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Green Growth Demystified: Investing in Vietnam's Inland and Coastal Waterways

This note summarizes the findings of Blancas and El-Hifnawi (2013), a World Bank report on inland waterway transport and coastal shipping in Vietnam.

Key messages

1. Vietnam's inland waterway transport and coastal shipping sector faces significant under-investment in terms of both capital and maintenance expenditures.
2. The case for investment in waterborne transport goes well beyond the need to match demand and supply, as the sector offers significant economies of ship size.
3. Larger barges not only result in lower unit transport costs but also lower emissions of local pollutants and greenhouse gases per ton-kilometer—a major benefit to Vietnam, given the country's disproportionate exposure to the risks caused by climate change.
4. Most of the expected benefits of investments in inland waterway transport will be intrasectoral rather than driven by modal shift away from the roads sector.

Key actions

1. Corridor 1 of the Mekong River Delta network, linking Vinh Long with Ho Chi Minh City—and including the Cho Gao Canal, the network's most pressing bottleneck at present— offers the highest economic returns to capacity expansion investments and should be seen as a development priority by the Government of Vietnam.
2. Besides Corridor 1 of the Mekong River Delta, investments in Corridor 1 of the Red River Delta, from Quang Ninh to Viet Tri, appear to be economically viable as well, albeit yielding slightly lower returns.
3. There is a strong economic case for establishing a Waterway Maintenance Fund to better pay for maintenance of the core sections of the national inland waterway network; this fund could be initially financed by vessel registration fees.
4. In the coastal shipping market, investments in a dedicated coastal shipping terminal at Haiphong port in Northern Vietnam appear to be economically attractive and should be further explored by the Ministry of Transport.

Vietnam's Twin Challenges

Over the past 25 years, Vietnam's record of economic growth and poverty reduction has been both breathtaking and unique among the least developed countries of the late 1980s. In recent years, however, two major challenges have emerged. First, slower global growth, more intense competition for foreign direct investment, and smaller gains in domestic productivity have made it more challenging for Vietnam to maintain

its earlier pace of economic growth. Second, more frequent occurrences of severe weather events and Vietnam's structural exposure to long-term climate change risks have in effect turned protecting the environment into a national priority.

Tackling these twin challenges—of boosting growth and reducing emissions that cause climate change—matters because, although Vietnam's poverty rates have dropped from approximately 60 percent in the early 1990s to below 10 percent today, large segments of the population could fall back into poverty at lower levels of growth and employment generation than previously attained. And the near-poor are the most vulnerable to cyclical economic downturns and the negative effects of climate-related risks, such as more frequent flood-causing storms (in the short term) and sea level rise (in the long term). Furthermore, major sectors of the Vietnamese economy, such as rice and coffee cultivation and aquaculture, are weather-driven.

Can Vietnam Grow and Protect the Environment at the Same Time?

Transportation is both a critical facilitator of growth, through productivity improvements, and a primary contributor of carbon emissions, through the use of fossil fuels. Yet, investments in more environmentally- and economically-efficient modes of transport can shatter the oft-held belief that developing countries face a tradeoff between curbing emissions and promoting growth.

In the particular case of Vietnam, a country blessed with a vast network of rivers and canals, two large river deltas, and more than 3,000 kilometers of coast line, investments in inland waterways can become a strategic pathway toward a lower-carbon freight transport system that can also strengthen long-term prosperity. Waterborne transport—defined as inland waterway transportation and coastal shipping—emits less greenhouse gases, uses less fuel, and causes fewer accidents and deaths per ton-kilometer than either trains or trucks. On average, barges can be four times more fuel-efficient than truck transport.

Inland Waterway Transport (IWT) is also fundamental to the everyday functioning of the Vietnamese economy. It captures a significant share of the freight market for both domestic and international itineraries, and provides the backbone for the movement of such growth-critical bulk commodities as construction materials, coal, fertilizer, and rice. Among all freight modes, IWT is estimated to capture approximately 48 percent of national tonnage, slightly higher than road sector's share of 45 percent.

Investments to promote the use of IWT and coastal shipping enable the use of largervessels. This generates economies of scale in both unit-level transport costs and emissions. Modal efficiency and competitiveness can be further enhanced through better linkages between waterways and other modes, such as drayage trucks for short-distance haulage, and through the adequate provision of ancillary logistics services such as warehousing. Improvements to the waterways, and the increased economic and trade activity that this can facilitate, can stimulate growth, create jobs, and reduce poverty.

Towards a More Balanced Freight Transport Sector

Inland waterways are a long-neglected link in Vietnam's multimodal transport network. Under-investment in IWT and coastal shipping reduces competitiveness, as it increases landed costs in supply chains and locks in sources of supply chain unpredictability. In a world where development has often been associated with road construction and increased use of motor vehicles, policymaking and investments in waterborne transport tend to be given secondary priority. Not surprisingly, the lion's share of public spending in transportation in Vietnam has been devoted to the roads sector. Some 80 percent of transport investments go to expanding and preserving the road network.

The presence of structural disadvantages in the IWT sector has led to suboptimal policy making in waterway capacity expansion and maintenance. Yet over the past 10 years Vietnam's IWT carriers, aware of economies of ship size, have implemented a remarkable market-driven fleet scaling-up process. Such market responsiveness bodes well for the economic and environmental impact of public investments in the expansion and modernization of the waterway network. Nevertheless, the average vessel carrying capacity of Vietnam's river-going cargo vessel fleet, of about 100 deadweight tons (DWT), remains low by international standards and far from the 1,000-DWT threshold, by which the majority of economies of ship size are captured.

