would not bring about any significant impact to their own operations because they travel on different route from Can Tho to Dong Thap. *"We don't run through Vam Cong, Cao Lanh route even if we want to go to Cao Lanh. Travelling through Can Tho and My Thuan Bridge is much more convenient."* – said Can Tho Transport Cooperative manager.

In terms of impact magnitude, Vam Cong Bridge is more appreciated than Cao Lanh Bridge as the demand to travel through Cao Lanh Bridge is lower than through Vam Cong Bridge. *"Vam Cong Bridge surely will bring about significant impact. Yet, the impact of Cao Lanh Bridge remains uncertain, because we normally use the route Vam Cong – My Thuan – Trung Luong Highway to HCMC. The route Vam Cong – Cao Lanh – Trung Luong Highway is barely used as the connecting road from Cao Lanh to Trung Luong is still too narrow, bumpy and crowded."* – said Doan Ket Transport Cooperative. Nonetheless, this view will certainly change in the future once the project Cao Lanh – My An connecting road is completed. The latter project is being planning and is expected to be completed by 2021.

Cao Lanh Bridge is a crucial part of the forthcoming new route to HCMC. This new route is highly regarded as a better traveling option and supplements the nearly overloaded route through My Thuan Bridge to HCMC by connecting Cao Lanh Bridge to N2 NR, while at the same time enabling a shorter traveling time to HCMC.

Hypothesis 4: The Project will lead to the growth in containerized road freight across three provinces

One of the hypotheses given for this evaluation is that the Project will lead to a growth in containerized road freight across the three provinces. The number of containers among the surveyed transport operators is at present time limited. In two transport cooperatives in An Giang, despite the large number of vehicles among the transport cooperatives (more than 1000 vehicles in 1 transport cooperative and 630 vehicles in the other cooperative),the number of containers remains relatively limited and accounts for less than one percent of the total number of vehicles. For Dong Thap, this number is higher, though not substantially, as its two transport cooperatives have 65 containers and over 1250 vehicles in total.

According to these transport operators, whether the hypothesis becomes realised remains a question to be clarified further in the coming years. There are many reasons behind the relatively limited number of containers currently in operation.

Firstly, transport operators from the three provinces face fierce competition from the inland waterway transportation and established logistics companies from HCMC. Most of the containerized freight are transported to HCMC. Their clients often choose the large logistics companies from HCMC if express delivery is required. The comparative advantages of these companies are mainly around their large-scale operations and their extensive experiences in transport and customs handling. If the client does not require quick delivery services, he or she can choose waterway transportation in order to benefit from the relatively low costs and high loading capacity of this type of transport.

Secondly, other barriers to containerized road freight are the comparatively low authorized loading capacity, as compared to international standards, and the inconsistency in authorized loading capacity of the road infrastructure. Due to this inconsistency, containers often run below capacity. *"Our containers can carry up to 40 tonnes; however the road network only allows us to load 20 tonnes at maximum. To maximize the efficiency, we often load 25 to 27 tonnes and have to bribe the law enforcement officer if being caught. Cao Lanh and Vam Cong Bridge is a great investment, but it won't help changing the situation"* – explained by Hiep Phat Loi Director. The operational efficiency is not highly impressive when these transport operators run about 40-50 percent under capacity as the current situation. These barriers hindering the growth in containerized road freight across the three provinces are expected to persist even with Cao Lanh Bridge and the Connectivity Project under full operation. Therefore, as for now prospects for growing containerized road freight across the three provinces are quite constrained.

Rather than a project that set out to promote growth in containerized road freight, transport operators instead believe that Cao Lanh Bridge and the Connectivity Project will promote the growth in the number of trucks. The first reason is that they will allow for bypassing the overloading and under-capacity issues currently persisting in container operations. In addition, the container takes much longer time to transport to HCMC while only being able to carry 20 tonnes at maximum, indicating relatively low operational capacity. *"From Long Xuyen to HCMC, while normal trucks might take only 6 hours to complete the trip, it takes the container about 10 to 12 hours to complete the same trip.*" – said the Doan Ket Transport Cooperative manager. The underlying reasons are the slower speed of containers on the general roads and longer waiting time for the ferry. The completion of Vam Cong and Cao Lanh Bridge will reduce the waiting time at the ferry. However, the first constraint will persist even after completion unless further investments are made for the connecting road from Cao Lanh to N2 NR. Despite the challenges, some transport operators still express optimism about the growth of containerized

freight transport in the future as the "law of market". *"The smaller transport vehicle will be replaced by larger transport vehicle if the road system can facilitate these changes"* explained by Truong Thinh Transport Cooperative manager. The transport operators also believe that the construction of Cao Lanh and Vam Cong Bridges is the catalyst for future infrastructure development. The likelihood of increasing the number of containers in Dong Thap depends on future infrastructure plans, especially the My An - Cao Lanh Road connecting to N2 NR. However, it should be noted that the transport operators are those who are aware of the project My An - Cao Lanh Road Project, which is still in the planning phase. The number of transport operators is quite small, and only three out of 13 transport operators are aware of this project. Information about any future infrastructure plan should be disseminated widely so that transport operators can plan their future operations more effectively.

Hypothesis 5: The Project will stimulate the development of Cao Lanh as an intra-provincial and inter-provincial bus passenger transit center, with increased tourism visitation and quicker access to/from HCMC

The survey results from the transport operators suggest that Cao Lanh has a low potential to become an inter-provincial bus passenger transit center. Instead, Cao Lanh Bridge might provide a better condition and facilitate more travel demand for intra-provincial bus passenger.

Having low potential to become an inter-provincial bus passenger transit center

Before asking transport operators their opinion regarding this hypothesis, two questions were asked in advance including (i) whether Cao Lanh Bridge will stimulate growth in tourism visitation; and (ii) with its presence, would Cao Lanh facilitate quicker access to/from HCMC.

From the viewpoint of An Giang and Can Tho transport operators, Dong Thap does not have as much tourism potential as other surrounding provinces of Can Tho, An Giang and Kien Giang. The surrounding provinces have distinguished characteristics that attract tourism. Can Tho has the location advantage, by lying in the center of the Mekong Delta, with relatively close proximity to My Thuan and Can Tho Bridge. Having a modern airport, Can Tho plays an important role as the connecting point to other provinces in the Delta. Kien Giang is famous for beach tourism and U Minh Thuong primitive forest, while An Giang is well-known for spiritual tourism. Despite having plenty of valuable ecotourism resources, such as Tram Chim National Park, Gao Giong ecotourism site, Sa Dec flower village (the home of hundreds of "uncanny flowers and strange herbs"), Go Thap, Oc Eo cultural relics and Nguyen Sinh Sac historical site, there is widespread belief that Dong Thap does not present high enough potential for tourism. *"We don't cross the river to Cao Lanh because there is no potential for tourism on that side"* – said Doan Ket Transport Cooperative manager.

Being well-aware about their province's tourism resources, Dong Thap transport operators remain confident that Cao Lanh Bridge will contribute to the province's tourism development. Yet, in their sharing, Dong Thap has yet to become one of the region's main destinations for tourism. Dong Thap tourist sites are at the present time supplementing other provinces' tourism activities. It is believed that Dong Thap tourist sites will benefit indirectly by the reduction of the time of other tourism activities spent on waiting at the ferry. *"At the moment, many people visit Chau Doc, An Giang for spiritual tourism. Sometimes they also want to visit Nguyen Sinh Sac historical site or to Xeo Quyt, but the waiting time at the ferry is too long. Hence, at the present moment it is impossible to combine these activities in one day, so they only visit Chau Doc. When Cao Lanh Bridge is completed, they do not have to wait at the ferry, and will more likely visit other touristic sites in Dong Thap."* – said Sa Dec Transport Cooperative manager.

According to Dong Thap Department of Tourism, the number of tourists in Dong Thap in 2016 is roughly 2.5 million, which is only half of the number for Kien Giang, An Giang and Can Tho[15]. The vision of Dong Thap for tourism by 2020 aims to increase this number to 3.5 million people, a target which remains considerably lower than the other three provinces. This suggests that Dong Thap has yet to build and strengthen its advantages from its tourism resources. According to transport operators, this task requires far more cohesive efforts by the province in order to promote tourism development. The construction of Cao Lanh Bridge, while being a premise for future road infrastructure, is by itself insufficient for the task.

[15] According to Department of Tourism in An Giang, Can Tho and Kien Giang, the number of tourism visitation in 2016 to their provinces are respectively 6.4 million, 5.3 million and 5.4 million times.

In addition, Cao Lanh Bridge has still yet to enable quicker access to HCMC. As previously explained, the connecting road after Cao Lanh Bridge toward HCMC has yet to sufficiently meet the demand for travel. *"Actually, it takes more time to travel through Cao Lanh to HCMC than the route running through Vam Cong – NR 80 – My Thuan, because from Cao Lanh to Trung Luong Highway, the road is narrow and crowded, leading to lower speed."* – explained the Sa Dec Transport Cooperative manager. An Giang transport operators also agree with this statement. "*Long Xuyen to HCMC is our main route. To travel from Long Xuyen to HCMC, the route chosen to go to HCMC is to bypass Vam Cong Bridge taking the NR 80 to My Thuan, heading to NR 1 to HCMC. Even if Cao Lanh Bridge comes into operation, we would not choose to use Cao Lanh Bridge and NR 30 because the NR is too narrow, bumpy and crowded."* – said Doan Ket Transport Cooperative manager.

In brief, there are many prerequisites to be met in order to turn Cao Lanh into an inter-provincial bus passenger transit center. At the present time, even An Giang and Kien Giang, which are the more developed provinces, hardly meet the prerequisites to become inter-provincial bus passenger transit centres themselves. Tourism development and improved infrastructure stand out as two critical conditions. Land allocation and investment attraction policies are no less important conditions to be met.

Intra-provincial bus passenger transit center

Although prospects for more tourism and improved transport to HCMC might not change in the near future, Cao Lanh Bridge nonetheless plays a very important role in connecting the two parts of the province itself, which has long been separated by Tien River. As previously mentioned, on the north bank of Tien River, there are Cao Lanh, Hong Ngu, Thanh Binh, Tan Hong and Tam Nong. The remaining districts including Sa Dec city, Lap Vo, Lai Vung and Chau Thanh, lie in the south bank of Tien River. There are currently very limited bus routes running between these two parts of Dong Thap. Therefore, Cao Lanh Bridge is literally "bridging" these two parts.

Box 2: Bridging the region

"Actually, there is demand for passenger carriers between the districts in the North and the South of Tien River. Yet, there is almost no bus route serving those people" - said Sa Dec Transport Cooperative manager. The results from ferry user survey corroborate this situation. According to Dong Thap transport operators, Cao Lanh Ferry is the primary reason for this situation. The waiting time for a bus at the ferry site is quite long and the variability of travel time is high. The costs incurred by waiting at the ferry and from the unpredictable ferry schedule due to high variability of travel time are barriers to efficient operations.

Sa Dec Transport Cooperative once attempted to run such a bus route. However, the route was terminated after several months, as the route's revenue could not cover its cost. "*We even tried both options including the short distance option - bypassing Cao Lanh ferry; and the longer distance option – bypassing My Thuan Bridge. They were both similarly cost-inefficient. Hence, we were forced to cancel this route."* added by Sa Dec Transport Cooperative.

However, the cooperative representative believes that the completion of Cao Lanh Bridge will change this situation. He said - *"We will re-establish the route between Sa Dec and the districts in the North bank such as Cao Lanh city, Tam Nong, Hong Ngu etc. to meet the underserved travel demand"*.

Sa Dec Transport Cooperative is not the only one transport operator responding in this way. Their opinion was shared by Cao Lanh Transport Cooperative. The transport operators believe that more players will participate in this underserved market for such bus routes. Dong Thap people will benefit the most from this change.

Source: Qualitative study of Cao Lanh Impact Evaluation 2017

By bridging the region, Cao Lanh Bridge is expected to facilitate greater tourism development within the province. For example, people from Sa Dec can easily visit Nguyen Sinh Sac historical site at Cao Lanh, and then visit other tourism sites such as Tram Chim and Xeo Quyt. Similarly, people from Cao Lanh can travel smoothly in order to visit Sa Dec's flower village. The greater travel demand will in return stimulate the development of passenger transport services. *"If there is more demand, we can run 29 seats bus instead of 16 seats bus, as the cost of running between these two types of bus are similar. It enables us to earn greater profit."* - said the Sa Dec Transport Cooperative manager.

Hypothesis 6: The Project will stimulate the growth in transport facility and employment in transport sector within all three provinces

Can Tho transport operators do not support this hypothesis. They believe that the project does not affect their operations because the chosen route to Dong Thap or An Giang currently do not bypass Vam Cong or Cao Lanh Bridge. In order to confirm this, the research team has met a representative of Phuong Trang, which one of the biggest passenger carriers in Vietnam and well-known for their swift activities in establishing new potential passenger carrier routes. *"Despite having the new route, it is very unlikely that we will change the route in the future"* – said Phuong Trang Can Tho representative. The statement from Phuong Trang representative reflects a fact that the impact of the Connectivity Project on Can Tho might be insignificant.

An Giang transport operators remain uncertain about the impact of Cao Lanh Bridge and the Connectivity Project. In their view to begin with, the Connectivity Project will ease the traveling through Vam Cong Ferry, and facilitate quicker access to HCMC through the "traditional" route – Vam Cong – My Thuan Bridge to Trung Luong. However, its impact on their operations remains unknown. "*While costs play a crucial role when considering change in transport operations, increase in transport needs is more important. I think in the future, the transport needs will increase, but at the moment we cannot estimate the magnitude of this change"* – said Doan Ket Transport Cooperative manager. It is not yet clear to An Giang transport operators what factors are needed in order to increase the transport needs. The only way to clarify is by trial and error. Truong Thinh Transport Cooperative, for instance, plans to experiment the route from Long Xuyen to Da Lat without visiting HCMC. With an average speed of 50 km per hour, the company is expecting to be able to reduce the travel duration from 12 hours to 9.5 hours as a result of the Connectivity Project.

Dong Thap transport operators, on the other hand, have a clearer idea about how Cao Lanh Bridge and the Connectivity Project will promote growth in the transport sector. For passenger transport services, the shortening of waiting time at Cao Lanh and Vam Cong Ferry is expected to boost travel demands to An Giang and Kien Giang. *"It is easier to travel to Ha Tien or to An Giang now when tourists do not have to spend a lot of time waiting at the ferries. We will survey the travel demand to decide whether or not we would open the new route to Ha Tien and An Giang. It's crucial in the transport sector to have a breakthrough and predict the new travel demand accordingly."* – said Cao Lanh Transport Cooperative manager. In addition, as previously explained, intra-provincial travel demands have yet to be sufficiently met as they currently remain cost inefficient from the traffic congestion and long waiting time at Cao Lanh Ferry. Dong Thap transport operators will participate in this underserved market once Cao Lanh Bridge comes into full operation.

Growth in freight transport operations related to combined consignment will be stimulated once Cao Lanh Bridge is completed. Freight transport services are very competitive and sensitive to transport price levels. Being more cost-efficient, transport operators will have a competitive advantage in approaching new customers who are willing to cooperate if the offered freight transport price is relatively low. Combined consignment freight services can also be provided for fruit, often viewed as the "less traditional commodity" for containers. This is because fruits require a tight schedule and short travel duration. "*Dong Thap has plenty of potential in agricultural products, especially fruits, with their own trademark like Cao Lanh mango, Lai Vung mandarin, Chau Thanh longan etc. There is high demand for combining consignments for many varieties of fruits from these district and transport to HCMC. However, the transportation time required for fruit is much shorter than for other commodities, normally about 5-6 hours. It has been impossible for us to combine consignment in these locations due to traffic congestion at Cao Lanh Ferry. Cao Lanh Bridge will make it possible."* - said Hiep Phat Loi Director.

Despite the positive remarks on how Cao Lanh Bridge and the Connectivity Project might boost growth in the transport sector, the views held by An Giang were meanwhile also shared by Dong Thap transport operators. Growth in the transport sectors will crucially depend on the growth of travel and transport demands. It has to be accommodated by further infrastructure investment and investment attraction policies in order to promote development in the transport sector.

6.2 Enterprises in industrial zones

In-depth interviews were conducted with 12 enterprises in six industrial zones across the three provinces of An Giang, Can Tho and Dong Thap. The six selected industrial zones are likely to benefit from Cao Lanh Bridge and the Connectivity Project. In each industrial park, the research aimed to interview three manufacturing importers/exporters operating in areas including agricultural products, manufacturing products and high-technology products. However, there was no high-technology manufacturing importers/exporters in the selected six industrial zones. Despite the small number of interviewees, findings from those still reflect the real situation of enterprises in the industrial zones.

Hypothesis 1: The Project investment will generate accessibility and mobility improvements, leading to wider socio-economic development benefits within and among the three provinces

There was consensus among all interviewees that Cao Lanh Bridge and the Connectivity Project will save travel time by easing the traffic congestion at the Cao Lanh and Vam Cong ferry sites. However, whether or not and how the project will benefit their operations is another question. With the road infrastructure in place, the impact of Cao Lanh Bridge to enterprises' operations appear limited at present. Vam Cong Bridge is expected to bring more benefits for enterprises in the industrial parks.

From the viewpoint of manufacturing enterprises in industrial parks (hereinafter called manufacturing enterprises), the impact of Cao Lanh Bridge as well the whole Connectivity Project may be felt in two important phases of their operations – transporting raw materials and the finished product. Similar to the transport operators, manufacturing enterprises reap the benefits of infrastructure projects when those projects are linked with their operations.

Cao Lanh Bridge is expected to reduce the transportation time and transportation costs of raw materials for manufacturing enterprises collecting their raw materials in Dong Thap. These are companies operating in the processing of fruit, vegetable and aquaculture by-products. It is noted that the value of time savings will ultimately depend on the nature of commodities transported. Raw materials derived from fruit, vegetable and aquaculture by-products are very sensitive to transportation time. The cost of delay is substantially high. If the transportation time is longer than allowed, manufacturing enterprises are usually forced to produce lower quality products. This is the case for aquaculture by-products when all the raw material must be ground into fish powder, which is the lowest value by-product. The worst case is when the raw material can no longer be used, which happens most often for vegetables and fruit processing. *"Delay in transportation time sometimes is caused by traffic congestion at Cao Lanh Ferry. Several hours spent on waiting at the ferry is deteriorating to the quality of raw materials. We have a saying for agriculture, "goods in the morning, trash in the afternoon", which illustrates how time duration affects the quality of agriculture products and the importance of keeping agricultural raw materials as fresh as possible in delivering high quality products."* – said a representative of An Giang Fruit-Vegetables & Foodstuff Joint Stock Company.

Enterprises can benefit from lower transportation costs and from shorter transportation time. As previously explained, Cao Lanh Bridge will lead to a reduction in travel time and transportation costs. These favorable implications can be passed on to the enterprises if transport operators offer lower freight costs. It has yet to be determined whether freight costs will be lowered, but the enterprises stand in a great position to negotiate on freight prices with transport operators nevertheless. In addition, expectations by transport operators of less variability in transport time from Cao Lanh Bridge, means lower contingency time and costs, manufacturing enterprises will in turn be able to reduce costs associated with late delivery, such as additional transportation cost and wage for workers.

Box 3: Higher performance of agriculture by-product processing activity – impact from Cao Lanh Bridge

Cuu Long Fish Import – Export Corporation is a large company located in Sa Dec Industrial Zone. The company has three main operations including seafood aquatic food, frozen aquaculture products and aquaculture by-products. The company has set up a closed cycle operation and monitors every key element in the whole process, except for their aquaculture by-product operations. The raw material for aquaculture by-product processing is the remaining fish body after being filleted. Despite having large-scale operations in aquaculture processing, the company is only able to provide a small proportion of the raw material for the

aquaculture by-product processing operations. In order to supply enough raw material for by-product processing operations, the company has to collect raw materials from other aquaculture processors across An Giang, Can Tho and Dong Thap.

