

This Chapter describes the predicted socio-economic impacts associated with construction and operation of the Project. It is based on the baseline data presented in **Chapter 6** and the impact assessment methodology detailed in **Chapter 4**.

15.1 ASSESSMENT METHODOLOGY

15.1.1 Socio-economic Receptors

A Project's area of influence (Aoi) generally includes the following:

- Direct footprint of the land that will be used, including the Project site, water supply pipeline route and 230kV overhead transmission line route;
- A physical distance around the direct footprint at a scale depending on the emissions related to a particular activity;
- A physical distance around the direct footprint at a scale depending on the indirect effects of a particular activity; and
- Associated facilities. As per the approach adopted for this ESIA, impacts from associated facilities will be assessed in the context of the Cumulative Impact Assessment (**Chapter 17**).

Impacts are described in the context of the effect that a Project or a Project's activities will have on a receptor. In this instance, the Project receptors are the villagers located within the area of influence that may be impacted or influenced by the Project (as a result of their proximity to the Project site and/ or Project associated infrastructure). This includes villagers located in:

- Sa Khar village,
- Hnan Ywa village,
- Hpet Taw village,
- Nyaung Kan village,
- Gyoke Pin village,
- Thien Ywa, and
- Tha Pyay Thar village (**Figure 15.1**).

It also includes the individuals and families living in the temporary accommodation facilities adjacent to the Project site. (The accommodation has been constructed by the nearby steel mill to house a small portion of its workforce on a temporary basis. The aim is for the workers to be moved to the steel mill's permanent accommodation by 2018.) In addition, there is a government run school located near the Project site. It services local villages, including Sa Khar village and Hnan Ywa village - the students and staff are potential receptors.

Figure 15.1 Project Site and Receptors

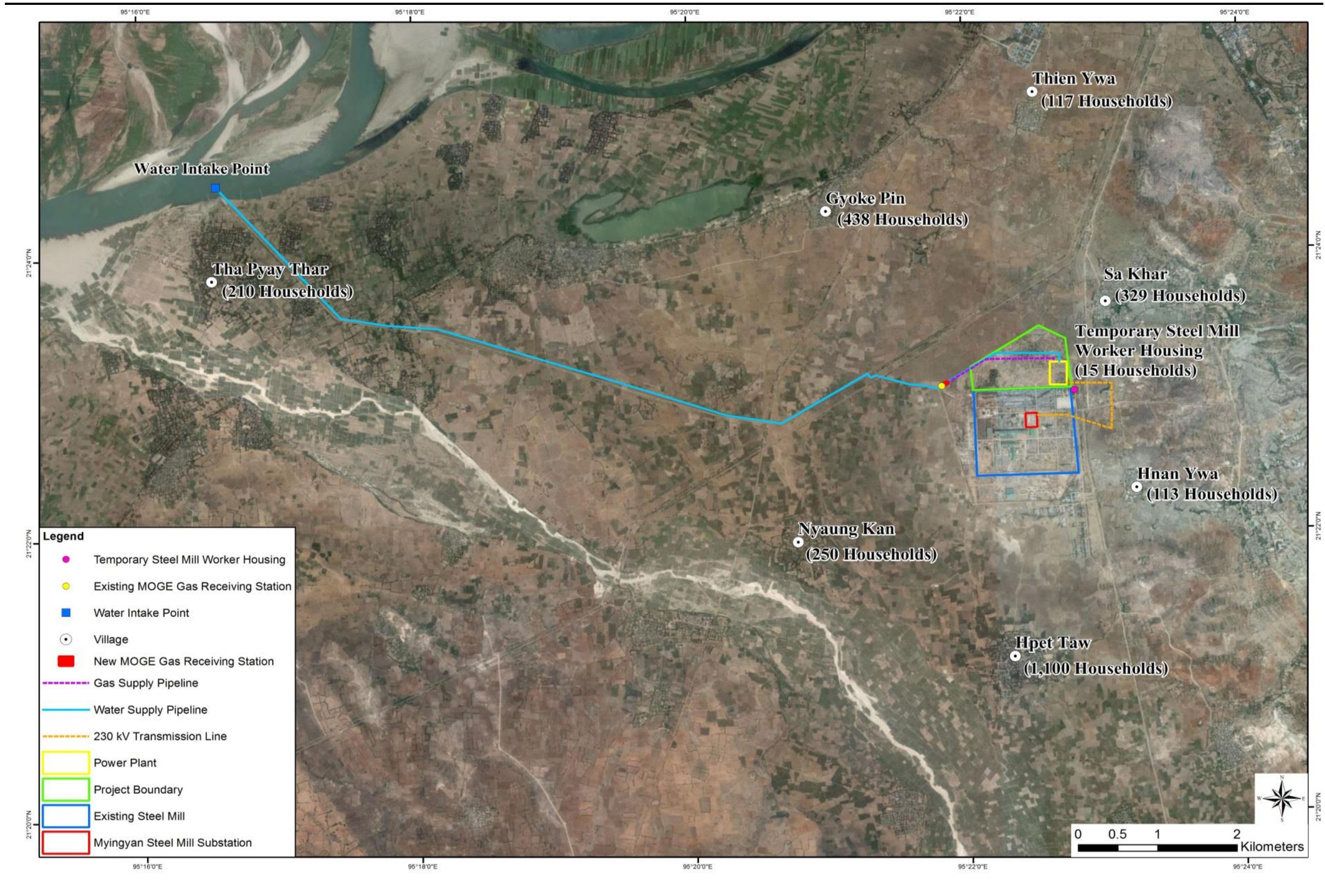


Table 15.1 summarises the socio-economic impacts that were identified during the scoping study and through engagement with relevant stakeholders. By and large, the impacts are expected to be limited to the local villages. However, there are a few activities that may impact the wider region – i.e. the Myingyan Township – such as employment opportunities and impacts associated with an increase in traffic.