Beyond vessel sizes alone, Vietnam faces a number of waterway sector management challenges. As more industries locate next to riverbanks, improvised berths of simple design and low cost have also proliferated. While convenient to their owners, such informal landings tend to hamper navigation and safety, thus increasing the costs of shipping. Aside from its incomplete network coverage, maintenance dredging is typically conducted in piecemeal fashion, whereas longer-term arrangements—such as those under performance-based contracts—could lower the cost and improve the efficiency and effectiveness of waterway maintenance. To date, no public or public-private efforts have been channeled towards modernizing the existing fleet of vessels and their engines, an avenue of policymaking that has shown positive impacts in Western Europe.

These challenges suggest that Vietnam's waterborne transport sector justifies larger funding envelopes and more targeted, bespoke policymaking, particularly relative to those of the roads sector.

Economically Sound Infrastructure Investments in Waterborne Transport

Ho Chi Minh City (HCMC) is the main transport node of Southern Vietnam and the country's primary international gateway. HCMC both attracts and produces a large array of diversified commodities and is directly connected to the complex inland waterway network of the Mekong River Delta. Within this network, Corridor 1—from Vinh Long, at the heart of the Delta region, to HCMC—is Vietnam's busiest and most congested inland waterway corridor. In particular, it comprises the 29-kilometer Cho Gao Canal, the most pressing time and cost-bottleneck anywhere in Vietnam's inland waterway network. Capacity expansion investments, such as capital dredging, waterway widening, bank protection works, and river training, can contribute to reducing congestion and increasing transport efficiency at this strategic corridor.

Out of all inland waterway corridors across Vietnam's two river delta networks, the upgrading of Corridor 1 of the Mekong Delta is expected to yield the most attractive economic returns to capacity expansion investments—estimated at 16 percent, inclusive of the value of reduced environmental externalities. Upgrading this corridor should be seen as a development priority.

Outside of the Mekong Delta, economically justified investments in capacity expansion are found at Corridor 1 of the Red River Delta in Northern Vietnam—linking Quang Ninh with Viet Tri—albeit yielding slightly lower economic returns compared to its Mekong Delta counterpart. In the coastal shipping market, it is estimated that upgrading a container terminal at Hai Phong Port to cater to domestic coastal shipments can achieve attractive economic returns—of approximately 13 percent—and drive modal shift away from the roads.

Regulatory Enhancements in Waterborne Transport

Regulatory improvements are often effective complementary interventions to investments in physical infrastructure. In the face of the deeply underfunded maintenance of Vietnam's waterways, the introduction of a Waterway Maintenance Fund can yield economically efficient outcomes by better preserving the cargo carrying capacity of the major inland waterway corridors. Such fund could initially be financed by vessel registration fees, and eventually migrate to more targeted (although more operationally complex) fuel levies and/or traffic tolls.

Another example of regulatory innovation in waterborne transport is the testing, on a pilot basis, of an engine modernization program. This can partially fund, alongside matching contributions by IWT carriers, the purchase of new engines for a portion of the largest operational vessels in the national fleet. New engines can provide significantly better emissions performance compared with current equipment, as confirmed by experience with similar public-private engine renewal schemes in Western Europe.

Limited Potential for Modal Shift in Vietnam's Freight Transport Market

Nearly all benefits of investing in inland waterways will originate from intrasectoral efficiency improvements rather than from modal shift away from the roads. There are two reasons for this. First, the inland waterway networks in Vietnam mainly run East-West. Given Vietnam's geographic characteristics, this limits the length of waterway sections—and by extension reduces IWT lengths of haul (the average IWT length of haul is

only 112 km). Since trucks are inherently more efficient than vessels at short lengths of haul, there is a limited amount of road freight volumes and commodity types for which a shift to the waterways is economical. Second, bulk commodities, the mainstay of waterborne transport, are already almost entirely captured by the IWT sector, leaving limited room for further gains away from trucks.

Although limited, some shift is expected to be obtained. This is particularly true for improvements in coastal shipping, where lengths of haul are much longer compared to inland waterway shipments. Experience from Western Europe suggests that inland waterways, when efficiently connected to ports and roads, can carry higher value, time-sensitive goods on a more consistent basis. Given the length-of-haul limitation of Vietnam's waterways, the importance of providing better multimodal linkages becomes all the more critical if IWT is to capture larger shares of containerized freight going forward.

A Path Less Travelled

Water borne transport offers a viable solution to Vietnam's twin development challenges. As Vietnam's multimodal transport network remains undeveloped along the physical, regulatory, and institutional dimensions, improvements to waterway connectivity and capacity can generate substantial benefits to shippers, carriers, and the poor. Though incremental in scope, such interventions can trigger transformational changes in the IWT sector, such as the continued support of the vessel scale-up process but realizing the potential of Vietnam's inland waterways as a driver of greener growth will require, inter alia, a re-balancing of the mix of public investment in transport towards the waterborne sector.

Reference

Blancas, Luis C. and M. Baher El-Hifnawi. 2013. *Facilitating Trade through Competitive, Low Carbon Transport: The Case for Vietnam's Inland and Coastal Waterways. Washington, DC: World Bank.*

For Further Discussion

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