According to the company representative, the company is substantially exposed to the risk of late delivery when purchasing raw material in Dong Thap. Many aquaculture processors in Dong Thap are located in Cao Lanh, where congestion at Cao Lanh ferry happens frequently. *"When there is severe congestion at Cao Lanh Ferry, we have to change the route toward My Thuan Bridge to guarantee that raw material remains fresh. This leads to additional transportation costs and other costs, such as overtime salary and food for workers, because the raw material will be worthless if left overnight. Even with those circumstances, the transportation time remains too long. When the raw material is no longer sufficiently fresh, we cannot separate parts of the fish into other more valuable by-products, such as fish stomach, fish bladder, and fish oil. Instead, we have to grind the fish into fish powder. For this reason, we do not often purchase raw materials in Dong Thap despite its close proximity to our plant and lower purchasing costs. When Cao Lanh Bridge comes into operation, this issue will be resolved."*

Source: Qualitative study of Cao Lanh Impact Evaluation 2017

Yet, many manufacturing enterprises in industrial zones may not been able to reap the benefits of the construction of Cao Lanh Bridge for their finished goods transportation. There are two reasons for this. First, the majority of finished goods are transported by inland waterway, which has the advantages of low cost and high loading capacity. More importantly, the route to HCMC from these industrial zones, including industrial zones in Dong Thap, does not bypass Cao Lanh Bridge. Further investment into the road network from Cao Lanh to N2 NR is crucial to bring about more significant impact for the manufacturing enterprises in industrial zones.

Hypothesis 3: The Project will expand and deepen the labor market areas for Cao Lanh residents, with improved road access to other provincial centers for additional employment opportunities.

The distance from Cao Lanh to the closet provincial centers is approximately 36 km to Long Xuyen, 67km to Can Tho, 111 km to Kien Giang. Cao Lanh Bridge and the Connectivity Project will certainly bring about improvements in the road access to other provincial centres such as Long Xuyen – An Giang, Rach Gia – Kien Giang, Can Tho. The question remains whether or not, and to what extent, this improvement will bring forth additional employment opportunities for Cao Lanh residents.

One of the interviewees, Co May Aquaculture Processing Company representative, answered this question by making the following rhetorical question: *"In your opinion, which are the most attractive provinces for workers?"*. *"Binh Duong and Long An. These are the labor hubs, as these provinces are considered to be huge industrial zones."* he said. Similar views are shared among other manufacturing enterprises. Many manufacturing exporters in industrial zones are short of labor, because many workers migrate to Binh Duong and Long An, where they are offered a higher salary. Unfortunately, as the other provincial centres are, at present time, not regarded as labor hubs, the hypothesis was unanimously rejected by all interviewers.

How Cao Lanh Bridge and the Connectivity Project will benefit Cao Lanh residents in terms of labor market opportunities was the second question posed to the manufacturing enterprises. The research team received two answers. The first one related to the direct impact of Cao Lanh Bridge. Although Sa Dec is a big industrial zone on the other side of the Tien River, the inconvenience of traveling between the North and the South bank of Tien River has long been seen as a barrier hindering workers to seek employment opportunities in Sa Dec. Removing this barrier will certainly be a crucial step toward expanding labor market opportunities for Cao Lanh residents. "*There are many laborers who want to work in Sa Dec Industrial Zone. However the distance is far. Also, they have to wait at the ferry. They have to get up very early. Otherwise, they have to rent a room near here. Often, workers from Cao Lanh do not come here. Having Cao Lanh Bridge, I think more workers, including Cao Lanh residents, will come to Sa Dec Industrial Zone*" – said Cuu Long Fish Import – Export Corporation representative. The other answer was on the macro-economic perspective. *"Cao Lanh Bridge is a premise for infrastructure development. When the road infrastructure is complete, Dong Thap will be able to further attract FDI and develop its tourism. More employment opportunities by potential will be created within the province."* – said Co May Aquaculture Processing Company representative.

Hypothesis 4: The Project will lead to the growth in containerized road freight across all three provinces (Achieving economies of scale, reduced numbers of individual small truck movements, and lower costs per unit of freight).

The selection of freight across transport modes, often called modal choice, is dependent on three main factors - price, speed and reliability. Among all interviewed manufacturing enterprises in the industrial zones, the decision of modal choice often involves three main modes of freight transportation including barge, trucks and containers. Barge, the most popular mode for inland waterway transportation due to its high loading capacity, is the most preferred transportation choice whereas containers is the least popular mode.

The loading capacity of a barge is about 5 to 10 times higher than the maximum road freight. The cost of transport by barge is much lower due to its high capacity. The cost of barge transport is two times lower than the cost of container transport. In addition, the risk associated with freight transportation by barge is less significant compared to containers. *"Transporting frozen seafood products requires refrigerating machines. It is safer for frozen seafood products when transported by barge because there is always an electric generator in place, unlike in containers."* – said the representative of NTSF Seafood Joint Stock Company. The major weakness of inland waterway transport is its longer transportation time. *"Transportation time by barge is three times higher than by containers."* – added by Can Tho Fertilizer and Chemical Joint Stock Company representative. Therefore, barge is often selected when the shipment is not urgent.

Trucks, on the other hand, are chosen over container transportation because of the shorter delivery time and lower costs. From Binh Hoa industrial zone in An Giang, for example, it currently takes 6 hours for a truck to arrive in HCMC, while the time taken for containers is 12 hours. In addition, container freight prices are higher as the containers normally run one-way empty while the freight prices are calculated based on two-way transport. The reason behind this is that trucks enjoy greater flexibility in combining cargo for the way back. It is obvious that the higher the load, the lower will costs be. However, at present almost all containers operate below capacity. This has certainly depressed the cost-saving advantage of containers compared to trucks.

Even though containerized road freight remains limited across all three provinces, manufacturing enterprises still believe that Cao Lanh and Vam Cong Bridge are important elements to the improvement of the transport network to HCMC. The Cao Lanh – My An project connecting to N2 NR will be the next step, and is expected to promote growth in containerized road freight. Having this system in place will lead to lower under-capacity rates, which is about 40 percent as currently reported. In other words, the system will enable containerize freight to achieve economy of scale, which may lead to lower costs per unit of freight. *"If the cost of containerized freight is about 20 to 30 percent higher than the cost of barge freight carry, we will certainly choose container, because the shortened time will compensate for the differences in costs and increase revenue. Currently, these costs are too high, and shorter transportation time by itself is insufficient to compensate for the higher costs of container."* – said Can Tho Fertilizer and Chemical Joint Stock Company representative.

Hypothesis 7: The Project will strengthen the Dong Thap provincial economy, with the creation of demand for bridge/road building materials and the acquisition of additional building skills and opportunities.

Manufacturing enterprises agreed that Cao Lanh Bridge will stimulate the development of the Dong Thap provincial economy. However, the reason is not the creation of demand for bridge/road building materials and the acquisition of additional building skills and opportunities, as suggested in the hypothesis. Rather, the development of the Dong Thap provincial economy is expected to be attributed to increased trade and further potential investment attraction.

Strengthened linkages between enterprises within the region

The majority of manufacturing enterprises within the region operate in the aquaculture and agriculture processing industry. In this industry, the supply of high quality raw materials plays a critical role in performance. For this reason, enterprises place a high priority on raw material sourcing decisions. As previously explained, improvements in the accessibility and mobility between the North and the South bank of Tien River will reduce transportation prices, and also minimize the risk associated with delayed delivery from traffic congestion at the ferries. These improvements may induce changes in their strategy of purchasing raw material.

Box 4: Change in decision-making of raw material purchasing as an impact from Cao Lanh Bridge construction

Cuu Long Fish Import – Export Corporation established an aquaculture by-product processing plant in 2014 with a total capacity of 8000 tonnes per year. Raw material is purchased in three locations, including An Giang, Can Tho and Cao Lanh. Despite the close proximity to Sa Dec Industrial Zone, raw material purchased from Cao Lanh only constitutes 30% of the total purchased raw materials, equal to only half of raw material purchased in An Giang. The main reason is the associated high risk of delayed delivery from bypassing Cao Lanh Ferry. According to the enterprise representative, loss from delayed delivery can reach up to 300 to 400 million VND per month.

When Cao Lanh Bridge comes into operation, the company will expand their raw material purchases to include Cao Lanh, as the transportation time and transport costs will be lower than An Giang. *"In the near future, we plan to increase the capacity of the aquaculture by-product processing plant by 70 percent. The purchase of raw material will increase significantly. With the presence of Cao Lanh Bridge, the main raw material purchasing location will be Cao Lanh if the supply suffices."* Said Cuu Long Fish Import – Export Corporation representative.

Source: Qualitative study of Cao Lanh Impact Evaluation 2017

Linkage between enterprises is expected to be strengthened not only within Dong Thap, but also within An Giang. Such linkages are to be particularly deepened in the key economic sectors of Dong Thap – fruit, rice and aquaculture. *"In general, when the Connectivity Project completes, we will expand the region of raw material purchase to include Dong Thap, for example mango in Dong Thap. We may also invest in growing fruit in Dong Thap as the province has great potential of growing high quality fruit"* – said the representative of An Giang Fruit-Vegetables & Foodstuff Join Stock Company. According to the Vice Director of Dong Thap Management board of industrial zones, Dong Thap has great potential to increase its trade with other provinces, such as Kien Giang and Can Tho, when transportation becomes more convenient.

Investment attraction

Increased trade and lower transportation costs will lead to lower production costs. In turn, lower production costs may promote the comparative advantage of the province and attract more investment. *"You know, transportation costs play an important role in determining the prices of agriculture products right? Lowering transportation costs has double effects to farmers. They can work with a lower production cost and sell with less discounts due to high transportation costs. When the product price is lower, Dong Thap has a competitive advantage in prices to compete with other provinces, and attracting more investment."* said Co May Aquaculture Processing Company representative.

Locational advantage is an important consideration of any investment decision. The locational advantage of Dong Thap can be maximised once the connecting route from Cao Lanh to N2 is completed. Dong Thap is in closer proximity to HCMC than both An Giang and Can Tho, whereas its labor costs are certainly lower than Can Tho. Cao Lanh Bridge is a critical component of this change. *"Cao Lanh Bridge is the starting point. I believe that further investment will be made to strengthen the traffic network"* – said the Vice Director of Dong Thap Management board of industrial zones. There is a broad consensus that, without the construction of Cao Lanh Bridge, there will be no point of building the Cao Lanh – My An road.

There is no doubt that Cao Lanh Bridge and future investment into connecting roads to HCMC will play an important role for increased trade and investment. However, there are many other accommodative factors that also require further consideration, such as investment attraction policy, land allocation policy and the provincial development strategy.

6.3 Households and gender analysis

Three ward/communes located near the Bridge were selected for this qualitative study. The three communes are Ward 6, Tinh Thoi commune in Cao Lanh city, and Tan My in Lap Vo district. As per the design of Cao Lanh Impact Evaluation, the respondents selected were residents affected by the projects. The types of residents included shop keepers/hawkers at Cao Lanh Ferry, households who had lost their agriculture land, and resettled households. In addition, a relatively neutral type of household was also included, characterised by households who had neither lost their agriculture land, nor resettled as a consequence of the project. In total, there were 78 respondents who participated in either in-depth interviews or focus group discussions. Women made up 55 per cent of total respondents.

In addition to a discussion about household perceptions of the expected benefits from Cao Lanh Bridge, this section will discuss other important side effects of the project and its activities. This section take a gender-sensitive approach to household perceptions. It has been previously emphasized by the ADB that transport infrastructure and services are often incorrectly considered to be "gender neutral", and that transport projects benefit men and women differently because there might exist some differences in their travel patterns, modes of transport access, and utilization of transport infrastructure and services. A quick survey was conducted after each in-depth interview and group discussion, aimed at shedding more light on the gender-specific responses toward expected the benefits of the Cao Lanh Bridge.

Hypothesis 1: The Project investment will generate accessibility and mobility improvements, leading to wider socio-economic development benefits within and among the three provinces

With regards to expected benefits from Cao Lanh Bridge, decreased travel time was most often the first response received from the focus group discussions and in-depth interviews. As previously explained, travel time will decrease as Cao Lanh Bridge may substitute for Cao Lanh Ferry, which will mean no waiting time at Cao Lanh Ferry.

In general, the waiting time for pedestrians, bicycle and motorbike occupants is shorter than for buses and trucks, because there is a separate line that enables faster access to the ferry for those types of vehicles. However, there are specific periods in which the waiting time is extended for all ferry users, including between 9pm to 5am every day, rush hours and during the rainy seasons.

> *"From 9 pm to 5 am every day, there is only one or two ferry in operation instead of at least four ferries crossing the river during other times of the day. In total, we have to wait about 30 minutes and 15 minutes on the ferry."* – Opinion from FGD of a resettled household at Tan My Commune.
>
> *"In the afternoon, sometimes there is a severe traffic jam at the ferry. Motorbikes have to wait in a long line from Dong Thap University to the ferry, about half a kilometre long line."* – said a shop keeper at Cao Lanh Ferry.
>
> *"During the rainy season, the river flow is stronger. The ferry crossing speed then becomes much slower. Sometimes it drifts far downstream and comes back. On average, it takes 30 minutes to cross the river."* – Opinion from FGD of unaffected household at Tinh Thoi Commune.

As the result, Cao Lanh Bridge will enable greater flexibility in terms of travel time than using the ferry for crossing. Given their multiple gender roles, women are said to experience greater "time poverty" because they are usually involved in numerous daily tasks (ADB, 2013). The benefits of reduced travel time and greater flexibility in travel time will certainly bring significant implications for women.

It should be noted that all respondent agree that Cao Lanh Bridge will lead to reduced travel time. However, another perspective provided was that, despite the fact that a large number of people will enjoy reduced travel time, for commuters living at a close proximity to Cao Lanh ferry their travel time is expected to increase.

> *"I do not know whether or not the ferry services will still be running once the Bridge comes into operation. It is much faster using the ferry to cross the river."* – said a shop keeper at Cao Lanh Ferry.

Gender-specificity is found among the collected opinions from the in-depth interviews and focus group discussions. Table 6.1 shows the results of responses, as separated by gender, on the question of whether or not Cao Lanh Bridge will lead to reduced travel time.

Table 6.1: Cao Lanh Bridge will lead to lower travel time

	Agree	Disagree	Don't know
Female	80.5%	14.6%	4.9%
Male	97.0%	3.0%	0.0%
Total	87.8%	9.5%	2.7%

Source: Cao Lanh qualitative study

According to the results in Table 1.1, approximately 97 percent of male respondents agreed that Cao Lanh Bridge will lead to reduced travel time, compared to 80.5 percent of female respondents. For those who disagreed, they rather believed that the ferry will remain more time-efficient for them, as walking remains the predominant mode of travel for them or that they happen to be traders at the markets near the ferry.

> *"It is more convenient to use the ferry for traders coming from Tan My commune to Tan Tich market, especially for female traders. Taking Cao Lanh Bridge is much farther than crossing the ferry."* – Opinion from FGD of household losing agricultural land at Tan My commune.

Results of focus group discussions reveal that most respondents lack information about the connecting road from Cao Lanh Bridge. Hence, they were unable to predict the impact of Cao Lanh Bridge on transportation costs. It was only obvious to them that the transportation costs of heavy vehicles in particular will be lowered once Cao Lanh Bridge comes into operation. The change in transportation costs overall remains ambiguous.

> *"Containers can enjoy lower transport costs. Previously, when containers were not allowed to cross Cao Lanh Ferry, they had to cross My Thuan Bridge. It is 45 km from here to My Thuan Bridge. Now when Cao Lanh Bridge is completed, containers do not have to take that route anymore. This change will allow us to save costs for 10-20 kilometers. I used to see some containers that arrived at the ferry and were forced to return back. Poor them"* – said a shop keeper at Cao Lanh Ferry.
>
> *"Trucks can cross the ferry faster and carry higher load, hence they enjoy lower transportation costs."* – said Ward 6 People's Committee Vice President.

The impact of Cao Lanh Bridge on the degree of convenience for traveling between provinces was widely appreciated from all focus group discussions and in-depth interviews. In particular, 100 percent of male respondents believed that Cao Lanh Bridge will make it more convenient for traveling between provinces. Only 4.8 percent of female respondents did not support this statement as they only traveled locally.

Table 6.2: Cao Lanh Bridge will make it more convenient traveling among provinces

	Agree	Disagree	Don't know
Female	95.1%	0.0%	4.8%
Male	100.0%	0.0%	0.0%
Total	97.3%	0.0%	2.7%

Source: Quick survey of Cao Lanh qualitative study

Interestingly, the male and female respondents held different reasons for agreeing that Cao Lanh Bridge will make it more convenient to travel between provinces. For female respondents, the single reason was that the bridge would facilitate more buses driving to other provinces. In addition to this reason, male respondents believed that the new route connecting to other provinces would be more preferable by offering quicker access to other provinces. This difference might illustrate that female commuters are more dependent on public transport than male commuters. Due to a lack of access to adequate transport, women generally enjoy less mobility than men and hence are much more constrained access to markets and employment opportunities. As Cao Lanh Bridge is expected to induce more intra- and inter-provincial bus routes, women stand a great chance of increasing their mobility.

Hypothesis 2: The Project will generate additional socio-economic benefits for Cao Lanh urban residents (improved access to health, education and cultural facilities).

Making travel more convenient is one way to bring about socio-economic benefit. According to the affected households, improvements are expected to be felt in the access to healthcare, education, cultural facilities and other public services. These benefits are not limited to Cao Lanh urban residents. Rather, residents in Dong Thap districts who are located on the other bank of Tien River are also expected to enjoy similar benefits.

The table below shows the respondents' perception of socio-economics benefits brought about by Cao Lanh Bridge. The results show that improved access to healthcare was seen as the most significant benefit of Cao Lanh Bridge. Meanwhile, many people remained in doubt about the potential impact of Cao Lanh Bridge on improving access to cultural facilities and other public services.

Table 6.3: Respondents' perception of socio-economic benefits brought by Cao Lanh Bridge

	Agree	Disagree	Don't know
Better access to healthcare	97.3%	1.4%	1.4%
Better access to education	87.8%	4.1%	8.1%
Better access to cultural facilities and other public services	81.1%	6.8%	12.2%

Source: Cao Lanh qualitative study

According to the respondents, there are two main reasons why Cao Lanh is believed to facilitate better access to healthcare. The first reason is the greater selection of hospitals for treatment.

> *"Thanks to Cao Lanh Bridge, patients can easily go to Can Tho or Long Xuyen, or to Cao Lanh, more conveniently than before. Also, there are many big hospitals in Dong Thap, mainly based in Cao Lanh city including Military hospital, Thai Hoa international hospital, hospital of traditional medicine, lung hospital etc. Residents from Lai Vung and Lap Vo districts can easily get there."* - Opinion from FGD of unaffected households in Tinh Thoi Commune.

The second reason is the shorter time of transferring patients between hospitals.

> *"The residents in Lai Vung and Lap Vo districts, who are located in the South bank of Tien River, can reach to the hospitals in Cao Lanh much faster"* – a shop keeper at Cao Lanh Ferry, Ward 6
>
> *"The ambulance can transfer patients more quickly because crossing the ferry taking more time than taking the Bridge, especially at night."* – Opinion from FGD of unaffected households in Tinh Thoi Commune.

