



## Development of Ferry Boat Routes in Northeast Asia Utilizing European Examples of Regional Connectivity

Elaborated by Burkhard Lemper, Director of the Maritime Economics and Transport  
Department at the Institute of Shipping Economics and Logistics,

in the context of the

Northeast Asia Local Development Forum

6<sup>th</sup> of August 2014, Yonago, Tottori Prefecture, Japan



Published by



As a federally owned enterprise, we support the German Government in achieving its objectives in the field of international cooperation for sustainable development.

**Published by:**

Deutsche Gesellschaft für  
Internationale Zusammenarbeit (GIZ) GmbH

**Registered offices**

Bonn and Eschborn, Germany  
T +49 228 44 60-0 (Bonn)  
T +49 61 96 79-0 (Eschborn)

Friedrich-Ebert-Allee 40  
53113 Bonn, Germany  
T +49 228 44 60-0  
F +49 228 44 60-17 66

Dag-Hammarskjöld-Weg 1-5  
65760 Eschborn, Germany  
T +49 61 96 79-0  
F +49 61 96 79-11 15

E [info@giz.de](mailto:info@giz.de)  
I [www.giz.de](http://www.giz.de)

**Name of the programme**

Support for Economic Cooperation in Sub-Regional Initiatives in Asia

**Programme office**

TaYuan Diplomatic Office  
14 Liangmahe South Street, Chaoyang District  
10600 Beijing, PR China  
T +86-10-8532-5344  
F +86-10-8532-5744

E [scsi-asia@giz.de](mailto:scsi-asia@giz.de)

**Author:**

Burkhard Lemper  
Magnus Brod

Items from named contributors do not necessarily reflect the views of the company/the editors.

**Photo credits**

Copyrights for all graphics: Burkhard Lemper/ISL except p. 10 by GTI  
Copyright for all pictures: GIZ SCSi

Beijing, September 2014

## About this Paper

On the 6<sup>th</sup> of August 2014, the Tottori Prefectural Government hosted the 2<sup>nd</sup> Meeting of the Greater Tumen Initiative (GTI) North East Asia Local Cooperation Committee (LCC) in Yonago, Japan. The LCC is the leading cooperation mechanism between local governments' bodies in the region and encompasses the Chinese provinces Heilongjiang, Jilin, Liaoning, and Inner Mongolia as well as the Russian territories of Primorsky and Khabarovsky, the Mongolian Province Dornod as well as the Japanese prefectures of Tottori and Niigata.

The LCC provides a platform for communication and cooperation among the participating entities. Thus it helps to close cooperation gaps between national, regional, and local policies and fosters the economic growth especially in border areas. Apart from delegates of the participating regions, international organisations as well as representatives from regional shipping and logistics companies attended the meeting and discuss regional connectivity and other areas of local cooperation.

Back to back with the LCC Meeting, the Northeast Asia Local Development Forum was held under the theme of "Regional Cooperation in Northeast Asia towards Sustainable Economic Growth". The "Regional Economic Cooperation and Integration (RCI) in Asia" programme of Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH supported the meeting with the contribution of logistical expert Prof. Dr. Lemper who delivered a presentation on ferry boat routes in the Greater Tumen Region in line with the overall transportation strategy of GTI. Where suitable the transfer of European best practices for local cooperation, can provide fruitful examples for the dynamic Greater Tumen Region and pave the way for future cross-border cooperation.

The following pages entail the presentation of Prof. Dr. Lemper under the heading "*Development of Ferry Boat Routes in Northeast Asia – Utilizing European Examples of Regional Connectivity*" including insights stemming from the Northeast Asia Local Development Forum and the ensuing discussions.



## Development of Ferry Boat Routes in Northeast Asia – Utilizing European Examples of Regional Connectivity

Prof. Dr. Burkhard Lemper,

Director – Institute of Shipping Economics and Logistics (ISL), Bremen Germany

Northeast Asia and more precisely the region covered by the Greater Tumen Initiative (GTI) is one of many dynamic regions in Asia. This holds true also from a global perspective. With the further increasing role of Asia as an economic centre compared to North America and Europe, Northeast Asia is gaining importance in economic terms.

