

MARANHÃO GRAIN TERMINAL - TEGRAM – BRAZIL



Figure 1: General image of the project

Sources: CGG Trading, TEGRAM - Terminal de Grãos do Maranhão, accessed in 2015, <http://www.cgctrading.com/logistica/tegram>.

Julia Carvalho Fernandes de Oliveira prepared this case study under the supervision of Judith Rodriguez ENV-SP and Cristina Contreras ENV-SP as part of the Harvard-Zofnass program directed by Dr. Andreas Georgoulas by initiative of IDB for the purposes of research and education. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective project design or implementation.

Copyright © 2014 by the President and Fellows of Harvard College. Permission is granted for use for nonprofit education purposes for all of the work, with attribution, except for third party materials incorporated in the work which may require permission from the authors of such material. For permission to use this work in other circumstances, write to Dr. Andreas Georgoulas, Harvard Graduate School of Design, 48 Quincy Street, Cambridge, MA 02138.

The authors would like to thank Ana Maria Vidaurre-Roche, member of IDB, Anna Costa from Oiti Consultoria Ambiental and Suzzy Nascimento and Geraldo Junqueira from the TEGRAM consortium for their input; this case would have not been possible without their contribution.

EXECUTIVE SUMMARY

TEGRAM is a private grain terminal located within the Port of Itaqui within the county of São Luís, in the state of Maranhão. One of the largest grain terminals in Brazil, it is also considered a logistics milestone for the national agribusiness, as it stimulates production and changes how grain exports are transported in Brazil by bringing the grain-producing areas closer to their global markets. The project sponsor is a consortium of four grain export business competitors. They envisioned TEGRAM as consisting of four warehouses and a set of conveyor belts and ship-loaders. The total project cost is estimated to be US \$400 million. At the time of this evaluation, the project was in the commissioning stage of the first phase, which is expected to provide for the export of 5 million tons of soybeans, soybean meal, and corn annually to international destinations, such as China and Europe. The following two phases are expected to support exports of 10 and 15 million tons, respectively. TEGRAM can be regarded as a project that is supporting Brazil's position as one of the world's leading exporters of commodities for years to come.¹

TEGRAM demonstrated a good approach in enhancing quality of life in the region. It should be noted that on a national scale, the project is stimulating sustainable growth and development by more closely connecting the northern growing region, where the production of grain has been increasing, to global export outlets. The region is better known as MAPITOBA, an area formed by the states of Maranhão, Piauí, Tocantins, and Bahia, as well as the northeastern part of Mato Grosso, eastern Pará, and northern Goiás; today it is the region with the fastest growth rate of farm acreage in the country.² Given the location of the project in an underutilized area of the Port of Itaqui, no community was fully engaged in the decision-making process. However, while the project is located in a remote area, the project team established some policies that improved the local quality of life. Such commitments can be found in the company's rate of hiring locally (about 90%) and the proper training provided for these workers, thus increasing local skills and capabilities, and consequently increasing operational capacity for business as well. Furthermore, TEGRAM enhances public health and safety by establishing programs to maintain the overall mental and physical health of the project's workers. The consortium made some efforts to enhance its relationship with the community through two social projects. The first involved students from a local school (Josefina Serrão) in a plan to build an orchard in collaboration with the Junior Agronomy Organization (Empresa Júnior de Agronomia) from the State University of Maranhão, to promote environmental education and responsibility among

¹ McKinsey Global Institute, "Connecting Brazil to the World: A Path to Inclusive Growth" (May 2014), 4.

² UOL, "Mapitoba: conheça a última fronteira agrícola do Brasil," accessed 2015, <http://vestibular.uol.com.br/resumo-das-disciplinas/atualidades/mapitoba-conheca-a-ultima-fronteira-agricola-do-brasil.htm>

the students. The other social program managed by the project team is focused on truck drivers and identifies opportunities for increasing their safety and overall workspace quality; among other things this has led to the identification of and plans to deal with child prostitution in the truck waiting lot.