Table 15.1 *Impacts and Receptors*

Potential Impacts	Receptors and Stakeholders
Employment and Economy	
<ul style="list-style-type: none"> • Increase in local employment opportunities • Increase in business development opportunities 	<ul style="list-style-type: none"> • Local government • Local villagers • Local businesses
Community Health	
<ul style="list-style-type: none"> • Increase in communicable diseases, including vector borne diseases and sexually transmitted infections 	<ul style="list-style-type: none"> • Local villagers • Project workforce (including contractors) • Local government • Local health care providers and infrastructure
Community Safety and Security	
<ul style="list-style-type: none"> • Increased potential for traffic accidents and incidents • Increased potential for safety issues associated with the presence of new infrastructure • Increased potential for contamination, including surface and groundwater, associated with the management and disposal of hazardous materials and waste 	<ul style="list-style-type: none"> • Local villages • Construction workers (including contractors) • Local government • Regional villages located along the transport routes
Environmental Emissions	
<ul style="list-style-type: none"> • Increase in noise leading to disruptions in community activities • Increase in vibrations impacting community infrastructure • Increase in dust leading to health implications 	<ul style="list-style-type: none"> • Local villagers • Project workforce (including contractors) • Local government
Community Infrastructure and Services	
<ul style="list-style-type: none"> • Increased pressure on community infrastructure and services 	<ul style="list-style-type: none"> • Local villagers • Project workforce (including contractors) • Local government • Local infrastructure providers
Social Networks	
<ul style="list-style-type: none"> • Increase in disposable income increasing the use of alcohol and drugs • Introduction of new people to the area leading to conflict and changes in social structures • Change in the availability of skilled workers 	<ul style="list-style-type: none"> • Local villagers • Project workforce (including contractors) • Local government • Local service providers
Land Acquisition and Involuntary Resettlement	
<ul style="list-style-type: none"> • Permanent economic and/ or physical displacement • Temporary economic and/ or physical displacement of activities 	<ul style="list-style-type: none"> • Local villagers • Local service providers • Local government
Cultural Heritage	
<ul style="list-style-type: none"> • Impacts on cultural heritages within the Project area • Impacts on archaeological resources 	<ul style="list-style-type: none"> • Local villagers • Project workforce (including contractors) • Local government

15.1.2 *Assumption and Limitations*

The Project is still in the early stages of development and hence some aspects of the Project have not yet been finalized. This includes the number of people likely to be employed during construction and operation of the Project from the local area – the numbers that have been provided are only indicative. It is understood that employment figures will continually be refined as the Project design is further developed and discussions are held with the prospective EPC Contractor regarding construction.

15.2 *ASSESSMENT OF IMPACTS*

This section describes the potential impacts and consequences of interaction between the Project activities and receptors. Where significance of the impacts is assessed as moderate to major, mitigation measures, management and monitoring are proposed. The proposed mitigation and management measures will be implemented by Sembcorp and its contractors.

Often, large scale projects result in in-migration – i.e. people moving to the project area to capitalize on employment and business development opportunities. (For example, people may move to Sa Khar to seek employment opportunities directly with the Project or within its supply chain). There are a host of impacts associated with in-migration. Rather than assessing in-migration separately, where in-migration is a contributing or driving factor for a particular impact, this is noted in the sections below.

15.2.1 *Impacts on Employment and the Economy*

Description

The Project will generate a range of employment opportunities. During construction, it is expected that approximately 660 direct employment opportunities will exist. This includes 190 skilled, 220 semi-skilled, and 250 unskilled workers. (However, estimates indicate that during peak construction number of required workers may reach 900.)

The number of people employed by the Project will decrease at the end of the construction phase. It is anticipated that approximately 80 direct employment opportunities will be created during the operation phase. An additional, 90 workers will be required every three years for a 30 day period to undertake maintenance.

In addition, the Project will require goods and services throughout its lifecycle. There are opportunities for local businesses to provide these goods and services (e.g. construction equipment, food for the accommodation camp). As a result, existing local businesses may expand or new businesses may be established locally to meet these demands – providing employment opportunities. This is referred to as indirect employment.

Potential Impact

Sembcorp has committed to capitalizing on local content opportunities, which will help to ensure that where feasible opportunities are provided to local people and businesses.

The Project will generate skilled and unskilled positions, with the number of unskilled positions dropping substantially after the construction period. Given that much of the local population is employed in the agricultural sector, this may limit the opportunity to employ local people, particularly during the operation phase given the skills required during the operation phase. It will be important to capitalize on the skills that are transferrable from the agricultural sector to the Project in order to maximize local employment.

In terms of indirect employment, the realization of opportunities will depend not only on the Project, but also on the initiative and business acumen of local entrepreneurs. Given the limited number of existing businesses, it is anticipated that the number of opportunities to create business development opportunities and/ or indirect employment will be limited.

The resulting impacts (e.g. increase in employment opportunities, increase in income for local people employed by the Project) were assessed as a positive – i.e. beneficial to the local villages. For this reason, the impact significance was not assessed (**Table 15.2** and **Table 15.3**).

Table 15.2 *Assessment of Impacts to Employment and Economy – Construction*

Impact	Impact to Employment and Economy				
Impact Nature	Negative	Positive	Neutral		
	An increase in employment opportunities and demand for goods and services are positive .				
Impact Type	Direct	Indirect		Induced	
	It directly impacts local villages.				
Impact Duration	Temporary	Short-term	Long-term	Permanent	
	The impact is short-term because it occurs during the construction phase.				
Impact Extent	Local	Regional		Global	
	The Project will provide employment opportunities for local villages, and possibly villages from within the surrounding areas (e.g. in-migration). Therefore, the impact is regional .				
Impact Scale	The impact scale is small to medium .				
Impact Frequency	Throughout the construction of the Project.				
Impact Magnitude	Positive	Negligible	Low	Medium	Large
	The impact is positive .				

Table 15.3 Assessment of Impacts to Employment and Economy - Operation

Impact	Impact to Employment and Economy				
Impact Nature	Negative	Positive	Neutral		
	An increase in employment opportunities and demand for goods and services are positive .				
Impact Type	Direct	Indirect	Induced		
	It directly impacts local villages.				
Impact Duration	Temporary	Short-term	Long-term	Permanent	
	The impact is long-term because it happens during operation phase.				
Impact Extent	Local	Regional	Global		
	The Project will provide employment opportunities for local villages, and possibly villages from within the surrounding areas (e.g. in-migration). Therefore, the impact is regional .				
Impact Scale	The impact scale is small to medium .				
Impact Frequency	Throughout the construction of the Project.				
Impact Magnitude	Positive	Negligible	Low	Medium	Large
	The impact is positive .				

Mitigation and/or Management Measures

The following measures are proposed to enhance the potential Project benefits:

- Develop and implement a local content plan. The plan should establish measures to facilitate local recruitment and procurement. This should include targets so that performance can be tracked and evaluated. Development of the plan should involve consultation with relevant stakeholders, including government authorities and local villagers;
- Review opportunities to establish a skills training program with an aim of training interested local villagers to contribute to the Project. This should include a skills audit to determine what skills will be required by the Project and what skills are available within the local villagers. This will need to be undertaken as early as possible so that a training program can be developed and implemented and villagers are able to meaningfully contribute to the Project;
- Inform local villagers of job opportunities in a timely manner. Ensure that the advertising process is locally and culturally appropriate;
- Inform local businesses of contracting opportunities in a timely manner. Ensure that the process is locally and culturally appropriate;
- Continue to engage stakeholders about employment and other economic opportunities in order to manage expectations about the benefits that can and will be delivered by the Project. This should form a part of the stakeholder engagement plan; and
- Develop an internal standard to guide labour practices in line with international standards, and apply this to the Project’s supply chain. This should include development and implementation of an internal grievance mechanism for direct employees and contractors, and ongoing monitoring to ensure that the standard is consistently implemented across the Project.