Even though the past years already showed an impressive and dynamic growth of economies and trade in Northeast Asia is expected not to slow down in the near future. In contrary: the gross domestic product and trade volume of Northeast Asia are expected to grow by 4.3% p.a. and 7.9% p.a. respectively until 2020.

This economic development and especially the international exchange of goods as a precondition need an efficient, reliable and capable transport infrastructure. Besides land-based infrastructure such as a road and rail network, sea transportation is essential to reach a good connectivity between the states in Northeast Asia and especially the GTI member states due to its geographical conditions. One appropriate means of transportation is a Roll on Roll off (Ro/Ro) ferry service.

### Ferry Boat Routes as Mode of Transportation

Although having also some minor drawbacks such as relatively high investment in vessels, increased operating cost and the higher share of „dead space“ the advantages of this system are crucial:

Ferry services can be implemented relatively quickly with only limited investment in shore-based infrastructure as the core element is an adjustable Ro/Ro ramp or berth if tides lead to changing quay heights. In comparison with other port infrastructure this is quite simple. In the initial phase or for a trial period ships could be chartered parallel to a floating mobile ramp. As there is little or no handling equipment needed port operation for Ro/Ro ferry services can be characterized as relatively low cost. It's a little different if only accompanied trucks (with prime mover and driver) are carried or also semi-trailers alone. For the latter the port operator would need to provide terminal trucks for fast loading and unloading.

#### **Box 1: Advantages of Ferry Services**

##### **Fast Connection**

- Relatively fast vessels
- Short Port Turnaround times
- Most relatively high frequency

##### **Simple and low cost Port Handling**

- Simple infrastructure needed such as a ramp and/or RoRo berth
- No or little handling equipment needed

##### **Flexible for most types of cargo plus passengers**

##### **Safe and reliable mode of transport**

- Reliable timetable due to scheduling by passenger transport
- Hardly any cargo damage due to handling in trailers or boxes

Despite this, the port handling process is very fast and efficient. In most cases the complete exchange of cargo and passengers in a port takes only one or two hours. In the Baltic Sea Region for example there are specialised services on short tracks. Here ferries with a capacity of more than 2,000 lane meters for trucks and cars plus up to 1,200 passengers have turnaround times of less than one hour. In connection with a very high frequency this ferry service can be characterised as a "floating bridge". Bear in mind that the length of the route is about 18 km. This function is also supported by the use of relatively fast vessels, which is a common feature of most ferries. However, fast in terms of up to 25 knots doesn't mean high-speed which is too expensive. Most Baltic high-speed routes closed down because the bunker costs became too high. See Table 1 for some examples of ferry boat lines in the Baltic Sea Region.

**Table 1. Examples of Ferry Boat Lines in the Baltic Sea Region**

Route	Bee Line/Scandlines	Tallink	Finn carriers
	Puttgarden-Rödby	Stockholm-Riga	Germany-Finland
Distance	10 nm	266 nm	610 nm
Ferries	4+1	2	5
Speed in knots	18	20	25
Frequency per day	48	1	1
Passengers	1.200	2.500	500
Lane m trucks	530	1.100	4.200
Time at sea	45 minutes	17 hours	27 hours
Time in port	15 minutes	7 hours	n.a.
Pax per year	6 millions	774.000	n.a.
Trucks per year	389.000	18.400	n.a.

With such short turnaround times Ro/Ro ships can do much more round trips in the same time than a container vessel. This balances the higher investment costs and lower capacity.

One main advantage of ferry services is also the flexibility in terms of cargo loaded which is even better than that of container services. On most Ro/Ro-ferries all types of cargo can be loaded as long as it is on trucks, trailers or any other rolling equipment. This includes containers on road chassis or special Ro/Ro trailers, but also pallets and, depending on the specification of the vessel, high & heavy units. Because of this flexibility different types of cargo flows and transport demand can be concentrated on a single service without the need to employ specialised ships for the different types of cargo (container, multi-purpose, car carrier etc.). This concentration also allows the employment of larger units already in an early stage of the development of such trades with a higher frequency.