According to the World Bank, an estimated 75 per cent of all maternal deaths could be prevented by more timely access to essential care. However, at the present time many women with obstetric complications lose a lot of valuable time before reaching a health facility. Therefore, reducing the transfer time between hospitals is critical for women. Still, there are concerns about whether or not the time saved from waiting for the ferry crossing could be compensated by the longer route that connects to the Bridge in the case of a commune being located near the ferry. As the respondents remain unclear about the future of their ferry services, they hope the Government will still keep the ferries in operation, so that the commuters and the ambulance can choose the optimal option for travel during circumscribed situations.

Those who held optimistic views for improved access to education for students residing in the South bank of Tien River far away from the ferry or from other province's to access Dong Thap University. Among those who did not believe that the bridge would bring about improved access to education, the main argument brought forward was that Dong Thap University is located a half kilometer from Cao Lanh Ferry, hence making it more convenient for them to continue using Cao Lanh Ferry.

> *"From primary school to high school, students do not need to cross the river for primary school to high school. Dong Thap University is nearby the ferry. I do not know where Cao Lanh Bridge will go, but it may be far from here. So it is not convenient for students to come to Dong Thap University at all."* – said Tan My People Committee Vice President.

Access to cultural facilities and other public services is the least mentioned benefit from Cao Lanh Bridge. Nevertheless, the 81.1 percent of the respondents who agreed that access to cultural facilities and other public services will be improved by Cao Lanh Bridge were broadly convinced by the benefits of shorter travel time.

Although other respondents were persuaded by similar reasons, they remained uncertain about whether or not and to what degree Cao Lanh Bridge will shorten the travel time for commuters.

Hypothesis 3: The Project will expand and deepen the labor market areas for Cao Lanh residents, with improved road access to other provincial centers for additional employment opportunities.

Among those 74 respondents who completed the quick survey, 63 respondents expressed their confidence that Cao Lanh Bridge will create and improve employment opportunities. Moreover, 53 of the total respondents were confident that Cao Lanh Bridge will bring about an increase in their labour income. Those who remained more pessimistic about prospects for more deepening and expanding labor market areas from the bridge project were mainly shopkeepers near Cao Lanh Ferry. The income levels of shopkeepers and hawkers near Cao Lanh Ferry are expected to significantly decrease, even if the Cao Lanh Ferry remains under operation.

> *"Ten years ago, my shop was very prosperous. Then My Thuan Bridge was built, and my business started to get worse. Many big trucks and cars changed their route to My Thuan instead of crossing Cao Lanh Ferry, and this change made me lose so many customers. When Cao Lanh Bridge comes into operation, I do not know whether or not Cao Lanh Ferry will be closed. Trucks and buses, my main customers, will most likely begin travelling through Cao Lanh Bridge. Motorbike drivers rarely buy anything from my shop. I might have to close the shop."* – said a shopkeeper at Cao Lanh Ferry.

Among the respondents who shared similar views as the one quoted above, none of them were convinced that improved road access to other provincial centers for seeking employment would lead to a deeper and more expanded labor market for Cao Lanh residents directly. Instead, they believed that improved mobility will lead to increased trade between locations, give way for efficient transportation systems, boost the competitiveness of the region, and attract new businesses. Therefore, Cao Lanh Bridge will most likely be able to promote labour market expansions for Dong Thap residents under two conditions, which are from increased investment and a more developed tourism sector.

> *"Cao Lanh Bridge will make Dong Thap more well-known among people. When they hear about Cao Lanh Bridge, they will know about Dong Thap. Cao Lanh Bridge will be the bright spot of Dong Thap, and attract businesses here"* – opinion from FGD of an unaffected household in Tinh Thoi commune.
>
> *"The economic prospects of Dong Thap will increase. Having Cao Lanh Bridge, Dong Thap will be able to develop in becoming a big city, attract more foreign investment and create more job opportunities"* – opinion from FGD of an unaffected household in Tan My commune.

Findings from the focus group discussions reveal that if one of the family members must work far from home, Binh Duong is the most common place to go because the province itself is a huge industrial zone. The respondents believed that once Cao Lanh is able to attract more foreign investment and create new job opportunities, many workers currently working in Binh Duong or Long An industrial zone will return to Dong Thap. This effect will be particularly significant for women.

> *"Cao Lanh Bridge may open up chances for more job opportunities within the province. Previously, many female workers migrated to industrial zones in Binh Duong, leaving their family behind. The migrated women have higher divorce rates compared to women staying at home."* - Opinion from FGD of a woman who lost her agriculture land in Tan My commune.

The opinion above is consistent with previous findings from Guatemala migration studies that migrated women are overall more vulnerable than migrated men or women who decided to stay behind[16]. Providing local women with better and more job opportunities will certainly improve their position in the family and reduce their vulnerability from high divorce rates.

[16] IOM, 2004, "Survey on the Impact of Family Remittances on Guatemalan Homes, Working Notebooks on Migration 19, IOM Guatemala, Guatemala City.

Other impact

Negative social impacts are associated with land acquisition, relocation and loss of livelihood as a result of Cao Lanh Project. An income restoration program has been implemented in order to mitigate the adverse impacts from Cao Lanh Bridge project on affected households. There are three specific groups of affected households: (i) shopkeepers and hawkers at Cao Lanh Ferry Terminals; (ii) households with lost agricultural land; and (iii) households with lost residential land. This section provides a brief synthesis of findings about the effectiveness of the implemented support programs and some unaddressed issues.

The first affected household group includes businesses that operate in the immediate vicinity of each existing ferry terminal. Among the three severely affected household groups, this group seems to be the most vulnerable. This group faces a significant risk of losing their livelihood, as it relies heavily on activities of traffic embarking or disembarking from the ferries. Once Cao Lanh Bridge comes into operation, the traffic volume in Cao Lanh Ferry is expected to decrease drastically as a consequence. According to the representative from commune Women Union, most shopkeepers and hawkers at Cao Lanh Ferry are female, mainly within the age range of 40 to 60 years old. Given these characteristics, the likelihood for occupational change or relocation to other places by this group is very low.

At present time, the income restoration program for this group has just been recently initiated following extensive consultations with shopkeepers and hawkers at the ferry terminal in Tan My commune and Ward 6, and an assessments of their needs. According to focus group discussions with those from Ward 6, supporting activities for them will include a lending program (with a cap of 30 million VND), and the opening of a new market place nearby where they will be prioritized if they plan to move their business activities there. Shopkeepers and hawkers of Tan My commune were solely consulted on the lending program. However, both groups said that they did not know when they would receive the support. According to the commune leaders and the Women's Union, the safeguard and social development consultants of Cao Lanh Bridge Project are still in the process of consolidating information from the assessment of needs conducted for this group. It remains unclear when these supporting measures will be introduced.

As emphasized in the Project's Social Action Plan, the timing of the implementation of mitigation measures will be crucial. It has been suggested that the planning process of support measures for this group needs to be accelerated and extended further by additional assistance. Currently, the interviewed shopkeepers appear to have little idea about how they can use their loans effectively.

> *"If there is no customer, I have to close the shop. If the project provides preferential lending, it is good, but I do not know how to use it effectively. The most important thing is whether or not there are any customers left to continue my business."* – said a shopkeeper in Cao Lanh ferry terminal in Ward 6, Cao Lanh city.
>
> *"Even if the Government lend to us at a preferential rate, we do not know if we can repay the loan if there is no customer left*." – Opinion from FGD with shopkeepers in Tan My commune.

For the groups of households who have lost their agricultural and residential lands, the income restoration program has already been implemented. Measures in the form of in-kind support have been implemented based on information from the assessment of needs conducted for this group. The majority of the interviewed households either received in-kind support for their agricultural activities or small business activities. The support measures have proven to be highly effective for small business operations, as the in-kind support has brought more value-added to these operations.

> *"I am a tailor. I received an over-locking machine for my business. Prior to having this machine, I had to go to other shops to overcast the product. Now that I have this machine myself, I can save time and costs for my business."* – shared by one female respondent in FGD among households with lost agricultural lands in Tinh Thoi commune.

In-kind support for livestock farming activities has yet to be proven as highly effective as for small business operations. All households who have been receiving support for livestock farming have so far been running economic losses from their activities. It has been reportedly discovered that the quality of livestock breeds often does not meet up to the relatively higher value for various breeds.

"*I was provided 24 million VND as a support for raising cows. They took me to An Giang to buy a cow. However, the cow was of low quality. I didn't believe that it was worth 24 million VND. After three months, I was only able to sell the cow for only 19 million VND."* – shared by a male respondent in FGD among resettled households in Tinh Thoi commune.

"I was supported 14 million VND, and I added 1 million VND more to buy a cow of 15 million VND. The quality of the cow was so poor, and hence I didn't want to buy it. But they told me that if I didn't buy it now, I would have to wait for a long time before I would have the opportunity to buy it again. After two months, the cow died. I told them that my cow died. Then one year later, I received a new cow, only because there was an epidemic disease among cows at that time." – said a male respondent from FGD with households who lost his agricultural land in Tan My commune.

It is strongly recommended that support for those households who have so far enjoyed only limited benefits from the income restoration program as a consequence from the low quality of livestock breeds, must be continued and possibly extended further.

Group discussions with affected households also highlighted another important issue concerning compensation schemes for confiscated land. In Tan My commune, there are 38 hectares of land near the Bridge which remain uncompensated.

"There is 38 hectares of land located below the approach road to the Bridge. This area was previously used for rice and fruit cultivation. However, we have been unable to cultivate in this area since the Cao Lanh Bridge construction process began. The construction broke the water line and electricity line to that area. Also, the road to that area was blocked because of the construction. We reported this to the project for so many times. Then they promised to confiscate and compensate for this area, but we have not heard anything from them yet ever since." – shared at the FGD with households who lost their agricultural land in Tan My commune.

"The project compensated for lost agricultural land. The rate was good. However, there is a small proportion of agricultural land left, around 200 square meters. How am I supposed to cultivate in this area? It would be better if the Government could compensate for the whole piece of land." – said by one female respondent in FGD with households who lost their agricultural land in Tan My commune.

It has been strongly suggested that the project needs to investigate in more detail the current situation of land use in the area mentioned above. In that way, appropriate measures of intervention for those affected households in the area can be designed accordingly.

Broadly speaking, among all the interviewed households, Cao Lanh Bridge has nevertheless brought great excitement. They expressed that they are proud to have Cao Lanh Bridge – a national-scale infrastructure project built in Dong Thap. Beside the recommendations made above on improving the support measures for affected households, more attention should also be placed on improving the current ways of how information about the Bridge and the ferry operations are disseminated publicly, such as information on the location of the approach road to Cao Lanh Bridge; master development plan that further promotes the efficiency of transport system connecting to HCMC; and the future of ferry services.

7 Synthesis

The following section syntheses the information presented in the preceding chapters, in particular it discusses the socio-economic characteristics of the region and the surveyed households, and explains how the connectivity project many benefit them. It also provides a provisional assessment of the impact hypotheses based on the qualitative data collected from the different beneficiary groups. Quantitative and qualitative data collected during the mid-line and end-line surveys will be used to explore these issues further and confirm or refute the hypotheses.

7.1 Who are the beneficiaries?

The Mekong Delta is home to 17.5 million people (19.2% of Vietnam's population) and accounts for one-fifth of Vietnam's GDP. It is vitally important to the Vietnamese economy. Despite this, the region lags behind the rest of Vietnam with regards to socio-economic achievements in education, skills and poverty reduction. The Prime Minster of Vietnam has established a steering committee devoted to developing new ideas for strengthening the Delta's economic and social performance. The assessment of development opportunities identified the weaknesses and strengths of the Mekong Delta. Together with issues in education and stronger regulation of the agricultural sector, transport infrastructure is seen as a major bottleneck for socio-economic development, which makes this connectivity project highly relevant to development in the Delta.

Commune and household level surveys were undertaken to better understand the socio-economic conditions of the targeted beneficiaries in the provinces of Don Thap, An Giang and Can Tho. 117 communes were surveyed, of which 48 are in Dong Thap, 35 are in An Giang and 34 are in Can Tho. On average, the population of each commune is 16,000 people and the average number of households per commune is 3790.

2,011 households were sampled across three provinces. The total number of household members in these households was 7,824. Household heads are predominantly male, and accounted for around two-thirds of those households surveyed. The average age of a household head is 54.4, and the average income per household is VND 26,988,000 per year (AUD 1,572). Most people do not have unemployment subsidies or social pensions and 98.7% of people are in the labour force; 22% of those are self-employed in the agricultural sector. The richest 20% of people tend to have a larger income share from non-farm business, while low income households have a larger share of income from remittances and social allowances.

Access to infrastructure plays an important role in improving living standards and the social welfare of people in each of the provinces. Markets are the places people visit most frequently. People visit markets around 20 times per month in Dong Thap, 15 times in An Giang and 17 times in Can Tho. Primary schools are the places with the second highest frequency of visits. Hospitals at district levels also constitute a particularly important type of infrastructure. Projects which facilitate greater access to this type of infrastructure have the potential to significantly benefit households.

The average distance from the surveyed households to the nearest road to Cao Lanh Bridge and Highway is 28.7 km in Dong Thap, 96.3 km in An Giang and 67.1 km in Can Tho. Motorbike is by far the most popular means of transportation. The regression analysis conducted in Section 4 shows that households who live further from the Cao Lanh Bridge are less likely to be poor. In other words, poor households tend to live closer to the bridge. As a result, in the impact evaluation, this difference in the distance to the bridge between households must be taken into account and will be when conducting the Diminishing Effects analysis. It is likely that those poorer people living closer to the Cao Lanh Bridge may derive greater benefit from its construction than the richer people who live further from, which is a positive result from an inclusive development perspective but one that needs to be confirmed by the Diminishing effects analysis and subsequent surveys.

Efficiently crossing the Tien and Hau Rivers is of paramount importance to the local and regional economy. At present 28,266 people per day use the Cao Lanh ferry to cross the Tien River and 52,395 people use the Vam Cong ferry to cross the Hau River. After the construction of the Cao Lanh and Vam Cong Bridges, the Cao

Lanh ferry services will be drastically reduced and the Vam Cong ferry service will be cancelled. Millions of pedestrians, motorcyclists, cars and trucks will then use these bridges.

There will be widespread benefit for the different populations of beneficiaries, the nature and degree of which will be confirmed after the collection of mid-line and end-line data. Waiting times, which are up to 20 minutes will be cut, which will enable people to travel to work, and to access education and health facilities more efficiently. The waiting times for trucks and buses will be drastically cut as well, which will support local and regional economic productivity. Those who cross the two rivers will benefit the most, these include large trucks, who are transporting goods long distances and local people who have to cross the rivers to travel to work. Benefits may also accrue to bus companies and this may stimulate local tourism. Women, who are typically undertaking more local but frequent travel across the Tien River are also likely to benefit significantly.

However, the effects of the two bridges will be quite different, as the results of the user surveys show, the Cao Lanh ferry, with around half of the passengers and a sixth of the freight volume of the Vam Cong ferry plays a more local role than the latter. As a result one may expect the impact of the Cao Lanh Bridge to be much more local in nature. Since the Vam Cong ferry caters to longer distance car, bus and truck traffic it can be expected that the completion of the entire Connectivity Project, of which the Cao Lanh Bridge is a part, would provide significant regional connectivity benefits as planned. The impact of the project as a whole will be quantified after future surveys are conducted.

7.2 Provisional analysis of impact hypotheses

The evaluation design proffers a number of hypotheses regarding the potential impact of the connectivity project on the lives of beneficiaries, the discussion below provides an overview of what the qualitative research has uncovered with regards to the validity of those hypotheses. These provisional insights must be corroborated through additional data collection at later phases but it points to some interesting issues which deserve to be followed up in later in the research.

Hypothesis 1: The Project investment will generate accessibility and mobility improvements, leading to wider socio-economic development benefits within and among the three provinces

The Cao Lanh Bridge is seen by transport industry stakeholders as a crucial part of the forthcoming new route to Ho Chi Minh City (HCMC). This new route is regarded as a better traveling option and supplements the nearly overloaded route through My Thuan Bridge to HCMC, by connecting Cao Lanh Bridge to the N2 NR. While reduced travel time and travel costs are widely perceived as the main benefits of Cao Lanh Bridge, transport operators noted that the magnitude of those benefits will depend on whether or not a toll will be collected from using the bridge, and how much that toll will be. This has yet to be determined.

From the viewpoint of manufacturing enterprises in industrial parks, the impact of Cao Lanh Bridge, as well the whole Connectivity Project, may be felt in two important phases of their operations, namely the transport of raw materials and the transport of the finished product. Similar to the transport operators, manufacturing enterprises reap the benefits of infrastructure projects when those projects are linked to their operations. Driving higher performance in the agriculture sector is clearly important from an economic perspective and can help improve local competiveness and productivity. However, some manufacturing enterprises in industrial zones were cautious about the presumed benefits suggesting that due to the fact the majority of their finished goods are transported by inland waterway, which has the advantages of low cost and high loading capacity, the benefits will be minimal. Further investment into the road network from Cao Lanh to N2 NR is crucial to bring about more significant impact for the manufacturing enterprises in industrial zones.

Householders identified decreased travel as the most important outcome of the Cao Lanh Bridge construction. The bridge is expected to enable greater flexibility in terms of travel time than using the ferry. Given their multiple gender roles and time poverty, reduced travel time and greater flexibility in travel time will certainly bring significant benefits for women. Although some of those surveyed (particular local shopkeepers) highlighted that the ferry may reduce their business turnover and increase travel time across the river.

Hypothesis 2: The Project will generate additional socio-economic benefits for Cao Lanh urban residents (improved access to health, education and cultural facilities).

As noted in Section 2, upwards of 80,000 people use the ferries to travel to work and to access health and education facilities on a daily basis, once both bridges are complete accessing these facilities is expected to become much easier. According to the affected households, improvements are expected to be felt in the access to healthcare, education, cultural facilities and other public services. These benefits are not limited to Cao Lanh urban residents. Rather, residents in Dong Thap districts who are located on the far bank of the Tien River are also expected to enjoy similar benefits. In the area of health care there is expected to be a number of benefits including: access to a broader range of healthcare facilities, reduced travel time to health care facilities, which has implications for maternal and infant mortality rates, and ease in transporting patients between hospitals in the region. With regards to education, householders were broadly in agreeance that the Cao Lang Bridge would improve access, except those who travel to Don Thap University which is located quite close to the Cao Lanh ferry. If that ferry is cancelled then there will be longer travel times for these people.

Hypothesis 3: The Project will expand and deepen the labor market areas for Cao Lanh residents, with improved road access to other provincial centres for additional employment opportunities.

Householders had mixed feelings regarding whether the project would expand labor markets and lead to employment benefits for Cao Lanh residents. Most beneficiaries were of the view that improved mobility will lead to increased trade between locations, improve transportation system efficiency, boost competitiveness, and attract new businesses. It was thought that the Cao Lanh Bridge will only promote labour market expansion under two conditions, namely: increased investment and a more developed tourism sector. Local shopkeepers remained pessimistic about the employment benefits. The income levels of shopkeepers and hawkers near the Cao Lanh Ferry is expected to significantly decrease, even if the Cao Lanh Ferry remains under operation. Some beneficiaries noted that the bridge may open up more job opportunities by bringing back workers who have migrated to industrial zones in Binh Duong (many of whom are women who have left their family behind). Providing local women with more local job opportunities will certainly improve their position in the family and reduce their vulnerability.

Industrial enterprises were sceptical that the bridge would facilitate a level of reverse migration away from the larger industrial zones such as Binh Duong. These zones are renowned labour hubs and offer higher salaries than local zones. They did suggest however that the Cao Lanh bridge would facilitate more efficient access for workers to the Sa Dec industrial zone which may expand labor market opportunities for local residents but this needs to be confirmed in subsequent research. In general, those in industrial zones were of the view that Cao Lang Bridge serves as a premise for increased local infrastructure investment and once that further investment is forthcoming Don Thap will attract more investment.