15.2.2 Impacts on Community Health

Description

The Project will employ a range of people during construction and operation. There is potential for the workforce to introduce and/ or increase the rate of spread of

communicable diseases in the Project area. This includes the introduction of a new disease and/ or a more virulent strain of an existing disease.

However, the workforce is not the only factor that may contribute to the transmission of communicable diseases. The Project is also likely to result in in-migration. Similar to the workforce, there is potential for in-migration to introduce and/ or increase the rate of spread of communicable diseases in the Project area.

There are a number of communicable diseases prevalent in the Project area, which are contributing to the current rates of morbidity and mortality. This includes TB which has been identified as a key contributor in the local villages to rates of morbidity, and to a lesser extent mortality.

Vector Borne Diseases

Another factor that will influence the prevalence and rates of communicable diseases is the creation of vector habitat during construction and potentially operation. Standing water (i.e. vector habitat) can be created in a variety of ways, such as alterations to drainage patterns during earth moving activities and establishment of trenches (which can fill with water during rainy periods).

Vector habitat is of particular note in a location such as Myanmar – where heavy rainfall occurs during the wet season creating large areas of standing water. This could be exacerbated by the Project – e.g. if trenches are filled with water during the wet season.

There are a number of vector borne diseases likely to exist in the Project area given their prevalence within the country. Of particular note is malaria, although not identified within the local area by villagers, if workers come from outside the local area this may be an issue. Malaria is prevalent in much of the country – this includes the multi-drug resistant form of malaria.

Sexually Transmitted Infections

An increase in the commercial sex trade is often associated with large scale developments, particularly when a large (often mainly male) workforce is required for a short period of time. If appropriate precautions are not taken, this too can increase the rates of communicable diseases in the Project area.

This includes sexually transmitted infections such as HIV/ AIDS. Myanmar has one of the highest rates of HIV/ AIDS infection in Southeast Asia, which increases the risk of HIV/ AIDS being transmitted.

Other Related Issues

The transmission of diseases can be exacerbated by a number of factors. Health care facilities are limited in the Project area. At present, most villages either receive a monthly visit from a doctor or need to drive to the next closest village in order to access health care.

The facilities that do exist are largely set up to address day to day health issues. Capacity (e.g. availability of diagnostic equipment, availability of medicine) to respond to an increase in the transmission of communicable diseases is limited.

In addition, it appears that there is generally a limited awareness and understanding within the Project area villages about the routes of transmission as well as symptoms of communicable diseases. This too can increase the risk of transmission - as people are less likely to take precautions to reduce the transmission of communicable diseases and/ or seek care once infected/ ill.

Potential Impacts

An increase in the transmission of communicable diseases may occur as the result of the introduction of workers into the area, creation of vector habitat, and/ or the presence of commercial sex workers.

In terms of communicable diseases, of particular note and concern are tuberculosis, malaria, and HIV/ AIDS, given their current prevalence within the country and local area. The receptors located closest to the Project site are likely to be most affected by an increase in vector habitat – including Sa Khar, Hnan Ywa and Tha Pyay Thar villages and the steel mill workers.

If left untreated communicable diseases can lead to long-term health issues and/ or in some instances death. In other words, the impact can be characterized as being long-term and in some instances permanent.

The existing local health care facilities have limited capacity to respond to an increase in the transmission of communicable diseases, leaving the local villagers vulnerable to an increase in the presence of communicable diseases. This is exacerbated by the fact that few villagers recognize the symptoms – which is what drives someone to seek treatment.

To minimize the impact, a number of steps can be taken – most of the measures largely center around (1) reducing the interaction between the workforce and local villagers and (2) minimizing the creation of vector habitat. Sembcorp has committed to establishing a camp to accommodate its workforce during construction. This will help to reduce the interaction between workers and local villagers. In terms of vector habitat, it may be difficult to minimize habitat during the wet season.

Given the existing management measures, the local extent and scale of the impact, the impact was assessed as **moderate** and **negative**. The impact would have been assessed as minor, however, the duration (and consequence) of the impact was identified as potentially long-term – i.e. long-term health issues and in some cases death (**Table 15.4**).

The workforce will be larger during construction, when compared to the operation phase. This increases the potential for the impact to occur (i.e. as there are more potential disease carriers) during the construction phase. This would typically increase the impact rating for the construction phase; however, the existing management measures (i.e. accommodating the workforce at a camp) will help

reduce the potential of the impact occurring, for this reason the construction and operation phases were both assessed as moderate and negative.

Table 15.4 Assessment of Impacts on Community Health

Impact	Impact on Community Health				
Impact Nature	Negative	Positive	Neutral		
	Increase of communicable diseases in the local area is negative .				
Impact Type	Direct	Indirect	Induced		
	The impact is direct .				
Impact Duration	Temporary	Short-term	Long-term	Permanent	
	The impact could be long lasting, even permanent, if left untreated.				
Impact Extent	Local	Regional	Global		
	The impact is limited to local villages.				
Impact Scale	The impact scale is medium.				
Impact Frequency	The impact likely occurs during the construction phase with the rare frequency.				
Impact Magnitude	Positive	Negligible	Small	Medium	Large
	The impact magnitude is likely to be small .				
Vulnerability of Receptors	Low	Medium	High		
	The vulnerability of receptor is likely to be high .				
Significance	Negligible	Minor	Moderate	Major	
	The significance is likely to be moderate .				

Mitigation and/or Management Measures

Based on the above assessment, a community health management plan should be developed to address potential health risks to local villagers. The plan should include the following elements:

- Training for all workers on the transmission routes and common symptoms of communicable diseases. This can help reduce the potential for workers to unknowingly transmit communicable diseases. This may also help to increase knowledge within Project area villages – e.g. through the training of workers that have been sourced from the local villages;
- Establish amenities at the camp to help minimize the interaction between the workforce (particularly temporary construction workers) and local villagers. This includes recreation facilities and health care infrastructure;
- Establish a workforce code of conduct. Include in the code specific measures that target anti-social behaviour, such as becoming involved with commercial sex workers;
- Undertake pre-employment screening to ensure fitness for work. It is important that the pre-screening process does not result in discrimination, but instead is used as a tool to minimize the transmission of communicable diseases;
- Vector management procedures, including measures to reduce the presence of vector habitat and consideration of whether pesticides will be utilized to reduce the presence of vectors onsite;
- Provision of onsite health care and medical facilities, to ensure that basic medical attention and first aid treatment can be sought during the hours that the work is being undertaken at the Project site. This will also help reduce the potential pressure on local health care facilities;
- Emergency management procedures should a health issue escalate and require a rapid response; and

- Explore opportunities to invest in local health infrastructure and services. This includes potential education programs focused on disease transmission and symptoms in conjunction with relevant local stakeholders (e.g. local health care providers).