#### **Box 2: Disadvantages of Ferry Services**

**Higher cost in comparison to specialised cargo transport (container, tank, bulk etc.)**

- More expensive vessels
- Slightly more personnel aboard the ships
- Higher operation expenses (OPEX) for faster ships with more personnel
- High share of “dead space”

**Danger of equipment imbalances**

- Imbalanced trades
- Use of special equipment (trailer, container) for cargo



With cost advantages on the port side on the one hand and slight disadvantages on the side of the vessel cost on the other hand it can be summarized that ferry services in general are applicable and recommendable on relatively short routes with important shares of port operation in the overall schedule. In this case the possibility to earn higher cost of the vessel and its operation is possible due to (time-)savings in ports. Especially for the implementation of new services in emerging markets the flexibility of ferries in terms of cargo transported as well as the ability to cover different cargo types and employ larger ships with related economies of scale compared to specialised services is an essential advantage. These advantages could also be used in the Greater Tumen Region (GTR) which currently is at the beginning of intensified economic cooperation.

### Box 3: Intermediate Results

#### Ferry boat services applicable and recommendable

- On **relatively short routes** with important shares of port operation in the overall schedule and hence the possibility to **compensate the higher cost of vessels** and its operation by **savings in ports**
- For the implementation of **new services in emerging markets** as the **flexibility in terms of cargo** transported as well as the ability to cover different cargo types and **employ larger ships** with related **economies of scale** compared to specialised services.

## The Development of Ferry Boat Routes in the Baltic Sea Region

In Northern Europe, especially in the Baltic Sea Region, the transport industry has made very good experience with this fast, flexible and reliable mode of transport. Until the beginning of the 1990s only very limited exchange of goods between Western European states and members of the former USSR and its allies existed. Main traffic routes in the Baltic with ferry services existed from Western Germany to Denmark, Sweden, Norway and Finland. Eastern Germany and Poland were linked via ferries (mainly railway ferry routes opened in the early 20th century) with Sweden, the Baltic States (i.e. Estonia, Latvia, Lithuania) and Finland. Thus, most services were north-south connections, while east west links had been of minor importance and were served by conventional coasters. In addition there were of course some deep-sea services for container or general cargo traffic but they were intended to serve more Extra-European trades (long-haul) than transport between European neighbours.



Figure 1: Baltic Sea Ferry Routes "East-West" 1989/90; Source: ISL 2014 based on Ferry lines information and Baltic Ports Organisation

After 1990 there was a new development. With the opening of the Eastern European countries and a beginning convergence process exchange of goods and passengers picked up significantly. Although it was also possible to transport, for example, goods from Germany or the Netherlands to the Russian Federation directly via land route with trucks, ferry transportation was introduced and fostered as a convenient and adequate alternative. One reason was that during the early years of the new era the road infrastructure in Eastern Germany, Poland, the Baltic States and the Russian Federation was in a very poor condition and, in addition, border controls led to waiting times of several hours or even days. Ferry boats offered an efficient alternative.