Hypothesis 4: The Project will lead to the growth in containerized road freight across the three provinces

Transport operators were of the view that, while important, the Cao Lanh Bridge will do little to address the significant constraints to containerized road transport in the region. There are a number of reasons for this including the fierce competition transport operators face from inland waterway transport companies, the comparative advantage of logistics companies from HCMC, and the low authorized loading capacity which sees local companies always running below capacity. Rather than a project that set out to promote growth in containerized road freight, transport operators instead believe that Cao Lanh Bridge and the Connectivity Project will promote growth in the number of trucks.

Even though containerized road freight remains limited across all three provinces, manufacturing enterprises believe that Cao Lanh and Vam Cong Bridge are important elements to the improvement of the transport network to HCMC. The Cao Lanh – My An project connecting to N2 NR will be the next step, and is expected to promote growth in containerized road freight. Having this system in place will lead to lower under-capacity rates, which is about 40 percent as currently reported. In other words, the system will enable containerize freight to achieve economy of scale, which may lead to lower costs per unit of freight.

Hypothesis 5: The Project will stimulate the development of Cao Lanh as an intra-provincial and inter-provincial bus passenger transit centre, with increased tourism visitation and quicker access to/from HCMC

The survey results from the transport operators suggest that Cao Lanh has a low potential to become an inter-provincial bus passenger transit centre. Instead, Cao Lanh Bridge might facilitate more travel demand for intra-provincial bus passengers. There are many prerequisites to be met in order to turn Cao Lanh into an inter-provincial bus passenger transit centre. At the present time, even An Giang and Kien Giang, which are the more developed provinces, hardly meet the prerequisites to become inter-provincial bus passenger transit centres themselves. Tourism development and improved infrastructure stand out as two critical conditions. Land allocation and investment attraction policies are no less important conditions to be met. Cao Lanh Bridge nonetheless plays a very important role in connecting the two parts of the province itself, which has long been separated by the Tien River. There are currently very limited bus routes running between the two parts of Dong Thap. Therefore, Cao Lanh Bridge is literally "bridging" these two parts.

Hypothesis 6: The Project will stimulate the growth in transport facility and employment in transport sector within all three provinces

Can Tho transport operators do not support this hypothesis. They believe that the project does not affect their operations because the preferred route to Dong Thap or An Giang currently does not bypass Vam Cong or Cao Lanh Bridge. An Giang transport operators remain uncertain about the impact of Cao Lanh Bridge and the Connectivity Project. In their view, the Connectivity Project will ease the travel through the Vam Cong Ferry, and facilitate quicker access to HCMC through the "traditional" route – Vam Cong – My Thuan Bridge to Trung Luong. However, its impact on their operations remains unknown. Dong Thap transport operators, on the other hand, have a clearer idea about how Cao Lanh Bridge and the Connectivity Project will promote growth in the transport sector. For passenger transport services, the shortening of waiting time at Cao Lanh and Vam Cong Ferry is expected to boost travel demands to An Giang and Kien Giang.

Growth in freight transport operations related to combined consignment will be stimulated once Cao Lanh Bridge is completed. Freight transport services are very competitive and sensitive to transport price levels. Being more cost-efficient, transport operators will have a competitive advantage in approaching new customers who are willing to cooperate if the offered freight transport price is relatively low. Combined consignment freight services can also be provided for fruit, often viewed as the "less traditional commodity" for containers. This is because fruits require a tight schedule and short travel duration. This could be one very positive benefit for freight transport providers.

Hypothesis 7: The Project will strengthen the Dong Thap provincial economy, with the creation of demand for bridge/road building materials and the acquisition of additional building skills and opportunities

Manufacturing enterprises agreed that Cao Lanh Bridge will stimulate the development of the Dong Thap provincial economy. However, the reason was not seen to be the creation of demand for bridge/road building materials and the acquisition of additional building skills and opportunities, as suggested in the hypothesis. Rather, the development of the Dong Thap provincial economy is expected to be attributed to increased trade and further potential investment attraction. Increased trade and lower transportation costs will lead to lower production costs. In turn, lower production costs may promote the comparative advantage of the province and attract more investment.

Hypothesis 8: The proposed project can be expected to improve the social welfare of the population within the three provinces and in relative road corridors, and be assessed as being an effective aid component, yielding positive results and value for money

The potential social welfare effects of the Bridge are many and varied. Key perceived positive social welfare-related outcomes from the Bridge, as identified by stakeholders, include:

- improved access and integration with north bank and south bank schools and education facilities, including cultural assets
- potential for time savings for ambulances/paramedics to bring patients to hospitals/medical facilities

- opportunities to rationalise various health facilities located on both sides of the river, and to allow for improved staff flexibility in rostering of staff
- possible increase in school enrolments from locations outside Cao Lãnh, stimulated by the commencement of new bus services connecting the north and south banks.

Making travel more convenient is one way to bring about social benefits. According to the affected households, improvements are expected to be felt in the access to healthcare, education, cultural facilities and other public services. These benefits are not limited to Cao Lanh urban residents. Rather, residents in Dong Thap districts who are located on the other bank of Tien River are also expected to enjoy similar benefits.

The results from the focus group discussions also show that improved access to healthcare was seen as the most significant benefit of Cao Lanh Bridge. Meanwhile, many people remained in doubt about the potential impact of Cao Lanh Bridge on improving access to cultural facilities and other public services.

While this may be the case, there was concern amongst some groups regarding the impact of the project on their livelihoods. The most affected household group includes businesses that operate in the immediate vicinity of each existing ferry terminal. Among the three severely affected household groups, this group seems to be the most vulnerable. This group faces a significant risk of losing their livelihood, as it relies heavily on activities of traffic embarking or disembarking from the ferries. Once Cao Lanh Bridge comes into operation, the traffic volume in Cao Lanh Ferry is expected to decrease drastically as a consequence.

At the present time, the income restoration program for this group has just been recently initiated following extensive consultations with shopkeepers and hawkers at the ferry terminal in Tan My commune and Ward 6, and after an assessments of their needs. According to focus group discussions with those from Ward 6, supporting activities for them will include a lending program (with a cap of 30 million VND), and the opening of a new market place nearby where they will be prioritized if they plan to move their business activities there. Shopkeepers and hawkers of Tan My commune were consulted on the lending program. However, both groups said that they did not know when they would receive the support.

As emphasized in the Project's Social Action Plan, the timing of the implementation of mitigation measures will be crucial. It has been suggested that the planning process of support measures for this group needs to be accelerated and extended further by additional assistance. Currently, the interviewed shopkeepers appear to have little idea about how they can use their loans effectively.

For the groups of households who have lost their agricultural and residential lands, the income restoration program has already been implemented. Measures in the form of in-kind support have been implemented based on the assessment of needs conducted for this group. The majority of the interviewed households either received in-kind support for their agricultural activities or small business activities. The support measures have proven to be highly effective for small business operations, as the in-kind support has brought more value-added to these operations.

Beside the recommendations made above on improving the support measures for affected households, more attention should be placed on improving information provision about the Bridge to the public including information on the location of the approach road to Cao Lanh Bridge, the master development plan that further promotes the efficiency of transport system connecting to HCMC, and the future of ferry services.

7.3 Conclusion

Overarching hypothesis: The Connectivity project will generate accessibility and mobility improvements that lead to wider socio-economic development benefits within and among the three provinces

The connectivity project will no doubt generate improvements that will lead to wider socio-economic development benefits, but the nature and level of these benefits needs to be determined by future research. As noted above, the Mekong delta lags behind other parts of Vietnam in socio-economic terms. This project has the potential to address some of these issues if augmented by other sensible policy and investment decisions. For example, it may improve agricultural sector efficiency, which may contribute to increasing local competitiveness. This may induce investment provided other enabling environment issues are addressed. The project may also improve access to health services which, if realised, could improve maternal and child health statistics and other general health measurements. The discussion above suggests that women may benefit from this project in various areas, including reducing time poverty and increasing mobility. Growth in local economies may be stimulated through increased intra-provincial transport, and intra-provincial economic opportunities may be increased. Most importantly, as will be examined further through future surveys and the Diminishing effects analysis, it seems that poorer people, who happen to live closer to the Cao Lanh Bridge, may benefit disproportionally from the project, again this will be confirmed via subsequent analysis.

8 Appendix A: Design and Monitoring Framework

A. Project Design and Monitoring Framework

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
Impact Improved and sustainable transport connectivity contributing to inclusive development in the Central Mekong Delta Region	Share of secondary sector employment in Dong Thap, Can Tho, and An Giang provinces increased from an average of 12% in 2013 to an average of 25% in 2025[a] 170,000 road users benefit daily from the project by 2020; the number increases by 5.8% per annum thereafter 5 million residents of An Giang, Can Tho, and Dong Thap provinces benefit from improved living standards by 2020 and onwards Adequate operation and maintenance and climate resilience awareness increased and, as a result, level of service expressed in International Roughness Index, maintained under 4 m/km during the project life	Traffic and travel time surveys Reports from review missions Reports from the DDIS-TA consultant Project completion report Independent resettlement monitoring, and benefits monitoring and evaluation report	**Assumption** Government's investment programs in the Mekong Delta Region under its Socio-Economic Development Plan and Expressway Development Plan are implemented as planned
Outcome Improved road transport access and travel time across and within the Central Mekong Delta Region	20,000 passenger car units including 4,000 goods vehicles per day use the project roads and bridges in 2020 Travel time from Ho Chi Minh City to Long Xuyen reduced from 3–3.5 hours in 2013 to 2.5 hours by the end of 2017 Travel time from Cao Lanh ferry to Vam Cong ferry reduced from 1–1.5 hours in 2013 to 30 minutes by the end of 2017	Traffic and travel time surveys Reports from the DDIS-TA consultant Project completion report Reports from review missions	**Assumption** Parts of the Second Southern Highway and GMS Southern Coastal Corridor are completed as planned **Risks** Project road and bridges not built, maintained, and operated to the specified standards Major traffic and ship collision accidents Inaccessibility of road and bridges due to

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
	Travel distance from Cao Lanh to Long Xuyen reduced from 35.4 km in 2013 to 29 km by the end of 2017		climate change impacts
Outputs 1. Project roads and bridges 2. Bridge health monitoring, traffic management, and emergency response systems	Two cable-stayed bridges and 26 km of roads open to traffic by the end of 2017 Bridge health monitoring, traffic management, and emergency response systems fully operational by the end of 2017	Reports from the DDIS-TA consultant Project completion report Independent resettlement monitoring and benefits monitoring and evaluation report Reports from review missions	**Assumptions** Financial and institutional capacity of Cuu Long CIPM remains sufficient to manage the project All affected households fully compensated before civil works begin Environmental management plan implemented and adverse environmental impacts mitigated **Risks** Procurement and corruption risks Social, resettlement, and environmental risks Unforeseen construction delays
Activities with Milestones **Civil works** 1.1 Civil works contracts commenced by the end of 2013 1.2 Civil works contracts completed by the end of 2017 **Project management** 1.3 Cuu Long CIPM's staff are fully mobilized by the end of 2013 to supervise project implementation **Resettlement** 1.4 Compensation payments completed by the end of 2013 1.5 Relocation implemented in 2013–2014 1.6 Income restoration programs implemented in 2013–2015		**Inputs** **Loan** **Asian Development Bank:** $410 million from ordinary capital resources **Government of Viet Nam:** $56 million **Grant** **Government of Australia:** $134 million **Loan** **Government of the Republic of Korea:** $260 million	

Cuu Long CIPM = Cuu Long Corporation for Investment, Development and Project Management of Infrastructure, DDIS-TA = detailed design and institutional support technical assistance, m/km = meters per kilometer, GMS = Greater Mekong Subregion.
[a] This translates into 400,000 new jobs in construction and manufacturing sectors.
Sources: Asian Development Bank and executing agency estimates.

9 Appendix B: Additional results from quantitative data analysis

Table A.4.1. Gross enrolment rate (%)

	Kindergarten	Primary	Lower-Secondary	Upper-secondary
General	56.77	97.28	82.30	37.56
Dong Thap	54.34	94.83	84.91	37.14
An Giang	47.58	99.85	81.20	33.97
Can Tho	70.91	99.22	77.03	41.89
Gender				
Male	56.51	97.56	82.33	37.12
Female	57.00	97.00	82.27	38.00
Urban/Rural				
Urban	61.77	97.94	85.25	43.95
Rural	52.18	96.58	79.80	31.81
Gender of household head				
Male	57.10	97.50	82.34	37.56
Female	55.96	96.73	82.18	37.57
Education level of household head				
No degree	49.40	98.02	75.27	30.57
Primary	55.84	98.06	85.27	33.48
Lower-Secondary	51.76	95.99	84.45	48.28
Upper-secondary	80.26	93.48	87.58	37.70
Post-secondary (college, university or above)	80.18	94.84	92.43	64.77
Vocational education	75.00	100.00	86.76	39.47
Household head's age				
Under 30 years old	69.57	100.00	50.00	0.00
From 30 to under 45 years old	65.14	96.25	86.93	28.72
From 45 to 60 years old	48.71	94.99	79.74	44.91
Over 60 years old	61.07	100.75	77.48	37.58
Status				
Non-poor	58.63	97.87	82.53	40.62
Poor	46.86	94.35	81.20	21.73
5 groups of income				
Lowest income quintile	45.49	95.12	76.54	31.60
Near lowest income quintile	50.36	97.13	83.76	30.60
Middle income quintile	56.43	100.69	85.97	36.65
Near highest income quintile	69.03	97.47	77.21	43.78
Highest income quintile	70.48	95.90	88.22	49.87

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.2. Percentage of agricultural land (annual crop land) having irrigation system

	Percentage of cultivated lands having irrigation system
General	91.79
Dong Thap	95.35
An Giang	97.15
Can Tho	77.02
Urban/Rural	
Urban	87.61
Rural	93.73
Household head's gender	
Male	93.00
Female	85.56
Education level of household head	
No degree	90.04
Primary	91.59
Lower-Secondary	95.44
Upper-secondary	94.96
Post-secondary (college, university or above)	91.70
Vocational education	92.62
Household head's age	
Under 30 years old	100.00
From 30 to under 45 years old	93.08
From 45 to 60 years old	91.80
Over 60 years old	90.49
Status	
Non-poor	92.37
Poor	80.64
5 groups of income	
Lowest income quintile	87.62
Near lowest income quintile	88.46
Middle income quintile	93.33
Near highest income quintile	92.48
Highest income quintile	95.60

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.3. Annual revenue of annual crops harvest (1000 VND/household)

	Rice	Maize	Sesame	Others	Total
General	95763.73	1055.66	663.18	8924.11	106406.66
Dong Thap	92696.61	758.78	568.85	7597.57	101621.82
An Giang	124365.09	2544.03	26.12	8274.78	135210.01
Can Tho	72734.46	177.17	1555.20	12700.99	87167.81
Urban/Rural					
Urban	80981.83	341.61	1012.55	13468.63	95804.63
Rural	101773.54	1345.96	521.14	7076.46	110717.09
Gender of household head					
Male	100428.59	1176.92	750.62	8151.95	110508.09
Female	71233.85	417.98	203.37	12984.44	84839.64
Education level of household head					
No degree	68346.52	1635.47	703.00	10318.93	81003.92
Primary	99929.25	1150.72	1030.86	7676.51	109787.34
Lower secondary	124049.52	0.00	66.92	15265.98	139382.43
Upper-secondary	120886.38	0.00	0.00	5423.51	126309.89
Post-secondary (college, university or above)	123007.03	484.38	215.00	738.59	124445.00
Vocational education	191690.73	0.00	0.00	5000.00	196690.73
Household head's age					
Under 30 years old (%)	270000.00	0.00	0.00	100.00	270100.00
From 30 to under 45 years old (%)	74078.19	2659.42	807.97	15381.38	92926.96
From 45 to 60 years old (%)	106317.21	356.65	947.87	7704.46	115326.20
Over 60 years old (%)	94910.25	825.97	55.84	5335.21	101127.27
Status					
Non-poor	100650.97	1108.02	696.93	8984.32	111440.23
Poor	18160.27	224.24	127.27	7967.94	26479.73
5 groups of income					
Lowest income quintile	33844.28	1184.17	417.92	6360.48	41806.84
Near lowest income quintile	43974.88	781.25	858.84	6978.62	52593.58
Middle income quintile	59320.65	1265.71	474.00	7045.64	68106.00
Near highest income quintile	82260.57	846.53	1396.83	15159.87	99663.81
Highest income quintile	250562.26	1176.47	270.59	9705.26	261714.58

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.4. Revenue of perennial plant (1000 VND/household)

	Coconut	Others	Total
General	3034.57	725.63	3760.20
Dong Thap	2929.65	1258.23	4187.88
An Giang	1240.80	1500.00	2740.80
Can Tho	3469.45	32.87	3502.33
Urban/Rural			
Urban	4588.62	1193.22	5781.84
Rural	1626.22	301.88	1928.09
Gender of household head			
Male	3501.22	835.12	4336.34
Female	1224.00	300.80	1524.80
Education level of household head			
No degree	2583.41	377.73	2961.14
Primary	2815.19	235.90	3051.10
Lower secondary	1592.63	2684.21	4276.84
Upper-secondary	2220.00	0.00	2220.00
Vocational education	10672.22	1222.11	11894.33
College and higher education	300.00	0.00	300.00
Household head's age			
Under 30 years old (%)	540.00	0.00	540.00
From 30 to under 45 years old (%)	2513.91	0.00	2513.91
From 45 to 60 years old (%)	2715.93	1412.40	4128.33
Over 60 years old (%)	3830.49	195.61	4026.10
Status			
Non-poor	3047.63	764.58	3812.22
Poor	2820.00	85.71	2905.71
5 groups of income			
Lowest income quintile	1460.59	76.47	1537.06
Near lowest income quintile	1793.18	741.82	2535.00
Middle income quintile	2932.76	6.76	2939.52
Near highest income quintile	1881.56	648.91	2530.47
Highest income quintile	6138.00	1666.67	7804.67

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.5: Revenue of fruit tree (1000 VND/household)

	Citrus fruits	Mango	Banana	Other fruits	Total
General	2971.66	12377.39	644.42	6143.82	22137.30
Dong Thap	4572.40	18987.53	258.87	7164.53	30983.33
An Giang	20.83	9702.85	310.56	962.36	10996.60
Can Tho	1977.53	578.09	1728.94	8179.44	12464.00
Urban/Rural					
Urban	2709.22	14176.31	614.16	4881.81	22381.50
Rural	3149.57	11157.93	664.94	6999.31	21971.76
Gender of household head					
Male	3246.78	13174.53	668.96	6522.58	23612.84
Female	1931.51	9363.56	551.67	4711.78	16558.52
Education level of household head					
No degree	1625.00	7667.74	214.13	3336.59	12843.46
Primary	2060.51	10154.64	540.32	6119.60	18875.07
Lower secondary	1939.06	12551.85	1340.19	6484.67	22315.76
Upper-secondary	13872.17	15947.83	1195.65	19240.87	50256.52
Post-secondary (college, university or above)	456.91	15749.09	1079.09	3600.45	20885.55
Vocational education	16888.89	82222.22	555.56	9653.33	109320.00
Household head's age					
Under 30 years old (%)	0.00	400.00	0.00	933.33	1333.33
From 30 to under 45 years old (%)	356.61	9410.71	502.86	6034.11	16304.29
From 45 to 60 years old (%)	3926.12	7361.27	922.58	7069.46	19279.43
Over 60 years old (%)	3039.74	19454.27	405.77	5269.01	28168.79
Status					
Non-poor	2959.60	13410.44	696.69	6706.18	23772.91
Poor	3100.00	1392.67	88.67	164.00	4745.33
5 groups of income					
Lowest income quintile	1109.26	7671.01	151.32	714.73	9646.32
Near lowest income quintile	2259.18	6498.09	203.24	4036.65	12997.15
Middle income quintile	875.00	4701.88	1434.38	3946.41	10957.66
Near highest income quintile	1395.85	14492.61	534.96	4591.57	21014.99
Highest income quintile	8577.37	26819.21	950.58	16534.28	52881.43