Where appropriate the community health management plan should be implemented in close coordination with government authorities and local health care providers.

In addition to the community health plan it is recommended that a complementary occupational health and safety plan be developed – to focus on managing potential issues that may affect the Project workforce. The plan should include measures to minimize the potential for the workforce to contract a communicable disease. This will help reduce the potential for the workforce to contract a communicable disease and subsequently introduce the disease in their home village/ community.

Significance of Residual Impact

Once management measures have been implemented, it is predicted that the impact will be reduced to **minor** and **negative** during construction and operation. However, on-going monitoring and evaluation of the management measures and community health situation will be needed. If monitoring indicates an increase in the transmission of communicable diseases, the management measures will need to be revised. This includes monitoring Sembcorp’s direct activities as well as Project contractors and in-migration.

15.2.3 Impacts on Community Safety and Security

Description

There are a number of safety related issues that are likely to arise as a result of the Project. This includes:

- Traffic accidents. An increase in traffic can lead to an increase in congestion, leading to frustration on the part of local villagers. However, given the low level of current road use, this is unlikely to occur. Instead, the key issue is likely to be the potential for an increase in accidents or incidents, which can lead to injuries and/ or fatalities;
- The presence of new infrastructure. There are often safety issues with the establishment of new infrastructure – e.g. community members falling in unsecured trenches or interacting with unsecured equipment. This can lead to onsite accidents and injuries; and
- The management of hazardous materials and waste. There are a number of Project activities that will generate hazardous waste – e.g. chemical cleaning of equipment during the pre-commissioning process. It is particularly important that these materials are managed appropriately so as not to contaminate the surrounding water sources, as many local villagers use groundwater and surface water for drinking and/ or other household activities.

The Project will increase the number of vehicles using local roads and waterways through the transport of workers, goods, materials and machinery to and from the Project site.

Heavy cargo (e.g. gas turbine, gas turbine generator, steam turbine) will be transported via the Ayeyarwady River. A barge will carry cargo from Thilawa Port in Yangon to Nyaung Hla Jetty, from which point it will be transported along the Nyaung U-Myingyan Road to the Project site. The Nyaung Hla Jetty and the Nyaung U-Myingyan Road (at the point where it crosses the Sintelwa River) will be reinforced to accommodate the cargo. (This will not involve the acquisition of land.)

Materials (such as structure steel, piping, and electrical equipment) will be transported from Mandalay to the Project site using existing roads No. 39 and No. 18.

With an increase in vehicles, particularly heavy haulage vehicles, comes the increased potential for accidents and injuries to occur. This can be exacerbated by people living immediately adjacent to roads networks, and not being accustomed to the presence of large vehicles and heavy traffic. The limited understanding and awareness of traffic can increase the likelihood of an accident occurring – e.g. crossing the road without looking either way. This is of particular concern for Sa Khar and Tha Pyay Thar, given their proximity to the transport routes.

There is also potential, as briefly mentioned earlier, for contamination to occur as a result of a spill or leak. This could occur during routine activities onsite as well as during the transport of goods/materials to the site. This may be exacerbated by the poor quality of the existing road infrastructure – e.g. hitting a substantial pothole could jostle cargo.

At present, local villages heavily rely on ground and surface water for a variety of household uses including drinking water. Given the reliance on existing water sources, it is unlikely that the local villages would have the ability to adapt to any sort of contamination – i.e. be able to find an alternative drinking water source.

In addition, the Project will require security. Security personnel will be employed during construction and operation. It is anticipated that a total of 12 people will be required during the operation phase; the number required during construction has not yet been determined. If conflict arises, there is potential for security personnel, as has been seen in other development Projects, to use excessive force.

Potential Impacts

Impacts to community safety and security can result from an increase in traffic, the establishment of onsite infrastructure and the management of hazardous materials. To a lesser extent, given the small number of security personnel required, the presence of security forces could also present a risk to the community.

There are measures in place to ensure that hazardous materials are managed and disposed of appropriately by the Project. This will help minimize the potential for local water sources to be contaminated.

In addition, the Project site will be fenced, while any activities outside the main footprint (such as the buried pipeline) will be appropriately sign posted. (A new fence will be constructed, given the existing fence has deteriorated over time.) This will help ensure that accidents associated with new infrastructure will be minimized.

Given this, the issue to which the local villagers are most vulnerable is the increase in traffic – as villagers live immediately adjacent to the existing roads and are unaccustomed to heavy vehicles traversing the area. This can lead to accidents, injuries and, in some instances, fatalities. The potential outcome of the impact is an injury and in some instances a fatality.

Due to the existing management measures, the local extent and scale of the impact, the impact was assessed as **moderate** and **negative** during construction, while **minor** and **negative** during operation (**Table 15.5** and **Table 15.6**). The impact would have been assessed as minor, however, the duration (and consequence) of the impact was identified as potentially long-term – i.e. the outcome of a traffic accident can have long-term implications.

The vehicle movements/ transport requirements will be greater during construction, when compared to the operation phase. This increases the potential for the impact to occur (i.e. as there are more potential disease carriers) during the construction phase and increases the impact rating.

Table 15.5 Assessment of Impacts on Community Safety and Security - Construction

Impact	Impact on Community Safety and Security			
Impact Nature	Negative	Positive	Neutral	
	The potential increase in safety and security risks in the local area is negative .			
Impact Type	Direct	Indirect	Induced	
	The impact is direct to the community health.			
Impact Duration	Temporary	Short-term	Long-term	Permanent
	Impact has the potential to have a lasting effect.			
Impact Extent	Local	Regional	Global	
	The impact is limited within the local villages.			
Impact Scale	The impact scale is medium.			
Impact Frequency	The impact likely occurs during the construction phase with the rare frequency.			
Impact Magnitude	Positive	Negligible	Small	Medium
	The impact magnitude is likely to be medium .			
Vulnerability of Receptors	Low	Medium	High	
	The vulnerability of receptor is likely to be medium .			
Significance	Negligible	Minor	Moderate	Major
	The significance is likely to be moderate .			