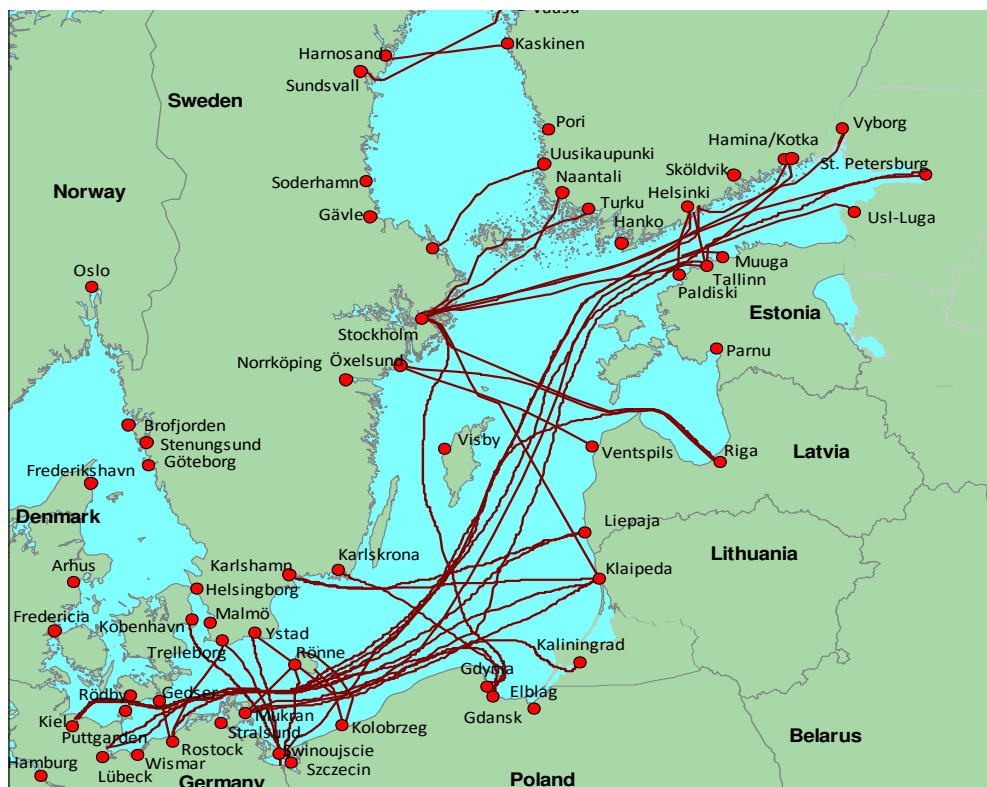


Figure 3: Baltic Sea Ferry Routes "East-West" 2014; Source: ISL based on ferry lines information and Baltic Ports Organisation

The examples of Baltic Sea Region Ferry Routes prove that ferry services can act as flexible, efficient and competitive means of transport. This holds true not only with regard to short sea routes without alternatives to sea transportation but also on corridors where land transportation is generally possible but is hindered by lack of capable infrastructure or regulatory barriers.

To sum up it can be said that fast, efficient and reliable ferry services can be recommended as a means of choice for establishing a multimodal transport system in the Greater Tumen Region. In the long run success is, of course determined by competitiveness and cost for the customers; i.e. prices and fares. The latter depend on the one hand on the existence of competition on similar routes, because monopoly profits will lead to bad acceptance of offered services. On the other hand prices are also and above all influenced by production cost.