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.6. Revenue of animal breeding (1000 VND/household)

	Pork	Cattle	Poultry	Other livestock	Total
General	17799.52	22857.22	8037.73	3253.46	51947.92
Dong Thap	14765.42	23240.10	9193.51	2372.58	49571.61
An Giang	9855.45	23717.82	3586.46	2860.30	40020.02
Can Tho	31376.96	21284.31	10269.76	5300.88	68231.92
Urban/Rural					
Urban	10111.31	20346.90	9772.99	3905.10	44136.30
Rural	22258.68	24313.20	7031.28	2875.50	56478.66
Gender of household head					
Male	17347.95	21948.15	5628.92	2558.95	47483.97
Female	19168.06	25612.24	15337.89	5358.22	65476.42
Education level of household head					
No degree	10115.77	22655.77	5774.49	1058.02	39604.05
Primary	19624.55	21741.38	9237.14	1888.34	52491.41
Lower secondary	10164.36	39850.91	4208.42	14869.36	69093.05
Upper-secondary	49177.50	7500.00	25908.70	372.00	82958.20
Post-secondary (college, university or above)	52440.00	0.00	12200.53	1400.00	66040.53
Vocational education	69500.00	0.00	512.50	0.00	70012.50
Household head's age					
Under 30 years old (%)	0.00	5000.00	1050.00	212.50	6262.50
From 30 to under 45 years old (%)	27419.29	23839.80	7634.52	1676.02	60569.62
From 45 to 60 years old (%)	17328.47	27456.84	9748.76	5103.74	59637.82
Over 60 years old (%)	10012.48	13957.14	5450.99	1435.52	30856.13
Status					
Non-poor	21251.89	26328.57	9182.36	3805.99	60568.82
Poor	2571.23	7545.21	2988.81	816.23	13921.48
5 groups of income					
Lowest income quintile	5985.74	11626.73	6791.51	605.95	25009.94
Near lowest income quintile	17586.05	21782.56	9460.07	2154.48	50983.15
Middle income quintile	20192.31	23435.90	4217.87	1781.01	49627.09
Near highest income quintile	15653.28	6081.97	6652.61	2654.10	31041.95
Highest income quintile	34550.72	54811.59	13631.74	10692.90	113686.96

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.7. Revenue of fishery (1000 VND/household)

	Aquaculture	Capture fishery	Total
General	107845.58	9036.02	116881.60
Dong Thap	28359.47	7347.43	35706.91
An Giang	403136.43	17968.64	421105.07
Can Tho	18757.60	4164.80	22922.40
Urban/Rural			
Urban	13806.05	5185.58	18991.63
Rural	154865.35	10961.24	165826.59
Gender of household head			
Male	141456.49	10906.44	152362.93
Female	17576.29	4012.63	21588.91
Education level of household head			
No degree	6272.08	7908.99	14181.07
Primary	323834.00	14687.50	338521.50
Lower secondary	15207.00	460.00	15667.00
Upper-secondary	0.00	3600.00	3600.00
Post-secondary (college, university or above)	51090.00	125.00	51215.00
Vocational education	75350.00	0.00	75350.00
Household head's age			
Under 30 years old (%)	21150.00	0.00	21150.00
From 30 to under 45 years old (%)	39631.35	6757.35	46388.70
From 45 to 60 years old (%)	198874.33	13089.50	211963.83
Over 60 years old (%)	15874.52	4201.77	20076.29
Status			
Non-poor	150465.65	10282.45	160748.10
Poor	1871.35	5936.81	7808.16
5 groups of income			
Lowest income quintile	3785.14	4835.14	8620.27
Near lowest income quintile	15184.33	9429.23	24613.57
Middle income quintile	12220.00	11780.91	24000.91
Near highest income quintile	55357.27	8595.00	63952.27
Highest income quintile	657211.11	14200.00	671411.11

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.8. Share of revenue from major crops in gross annual crop revenue (%)

	Rice	Maize	Sesame	Others
General	78.04	2.17	1.10	18.70
Dong Thap	78.54	1.97	1.11	18.38
An Giang	80.25	4.58	0.04	15.13
Can Tho	74.54	0.09	2.18	23.19
Urban/Rural				
Urban	71.92	0.35	2.25	25.49
Rural	80.51	2.90	0.63	15.96
Gender of household head				
Male	79.54	2.15	1.08	17.23
Female	70.15	2.25	1.20	26.40
Education level of household head				
No degree	70.69	2.46	1.58	25.27
Primary	80.68	2.99	1.10	15.23
Lower secondary	79.49	0.00	0.50	20.01
Upper-secondary	86.55	0.00	0.00	13.45
Post-secondary (college, university or above)	88.82	2.62	0.84	7.72
Vocational education	94.17	0.00	0.00	5.83
Household head's age				
Under 30 years old (%)	50.00	0.00	0.00	50.00
From 30 to under 45 years old (%)	77.76	2.59	1.07	18.58
From 45 to 60 years old (%)	79.70	1.76	1.53	17.00
Over 60 years old (%)	75.81	2.50	0.39	21.29
Status				
Non-poor	79.54	2.05	1.14	17.26
Poor	54.18	3.94	0.35	41.54
5 groups of income				
Lowest income quintile	69.54	3.95	1.15	25.36
Near lowest income quintile	70.84	2.62	2.42	24.13
Middle income quintile	82.03	0.80	0.61	16.56
Near highest income quintile	79.15	2.61	1.17	17.07
Highest income quintile	88.84	0.79	0.17	10.19

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.9. Share of revenue from major crops in gross perennial crop revenue (%)

	Coconut	Others
General	84.25	15.75
Dong Thap	70.59	29.41
An Giang	80.00	20.00
Can Tho	94.82	5.18
Urban/Rural		
Urban	84.29	15.71
Rural	84.21	15.79
Gender of household head		
Male	85.78	14.22
Female	78.95	21.05
Education level of household head		
No degree	87.88	12.12
Primary	86.21	13.79
Lower secondary	73.96	26.04
Upper-secondary	100.00	0.00
Post-secondary (college, university or above)	71.43	28.57
Vocational education	100.00	0.00
Household head's age		
Under 30 years old (%)	100.00	0.00
From 30 to under 45 years old (%)	100.00	0.00
From 45 to 60 years old (%)	77.27	22.73
Over 60 years old (%)	88.33	11.67
Status		
Non-poor	84.15	15.85
Poor	87.18	12.82
5 groups of income		
Lowest income quintile	85.71	14.29
Near lowest income quintile	78.57	21.43
Middle income quintile	92.31	7.69
Near highest income quintile	70.98	29.02
Highest income quintile	95.45	4.55

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.10: Share of revenue from major crops in gross fruit revenue

	Citrus fruits	Mango	Banana	Other fruits
General	8.14	35.86	21.52	34.48
Dong Thap	9.73	38.99	18.45	32.83
An Giang	0.16	60.37	20.03	19.44
Can Tho	10.50	12.15	28.87	48.48
Urban/Rural				
Urban	7.42	41.30	23.49	27.78
Rural	8.62	32.20	20.19	38.98
Gender of household head				
Male	8.90	38.15	17.97	34.98
Female	5.62	28.22	33.32	32.84
Education level of household head				
No degree	5.72	41.55	19.68	33.05
Primary	8.78	33.14	25.69	32.39
Lower secondary	8.87	34.93	18.98	37.22
Upper-secondary	13.40	41.03	4.44	41.13
Post-secondary (college, university or above)	5.90	29.77	35.06	29.26
Vocational education	10.33	26.77	7.76	55.14
Household head's age				
Under 30 years old (%)	0.00	53.33	0.00	46.67
From 30 to under 45 years old (%)	3.45	27.92	23.57	45.06
From 45 to 60 years old (%)	11.87	32.06	21.02	35.05
Over 60 years old (%)	5.56	42.24	21.91	30.29
Status				
Non-poor	7.41	36.28	20.77	35.53
Poor	16.67	30.86	30.25	22.22
5 groups of income				
Lowest income quintile	11.87	39.18	13.06	35.89
Near lowest income quintile	8.33	35.10	27.19	29.38
Middle income quintile	6.38	38.65	28.62	26.35
Near highest income quintile	2.89	36.13	16.52	44.45
Highest income quintile	10.77	31.69	23.20	34.34

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.11. Share of revenue from each animal in gross breeding revenue

	Pork	Cattle	Poultry	Other
General	19.55	18.54	57.09	4.82
Dong Thap	17.10	22.30	54.60	6.00
An Giang	15.31	25.87	55.07	3.74
Can Tho	28.45	4.07	63.84	3.64
Urban/Rural				
Urban	15.64	8.73	71.80	3.83
Rural	21.80	24.20	48.62	5.39
Gender of household head				
Male	18.87	20.91	54.02	6.20
Female	21.61	11.39	66.36	0.64
Education level of household head				
No degree	14.10	25.08	58.23	2.60
Primary	19.13	16.95	57.32	6.61
Lower secondary	19.94	14.10	58.04	7.92
Upper-secondary	52.40	9.26	37.86	0.47
Post-secondary (college, university or above)	26.67	0.00	67.17	6.17
Vocational education	50.00	0.00	50.00	0.00
Household head's age				
Under 30 years old (%)	0.00	47.96	50.00	2.04
From 30 to under 45 years old (%)	26.22	23.01	44.76	6.01
From 45 to 60 years old (%)	21.09	16.82	57.72	4.37
Over 60 years old (%)	10.97	16.97	67.48	4.57
Status				
Non-poor	22.04	18.20	55.18	4.58
Poor	8.43	20.06	65.63	5.88
5 groups of income				
Lowest income quintile	13.79	22.58	60.27	3.36
Near lowest income quintile	18.73	22.97	51.26	7.04
Middle income quintile	23.68	21.59	51.63	3.10
Near highest income quintile	13.44	7.04	72.01	7.51
Highest income quintile	29.65	13.66	52.91	3.77

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.12. Share of revenue from each type of fishery in gross breeding revenue

	Aquaculture	Capture fishery
General	32.99	67.01
Dong Thap	33.35	66.65
An Giang	19.99	80.01
Can Tho	47.02	52.98
Urban/Rural		
Urban	42.86	57.14
Rural	28.17	71.83
Gender of household head		
Male	31.86	68.14
Female	36.13	63.87
Education level of household head		
No degree	20.04	79.96
Primary	40.00	60.00
Lower secondary	70.00	30.00
Upper-secondary	0.00	100.00
Post-secondary (college, university or above)	75.00	25.00
Vocational education	100.00	0.00
Household head's age		
Under 30 years old (%)	100.00	0.00
From 30 to under 45 years old (%)	24.76	75.24
From 45 to 60 years old (%)	37.09	62.91
Over 60 years old (%)	32.86	67.14
Status		
Non-poor	42.14	57.86
Poor	10.49	89.51
5 groups of income		
Lowest income quintile	15.89	84.11
Near lowest income quintile	40.62	59.38
Middle income quintile	31.82	68.18
Near highest income quintile	15.05	84.95
Highest income quintile	77.78	22.22

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.13. Percentage of sold/exchanged annual crop product (%)

	Rice	Maize	Sesame	Others	Total
General	91.63	99.83	99.94	69.03	87.03
Dong Thap	90.31	99.77	99.87	59.69	83.67
An Giang	95.69	99.92		69.97	91.05
Can Tho	90.53		100.00	89.51	91.00
Urban/Rural					
Urban	89.60	100.00	100.00	87.90	89.93
Rural	92.39	99.82	99.86	58.91	85.83
Gender of household head					
Male	91.12	99.81	99.92	67.37	86.55
Female	94.70	100.00	100.00	75.90	89.67
Education level of household head					
No degree	89.99	100.00	100.00	68.88	84.64
Primary	92.94	99.68	100.00	74.43	89.83
Lower secondary	92.50		98.62	59.92	85.70
Upper-secondary	88.34			65.72	84.38
Post-secondary (college, university or above)	92.82	100.00	100.00	39.20	87.10
Vocational education	96.49			100.00	96.79
Household head's age					
Under 30 years old (%)	100.00			0.00	50.00
From 30 to under 45 years old (%)	92.00	99.90	99.80	66.05	86.62
From 45 to 60 years old (%)	91.00	99.64	100.00	70.38	87.17
Over 60 years old (%)	92.38	100.00	100.00	71.40	87.63
Status					
Non-poor	92.65	99.81	99.93	70.05	88.26
Poor	71.21	100.00	100.00	61.05	69.15
5 groups of income					
Lowest income quintile	89.52	100.00	100.00	80.82	88.01
Near lowest income quintile	87.45	100.00	99.83	54.77	79.50
Middle income quintile	90.33	98.94	100.00	80.69	88.67
Near highest income quintile	95.51	100.00	100.00	70.12	90.31
Highest income quintile	94.84	100.00	100.00	55.31	89.49

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.14. Percentage of perennial crop sold/exchanged

	Coconut	Others	Total
General	59.81	87.83	64.37
Dong Thap	46.59	87.97	58.76
An Giang	98.86	100.00	99.09
Can Tho	63.47	83.33	64.74
Urban/Rural			
Urban	62.84	91.21	67.56
Rural	56.02	83.33	60.34
Gender of household head			
Male	62.76	92.97	67.27
Female	48.59	75.00	54.15
Education level of household head			
No degree	54.66	100.00	60.16
Primary	62.11	100.00	67.33
Lower secondary	63.79	62.50	63.42
Upper-secondary	74.71		74.71
Post-secondary (college, university or above)	73.54	89.83	78.20
Vocational education	13.33		13.33
Household head's age			
Under 30 years old (%)	33.33		33.33
From 30 to under 45 years old (%)	51.23		51.23
From 45 to 60 years old (%)	68.23	87.97	72.71
Over 60 years old (%)	53.45	87.50	57.99
Status			
Non-poor	60.31	90.74	65.14
Poor	48.25	50.00	48.69
5 groups of income			
Lowest income quintile	58.75	100.00	64.64
Near lowest income quintile	73.95	100.00	79.54
Middle income quintile	56.37	100.00	59.73
Near highest income quintile	50.61	75.66	58.24
Highest income quintile	61.97	100.00	63.70

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.15. Percentage of fruit sold/exchanged

	Citrus fruits	Mango	Banana	Other fruits	Total
General	90.51	75.40	58.57	72.78	71.87
Dong Thap	92.46	78.79	45.40	71.53	70.65
An Giang	0.00	75.83	66.94	68.07	70.73
Can Tho	97.19	58.03	74.71	76.00	75.05
Urban/Rural					
Urban	97.75	78.27	58.55	64.98	71.04
Rural	86.49	72.91	58.58	77.04	72.43
Gender of household head					
Male	88.45	75.70	58.54	76.35	73.60
Female	100.00	74.06	58.63	61.18	66.32
Education level of household head					
No degree	95.08	64.46	53.33	47.17	57.95
Primary	99.78	80.70	59.20	75.58	74.45
Lower secondary	80.18	83.96	55.76	87.32	78.93
Upper-secondary	99.87	72.87	98.00	98.48	89.31
Post-secondary (college, university or above)	50.00	70.50	50.52	85.70	67.26
Vocational education	100.00	100.00	85.19	76.67	86.57
Household head's age					
Under 30 years old (%)		0.00		0.00	0.00
From 30 to under 45 years old (%)	99.20	80.87	30.67	86.74	70.22
From 45 to 60 years old (%)	86.05	80.78	71.82	78.28	78.61
Over 60 years old (%)	96.20	72.93	55.15	63.26	67.22
Status					
Non-poor	90.27	74.87	58.23	74.37	72.15
Poor	92.50	83.33	62.29	33.87	67.72
5 groups of income					
Lowest income quintile	99.96	73.68	63.88	61.11	70.54
Near lowest income quintile	92.31	78.50	50.12	73.56	70.03
Middle income quintile	92.50	86.22	41.05	72.44	70.66
Near highest income quintile	74.27	76.33	64.01	76.95	73.56
Highest income quintile	89.84	67.31	68.46	76.48	73.30

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.16. Percentage of animal sold/exchanged

	Pork	Cattle	Poultry	Other livestock	Total
General	60.28	20.70	24.05	49.86	33.67
Dong Thap	55.30	19.22	21.34	54.12	32.59
An Giang	52.87	22.08	16.95	53.84	27.91
Can Tho	70.86	26.57	35.20	14.81	42.40
Urban/Rural					
Urban	64.25	27.67	30.12	36.31	35.72
Rural	58.53	19.20	19.61	53.55	32.64
Gender of household head					
Male	58.79	19.82	25.33	48.05	33.78
Female	64.30	25.60	20.65	61.86	33.29
Education level of household head					
No degree	51.28	21.23	24.80	64.31	33.22
Primary	69.52	20.98	23.62	39.31	33.50
Lower secondary	58.00	14.59	16.01	51.08	29.10
Upper-secondary	61.97	33.43	43.63	33.33	49.20
Post-secondary (college, university or above)	58.00		26.40	28.57	34.44
Vocational education	38.46		45.45		41.96
Household head's age					
Under 30 years old (%)		0.00	0.00	88.24	29.41
From 30 to under 45 years old (%)	60.66	23.54	29.19	52.86	39.55
From 45 to 60 years old (%)	62.82	18.23	24.30	43.75	33.28
Over 60 years old (%)	51.03	22.74	20.45	55.60	28.40
Status					
Non-poor	63.04	20.95	24.56	48.01	34.86
Poor	33.67	19.61	22.03	59.97	28.07
5 groups of income					
Lowest income quintile	55.09	17.45	21.85	57.68	29.91
Near lowest income quintile	61.15	18.82	19.08	69.73	34.46
Middle income quintile	57.33	19.20	24.40	49.35	33.80
Near highest income quintile	66.22	27.66	29.70	25.40	33.54
Highest income quintile	63.59	31.82	27.29	33.41	37.61

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.17. Percentage of fishery sold/exchanged

	Aquaculture	Capture fishery	Total
General	40.87	56.36	51.08
Dong Thap	34.44	47.47	42.96
An Giang	32.98	71.18	63.28
Can Tho	59.29	65.00	62.26
Urban/Rural			
Urban	40.25	37.97	38.95
Rural	41.29	63.36	56.74
Gender of household head			
Male	36.55	55.57	49.29
Female	51.52	58.70	56.03
Education level of household head			
No degree	45.88	61.24	57.76
Primary	40.92	55.60	49.73
Lower secondary	43.51	0.00	30.46
Upper-secondary		16.67	16.67
Post-secondary (college, university or above)	0.00	0.00	0.00
Vocational education	50.00		50.00
Household head's age			
Under 30 years old (%)	99.29		99.29
From 30 to under 45 years old (%)	40.00	59.37	54.27
From 45 to 60 years old (%)	44.74	61.23	55.02
Over 60 years old (%)	28.26	43.53	38.28
Status			
Non-poor	38.79	55.65	48.39
Poor	57.58	57.47	57.48
5 groups of income			
Lowest income quintile	55.31	55.19	55.21
Near lowest income quintile	23.45	57.32	43.11
Middle income quintile	67.46	48.80	54.74
Near highest income quintile	25.00	55.47	49.93
Highest income quintile	41.08	93.75	52.78