In terms of leadership, the project has an outstanding approach in working together as a team, with its four sponsors (who are regularly business competitors in grain export) collaborating to design, deliver, and operate TEGRAM. Another aspect of collaboration concerns the social program for the truck drivers, which came in the form of meetings conducted by both the team and a third-party company. In managing any possible constraints to the project, the team is reaching out to authorities to improve the only access road, BR-135, which is currently facing traffic issues due to the increased volume of truck traffic which began during the project's commissioning phase. The project includes a parking lot for the trucks, close to 20 km from the port, in which they wait to be called to unload grain at the warehouses, thus reducing emissions by minimizing truck idling time.






A key point to consider when designing an infrastructure project is how resources are allocated. Projects should be concerned with the quantity, sources, and characteristics of all materials used to build the project, and should assess their impact on overall sustainability. TEGRAM took a good approach to reducing excavated materials taken off site; all of the project's cut-and-fill operations were conducted in a way that allowed all the excavated materials to remain on site or within the Port of Itaqui's limits for internal uses, such as filling or leveling. Furthermore, the warehouses' major structures are made premolded units, therefore providing for ease of deconstruction and recycling. Part of the project's water monitoring is the responsibility of the port administrator, with the rest being that of the project team. To avoid impacts to water quality, the project adopted watertight tanks for the wastewater and effluents generated by the warehouses, to be sent to treatment stations outside of the port area. The plans for water monitoring will be adopted as soon as the rainy season begins.

In terms of ecological impact, the project does not use prime habitat or farmland, as it is located in an area that was previously developed. The project does not require water in large volumes due to the nature of its activities; therefore water resources of the hydrographic basin of São Luís will not be compromised. The location of the grain terminal is in a coastal plain, a flat surface that is considered not to have risks from adverse geology. Efforts have also been made to identify and protect the fauna found on site. The Vegetation Suppression Plan established the needed procedures and actions to mitigate the impacts caused by flora and fauna suppression. In preserving the ecosystem, the TEGRAM team took proper actions to

handle all of the individual local fauna and flora, mitigating any possible impacts caused by the project. The project will not jeopardize wetland or surface water functions since, according to the environmental control plan, the project does not have a great influence on the local hydrology.

Climate and risk management is exemplified by overall reduction in greenhouse gas emissions, due to the project's strategic location: compared to more developed areas of southern Brazil, it is closer to the grain production sources in the country and (taking advantage of the Panama Canal expansion) to international export destinations such as China and Europe. As regards reducing emissions from air pollutants, the team has only worked within legal requirements, which relate to the reduction of particulate matter emissions; on this issue, TEGRAM has been working to carefully meet all of the required levels.

It is worth mentioning that the project still has room for improvements in sustainability. To improve the quality of life, the team should seek an approach that is more locally focused, and try to work with the surrounding community to enhance their quality of life. In particular, the project team should consider a social program for children who are susceptible to prostitution. TEGRAM is a large-scale project with many possible social, environmental, and economic impacts; thus it should also seek to improve the leadership regarding local communities, and that on a national level. As for how resources are allocated and how the natural world is managed, the team should be concerned with the project's impact on the environment, thus with the quantity, sources, and characteristics of all materials used to build the project. The area surrounding the project is comprised of a valuable natural fragile ecosystem, where the team could have created a buffer zone or taken other proactive compensatory actions. The site is in the port area that belongs to the EMAP, and according to the project team, there is not enough space to create a buffer. In addition, they state that compensation measures regarding vegetation interventions should be made by legal request. It is important to remember that the impact of contamination is often cumulative, especially in water bodies such as aquifers and streams, and that each project and site shares responsibility for protecting the quality of the larger system; thus the team should put in place a comprehensive plan for water and environmental monitoring. Considering climate and risk, TEGRAM should take more sustainable approaches with a more long-term view and build upon the project's resilience. Projects with long lifespans should be designed to consider all particularities that the future might hold for the projects' robustness.