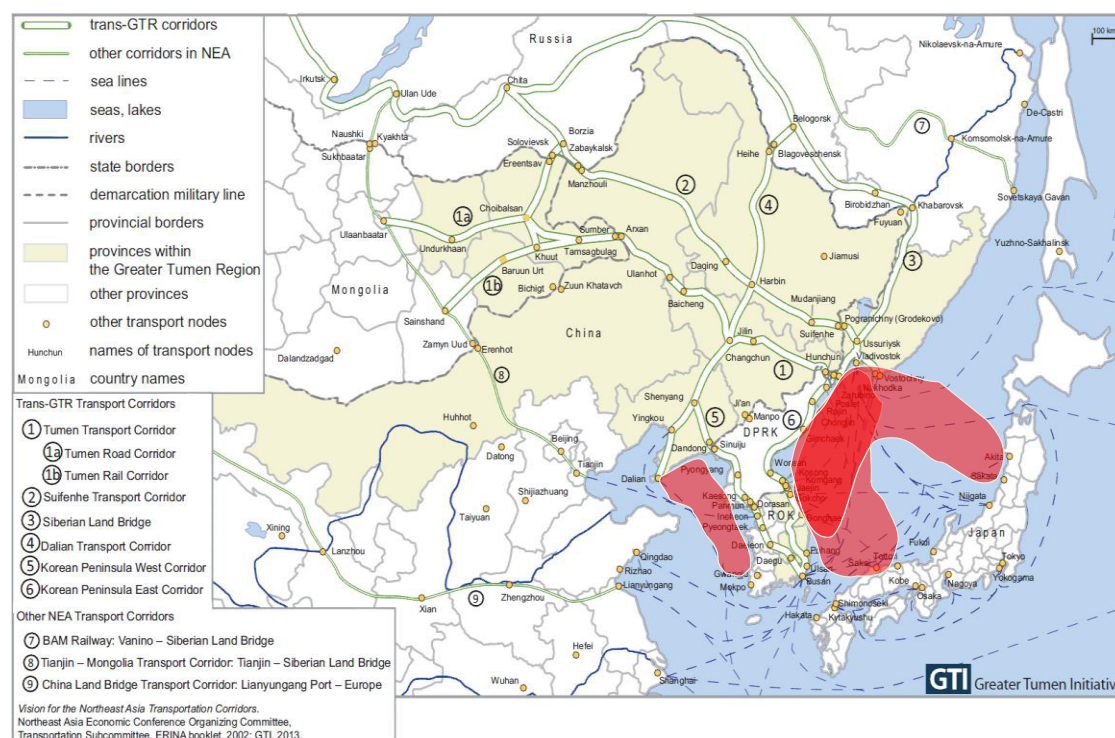


Figure 4: RoRo-Ferry Services recommended for NEA and GTR to foster multimodal transport; Source: GTI 2014

Hence, if traffic demand shall be maintained or newly generated, the overall cost of the intermodal transport chain has to be reduced for the costumers. This can be addressed by e.g.:

- **Reducing traffic imbalances:** Imbalanced trades cause underutilisation of vessels or transportation of empty equipment. Therefore measures and initiatives fostering international and regional trade could improve overall vessel utilisation and reduce average unit cost for transport. The major reason for imbalances in the Baltic Sea is the exports from wood, pulp and paper from Northern Europe to the Continental Europe. They are not only carried by common user ferry services but also by privately organized Ro/Ro services with more specialized ships.
- **Improving availability of equipment:** This aspect is in close relation with the aforementioned. Traffic imbalances often result in imbalances of available equipment at either end of the transport chain. Even in case of generally balance trade volumes, different requirements regarding equipment resulting from different types of goods (e.g. reefer cargo and liquid bulk) can generate equipment imbalances. In addition, the problem becomes even more significant if different logistic service providers are active and no exchange of equipment can be organised. Besides trying to reduce equipment imbalances by selective “trade creation”-measures one other measure to reduce cost could be to support co-operation of logistic service providers on a funded project basis.

- **Direct financial support:** The last and from economist's point of view least option would be a direct subsidy to ferry service operator. In regions where without such intervention a necessary service would not be implemented due to missing financial viability, a public contribution by means of a public service obligation (PSO) might be accepted. However, a precondition of course is a transparency with regard to cost in order not to finance monopoly profits of single operator.

All of these measures have been applied in Europe to some extent. There have been several national and EU level initiatives and programmes to support short sea shipping and the modal shift from road to sea and in several of the projects funded one or more of the three aspects mentioned above have been addressed. Some of the projects might be worth being considered also in the GTR and under the GTI LCC framework.

## Concluding Recommendations

With the invention of the DBS Ferry Service connecting the ports of Vladivostock (Russian Federation), Donghae (Republic of Korea) and Sakaiminato (Japan) one of the possible service routes has been opened (after others have been closed down due to disappointing results). However, this service is characterized as cruise ferry and the main focus is on passengers. This, on the one hand, means that there is high competition by low budget airlines which needs to be taken into account by the pricing scheme. On the other hand, and that is more important when considering the intended integrating effects of such services with respect to economic development, it has to be stated that the weekly service frequency has to be raised, in order to become competitive compared to other shipping services and make economic exchange more attractive. This increased service frequency in connection with a ship and service design more focussed on cargo - has good chances to attract more cargo and improve cargo-deck utilisation even for more frequent sailings. However, a precondition of course is also an attractive, competitive pricing scheme. In this regard it could be helpful to consider public funding for an initialisation phase using one of the instruments described above.