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.18. Price of annual crop (1000 VND/kg)

	Rice	Maize	Sesame
General	6.56	8.15	31.60
Dong Thap	6.73	5.90	32.85
An Giang	6.37	11.25	
Can Tho	6.32		30.35
Urban/Rural			
Urban	6.54	12.00	31.61
Rural	6.56	7.94	31.58
Gender of household head			
Male	6.54	8.38	31.62
Female	6.65	6.18	31.50
Status			
Non-poor	6.56	8.48	31.67
Poor	6.46	5.35	30.00
5 groups of income			
Lowest income quintile	6.28	7.77	32.20
Near lowest income quintile	6.52	6.10	32.25
Middle income quintile	6.56	6.17	29.00
Near highest income quintile	6.51	12.82	30.83
Highest income quintile	6.85	8.00	32.92

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.19. Price of annual crop (1000 VND/kg)

	Rice	Maize	Sesame
General	6.56	8.15	31.60
Dong Thap	6.73	5.90	32.85
An Giang	6.37	11.25	
Can Tho	6.32		30.35
Urban/Rural			
Urban	6.54	12.00	31.61
Rural	6.56	7.94	31.58
Gender of household head			
Male	6.54	8.38	31.62
Female	6.65	6.18	31.50
Status			
Non-poor	6.56	8.48	31.67
Poor	6.46	5.35	30.00
5 groups of income			
Lowest income quintile	6.28	7.77	32.20
Near lowest income quintile	6.52	6.10	32.25
Middle income quintile	6.56	6.17	29.00
Near highest income quintile	6.51	12.82	30.83
Highest income quintile	6.85	8.00	32.92

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.20. Price of perennial crop/fruits

	Coconut (1000 VND/nut)	Mango (1000 VND/kg)	Banana (1000 VND/kg)
General	7.44	14.88	6.16
Dong Thap	7.92	14.47	6.24
An Giang	8.02	16.73	7.41
Can Tho	7.13	12.72	5.53
Urban/Rural			
Urban	7.47	14.02	5.70
Rural	7.39	15.63	6.48
Gender of household head			
Male	7.47	15.01	6.47
Female	7.34	14.32	5.54
Status			
Non-poor	7.45	15.01	6.13
Poor	7.17	13.02	6.44
5 groups of income			
Lowest income quintile	6.92	13.41	6.09
Near lowest income quintile	7.36	13.02	7.61
Middle income quintile	8.61	19.18	6.04
Near highest income quintile	6.99	15.50	5.58
Highest income quintile	7.45	14.17	5.52

Source: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.21: Revenue of sold/exchanged annual crop (1000 VND/household)

	Rice	Maize	Sesame	Others	Total
General	93508.78	1052.99	663.07	5897.27	101122.11
Dong Thap	89983.66	758.33	568.65	5404.13	96714.76
An Giang	122918.39	2540.67	26.12	3469.55	128954.73
Can Tho	70694.19	170.08	1555.20	9608.19	82027.65
Urban/Rural					
Urban	79220.32	336.02	1012.55	9369.84	89938.73
Rural	99317.98	1344.48	520.98	4485.44	105668.89
Gender of household head					
Male	98007.28	1173.75	750.49	5176.44	105107.97
Female	69853.73	417.98	203.37	9687.71	80162.79
Education level of household head					
No degree	66282.47	1635.47	703.00	6108.52	74729.46
Primary	97934.97	1143.61	1030.86	5442.83	105552.27
Lower secondary	121420.98	0.00	66.00	10864.62	132351.60
Upper-secondary	117415.62	0.00	0.00	3562.16	120977.78
Post-secondary (college, university or above)	120095.31	484.38	215.00	443.75	121238.44
Vocational education	189168.00	0.00	0.00	5000.00	194168.00
Household head's age					
Under 30 years old (%)	270000.00	0.00	0.00	0.00	270000.00
From 30 to under 45 years old (%)	72304.20	2649.64	807.54	12064.71	87826.08
From 45 to 60 years old (%)	103631.24	356.14	947.87	4257.55	109192.81
Over 60 years old (%)	92931.13	825.97	55.84	3247.50	97060.45
Status					
Non-poor	98361.30	1105.18	696.81	5865.42	106028.71
Poor	16456.70	224.24	127.27	6403.03	23211.24
5 groups of income					
Lowest income quintile	32005.29	1184.17	417.92	5567.80	39175.18
Near lowest income quintile	41984.22	781.25	858.30	4020.80	47644.58
Middle income quintile	57246.31	1260.14	474.00	5615.95	64596.41
Near highest income quintile	80205.43	837.62	1396.83	8802.38	91242.26
Highest income quintile	247310.18	1176.47	270.59	5778.15	254535.39

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.22. Revenue of sold/exchanged perennial crop (1000 VND/household)

	Coconut	Others	Total
General	2521.25	704.25	3225.49
Dong Thap	2435.44	1217.72	3653.16
An Giang	1238.40	1500.00	2738.40
Can Tho	2843.42	27.42	2870.84
Urban/Rural			
Urban	4118.41	1149.97	5268.38
Rural	1073.81	300.31	1374.13
Gender of household head			
Male	2936.74	809.26	3746.00
Female	909.12	296.80	1205.92
Education level of household head			
No degree	1886.55	377.73	2264.27
Primary	2336.29	235.90	2572.19
Lower secondary	1347.37	2663.16	4010.53
Upper-secondary	1188.00	0.00	1188.00
Post-secondary (college, university or above)	10533.33	976.67	11510.00
Vocational education	40.00	0.00	40.00
Household head's age			
Under 30 years old (%)	180.00	0.00	180.00
From 30 to under 45 years old (%)	1888.70	0.00	1888.70
From 45 to 60 years old (%)	2360.95	1371.89	3732.84
Over 60 years old (%)	3156.05	188.29	3344.34
Status			
Non-poor	2586.02	744.50	3330.52
Poor	1457.14	42.86	1500.00
5 groups of income			
Lowest income quintile	1136.47	76.47	1212.94
Near lowest income quintile	1626.36	741.82	2368.18
Middle income quintile	2089.71	6.76	2096.48
Near highest income quintile	1053.38	567.38	1620.75
Highest income quintile	5830.00	1666.67	7496.67

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.23. Revenue of sold/exchanged fruits (1000 VND/household)

	Citrus fruits	Mango	Banana	Other fruits	Total
General	2931.81	12174.10	569.28	5712.45	21387.64
Dong Thap	4554.27	18855.29	202.64	7011.09	30623.30
An Giang	0.00	9176.46	261.94	839.44	10277.85
Can Tho	1876.40	486.07	1592.38	6911.46	10866.31
Urban/Rural					
Urban	2645.39	14021.35	522.92	4016.10	21205.76
Rural	3125.98	10921.88	600.71	6862.38	21510.94
Gender of household head					
Male	3196.39	12964.24	606.91	6019.04	22786.58
Female	1931.51	9186.71	427.01	4553.29	16098.52
Education level of household head					
No degree	1524.13	7483.89	156.65	3224.13	12388.81
Primary	2049.71	10047.34	483.36	5254.01	17834.42
Lower secondary	1905.26	12214.81	1235.37	6308.43	21663.87
Upper-secondary	13869.57	15356.52	1152.17	18993.48	49371.74
Post-secondary (college, university or above)	454.55	15506.82	852.59	3515.91	20329.86
Vocational education	16888.89	82222.22	466.67	9297.78	108875.56
Household head's age					
Under 30 years old (%)	0.00	0.00	0.00	0.00	0.00
From 30 to under 45 years old (%)	353.75	9241.07	441.07	5956.43	15992.32
From 45 to 60 years old (%)	3856.21	7216.57	872.57	6846.76	18792.11
Over 60 years old (%)	3017.47	19176.09	295.45	4471.02	26960.03
Status					
Non-poor	2944.21	13188.65	615.42	6245.94	22994.22
Poor	2800.00	1386.00	78.67	39.67	4304.33
5 groups of income					
Lowest income quintile	1108.11	7627.09	139.32	639.19	9513.72
Near lowest income quintile	2255.65	6432.35	123.97	3913.01	12724.99
Middle income quintile	734.38	4609.69	1328.38	3875.94	10548.38
Near highest income quintile	1370.43	14105.60	468.25	4408.66	20352.94
Highest income quintile	8539.47	26406.05	836.18	14958.16	50739.87

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.24. Revenue of sold/exchanged animal (1000 VND/household)

	Pork	Cattle	Poultry	Other livestock	Total
General	11644.33	5037.47	4076.85	1996.35	22754.99
Dong Thap	8749.79	3704.69	4547.29	1107.62	18109.39
An Giang	5970.30	9579.21	1730.79	750.50	18030.79
Can Tho	22711.27	3049.02	5514.35	4902.90	36177.55
Urban/Rural					
Urban	6467.59	3886.21	4728.04	3560.00	18641.83
Rural	14646.84	5705.20	3699.15	1089.44	25140.63
Gender of household head					
Male	10892.26	5103.70	2895.29	902.56	19793.80
Female	13923.57	4836.73	7657.69	5311.22	31729.22
Education level of household head					
No degree	6600.00	6283.97	2843.03	637.37	16364.37
Primary	14037.66	4913.79	4591.28	533.78	24076.51
Lower secondary	6578.18	4454.55	1841.71	10936.93	23811.36
Upper-secondary	30332.50	2600.00	16875.00	210.00	50017.50
Post-secondary (college, university or above)	33733.33	0.00	4047.47	400.00	38180.80
Vocational education	15000.00	0.00	400.00	0.00	15400.00
Household head's age					
Under 30 years old (%)	0.00	0.00	0.00	187.50	187.50
From 30 to under 45 years old (%)	17202.55	6288.78	3735.82	465.37	27692.51
From 45 to 60 years old (%)	11397.63	5452.63	5310.60	3667.52	25828.38
Over 60 years old (%)	7124.86	3214.29	2240.29	435.71	13015.14
Status					
Non-poor	14011.83	5813.04	4625.60	2420.79	26871.26
Poor	1201.37	1616.44	1656.33	124.18	4598.32
5 groups of income					
Lowest income quintile	3753.47	2193.07	3190.28	248.27	9385.08
Near lowest income quintile	12036.05	4666.28	5530.00	1311.63	23543.95
Middle income quintile	13092.31	3487.18	2045.90	738.77	19364.15
Near highest income quintile	9402.46	2196.72	3400.82	183.61	15183.61
Highest income quintile	23051.59	13927.54	6456.90	8432.75	51868.78

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.25. Revenue of sold/exchanged fishery (1000 VND/household)

	Aquaculture	Capture fishery	Total
General	4696.82	7747.65	12444.47
Dong Thap	3643.95	5764.28	9408.22
An Giang	2329.46	17038.64	19368.11
Can Tho	10549.00	3371.20	13920.20
Urban/Rural			
Urban	6501.86	3446.86	9948.72
Rural	3794.30	9898.05	13692.35
Gender of household head			
Male	4891.76	9529.63	14421.38
Female	4173.29	2961.77	7135.06
Education level of household head			
No degree	2323.06	6943.99	9267.04
Primary	4870.13	12472.00	17342.13
Lower secondary	9382.50	0.00	9382.50
Upper-secondary	0.00	600.00	600.00
Post-secondary (college, university or above)	0.00	0.00	0.00
Vocational education	75000.00	0.00	75000.00
Household head's age			
Under 30 years old (%)	21000.00	0.00	21000.00
From 30 to under 45 years old (%)	5378.38	5639.65	11018.03
From 45 to 60 years old (%)	6056.50	11322.67	17379.17
Over 60 years old (%)	725.81	3594.19	4320.00
Status			
Non-poor	5864.46	8830.92	14695.38
Poor	1793.51	5054.11	6847.62
5 groups of income			
Lowest income quintile	2361.08	3910.81	6271.89
Near lowest income quintile	1372.17	7099.07	8471.23
Middle income quintile	4288.18	10109.09	14397.27
Near highest income quintile	927.27	7553.41	8480.68
Highest income quintile	20145.83	14066.67	34212.50

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.26. Average output of annual crop (ton/year)

	Rice	Maize	Sesame	Others	Total
General	13.93	0.17	0.02	0.03	14.14
Dong Thap	13.16	0.15	0.02	0.01	13.33
An Giang	18.30	0.35	0.00	0.07	18.73
Can Tho	11.12	0.02	0.05	0.01	11.20
Urban/Rural					
Urban	11.93	0.03	0.03	0.02	12.02
Rural	14.74	0.22	0.02	0.03	15.01
Gender of household head					
Male	14.62	0.18	0.02	0.03	14.85
Female	10.30	0.10	0.01	0.01	10.42
Education level of household head					
No degree	9.99	0.22	0.02	0.01	10.24
Primary	14.43	0.22	0.03	0.06	14.74
Lower secondary	17.04	0.00	0.00	0.00	17.05
Upper-secondary	19.96	0.00	0.00	0.00	19.96
Post-secondary (college, university or above)	17.81	0.09	0.01	0.02	17.92
Vocational education	27.20	0.00	0.00	0.00	27.20
Household head's age					
Under 30 years old (%)	56.00	0.00	0.00	0.00	56.00
From 30 to under 45 years old (%)	10.93	0.44	0.03	0.08	11.47
From 45 to 60 years old (%)	15.93	0.04	0.03	0.01	16.01
Over 60 years old (%)	12.65	0.15	0.00	0.00	12.81
Status					
Non-poor	14.64	0.18	0.02	0.03	14.86
Poor	2.65	0.04	0.00	0.00	2.70
5 groups of income					
Lowest income quintile	5.50	0.19	0.01	0.00	5.70
Near lowest income quintile	6.74	0.14	0.03	0.00	6.91
Middle income quintile	8.80	0.26	0.02	0.11	9.19
Near highest income quintile	12.89	0.10	0.05	0.01	13.05
Highest income quintile	34.60	0.15	0.01	0.02	34.77

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.27. Average output of perennial crop and fruits (ton/year)

	Coconut (nut)	Citrus fruit (ton)	Mango (ton)	Banana (ton)
General	524.75	1.20	1.40	0.47
Dong Thap	539.59	2.08	0.18	2.17
An Giang	307.83	0.71	0.22	0.45
Can Tho	538.65	0.17	1.21	1.32
Urban/Rural				
Urban	719.30	1.89	0.51	1.13
Rural	317.79	1.08	0.44	1.96
Gender of household head				
Male	596.40	1.36	0.50	1.81
Female	230.63	1.57	0.39	1.07
Education level of household head				
No degree	459.65	0.69	0.27	0.82
Primary	479.94	1.31	0.42	1.80
Lower secondary	312.31	1.43	0.71	1.88
Upper-secondary	549.00	2.03	1.34	3.15
Post-secondary (college, university or above)	1664.29	2.27	0.66	2.07
Vocational education	50.00	6.50	0.29	1.97
Household head's age				
Under 30 years old (%)	60.00	0.07		0.70
From 30 to under 45 years old (%)	439.61	0.93	0.43	2.05
From 45 to 60 years old (%)	504.35	0.96	0.72	1.74
Over 60 years old (%)	606.89	2.00	0.25	1.38
Status				
Non-poor	518.29	1.51	0.52	1.74
Poor	675.00	0.19	0.04	0.08
5 groups of income				
Lowest income quintile	334.46	0.86	0.20	0.44
Near lowest income quintile	344.81	0.88	0.13	1.30
Middle income quintile	494.00	0.56	0.84	0.80
Near highest income quintile	345.84	1.56	0.48	1.43
Highest income quintile	892.14	2.78	0.67	3.89

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.28. Productivity of annual plants (ton/ha/year)

	Rice	Maize	Sesame
General	4.66	6.65	0.82
Dong Thap	4.41	7.15	0.74
An Giang	5.12	5.96	
Can Tho	4.75		0.89
Urban/Rural			
Urban	4.54	7.52	0.77
Rural	4.70	6.60	0.88
Gender of household head			
Male	4.68	6.54	0.88
Female	4.49	7.55	0.54
Education level of household head			
No degree	4.51	6.32	0.60
Primary	4.75	6.57	1.12
Lower secondary	4.87		1.21
Upper-secondary	4.67		
Post-secondary (college, university or above)	4.44	10.00	0.55
Vocational education	4.63		
Household head's age			
Under 30 years old (%)	4.67		
From 30 to under 45 years old (%)	4.73	8.51	0.77
From 45 to 60 years old (%)	4.61	5.62	0.89
Over 60 years old (%)	4.67	5.46	0.54
Status			
Non-poor	4.70	6.85	0.84
Poor	3.85	4.88	0.35
5 groups of income			
Lowest income quintile	4.22	5.72	0.56
Near lowest income quintile	4.55	7.05	0.91
Middle income quintile	4.61	8.37	0.76
Near highest income quintile	4.89	5.81	1.20
Highest income quintile	4.96	8.33	0.42

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.29. Productivity of perennial plants and fruit trees (ton/ha/year)

	Coconut (nuts/ha)	Mango (ton/ha)	Banana (ton/ha)
General	5893.79	12.12	24.55
Dong Thap	4425.00	14.57	29.39
An Giang	3212.50	9.25	15.24
Can Tho	6938.70	6.61	21.10
Urban/Rural			
Urban	7587.34	12.36	22.95
Rural	3776.86	11.91	25.74
Gender of household head			
Male	6617.89	12.36	26.77
Female	3142.22	10.98	20.12
Education level of household head			
No degree	4628.98	7.10	30.82
Primary	7812.12	11.35	25.03
Lower secondary	4520.95	17.80	13.88
Upper-secondary	9300.00	14.97	32.21
Post-secondary (college, university or above)	6133.33	15.07	27.72
Vocational education	333.33	35.71	9.92
Household head's age			
Under 30 years old (%)	666.67	5.33	
From 30 to under 45 years old (%)	5493.60	15.04	41.46
From 45 to 60 years old (%)	7587.14	12.88	28.05
Over 60 years old (%)	4049.76	11.18	17.03
Status			
Non-poor	5756.81	12.48	24.65
Poor	9044.44	7.15	23.43
5 groups of income			
Lowest income quintile	2492.50	5.69	31.23
Near lowest income quintile	4603.56	10.53	16.70
Middle income quintile	5011.11	9.82	10.65
Near highest income quintile	5171.07	15.38	34.84
Highest income quintile	9568.25	17.91	27.95

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.30. Selling/Exchanging location for annual crop (%)

	Buyer coming to household	Selling at the buyer's place	Selling at communal market	Other
General	93.18	3.71	2.42	0.69
Dong Thap	91.27	5.44	2.47	0.82
An Giang	96.04	1.44	2.16	0.36
Can Tho	94.51	2.20	2.56	0.73
Urban/Rural				
Urban	91.12	3.55	4.44	0.89
Rural	94.02	3.78	1.59	0.61
Gender of household head				
Male	93.19	3.86	2.24	0.71
Female	93.10	2.87	3.45	0.57
Education level of household head				
No degree	90.65	5.28	3.60	0.48
Primary	95.02	1.58	2.26	1.13
Lower secondary	93.13	6.11	0.76	0.00
Upper-secondary	97.47	0.00	1.27	1.27
Post-secondary (college, university or above)	89.83	8.47	1.69	0.00
Vocational education	96.67	3.33	0.00	0.00
Household head's age				
Under 30 years old (%)	100.00	0.00	0.00	0.00
From 30 to under 45 years old (%)	94.33	4.67	1.00	0.00
From 45 to 60 years old (%)	93.15	3.16	2.46	1.23
Over 60 years old (%)	91.96	3.85	3.85	0.35
Status				
Non-poor	93.08	3.82	2.37	0.73
Poor	94.92	1.69	3.39	0.00
5 groups of income				
Lowest income quintile	92.50	2.92	3.33	1.25
Near lowest income quintile	91.35	4.81	2.40	1.44
Middle income quintile	93.19	3.83	2.98	0.00
Near highest income quintile	95.56	0.44	3.56	0.44
Highest income quintile	93.20	6.40	0.00	0.40