Table 15.6 Assessment of Impacts on Community Safety and Security – Operation

Impact	Impact on Community Safety and Security			
Impact Nature	Negative	Positive	Neutral	
	The potential increase in safety and security risks in the local area is negative .			
Impact Type	Direct	Indirect	Induced	
	The impact is direct to the community health.			
Impact Duration	Temporary	Short-term	Long-term	Permanent
	Impact has the potential to have a lasting effect.			
Impact Extent	Local	Regional	Global	
	The impact is limited within the local villages.			
Impact Scale	The impact scale is medium.			
Impact Frequency	The impact likely occurs during the operation phase with the rare frequency.			
Impact Magnitude	Positive	Negligible	Small	Medium
	The impact magnitude is likely to be Small .			
Vulnerability of Receptors	Low	Medium		High
	The vulnerability of receptor is likely to be medium .			
Significance	Negligible	Minor	Moderate	Major
	The significance is likely to be minor .			

Mitigation and/or Management Measures

Based on the above assessment, the following management measures associated with community safety and security are suggested:

- Develop and implement a traffic management plan. The plan should set out measures to minimize the risks associated with transporting materials, goods, and workers to and from site. This includes fatigue management, busing workers to and from the Project site, and ensuring all employees observe recommended speed limits;
- The traffic management plan should be developed in consultation with local stakeholders. Stakeholders should be notified in advance of the Project commencing of traffic routes that will be utilised and, where known, periods of increased traffic volumes. Where possible, traffic movements will be coordinated so as to limit disruptions to local activities;
- Ensure all employees complete training prior to driving any Project vehicle. The content of the training should be tailored to the employee’s role;
- Explore opportunities to work with local stakeholders to increase awareness within local villages about the hazards associated with traffic;
- Provide appropriate training for security personnel and monitor implementation of the training over time (to minimize any potential use of excessive force); and
- Develop and implement waste management plan. The plan should set out procedures for appropriately managing and disposing of hazardous materials and other forms of waste.

Residual Impacts

Assuming that the above management measures will be implemented and monitored over time, the residual impact was assessed as **minor** and **negative**. Ongoing monitoring should occur to track implementation and evaluate the management measures. This includes monitoring Sembcorp’s direct activities as well as Project contractors.

Description

The construction and operation of the Project will generate:

- Noise, which can result from a variety of onsite activities (e.g. construction of infrastructure, reversing sensors on large vehicles). Noise can lead to hearing loss and disrupt community activities (such as sleep). Ongoing disruptions have been linked to increases in depression and anxiety;
- Vibrations, which can result from construction activities (e.g. piling, drilling, operation of compressors and generators). Vibrations if strong enough can damage the foundation of nearby infrastructure (e.g. businesses, community centers); and
- Dust, which can be generated through vegetation clearing, site grading, driving on dry, dirt roads. This can impact the surrounding air quality, disrupting the amenity value of an area and potentially impacting community health (e.g. further aggravating existing respiratory illnesses).

Potential Impacts

In terms of noise, the closest receptors are Sa Khar Village (located 980 meters from the nearest noise source) and Hnan Ywa Village (located 1,960 metres to the southeast of a noise source). It is anticipated that during construction and operation the noise generated will not exceed applicable noise criteria at either receptor location. For this reason, the impact is expected to be **negligible**. Further details are provided in **Chapter 10**.

In terms of vibrations, given the distance to the nearest receptor, no impact is expected. Further details are provided in **Chapter 10**.

In terms of dust, the closest receptors are the steel mill workers located at the temporary accommodation facility (10 m away), while the next closest are the Sa Khar villagers (630 m away). Dust can reduce the amenity of the area and exacerbate existing respiratory illnesses (e.g. asthma).

It is not anticipated that the receptors will experience impacts associated with the generation of dust. This is largely due to the management measures that will be put in place. The Project will establish site hoardings, sufficient set-backs, and implement other dust suppression techniques to minimize fugitive dust. (Further details are provided in **Chapter 7**.) In addition, respiratory illnesses were not identified as an issue within the local villages. Given the short-term nature of the impacts, the impacts associated with dust are expected to be **minor (Table 15.7)**.

Table 15.7 Assessment of Impacts from Environmental Emissions

Impact	Impact from Environmental Emissions			
Impact Nature	Negative	Positive	Neutral	
	Increase of environmental emissions has the potential to result in negative impacts in the local area.			
Impact Type	Direct	Indirect	Induced	
	The impact is direct to the community health.			
Impact Duration	Temporary	Short-term	Long-term	Permanent
	Impact is likely to be temporary (i.e. while the emissions is occurring).			
Impact Extent	Local	Regional	Global	
	The impact is limited within the local villages.			
Impact Scale	The impact scale is medium.			
Impact Frequency	The impact likely occurs during the construction phase with the rare frequency.			
Impact Magnitude	Positive	Negligible	Small	Medium
	The impact magnitude is likely to be small .			
Vulnerability of Receptors	Low	Medium		High
	The vulnerability of receptor is likely to be medium .			
Significance	Negligible	Minor	Moderate	Major
	The significance is likely to be minor .			

Mitigation and/or Management Measures

Management measures have been proposed in **Chapter 7** and **Chapter 10**. These measures will need to be followed in order to ensure that the impact is negligible.

Sembcorp will need to develop and implement a stakeholder engagement plan as part of the Project. The plan should include measures to notify local stakeholders in advance of any particularly noisy activities (e.g. pile driving). This will ensure stakeholders anticipate (and can appropriately respond to) the disruption associated with noise.

15.2.5 Impacts on Community Infrastructure and Services

Description

An increase in population in the local area (due to employment opportunities and in-migration) is likely to place additional pressure on existing infrastructure and services (e.g. health care, roads). This often results in a reduction in capacity of existing infrastructure and services to meet the needs of the local villagers (as well as the additional population added by the Project); leading to longer wait times and diminished quality of services as well as reduced access to and increased wear and tear on infrastructure. For example, an increase in road traffic can speed up the wear and tear experienced by roads, requiring roads to be fixed earlier than typically required. This creates a new cost sooner than anticipated for those involved in maintaining (and repairing) road infrastructure.

Potential Impacts

The construction period is expected to last 22.5 month. During this time, it is anticipated that the workforce will peak at 900 workers.

Although effects will be made to source workers from the local area, it is anticipated that a number of workers will be brought in from outside the area. It is the workers

from outside the area (as well as the influx associated with in-migration) that contributes to the pressure that is experienced by community infrastructure and services.

However, during construction the workforce will be accommodated at a camp – which will have a range of on-site amenities. This will minimize the need for the workforce to utilize (or rely on) local infrastructure – i.e. minimizing the pressure that may be experienced by community infrastructure and services. (It is expected that at the conclusion of the construction phase, the workers brought in from outside the area will leave.)

However, traffic may still create an issue – particularly during construction when transport needs are higher (when compared to the operation phase). An increase in traffic along the Ayeyarwady River will potentially displace current users. This means that river users may need to modify their activities (i.e. during specific points in the construction phase). This is expected to be a very temporary situation – as only a handful of cargo shipments will be required during the construction phase.