## About the Author

Prof. Dr. Burkhard Lemper is Director and Head of the Maritime Economics and Transport Department at ISL. He has managed a wide variety of projects for individual clients in the maritime industry, especially for port authorities, ship yards and shipping companies. He has worked on studies for the German Ministries of Transport as well as of Research and Technology, dealing with developments in the European and world wide transport markets, especially container transport, port development projects and feasibility studies including cost benefit analyses. He has written and published especially on maritime sector issues. Other important aspects of his research are cargo flow and market analysis, simulation of cargo flows and transport modelling.

## About ISL

The ISL - Institute of Shipping Economics and Logistics was founded in Bremen in 1954. By combining tradition with modern science, we have since positioned ourselves as one of Europe's leading institutes in the area of maritime research, consulting and knowledge transfer. Today, around 60 employees at our offices in Bremen and Bremerhaven handle projects from all over the world in interdisciplinary teams. Whether in China and South-East Asia, Saudi Arabia, Dubai, Russia or the Ukraine, whether logistics systems, maritime economics and transport **or** information logistics are concerned - we ensure that innovative ideas are developed into solutions with practical applicability on behalf of our project partners from the public and private sector, both on a national and international level.

For more information refer to: [www.isl.org](http://www.isl.org)

# GIZ Programme “Support for Economic Cooperation in Sub-Regional Initiatives in Asia (SCSI)”

## Background

Initiatives in support of regional cooperation and integration have increasingly come to be understood as key to Asia’s future development. They enhance the region’s division of labour, its capabilities to attract investments, as well as its access to global markets. Moreover, sub-regional initiatives improve the connectivity between interior lands and peripheral areas, whereby they not only contribute to the reduction of regional disparities, but also facilitate the development of regional competitive advantages.

## Our Approach

The SCSI Programme aims to support both public stakeholders at the national, (sub-)regional and local level, and private stakeholders in the context of sub-regional cooperation initiatives. In doing so, the programme intends to enhance

the structural conditions of regional economic cooperation, improve the implementation capabilities of the relevant stakeholders, and foster the inclusion of the private sector in the relevant processes.