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.31. Selling/Exchanging location for fruits (%)

	Buyer coming to household	Selling at the buyer's place	Selling at communal market	Other
General	87.14	5.71	4.29	2.86
Dong Thap	84.00	8.00	4.00	4.00
An Giang	80.00	0.00	20.00	0.00
Can Tho	90.00	5.00	2.50	2.50
Urban/Rural				
Urban	82.05	7.69	5.13	5.13
Rural	93.55	3.23	3.23	0.00
Gender of household head				
Male	87.93	3.45	5.17	3.45
Female	83.33	16.67	0.00	0.00
Education level of household head				
No degree	88.00	8.00	4.00	0.00
Primary	91.67	4.17	4.17	0.00
Lower secondary	75.00	8.33	0.00	16.67
Upper-secondary	100.00	0.00	0.00	0.00
Post-secondary (college, university or above)	83.33	0.00	16.67	0.00
Vocational education	100.00	0.00	0.00	0.00
Household head's age				
Under 30 years old (%)	100.00	0.00	0.00	0.00
From 30 to under 45 years old (%)	87.50	12.50	0.00	0.00
From 45 to 60 years old (%)	86.84	5.26	5.26	2.63
Over 60 years old (%)	86.96	4.35	4.35	4.35
Status				
Non-poor	87.88	6.06	4.55	1.52
Poor	75.00	0.00	0.00	25.00
5 groups of income				
Lowest income quintile	100.00	0.00	0.00	0.00
Near lowest income quintile	76.92	15.38	7.69	0.00
Middle income quintile	100.00	0.00	0.00	0.00
Near highest income quintile	78.95	5.26	5.26	10.53
Highest income quintile	88.24	5.88	5.88	0.00

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.32. Selling/Exchanging location for animal (%)

	Buyer coming to household	Selling at the buyer's place	Selling at communal market	Other
General	85.13	4.11	9.49	1.27
Dong Thap	83.44	5.52	10.43	0.61
An Giang	85.07	1.49	11.94	1.49
Can Tho	88.37	3.49	5.81	2.33
Urban/Rural				
Urban	79.82	8.26	10.09	1.83
Rural	87.92	1.93	9.18	0.97
Gender of household head				
Male	85.48	3.23	10.08	1.21
Female	83.82	7.35	7.35	1.47
Education level of household head				
No degree	81.67	5.83	11.67	0.83
Primary	90.68	1.69	5.93	1.69
Lower secondary	76.19	9.52	11.90	2.38
Upper-secondary	95.45	0.00	4.55	0.00
Post-secondary (college, university or above)	83.33	0.00	16.67	0.00
Vocational education	50.00	0.00	50.00	0.00
Household head's age				
Under 30 years old (%)	100.00	0.00	0.00	0.00
From 30 to under 45 years old (%)	87.37	4.21	8.42	0.00
From 45 to 60 years old (%)	87.58	4.58	5.88	1.96
Over 60 years old (%)	76.12	2.99	19.40	1.49
Status				
Non-poor	86.89	3.75	8.24	1.12
Poor	75.51	6.12	16.33	2.04
5 groups of income				
Lowest income quintile	83.10	5.63	9.86	1.41
Near lowest income quintile	83.33	5.56	11.11	0.00
Middle income quintile	82.81	4.69	10.94	1.56
Near highest income quintile	80.95	0.00	14.29	4.76
Highest income quintile	94.03	2.99	2.99	0.00

Sources: Baseline survey of Cao Lanh Impact Evaluation

Table A.4.33. Selling/Exchanging location for fishery (%)

	Buyer coming to household	Selling at the buyer's place	Selling at communal market	Other
General	32.10	12.35	49.38	6.17
Dong Thap	38.10	21.43	38.10	2.38
An Giang	33.33	0.00	66.67	0.00
Can Tho	16.67	5.56	55.56	22.22
Urban/Rural				
Urban	28.57	19.05	47.62	4.76
Rural	33.33	10.00	50.00	6.67
Gender of household head				
Male	36.21	8.62	50.00	5.17
Female	21.74	21.74	47.83	8.70
Education level of household head				
No degree	26.00	16.00	52.00	6.00
Primary	44.00	8.00	44.00	4.00
Lower secondary	25.00	0.00	50.00	25.00
Upper-secondary	0.00	0.00	100.00	0.00
Post-secondary (college, university or above)	100.00	0.00	0.00	0.00
Vocational education				
Household head's age				
Under 30 years old (%)	0.00	0.00	100.00	0.00
From 30 to under 45 years old (%)	37.50	20.83	41.67	0.00
From 45 to 60 years old (%)	30.95	9.52	54.76	4.76
Over 60 years old (%)	28.57	7.14	42.86	21.43
Status				
Non-poor	36.36	12.73	47.27	3.64
Poor	23.08	11.54	53.85	11.54
5 groups of income				
Lowest income quintile	32.00	4.00	52.00	12.00
Near lowest income quintile	17.65	17.65	64.71	0.00
Middle income quintile	42.86	21.43	35.71	0.00
Near highest income quintile	7.69	23.08	69.23	0.00
Highest income quintile	66.67	0.00	16.67	16.67

Sources: Baseline survey of Cao Lanh Impact Evaluation

10 Appendix C: Qualitative Research Tools

In-depth interview with transport operator

A. Informant's information

Full name:	……
Gender (Cross X)	Male: ……..Female: ……..Other: …….
Ethnicity:	……
Organization:	……
Position:	……
Phone number:	……

B. Interview focus:

General information of the organization

Evaluation of current transportation infrastructure and provincial connectivity

Opinion with regards to potential impacts brought about by the project to the development of the province.

Opinion with regards to potential impacts brought about by the project to the development of the company.

Recommendations to maximize the synergy effects for similar projects and transportation programs

C. Main questions

(Interviewers can add more questions, but must ask all following questions)

No	Questions
	General information of the organization Organizations' main activity Total labour size in general and total female employee that currently working in the organization The organization's transport means: Number of main transport means using for passenger transport/freight transport Main operation routes Transportation time and cost for passenger transport/freight transport
	Evaluation of current transportation infrastructure and provincial connectivity, difficulties and advantages for the organization's operation Evaluation of current transportation infrastructure, difficulties and advantages for the organization's operation. Connectivity of the organization [at the following level] [related to socio-economic development benefit] Linkage with other enterprises within the province Linkage with other enterprises in other provinces Linkage with other stakeholders (suppliers, partners, clients …)

	Opinion with regards to potential impacts brought about by the project to the development of the province. Transportation infrastructure within the region Opportunity to expand the enterprises' operation market Opportunity for job creation in general and job creation for female labour Transportation demand and passenger/freight transportation activity of inter-provincial enterprise Tourism activity of the province (to be asked only with passenger transport operator) Transportation time and volume for passenger/freight transport in the coming period (to achieve economy of scale, reduced numbers of individual small truck Other impacts
	Opinion with regards to potential impacts brought about by the project to the development of the company Changes in size Changes in operation's type Changes in labour size (in general and for female employee) and the ability to attract labour from other provinces [To be asked with passenger transport operator] Changes in operating route, and frequency of each route [inter-provincial, intra-provincial, to HCMC or Can Tho city] Changes in revenue and cost of transportation [increase or decrease as compared to before the project] [To be asked with freight transport operator] Changes in the use of different transportation means for freight transport as compared to before the project Changes in road transport by container in 3 provinces as compared to before the project [achieving economies of scale, reducing numbers of individual small truck movements, and lowering costs per unit of freight] Changes in operating route, and frequency of each route [inter-provincial, intra-provincial, to HCMC or Can Tho city] Changes in revenue and cost of transportation Your opinion toward the following statement: The project will stimulate the growth in transport and storage-related enterprise facilities and employment within all three provinces. Reason?
	Recommendations to maximize the synergy effects for similar projects and transportation programs

INDEPTH INTERVIEW WITH ENTERPRISES IN THE INDUSTRIAL PARK

A. Informant's information

Full name:	……
Gender (Cross X)	Male: ……..Female: ……..Other: …….
Ethnicity:	……
Organization:	……
Position:	……
Phone number:	……

B. Interview focus:

General information of the organization

Evaluation of current transportation infrastructure and provincial connectivity

Opinion with regards to potential impacts brought about by the project to the development of the province.

Opinion with regards to potential impacts brought about by the project to the development of the company.

Recommendations to maximize the synergy effects for similar projects and transportation programs

C. Main questions

(Interviewers can add more questions, but must ask all following questions)

No	Questions
	General information of the organization Organizations' main activity Total labour size in general and total female employee that currently working in the organization The organization's transport means: Number of main transport means using for passenger transport/freight transport Main operation routes Transportation time and cost for freight transport
	Evaluation of current transportation infrastructure and provincial connectivity, difficulties and advantages for the organization's operation Evaluation of current transportation infrastructure, difficulties and advantages for the organization's operation. Connectivity of the organization [at the following level] [related to socio-economic development benefit] Linkage with other enterprises within the province Linkage with other enterprises in other provinces Linkage with other stakeholders (suppliers, partners, clients …)
	Opinion with regards to potential impacts brought about by the project to the development of the province. Transportation infrastructure within the region Opportunity to expand the enterprises' operation market Opportunity for job creation in general and job creation for female labour Transportation demand and passenger/freight transportation activity of inter-provincial enterprise

	Tourism activity of the province (to be asked only with passenger transport operator) Transportation time and volume for freight transport in the coming period (to achieve economy of scale, reduced numbers of individual small truck) Other impacts
	Opinion with regards to potential impacts brought about by the project to the development of the company Changes in size Changes in operation's type Changes in labour size (in general and for female employee) and the ability to attract labour from other provinces Changes in access to input material in: Suppliers [number, location] Transportation time Transportation cost Change in access to market in: Clients [number, location] Transportation time Transportation cost Your opinion toward the following statements and your reason: The project will lead to the growth in containerized road freight across all three provinces (achieving economies of scale, reduced numbers of individual small truck movements, and lower costs per unit of freight). The project will stimulate the growth in transport and storage-related enterprise facilities and employment within all three provinces.
	Recommendations to maximize the synergy effects for similar projects and transportation programs

IN-DEPTH INTERVIEW WITH THE INDUSTRIAL PARK REPRESENTATIVES

A. Informant's information

Full name:	……
Gender (Cross X)	Male: ……..Female: ……..Other: …….
Ethnicity:	……
Organization:	……
Position:	……
Phone number:	……

B. Interview focus:

General information about the industrial park and the enterprises working in the industrial park

Evaluation of current transportation infrastructure and provincial connectivity

Opinion with regards to potential impacts brought about by the project to the development of the province and the industrial park.

Opinion with regards to potential impacts brought about by the project to the development of the enterprises in the industrial park.

Recommendations to maximize the synergy effects for similar projects and transportation programs

C. Main questions

(Interviewers can add more questions, but must ask all following questions)

No.	Question
	General information of the industrial park Establishment and development process Number of enterprises in the industrial park Main sector that the enterprises in the industrial park work Average size of the enterprises in the industrial park Labour size and the proportion of female employee
	Evaluation of current transportation infrastructure and provincial connectivity, difficulties and advantages for the organization's operation Evaluation of current transportation infrastructure, difficulties and advantages for the operation of enterprises working in the industrial park Connectivity of the organization [at the following level] [related to socio-economic development benefit] Linkage with other enterprises within the province Linkage with other enterprises in other provinces Linkage with other stakeholders (suppliers, partners, clients …)
	Opinion with regards to potential impacts brought about by the project to the development of the province. Transportation infrastructure within the region Opportunity to expand the enterprises' operation market Opportunity for job creation in general and job creation for female labour Transportation demand for freight transportation activity of enterprise in the province

	Transportation time and volume for freight transport in the coming period (to achieve economy of scale, reduced numbers of individual small truck Other impacts
	Opinion with regards to potential impacts brought about by the project to the development of industrial park and the enterprises in the industrial park Changes in size Changes in operation's type Changes in labour size (in general and for female employee) and the ability to attract labour from other provinces Changes in access to input material in: Suppliers [number, location] Transportation time Transportation cost Change in access to market in: Clients [number, location] Transportation time Transportation cost Your opinion toward the following statements and your reason: The project will lead to the growth in containerized road freight across all three provinces (achieving economies of scale, reduced numbers of individual small truck movements, and lower costs per unit of freight). The project will stimulate the growth in transport and storage-related enterprise facilities and employment within all three provinces.
	Recommendations to maximize the synergy effects for similar projects and transportation programs

IN-DEPTH INTERVIEW WITH LOCAL AUTHORITY (COMMUNE LEVEL)

A. Informant's information

Full name: ……

Gender (Cross X) Male: ……..Female: ……..Other: …….

Ethnicity: ……

Organization: ……

Position: ……

Phone number: ……

B. Interview focus

The commune's socio-economic characteristics

Awareness and participation of local authority in the project activities

Opinion with regards to potential impacts brought about by the project to the local community

Supporting activities for affected households

Recommendations to maximize the synergy effects for similar projects and transportation programs

C. Main questions

(Interviewers can add more questions, but must ask all following questions)

No	Questions
	The socio-economics characteristics of the commune Population (number of households, people and woman) Rate of poor or near-poor household (how many are poor female-headed household) Economic situation (Average income per capita, main livelihood activity…) Ethnicity of citizen in the commune Access to health, education etc.
	Awareness and participation of local authority in the project activities Do you know information about the Project? If yes, what information and from which information channel? Does the local authority participate in the project activities? If yes, which activities and the participation level? Do you directly participate in the project activities? If yes, which activity and what is the participation level? Informed about the project activities and progress Consultation in the plan making for the construction of the bridge Consultation in the process of support design for affected household Participate in the support activities Participate in the pre-construction study Participate in the land clearance Other activities, please describe
	Opinion with regards to potential impacts brought about by the project to the local community: Economic benefit

	Changes in income in general and income for female labour Job creation in general and job creation for female labour Changes in the number of SME and household business established and developed in the area and the number of SME and household business having female director Other economic benefits, please describe Changes in transport infrastructure Access intra-province and inter-provinces Transportation time Transportation cost Changes in access to healthcare Changes in access to education Dropout rate in general and dropout rate of female students Education quality Changes in access to cultural facilities Changes in access to public services Changes in access to other services [post office etc.] Other benefits, please describe Is there any negative impact with the local community which happened or will happened in the coming period (with male and female)? If yes, please describe the impact and the mitigation measures that the local community undertook or will undertake.
	Supporting activities for affected households Please describe supporting activities undertaken for affected households Local authority's activities Activities coordinating with the Project Activities of other organizations Your evaluation of the relevance, effectiveness of the supporting activities?
	Recommendations to maximize the synergy effects for similar projects and transportation programs

IN-DEPTH INTERVIEW WITH HOUSEHOLD BEING RESETTLED

A. Informant's information

Full name: ……

Gender (Cross X) Male: ……..Female: ……..Other: …….

Ethnicity: ……

Job: ……

Phone number: ……

B. Interview focus

Basic information of the household

Awareness and the participation of resettled household in the project activities

Evaluation of the resettlement situation and project support

Opinion of potential impact brought about by the project

Recommendations/other opinions of the household

C. Main questions

(Interviewers can add more questions, but must ask all following questions)

No	Questions
	Basic information of the household (Ethnicity, household size, number of female, number of member in labour age, occupation)
	Awareness and the participation of resettled household in the project activities Do you know about CLBP? What information do you know about CLBP? From which information channel? Do you or other household members participate in the project activities? If yes, at which participation level? Informed about the project activities and progress Consultation in the plan making for the construction of the bridge Consultation in the process of support design for affected household Participate in the support activities Participate in the pre-construction study Participate in the land clearance Work for project activities Other project activities, please describe
	Evaluation of the resettlement situation and project support Evaluation of the resettlement situation: Description of the resettlement place: Compare access to healthcare, education and living condition between the resettled place and the prior place? Other support activities Describe other support activities [micro-finance funding; agricultural extension; small business; vocational training; information campaign about HIV and human trafficking]

	Evaluation of the ***relevance*** of Project support with the household's demand? [To which extent is the relevance level for female household members] Evaluation of the ***benefits*** of the Project support with the household? [To which extent, it benefits female household members] Evaluation of the ***effectiveness*** of the Project support with the household? [To which extent is the effectiveness for female household members]
	Opinion with regards to potential impacts brought about by the project to the household: Economics benefit Changes in income in general and income for female labour Job creation in general and job creation for female labour Other economics benefit Changes in transport infrastructure Access intra-province and inter-provinces Transportation time Transportation cost Changes in access to healthcare [easier to access healthcare facility] Changes in access to education [easier to access to school] Changes in access to cultural facilities Changes in access to public services Changes in access to other services [post office etc.] Other benefits, please describe Is there any negative impact with the local community which happened or will happened in the coming period (with male and female)? If yes, please describe the impact and the mitigation measures that the local community undertook or will undertake?
	Besides the project support, does your household have other source of support to improve the household living standard? From local authority From other sources, please describe
	Recommendations/other opinions of the household

FOCUS GROUP DISCUSSION WITH RESETTLED HOUSEHOLD

I. FOCUS GROUP DISCUSSION GUIDE

Purpose of focus group discussion

To understand the awareness and participation level of the resettled households in the project activities, evaluating the relevance of support program and the changes brought by the Project.

Target for FGD

Interview group of male and female separately. Each group has 6-8 members, who are the member of resettled household and are. Each group have poor/near-poor household and ethnic minority household if there's any.

Duration of FGD: 1.5 to 2 hours

Task assignment:

Notetaking officer record information about the group discussion in a personal notebook then re-type it into computer at the end of the survey or the end of day

Officer incharge of taking note should actively record and take pictures

How to take note: record the FGD by each question, example, along with the time at which GDF take places, who raise their statements, how do responder raises his/her statement? Does the atmosphere of FGD stay at high level, does everyone discussing lively and enthusiastic? The notetaker should focus on recording the response of participants rather than the question of excecutive officer.

Stationery:

3 A0 papers

12 color A4 papers

02 double size tapes

01 one size tape

06 marker pen

06 pencils and erasers

01 scissors

Every single FGD must follow following codes:

Encourage the active participation of every single participant

Encourage the discussion of every members

Ensure the fairness, equality of rights and voice of all participants

Both officers only guide the participant and do not give out any statement

Both officers accept the response of all participants and do not judge any of them

Ask the participants for permission for recording and taking pictures

II. STEPS TO IMPLEMENT

Step 1: Self introduce and asking for permission

Introduce the survey team

Introduce the purpose, content and the process of FGD

Ask for their identity and write their name on a colored paper then stick it on participants' shirt.

Ask for the permission to record.

Step 2: Start discussion

III. FOCUS GROUP DISCUSSION CONTENT

Exercise 1: Mapping the resettlement place and the commune/village

Content:

All participants draw on 1 paper the commune/village map and the resettlement place

On that map, mark the household place, the administrative center, school, commune health's clinic, cultural house and other important facilities.