An increase in traffic along key roads may increase wear and tear – including No 39, No 18 and Nyaung U-Myingyan. Given the poor quality of the existing road infrastructure, this will mean that upgrades may be required sooner than planned along the existing roads.

In terms of the operation phase, it is anticipated that approximately 80 people will be employed. It is assumed that some of these workers will come from outside the local area (however, the breakdown in terms of the number of people from outside the local area is unknown). (Accommodation arrangements have not yet been determined for the workers that will be employed from outside the area.) Given the duration of the Project, it is anticipated that the operational workforce will relocate to the Project area, bringing their families with them. These workers may place some additional pressure on the local infrastructure. However, given the small workforce, and assuming that some will be sourced from the local area, it is anticipated that this additional pressure can be accommodated.

In addition, during both the construction and operation phase, the Project may place additional pressure on existing health care infrastructure – e.g. should a worker get sick, should an incident occur on site resulting in an injury. However, there is limited capacity for the existing health care infrastructure to respond to this demand (due to the limited number of health care workers, facilities and diagnostic equipment). For this reason, if health care is required, workers will likely need to utilize facilities outside the local area. The proposed community health management plan, occupational health and safety plan and emergency response plan will help reduce any pressure that may be placed on local health care facilities.

In terms of the construction phase, the key issue is the impact that road infrastructure may experience. However, this impact is expected to be local in terms of the extent and scale and occur over a short period of time. In addition, the Project is expecting to upgrade a number of existing roads, which will help address the impact. For these reasons, the impact was assessed as **minor** and **negative** (*Table 15.8*).

In terms of the operation phase, there is potential to impact more widely on community infrastructure (e.g. schools, community centers). This assumes that workers will be brought in from outside the local area and bring with them their families. This may occur, but is expected to result in only a handful of families moving into the area. As a result, the extent and scale of the impact is likely to be local and the overall impact is likely to be small. For these reasons, the impact was assessed as **minor** and **negative** (*Table 15.9*).

The above impacts may be greater depending on the degree of in-migration that occurs. This will need to be monitored closely – and the impact revisited should this become an issue.

Table 15.8 *Assessment of Impacts on Community Infrastructure and Services - Construction*

Impact	Impact on Community Infrastructure and Services			
Impact Nature	Negative	Positive	Neutral	
	An increase in population may put additional pressure on community infrastructure and services – which is a negative impact.			
Impact Type	Direct	Indirect	Induced	
	The impact is direct to the community infrastructure and services.			
Impact Duration	Temporary	Short-term	Long-term	Permanent
	Impact is likely to be temporary.			
Impact Extent	Local	Regional	Global	
	The impact is limited to the local villages.			
Impact Scale	The impact scale is small.			
Impact Frequency	The impact likely occurs during the construction phase with the rare frequency.			
Impact Magnitude	Positive	Negligible	Small	Medium
	The impact magnitude is likely to be small .			
Vulnerability of Receptors	Low	Medium	High	
	The vulnerability of receptor is likely to be medium .			
Significance	Negligible	Minor	Moderate	Major
	The significance is likely to be minor .			

Table 15.9 *Assessment of Impacts on Community Infrastructure and Services - Operation*

Impact	Impact on Community Infrastructure and Services			
Impact Nature	Negative	Positive	Neutral	
	An increase in population may put additional pressure on community infrastructure and services – which is a negative impact.			
Impact Type	Direct	Indirect	Induced	
	The impact is direct to the community infrastructure and services.			
Impact Duration	Temporary	Short-term	Long-term	Permanent
	Impact is likely to be short-term.			
Impact Extent	Local	Regional	Global	
	The impact is limited to the local villages.			
Impact Scale	The impact scale is small.			
Impact Frequency	The impact likely occurs during the operation phase with the rare frequency.			
Impact Magnitude	Positive	Negligible	Small	Medium
	The impact magnitude is likely to be small .			
Vulnerability of Receptors	Low	Medium	High	
	The vulnerability of receptor is likely to be medium .			
Significance	Negligible	Minor	Moderate	Major
	The significance is likely to be minor .			

Mitigation and/or Management Measures

Based on the above assessment, the following management measures are suggested:

- Provide appropriate amenities at the workforce accommodation camp – e.g. recreational opportunities. This will help reduce the need for workers to utilize local infrastructure and services;
- Develop and implement a traffic management plan to minimize the impact experienced by road users as a result of the Project. The traffic management plan should be developed in consultation with local stakeholders. Stakeholders should be notified in advance of the Project commencing of traffic routes that will be utilised and, where known, periods of increased traffic volumes. Where possible, traffic movements will be coordinated so as to limit disruptions to local activities;
- Develop and implement a social investment/ corporate social responsibility plan/ program in consultation with local stakeholders. As part of the plan, Sembcorp should explore opportunities to enhance community infrastructure and services; and
- Develop and implement a community health management plan and an occupational health and safety plan in consultation with relevant stakeholders (e.g. local health practitioners). These plans will ensure that appropriate and adequate health care services are provided on site and at the accommodation camp to address/ manage worker illnesses and injuries.

Residual Impacts

Assuming that the above management measures will be implemented and monitored over time, the residual impact was assessed as **negligible** and **negative**. Ongoing monitoring should occur to track implementation and evaluate the management measures. This includes monitoring Sembcorp's direct activities as well as Project contractors.

15.2.6

Impacts on Social Networks

Description

Although employment opportunities bring positive economic benefits, they also can result in social issues. These are largely associated with the following:

- The movement of skilled workers. Often large scale projects, offer better pay and benefits (when compared to local jobs). The result is a movement of workers from their existing positions to the employment opportunities offered by the Project. This can reduce the local skills pool;
- An increase in disposable income within the local villages. Although this can have positive benefits such as improvement in nutrition and education (e.g. as education outside the community becomes affordable). It often results in negative impacts, such as an increase in the use of drugs and alcohol, an increase in the price of commodities and food, and an increase in high fatty and sugary foods. (These types of foods can be introduced to an area to cater for the workforce.) The induced impacts are an increase in non-communicable diseases (e.g. due to drug and alcohol consumption);
- The introduction of new people in an area. This can lead to conflict within local communities. This stems from a variety of issues including differences in ethnicity and/ or religious values as well as jealousy that 'outsiders' have

successfully secured positions within the Project. Such situations are likely to create tension and conflict between local men and the workers in question; and

- The introduction of new people can also change the social structures and networks, including the leadership structures.

Potential Impacts

Although employment is a positive economic benefit, it can also result in a number of potential negative social impacts. This includes a reduction in the local skills pool, an increase in disposable income, and changes in social interactions.