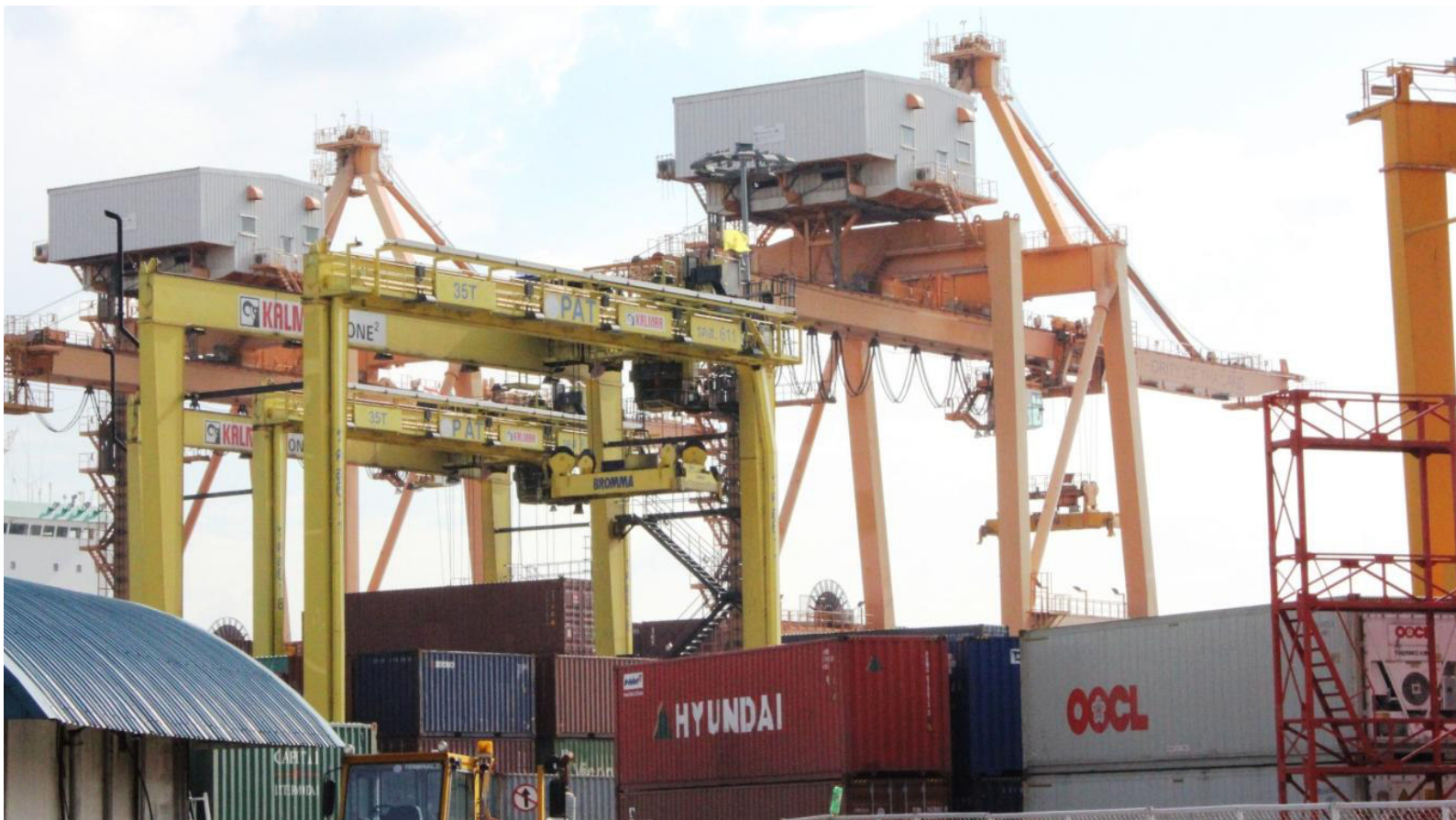
In particular, the SCSI Programme aims to support the intensification of cross-border economic relations between the PR China and its neighbouring countries– that is Cambodia, the Lao PDR and Viet Nam in the framework of the Pan-Beibu Gulf (PBG) Economic Cooperation, and Mongolia in the framework of the Greater Tumen Initiative (GTI) – in order to ensure these countries’ equal inclusion into the respective integration processes and thereby facilitate their future development.

## Focus Areas

- Addressing functional aspects of regional cooperation and integration in the region through human capacity development.
- Contributing to the implementation of concrete projects in the fields of trade facilitation, maritime economy, and local cross-border cooperation.
- Promoting peer-to-peer learning and exchange of good practices among regional initiatives, leading to pilot replication of lessons learnt.

Fact Box SCSI	
<b>Project Name</b>	Support for Economic Cooperation in Sub-Regional Initiatives in Asia
<b>Commissioned by</b>	German Federal Ministry for Economic Cooperation and Development (BMZ)
<b>Key Subjects</b>	Trade Facilitation, Port Cooperation, Cross-Border Economic Zones, Public Private Partnerships
<b>Duration</b>	2015 – 2019



**Registered offices**

Bonn and Eschborn, Germany  
T +49 228 44 60-0 (Bonn)  
T +49 61 96 79-0 (Eschborn)

Dag-Hammarskjöld-Weg 1-5  
65760 Eschborn, Germany  
T +49 61 96 79-0  
F +49 61 96 79-11 15

E [info@giz.de](mailto:info@giz.de)  
I [www.giz.de](http://www.giz.de)

**Support for Economic Cooperation in  
Sub-Regional Initiatives in Asia**

TaYuan Diplomatic Office  
14 Liangmahe South Street, Chaoyang District  
100600 Beijing, PR China

E [scsi-asia@giz.de](mailto:scsi-asia@giz.de)