Study of Climate Change Adaptation Measures Considering Port Use

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1. Introduction

Future climate change is expected to increase mean sea level and tidal anomalies at high tides, increasing the risk of inundation at port terminals. As a countermeasure, it is assumed that part or the entire terminal will be raised, and that tidal walls will be installed, but these measures will affect port use such as cargo handling. Our laboratory has started studying climate change adaptation measures to reduce the impact on port use.

2. Collecting and organizing examples of overseas initiatives

In the German port of Hamburg, a tidal wall is installed at the water edge of a container terminal (**photo**). This is a response based on the history that the entire terminal died in the past and future climate change. The Port of Los Angeles in the United States is studying the entire port assuming the year 2100. Through inundation risk assessments and workshops held by relevant parties, the port is divided into several regions to examine possible countermeasures. There are not many other examples, but mainly ports that suffered from storm surge damage in the past are considering and implementing countermeasures.

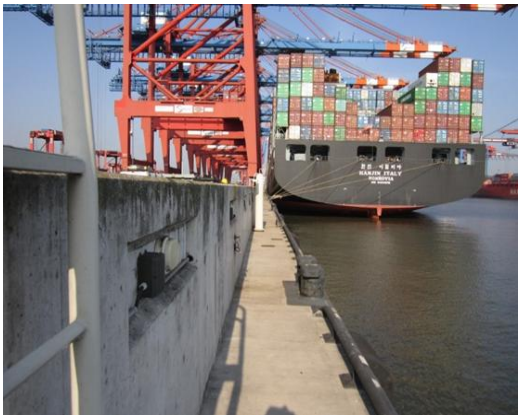

Photo:Example of installing a seawall at Hamburg Port

3. Hearing survey with port users

A hearing survey has been conducted with domestic port users on the effects of installing seawalls and raising them. For example, it was pointed out by operators who hold ropes when ships dock that installing seawalls near the water would hinder their work and make it difficult to evacuate when mooring lines break. On the other hand, it has been pointed out that setting seawalls on the inland side would reduce the space available to cargo handling operators and impede vehicle traffic.

Another issue is ensuring consistency with port use when implementing countermeasure construction. For example, when raising the entire rear yard at a certain height, how to achieve consistency with daily cargo handling operations is a problem. There is a case where the container yard was divided into several sections and raised one section each year without significantly reducing the amount of cargo handled at the terminal. However, in this case, it is necessary to carry out construction

work with sufficient coordination with users and take time.

4. Conclusion

The implementation of climate change measures is likely to have an impact on port use, but measures to minimize this impact will be necessary in the future. In this case, it is important to take measures in cooperation with relevant parties, targeting a certain unified area. New technologies, such as movable seawalls and automatic berthing systems, are also expected to reduce the impact on users.

☞ For more details, please refer to the following.

1) National Institute for Land and Infrastructure Management Material No. 1264
http://www.nilim.go.jp/lab/bcg/siryou/tnn/tnn1264.htm