The potential impacts during construction will be minimized as the workforce will largely reside within the workforce accommodation camp – reducing the interaction between the workforce and local villagers and the potential for community conflict.

Although the impact will be reduced, some impact will still occur, as a portion of the construction workforce will be sourced from local villages. This will increase disposable income and may result in a shift in skilled workers from existing industries.

It is anticipated that this impact will be **minor** and **negative**. This is largely because the extent, scale and duration of the impact will be small (i.e. localized impact over a short period of time) during construction. The impact is minor instead of negligible given the vulnerability of the local villagers.

In terms of operation, although the operation phase occurs over a longer period of time, the extent and scale of the impact is still expected to be small. This is largely due to the relatively small size of the workforce. In addition, Sembcorp's commitment to employing locally will help reduce the introduction of new people into the local area.

The above impacts may be greater depending on the degree that in-migration occurs. This will need to be monitored closely – and the impact revisited should this become an issue.

Table 15.10 Assessment of Impacts on Social Networks – Construction

Impact	Impact on Social Networks			
Impact Nature	Negative	Positive	Neutral	
	The Project has the potential to impact on social networks, which is a negative impact.			
Impact Type	Direct	Indirect	Induced	
	The impact is direct to the community health.			
Impact Duration	Temporary	Short-term	Long-term	Permanent
	Impact is likely to be short-term.			
Impact Extent	Local	Regional	Global	
	The impact is limited to the local villages.			
Impact Scale	The impact scale is medium.			
Impact Frequency	The impact likely occurs during the construction phase with the rare frequency.			
Impact Magnitude	Positive	Negligible	Small	Medium
	The impact magnitude is likely to be small .			
Vulnerability of Receptors	Low	Medium		High
	The vulnerability of receptor is likely to be medium given the potential consequences.			
Significance	Negligible	Minor	Moderate	Major
	The significance is likely to be minor .			

Table 15.11 Assessment of Impacts on Social Networks – Operation

Impact	Impact on Social Networks			
Impact Nature	Negative	Positive	Neutral	
	The Project has the potential to impact on social networks, which is a negative impact.			
Impact Type	Direct	Indirect	Induced	
	The impact is direct to the community health.			
Impact Duration	Temporary	Short-term	Long-term	Permanent
	Impact has the potential to have a lasting effect.			
Impact Extent	Local	Regional	Global	
	The impact is limited to the local villages.			
Impact Scale	The impact scale is medium.			
Impact Frequency	The impact likely occurs during the operation phase with the rare frequency.			
Impact Magnitude	Positive	Negligible	Small	Medium
	The impact magnitude is likely to be small .			
Vulnerability of Receptors	Low	Medium		High
	The vulnerability of receptor is likely to be medium given the potential consequences.			
Significance	Negligible	Minor	Moderate	Major
	The significance is likely to be minor .			

Mitigation and/or Management Measures

Based on the above assessment, the following management measures are suggested:

- Develop and implement a workforce code of conduct that addresses issues such as anti-social behavior and drug and alcohol consumption;
- Provide an introduction for workers moving into the area (even temporarily) – so that workers understand local culture and customs; and
- Develop and implement a local content plan. A key aspect should be providing local employment opportunities (to reduce the number of workers being brought into the local area from outside).

Residual Impacts

Assuming that the above management measures will be implemented and monitored over time, the residual impact was assessed as **minor** and **negative**. Ongoing monitoring should occur to track implementation and evaluate the management measures. This includes monitoring Sembcorp's direct activities as well as Project contractors.

15.2.7

Impacts from Land Acquisition and Involuntary Resettlement

Description

The construction of new infrastructure often requires the acquisition of land and can lead to (physical and/ or economic) displacement and/ or disruption of communities. Displacement can be permanent, in which land is procured by the Project and existing uses can no longer occur, or temporary, in which existing land uses can resume once the Project activity causing the displacement has finished.

Physical and/ or economic displacement of community activities or infrastructure is likely to occur as a result of the Project due to the following activities:

- Installation of the water supply pipeline;
- Installation and operation of the 230kV overhead transmission line; and
- Development of the infrastructure at the Project site.

Water supply pipeline

The Project will require the installation of a water supply pipeline. The pipeline will run alongside an existing irrigation channel between the Project site and the Ayeyarwady River. It will be located within an existing 15m right of way, which is owned by the Ministry of Irrigation and Agriculture. Construction is expected to take approximately 11 months.

Although the land is owned by the Ministry of Agriculture, it is currently used by local villagers. Much of the pipeline route is used for seasonal crop production – it typically forms a part of a larger plot of land under cultivation. In addition, an initial survey of the pipeline route indicates that there are approximately 8 to 10 squatters that have established infrastructure within the right of way. This includes approximately 3 shops and 5 houses.

Agriculture is the primary employer/ source of income in local villages, with most villagers involved in the cultivation of crops and a smaller number involved in rearing livestock for sale.

230kV Overhead Transmission line

A 230kV overhead transmission line will be constructed at the Project site. The line, which will be approximately 2.5 km in length, will extend from the generator at the power plant to a sub-station located within the steel mill complex. Connection beyond the sub-station is the responsibility of the GOM. Construction is expected to take approximately 7 months.

Although a transmission line will be established, the route has not yet been determined. An initial land use survey is underway and will help to identify existing land uses and potential constraints.

Project site

Land for the Project site was acquired a number of years ago. At the time it had not yet been determined that the Project would be constructed at the site, nor was Sembcorp identified as the potential operator. Compensation was provided to the land owners that were involved in the acquisition process.

At present a small number of villagers, mostly from Sa Khar, by-pass the security fence, which extends around the perimeter of the Project site, to collect firewood. Firewood is the primary source of fuel for cooking in local villages and is largely sourced from surrounding farmland or is purchased from the local village leader. Establishment of the power plant, and supporting infrastructure, will prevent villagers from accessing the site in the future. (Based on recent interviews with local stakeholders, the site is used for firewood collection and no other purposes.)

Potential Impacts

Based on the existing Project activities the following impacts may arise:

- Loss of land (or access to land). Although the land along the water supply pipeline is owned by the Ministry of Irrigation and Agriculture, it is currently used by local villagers for growing crops. Current users will lose access to this land during installation of the pipeline. However, the pipeline will be buried – it is assumed that existing land uses to continue after the pipeline has been installed. The pipeline is expected to take up to 11 months to construct, which means that land users will potentially lose a full year of crops, if not longer depending on how quickly crops can be reestablished post-construction. Most local villagers are reliant on the agricultural sector for income – and there are limited alternative employment options.
- Loss of crops. In addition to losing access to land for income generation, local villagers may lose their crops – i.e. the crops currently being grown. Much of the land that will be used by the water pipeline is subject to seasonal crops. These crops will be removed during construction, which will mean a loss of income:
- Loss of housing and business infrastructure. There are approximately 5 houses and 3 shops located along the water supply pipeline route that have been constructed by squatters. This infrastructure may need to be relocated as a result of the pipeline and/ or be disrupted (e.g. lack of access to shops) during construction. ; and
- Loss of community resources. The Project site is currently used by a handful of villagers from Sa Khar for firewood collection. This activity will no longer be able to occur as the Project site will be fenced, and for safety purposes access will no longer be allowed. However, nearby areas, such as those contained within the steel mill complex will still be accessible to the local communities.