The map will be used for the households to evaluate the relevance of the resettlement activities in Exercise 2

Exercise 2: List the project's activities and evaluate the relevance of support with the households' demand

Content:

List the project's activities

Discussion about each activities listed: Grade the relevance from 1 to 5 according the following scale:

Scale:

1 – Irrelevant; 2 – Little relevant; 3 – Relevant; 4 – Very relevant

Form of presentation:

Activities' name	Evaluation of the relevance in scale 4			
	(1)	(2)	(3)	(4)
Resettlement support				
Vocational training				
Micro-credit				
Small business's support				
Agriculture extension support				
Information campaign about HIV and human trafficking				
Other activity 1 ……				
Other activity 2……				

Exercise 3: List the project impact with the household (especially with female household members)

Content:

Participants list the Project's impact *to each individual*

Positive/negative impact; impact that happened and will happen

Impact with female members [Mark] ★

Grading the project's impact according to the scale

Little impact; 2- Large impact; 3- Very large impact

Form of presentation:

Positive impact happened	Negative impact happened
Positive impact will happen	Negative impact will happen

Exercise 4: The most important change

Content:

Each participant tell the story of change after having the Project

Each write their stories in 1 colour card

Can ask the participant to talk about the story

Notes of content: change about household livelihood, awareness, change about the access to services, changes about the transportation, living conditions and living standard of the household …

card

Name: Nguyen Van A

Address:

Story of change:

……
……
……
……
……
……
……

IN-DEPTH INTERVIEW WITH THE HOUSEHOLDS LOSING THE AGRICULTURAL LAND

A. Informant's information

Full name:	……
Gender (Cross X)	Male: ……..Female: ……..Other: …….
Ethnicity:	……
Job:	……
Phone number:	……

B. Interview focus

Basic information of the household

Awareness and the participation of the household in the project activities

Evaluation of the compensation for agricultural land and project support

Opinion of potential impact brought about by the project

Recommendations/other opinions of the household

C. Main questions

(Interviewers can add more questions, but must ask all following questions)

No	Questions
	Basic information of the household (Ethnicity, household size, number of female, number of member in labour age, occupation)
	Awareness and the participation of households in the project activities Do you know about CLBP? What information do you know about CLBP? From which information channel? Do you or other household members participate in the project activities? If yes, at which participation level? Informed about the project activities and progress Consultation in the plan making for the construction of the bridge Consultation in the process of support design for affected household Participate in the support activities Participate in the pre-construction study Participate in the land clearance Work for project activities Other project activites, please describe
	Evaluation of the compensation for agricultural land and project support Evaluation of the compensation for agricultural land: Description of the agricultural land of the household, and the agricultural land being compensated by the project? Compensation schemes and the relevance of compensation schemes Evaluation of other support activities Describe other support activities [micro-finance funding; agricultural extension; small business; vocational training; information campaign about HIV and human trafficking] Evaluation of the ***relevance*** of Project support with the household's demand? [To which extent is the relevance level for female household members] Evaluation of the ***benefits*** of the Project support with the household? [To which extent, it benefits female household members] Evaluation of the ***effectiveness*** of the Project support with the household?
	Opinion with regards to potential impacts brought about by the project to the household: Economics benefit Changes in income in general and income for female labour Job creation in general and job creation for female labour

	Other economics benefit Changes in transport infrastructure Access intra-province and inter-provinces Transportation time Transportation cost Changes in access to healthcare [easier to access healthcare facility] Changes in access to education [easier to access to school] Changes in access to cultural facilities Changes in access to public services Changes in access to other services [post office etc] Other benefits, please describe Is there any negative impact with the local community which happened or will happened in the coming period (with male and female)? If yes, please describe the impact and the mitigation measures that the local community undertook or will undertake?
	Besides the project support, does your household have other source of support to improve the household living standard? From local authority From other sources, please describe
	Recommendation/other opinion of the household

4.8 FOCUS GROUP DISCUSSION WITH THE HOUSEHOLDS LOSING THE AGRICULTURAL LAND

I. FOCUS GROUP DISCUSSION GUIDE

Purpose of focus group disccusion

To understand the awareness and participation level of the households losing agricultural land in the project activities, evaluating the relevance of support program and the changes brought by the Project.

Target for FGD

Interview group of male and female separately. Each group has 6-8 members, who are the member of households who lost agricultural land. Each group have poor/near-poor household and ethnic minority household if there's any.

Duration of FGD: 1.5 to 2 hours

Task assignment:

Notetaking officer record information about the group discussion in a personal notebook then re-type it into computer at the end of the survey or the end of day

Officer incharge of taking note should actively record and take pictures

How to take note: record the FGD by each question, example, along with the time at which GDF take places, who raise their statements, how do responder raises his/her statement? Does the atmosphere of FGD stay at high level, does everyone discussing lively and enthusiastic? The notetaker should focus on recording the response of participants rather than the question of excecutive officer.

Stationery:

3 A0 papers

12 color A4 papers

02 double size tapes

01 one size tape

06 marker pen

06 pencils and erasers

01 scissors

Every single FGD must follow following codes:

Encourage the active participation of every single participant

Encourage the discussion of every members

Ensure the fairness, equality of rights and voice of all participants

Both officers only guide the participant and do not give out any statement

Both officers accept the response of all participants and do not judge any of them

Ask the participants for permission for recording and taking pictures

II. STEPS TO IMPLEMENT

Step 1: Self introduce and asking for permission

Introduce the survey team

Introduce the purpose, content and the process of FGD

Ask for their identity and write their name on a colored paper then stick it on participants' shirt.

Ask for the permission to record.

Step 2: Start discussion

III. FOCUS GROUP DISCUSSION CONTENT

Exercise 1: List the project's activities and evaluate the relevance of support with the households' demand

Content:

List the project's activities

Discussion about each activities listed: Grade the relevance from 1 to 5 according the following scale:

Scale:

1 – Unrelevant; 2 – Little relevant; 3 – Relevant; 4 – Very relevant

Form of presentation:

Activities' name	Evaluation of the relevance in scale 4			
	(1)	(2)	(3)	(4)
Vocational training				
Micro-credit				
Small business's support				
Agriculture extension support				
Information campaign about HIV and human trafficking				
Other activity 1 ……				
Other activity 2……				

Excercise 2: List the project impact with the household (especially with female household members)

Content:

Participants list the Project's impact *to each individual*

Positive/negative impact; impact that happened and will happen

Impact with female members [Mark] ★

Grading the project's impact according to the scale

Little impact; 2- Large impact; 3- Very large impact

Form of presentation:

Positive impact happened	Negative impact happened
Positive impact will happen	Negative impact will happen

Exercise 3: The most important change

Content:

Each participant tell the story of change after having the Project

Each write their stories in 1 colour card

Can ask the participant to talk about the story

Notes of content: change about household livelihood, awareness, change about the access to services, changes about the transportation, living conditions and living standard of the household …

Colour card

Name: Nguyen Van A

Address:

Story of change:

……
……
……
……
……
……
……

IN-DEPTH INTERVIEW WITH HOUSEHOLD NOT BEING AFFECTED

A. Informant's information

Full name: ……

Gender (Cross X) Male: ……..Female: ……..Other: …….

Ethnicity: ……

Job: ……

Phone number: ……

B. Interview focus

Basic information of the household

Awareness and the participation of the household in the project activities

Opinion of potential impact brought about by the project

Recommendations/other opinions of the household

C. Main questions

(Interviewers can add more questions, but must ask all following questions)

No	Questions
	Basic information of the household (Ethnicity, household size, number of female, number of member in labour age, occupation)
	Awareness and the participation of resettled household in the project activities Do you know about CLBP? What information do you know about CLBP? From which information channel? Do you or other household members participate in the project activities? If yes, at which participation level? Informed about the project activities and progress Consultation in the plan making for the construction of the bridge Consultation in the process of support design for affected household Participate in the support activities Participate in the pre-construction study Participate in the land clearance Work for project activities Other project activites, please describe
	Opinion with regards to potential impacts brought about by the project to the household: Economics benefit Changes in income in general and income for female labour Job creation in general and job creation for female labour Other economics benefit Changes in transport infrastructure Access intra-province and inter-provinces Transportation time Transportation cost

	Changes in access to healthcare [easier to access healthcare facility] Changes in access to education [easier to access to school] Changes in access to cultural facilities Changes in access to public services Changes in access to other services [post office etc] Other benefits, please describe Is there any negative impact with the local community which happened or will happened in the coming period (with male and female)? If yes, please describe the impact and the mitigation measures that the local community undertook or will undertake?
	Recommendations/other opinions of the household

FOCUS GROUP DISCUSSION WITH HOUSEHOLD NOT BEING AFFECTED

I. FOCUS GROUP DISCUSSION GUIDE

Purpose of focus group discussion

To understand the awareness and participation level of the households not being affected in the project activities, evaluating the relevance of support program and the changes brought by the Project.

Target for FGD

Each group has 6-8 members, who are the member of households not being affected. Each group have poor/near-poor household and ethnic minority household if there's any.

Duration of FGD: 1.5 to 2 hours

Task assignment:

Notetaking officer record information about the group discussion in a personal notebook then re-type it into computer at the end of the survey or the end of day

Officer incharge of taking note should actively record and take pictures

How to take note: record the FGD by each question, example, along with the time at which GDF take places, who raise their statements, how do responder raises his/her statement? Does the atmosphere of FGD stay at high level, does everyone discussing lively and enthusiastic? The notetaker should focus on recording the response of participants rather than the question of excecutive officer.

Stationery:

3 A0 papers

12 color A4 papers

02 double size tapes

01 one size tape

06 marker pen

06 pencils and erasers

01 scissors

Every single FGD must follow following codes:

Encourage the active participation of every single participant

Encourage the discussion of every members

Ensure the fairness, equality of rights and voice of all participants

Both officers only guide the participant and do not give out any statement

Both officers accept the response of all participants and do not judge any of them

Ask the participants for permission for recording and taking pictures

II. STEPS TO IMPLEMENT

Step 1: Self introduce and asking for permission

Introduce the survey team

Introduce the purpose, content and the process of FGD

Ask for their identity and write their name on a colored paper then stick it on participants' shirt.

Ask for the permission to record.

Step 2: Start discussion

III. FOCUS GROUP DISCUSSION CONTENT

Exercise 1: Awareness and participation in the project activities

Content:

List the project's activities

Discuss about the participation of the households in the project activities

Lưu ý một số các hoạt động sau:

Being informed about the construction of the bridge and the progress
Being informed and consulted about the design of support activities
Micro-credit
Vocational training support
Agricultural extension support
Small business's support
Information campaign about HIV and human trafficking
Other activities [please describe]

Excercise 2: List the project impact with the household (especially with female household members)

Content:

Participants list the Project's impact *to each individual*

Positive/negative impact; impact that happened and will happen

Impact with female members [Mark] ★

Grading the project's impact according to the scale

Little impact; 2- Large impact; 3- Very large impact

Form of presentation:

Positive impact happened	Negative impact happened
Positive impact will happen	Negative impact will happen

Exercise 3: The most important change

Content:

Each participant tell the story of change after having the Project

Each write their stories in 1 colour card

Can ask the participant to talk about the story

Notes of content: change about household livelihood, awareness, change about the access to services, changes about the transportation, living conditions and living standard of the household …

Colour card

Name: Nguyen Van A

Address:

Story of change:

……
……
……
……
……
……
……

IN-DEPTH INTERVIEW WITH THE SHOP-KEEPER NEAR THE FERRY (INCLUDING HAWKER)

A. Informant's information

Full name: ……

Gender (Cross X) Male: ……..Female: ……..Other: …….

Ethnicity: ……

Job: ……

Phone number: ……

B. Interview focus

Basic information of the household

Awareness and participation of household in the project activities

Evaluation of project supports

Opinion of potential impact brought about by the project

Recommendations/other opinions of the informant

C. Main questions

(Interviewers can add more questions, but must ask all following questions)

No	Questions
	Basic information of the household (Ethnicity, household size, number of female, number of member in labour age, occupation)
	Business situation of the household: Describe the household business Are there any changes with regards to the business activities of the household when Cao Lanh Bridge come into operation? If yes, how are the changes?
	Awareness and the participation of resettled household in the project activities Do you know about CLBP? What information do you know about CLBP? From which information channel? Do you or other household members participate in the project activities? If yes, at which participation level? Informed about the project activities and progress Consultation in the plan making for the construction of the bridge Consultation in the process of support design for affected household Participate in the support activities Participate in the pre-construction study Participate in the land clearance Work for project activities Other project activities, please describe
	Evaluation of project supports

	Describe other support activities [micro-finance funding; agricultural extension; small business; vocational training; information campaign about HIV and human trafficking] Evaluation of the ***relevance*** of Project support with the household's demand? [To which extent is the relevance level for female household members] Evaluation of the ***benefits*** of the Project support with the household? [To which extent, it benefits female household members] Evaluation of the ***effectiveness*** of the Project support with the household? [To which extent is the effectiveness for female household members]
	Opinion with regards to potential impacts brought about by the project to the household: Economics benefit Changes in income in general and income for female labour Job creation in general and job creation for female labour Other economics benefit Changes in transport infrastructure Access intra-province and inter-provinces Transportation time Transportation cost Changes in access to healthcare [easier to access healthcare facility] Changes in access to education [easier to access to school] Changes in access to cultural facilities Changes in access to public services Changes in access to other services [post office etc] Other benefits, please describe Is there any negative impact with the local community which happened or will happened in the coming period (with male and female)? If yes, please describe the impact and the mitigation measures that the local community undertook or will undertake?
	Besides the project support, does your household have other source of support to improve the household living standard? From local authority From other sources, please describe
	Recommendations/other opinions of the household

FOCUS GROUP DISCUSSION OF THE SHOP-KEEPERS NEAR THE FERRY

I. FOCUS GROUP DISCUSSION GUIDE

Purpose of focus group discussion

To understand the awareness and participation level of shop-keeper near the ferry, evaluating the relevance of support program and the changes brought by the Project.

Target for FGD

Each group has 6-8 members, who are the shop-keepers near the ferry. Each group have poor/near-poor household and ethnic minority household if there's any.

Duration of FGD: 1.5 to 2 hours

Task assignment:

Notetaking officer record information about the group discussion in a personal notebook then re-type it into computer at the end of the survey or the end of day

Officer incharge of taking note should actively record and take pictures

How to take note: record the FGD by each question, example, along with the time at which GDF take places, who raise their statements, how do responder raises his/her statement? Does the atmosphere of FGD stay at high level, does everyone discussing lively and enthusiastic? The notetaker should focus on recording the response of participants rather than the question of excecutive officer.

Stationery:

3 A0 papers

12 color A4 papers

02 double size tapes

01 one size tape

06 marker pen

06 pencils and erasers

01 scissors

Every single FGD must follow following codes:

Encourage the active participation of every single participant

Encourage the discussion of every members

Ensure the fairness, equality of rights and voice of all participants

Both officers only guide the participant and do not give out any statement

Both officers accept the response of all participants and do not judge any of them

Ask the participants for permission for recording and taking pictures

II. STEPS TO IMPLEMENT

Step 1: Self introduce and asking for permission

Introduce the survey team

Introduce the purpose, content and the process of FGD

Ask for their identity and write their name on a colored paper then stick it on participants' shirt.

Ask for the permission to record.

Step 2: Start discussion

III. FOCUS GROUP DISCUSSION CONTENT

Exercise 1: List the project's activities and evaluate the relevance of support with the households' demand

Content:

List the project's activities

Discussion about each activities listed: Grade the relevance from 1 to 5 according the following scale:

Scale:

1 – Irrelevant; 2 – Little relevant; 3 – Relevant; 4 – Very relevant

Form of presentation:

Activities' name	Evaluation of the relevance in scale 4			
	(1)	(2)	(3)	(4)
Vocational training				
Micro-credit				
Small business's support				
Agriculture extension support				
Information campaign about HIV and human trafficking				
Other activity 1 ……				
Other activity 2……				

Exercise 2: List the project impact with the household (especially with female household members)

Content:

Participants list the Project's impact *to each individual*

Positive/negative impact; impact that happened and will happen

Impact with female members [Mark] ★

Grading the project's impact according to the scale

Little impact; 2- Large impact; 3- Very large impact

Form of presentation:

Positive impact happened	Negative impact happened
Positive impact will happen	Negative impact will happen

Exercise 3: The most important change

Content:

Each participant tell the story of change after having the Project

Each write their stories in 1 colour card

Can ask the participant to talk about the story

Notes of content: change about household livelihood, awareness, change about the access to services, changes about the transportation, living conditions and living standard of the household …

Colour card

Name: Nguyen Van A

Address:

Story of change:

……
……
……
……
……
……
……

IN-DEPTH INTERVIEW WITH LOCAL EMPLOYEE WORKING FOR THE CONSTRUCTION

A. Informant's information

Full name:	……
Gender (Cross X)	Male: ……..Female: ……..Other: ……..
Ethnicity:	……
Job:	……
Phone number:	……

B. Interview's focus

Basic information of the local employee's household

Awareness and participation of the informant in the project activities

Evaluation of the current job in the Project activity

Opinion of potential impact brought about by the project

Recommendations/other opinions of the informant

C. Main questions

(Interviewers can add more questions, but must ask all following questions)

No	Questions
	Basic information of the household (Ethnicity, household size, number of female, number of member in labour age, occupation)
	Awareness and the participation of the local employee in the project activities What information do you know about CLBP? From which information channel? Do you or other household members participate in the project activities? If yes, at which participation level? Informed about the project activities and progress Consultation in the plan making for the construction of the bridge Consultation in the process of support design for affected household Participate in the support activities Participate in the pre-construction study Participate in the land clearance Work for project activities Other project activities, please describe
	Evaluation of your current job in CLBP: Description of your current job [which position, work for which company, responsivities , the duration of job, wage, benefit …] Having contract (in document) or oral agreement Have you ever been in the following situation while working for the project [not being paid, labor accident, do not have the labour equipment protection, no document contract …]. If yes, please describe Is there any female labour? Do you know any female labour experiences the stated situation above? Do you have training for the job?
	Evaluation of other support activities the local employee received

	Describe other support activities [micro-finance funding; agricultural extension; small business; vocational training; information campaign about HIV and human trafficking] Evaluation of the ***relevance*** of Project support with the household's demand? [To which extent is the relevance level for female household members] Evaluation of the ***benefits*** of the Project support with the household? [To which extent, it benefits female household members] Evaluation of the ***effectiveness*** of the Project support with the household? Gia đình ông/bà có nhận được hỗ trợ của Dự án và đánh giá về các hoạt động hỗ trợ nếu có: How the participation in the current job impact your future occupation?
	Opinion with regards to potential impacts brought about by the project to the household: Economics benefit Changes in income in general and income for female labour Job creation in general and job creation for female labour Other economics benefit Changes in transport infrastructure Access intra-province and inter-provinces Transportation time Transportation cost Changes in access to healthcare [easier to access healthcare facility] Changes in access to education [easier to access to school] Changes in access to cultural facilities Changes in access to public services Changes in access to other services [post office etc] Other benefits, please describe Is there any negative impact with the local community which happened or will happened in the coming period (with male and female)? If yes, please describe the impact and the mitigation measures that the local community undertook or will undertake?
	Recommendations/other opinions of the informant

GUIDE FOR TAKING NOTE OF FOCUS GROUP DISCUSSION

(Note: Officer uses this guide and write in notebook then re-type it into computer)

Time: From.....To..... Day.....Month.....Year 2017

Location: ……

Number of participators: ..... People

Name of executive officer: .....

Note taker name.....

Component of participants:

No	Full name	Age	Position	Work unit	Note
1					
2					
3					

Recording codes:

Try to take note every response in detail and DO NOT take note briefly from the view of recording officer

It is preferable to write the opinion of the participants than the opinions of the executive officer

Add information from recorder to the note taken in notebook.

Record the name of people who raise statement in detail.

For unclear statements, the whole response is still recorded but the note taker have to write a small note (to clarify the appropriate meaning of responder) next to the content of the response.

Record the process of FGD in detail not the general idea of whole group from officer's perspective

Record the attitude and behavior of each respondent to figure out the exact idea they want to give through their statements.

Record the attitude and behavior of all respondent, for example if people discuss lively with enthusiasm.

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