		
<p>Figure 2: People & Leadership award Summary of results</p>	<p>Figure 3: Climate & Environment award Summary of results</p>	<p>Figure 4: Infrastructure 360 award Summary of results</p>
 <p>Impacto en Población y Liderazgo</p>	 <p>Cambio Climático y Medio Ambiente</p>	 <p>Infraestructura 360</p>

APPENDIX E: SOURCES

DOCUMENTATION PROVIDED
General Information.
IPHAN. <i>Relatório Final das Atividades de Campo referente à Pesquisa Arqueológica</i> . São Luís, MA: 2012.
Scientia. <i>Prospecção Arqueológica na Área do TEGRAM</i> . São Paulo, SP: 2013.
Ducol Engenharia LTDA. <i>Relatório de Supressão Vegetal</i> . São Luís, MA: 2012.
STCP. <i>Prestação de Serviços de Resgate e Translocação de Fauna e Flor</i> . Curitiba, PR: 2012.
SENAI. <i>Contrato de Prestação de Serviços entre SENAI e TEGRAM</i> . São Luís, MA: 2014.
Porto do Itaqui. <i>Plano de Controle Ambiental</i> . São Luís, MA: 2011.
ENFASE. <i>Relatório de Monitoramento Ambiental de Ruídos nas Instalações do Consórcio TEGRAM-ITAQUI</i> . São Luís, MA: 2013.
TEGRAM. <i>Apresentação Projeto de Educação Ambiental</i> . São Luís, MA: 2015.
EJAGRO. <i>Solicitação de Parceria</i> . São Luís, MA: 2015.
TEGRAM. <i>Relação Atualizada de Colaboradores</i> . São Luís, MA: 2015.
TEGRAM. <i>Ações SSMA</i> . São Luís, MA: 2015.
AON. <i>Análise Preliminar de Perigos</i> . São Paulo, SP: 2013.
TEGRAM. <i>Análise de Risco Simplificada</i> . São Luís, MA: 2015.
Corpo de Bombeiros Militar. <i>Certificado de Aprovação 7322/2015</i> . São Luís, MA: 2015.
Corpo de Bombeiros Militar. <i>Certificado de Aprovação 7323/2015</i> . São Luís, MA: 2015.
Corpo de Bombeiros Militar. <i>Licença Vinculada 0005/2015</i> . São Luís, MA: 2015.
Corpo de Bombeiros Militar. <i>Licença Vinculada 0014/2015</i> . São Luís, MA: 2015.
Corpo de Bombeiros Militar. <i>Licença Vinculada 0015/2015</i> . São Luís, MA: 2015.
Corpo de Bombeiros Militar. <i>Licença Vinculada 0005/2015</i> . São Luís, MA: 2015.
Projectual. <i>Estudo de Impactos de Tráfego do TEGRAM na BR-135</i> . São Luís, MA: 2015.

TEGRAM. <i>Apresentação Sinalização Interna</i> . São Luís, MA: 2015.
TEGRAM. <i>Reunião de Gestão do Calendário Social & SSMA</i> . São Luís, MA: 2015.
Louzeiros Engenharia e Consultoria Ambiental. <i>Lauda de Estanqueidade</i> . São Luís, MA: 2015.
TEGRAM. <i>Relatório de Andamento 4</i> . São Luís, MA: 2015.
TEGRAM. <i>Procedimento de Controle de Emissão de Material Particulado</i> . São Luís, MA: 2015.
Câmara dos Deputados. <i>Estudo de tráfego/ BR -135/ PAC - 3</i> . Brasília, DF: 2014.
TEGRAM. <i>Subprograma de recuperação de áreas degradadas e controle de erosão</i> . São Luís, MA: 2015.
TEGRAM. <i>Arrendamento do Terminal de Grãos do Maranhão no Porto do Itaqui - Lotes I, II, III e IV</i> . São Luís, Ma: 2011.
Governo do Estado do Maranhão. <i>Autorização do Uso da Água</i> . São Luís, MA: 2012.
TEGRAM. <i>Procedimento Gestão de Efluentes Consórcio TEGRAM e lotes 1 a 4</i> . São Luís, MA.
TEGRAM. <i>Procedimento Gestão de Efluentes Consórcio TEGRAM e lotes 1 a 4</i> . São Luís, MA.
TEGRAM. <i>Matriz de Treinamento de Saúde e Segurança Administrativo</i> . São Luís, MA: 2015.
TEGRAM. <i>Matriz de Treinamento de Saúde e Segurança Manutenção</i> . São Luís, MA: 2015.
TEGRAM. <i>Matriz de Treinamento de Saúde e Segurança Operação</i> . São Luís, MA: 2015.
TEGRAM. <i>Matriz de treinamento Planejamento TEGRAM</i> . São Luís, MA: 2015.
TEGRAM. <i>Procedimento operacional para descarregamento de vagões</i> . São Luís, MA: 2015.