Those using land along the water supply pipeline will be impacted by the Project. However, it is anticipated that the impact will be temporary. Although the impact will be limited to the squatters located along the route, these land users are dependent on land for income (i.e. either agriculture or shops). Given this vulnerability, it is anticipated that the impact will be **moderate** and **negative** for this undertaking agricultural activities; however, the impact on those that will be resettled is expected to be **high** and **negative** (*Table 15.12*).

In addition, villagers will no longer be able to access the Project site to collect firewood. It is anticipated that, given the small number of people currently accessing the site, there are viable alternative sites for the collection of firewood. It is anticipated that the impact will be **minor** and **negative**.

Once the 230kV overhead transmission route has been finalized, the potential impacts arising from its installation (e.g. displacement of existing land uses) will need to be reviewed.

Table 15.12 Assessment of Impacts on from Land Acquisition and Involuntary Resettlement

Impact	Impact from Land Acquisition and Involuntary Resettlement			
Impact Nature	Negative	Positive	Neutral	
	An increase in physical and economic displacement in the local area is a negative impact.			
Impact Type	Direct	Indirect	Induced	
	The impact is direct . Villagers may be physically and/ or economically displaced – meaning that they may be required to move and/ or lose income as a result of the Project.			
Impact Duration	Temporary	Short-term	Long-term	Permanent
	Impact has the potential to be short-term for those involved in agriculture; however, the impact may be long-lasting for the five households that may need to be resettled.			
Impact Extent	Local	Regional	Global	
	The impact is limited within the local villages.			
Impact Scale	The impact scale is medium.			
Impact Frequency	The impact likely occurs during the construction phase with the rare frequency.			
Impact Magnitude	Positive	Negligible	Small	Medium
	The impact magnitude is likely to be small .			
Vulnerability of Receptors	Low	Medium	High	
	The vulnerability of receptor is likely to be high .			
Significance	Negligible	Minor	Moderate	Major
	The significance is likely to be moderate .			

Mitigation and/or Management Measures

In instances where displacement occurs, research has shown that resettlement frequently results in the impoverishment of those affected; however, impoverishment is not an inevitable consequence. With appropriate management, livelihoods can be restored post-relocation, and the process can contribute to the long-term development of the community or individuals relocated.

As MEPE is leading the land acquisition process for the water pipeline and transmission line, however, the acquisition process has not yet started. Discussions

are still underway as to the routes that will be taken. For the water pipeline the routing process has involved an initial land use survey – to identify what land uses currently exist. By understanding local land uses, the route can be modified to minimize the impacts experienced by local villagers. A similar process will be followed for the transmission line.

Prior to commencement of the land acquisition process, Sembcorp will work with MEPE to identify (and if required fill) any gaps between the process that the MEPE is undertaking and the requirements set-out in the IFC performance standards and the ADB safeguards.

Sembcorp is committed to minimizing the impacts associated with land acquisition/land use required as part of the Project. In instances where impacts cannot be avoided, compensation (cash or in-kind) will be provided.

The following steps are suggested in order to minimize the likely impacts associated with the Project:

- Work with MEPE during the river water supply pipeline and 230kV overhead transmission line right of way land acquisition process, so that the process and outcome is consistent with IFC and ADB requirements;
- Establish plans based on a resettlement framework; and
- Consultation with stakeholders that may be impacted by the Project, to ensure that stakeholders are clear about the potential impacts and proposed mitigation measures.

Residual Impacts

Assuming that the above management measures will be implemented it is anticipated that the impacts will be temporary, and mitigated through compensation (cash or in-kind). For these reasons, the residual impact is expected to be **moderate** and **negative**.

15.2.8 Impacts on Cultural Heritage

No known archaeological resources; three items of ancient above ground resources (i.e. HT1, SK1 and SK3) and 16 items of living heritage sites were identified within the cultural heritage study area. None of them were located within the Project's footprint. Therefore, no direct impact during the construction and operation phases is anticipated.

Indirect impact on the tangible cultural heritage resources identified is minimal due to the large separation distance between the Project's footprint and the items. TPT1 and TPT3 are the only two items with distance to the proposed water intake pipeline less than 100m. However, as they were surrounded by soft ground (i.e. agricultural land), potential adverse impact (e.g. vibration and settlement) during both construction and operational phases is also considered minimal.

No significant intangible cultural heritage was identified and no adverse impact is anticipated through interview with villagers and stakeholder's meeting. However, as most of the festivals and ceremonies take place at the pagoda complex and monasteries, traffic impact may be an issue on the track along the proposed water

intake pipeline where TPT1 and TPT3 located nearby. Transport will increase during construction phase for transferring cargos from Ayeyarwady River to plant site, which may potentially influence the accessibility to TPT1 and TPT3 during festivals or ceremonies period. However, the impact is expected to be temporary and avoidable by better logistic arrangement planning, as only a handful of cargo shipments will be required during the construction phase. No adverse impact on intangible cultural heritage is anticipated during operational phase.

15.3

SUMMARY

The impact assessment identified a number of positive and negative impacts that are likely to occur during construction and operation of the Project. Significance of these impacts before and after management is summarized in **Table 15.13**.

Table 15.13 Summary of Impact Significance Before and After Mitigation

Sections	Impacts	C/ O	Significance of Impacts		
			Impact Direction	Before Mitigation*	With Mitigation**
15.2.1	Employment and economy	C/ O	Positive		
15.2.2	Community health	C/ O	Negative	Moderate	Minor
15.2.3	Community safety and security	C	Negative	Moderate	Minor
		O	Negative	Minor	Minor
15.2.4	Environmental emissions	C/ O	Negative	Negligible	Negligible
15.2.5	Community Infrastructure and services	C/ O		Minor	Minor
15.2.6	Social networks	C/ O	Negative	Minor	Minor
15.2.7	Land acquisition and involuntary resettlement	C/O	Negative	Moderate to High	Moderate
15.2.8	Cultural heritage	C/O	Negative	Negligible	Negligible

Note: C = Construction phase, O= Operation phase

(*) with in-place/existing controls but without mitigation measures/management suggested from ERM.

(**) with mitigation measures/management suggested from ERM.