Developing Prompt List for Landlocked Developing Countries' Access to Seaport in Transit Countries

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Abstract: This study attempts to identify and extract risk factors faced by Landlocked Developing Countries (LLDCs) in accessing to seaport in Transit Countries (TCs) for cargo haulage. It is widely said that counties enclosed by land without direct access to seaport are facing several challenges in high transport cost which makes economic growth of LLDCs decline. Since TCs are out of LLDCs' jurisdiction, LLDCs has no right on decision making for infrastructure planning in TCs and therefore will face several risks. Unfortunately, risks arise on the haulage is commonly recognized as quite tough task to be identified properly. In this study, we attempts to develop a prompt list which is one of the useful risk identification tools for freight transport of LLDCs for their logistics activities on the route between LLDCs and seaport in TCs.

Key Words: *landlocked developing countries, intermodal transport, risk extraction, prompt list*

1. INTRODUCTION

Landlocked countries are commonly defined as countries enclosed by only land without sea. Due to no direct access to seaport in their own territory, they are compelled to access to seaports in other countries for their international logistics activities. Land transport such as truck and rail are normally operated for access to seaport. There are 43 landlocked countries in the world (UNCTAD, 2006). Some countries like Switzerland has waterway for direct access to sea passing through the Rhine River which is practically operating container vessels from the city of Basel connecting with the North Sea. In the most cases of that landlocked developing countries (LLDCs) engage in an international logistics activities using sea transport, they are forced to depend upon seaport in other countries' territory. In this case, they will face several risks occurred in TCs. It is not controllable such risks for LLDCs due to the limitation of their authority to make decision on the transport infrastructure planning in TCs.

These risks normally arise in each transport infrastructure. For example, dead stock of cargo due to the lack of sufficient space of Container Yard (CY) in TCs can sometimes be alleviated by expansion of the CY. However, it is quite difficult to expand it by LLDCs initiative or intension. Issues caused by above are discussed among LLDCs and international organization like UNESCAP (2006) however, it has been only pointed out its existence so far. In short, there is little specific discussion and countermeasure, and even clear definition for what the risk factors are and/or who suffers from them is less discussed.

Economic growth would be declined by 0.5% (Sachs, 2004) and total amount money paid to TCs reaches up to 14% of all export earnings (Collier, 2007) in case countries are enclosed by

land. As mentioned before, direct operation of sea transport, which gives us high economies of scale due to its high capacity and low fare, is unfortunately not available for LLDCs. In Bolivia, one of the LLDCs in Latin America, export commodities are dependent on mainly high value-added goods per unit weight, such as silver, gold, rubber, tin, hydrocarbon, coca, etc. Otherwise, Bolivia cannot payback its high transport cost.

From above backgrounds, international aid and countermeasure from the perspective of logistics field for further economic growth of LLDCs are highly required. There are at least two physical routes to access to seaport for any LLDCs. Daganzo (1998) developed mode choice model for intermodal freight transport. This model seems to be somewhat straightforward due to the reason that variables in the model contain only transport cost and time. After that, the model incorporating change in cost on transshipment and other charges into the Daganzo's model was developed (Limao and Venables, 2001; Banomyoung, 2000; Raballand *et al.*, 2005). However, no mode and route choice model which takes into account risk factors faced by LLDCs has been developed yet. Risk factors are quite significant decisive factors on mode/route choice. In order to choose desirable route on access to seaport in TCs (and vice versa), risk factors should be extracted precisely as a first step of developing new mode/route choice model.

It is pointed out that transport cost is almost uncorrelated with distances for access to seaport. The dominant factor affecting transport cost is infrastructure condition in TCs (Collier, 2007). In this study, we consider several sources of risk arisen in mainly infrastructure. The objective is to extract risk factors on the route between LLDCs and seaport of TCs. In addition, proper risk extraction annoys most of LLDCs due to its difficulty. Therefore in this study, we also aim to make a prompt list which can be a useful tool for supporting risk extraction for LLDCs.

2. DEFINITION OF RISK

Since large numbers of risk definition which of them are mostly ambiguously expressed, it becomes a cause of confusion for understanding of risk (Yamamoto *et al.*, 2004). Hence, this study starts with stating the definition of risk.

There is no consensus for definition of risk, however, according to Kikkawa (1999), the most basic and widely used risk definition is "product of probability of occurrence of danger and its severity" advocated by National Research Council (NRC, 1989). Recently, Vose (2003) explains risk as "potential phenomena affecting negative impact that probability of occurrence is less than 50%". In addition, both variability and uncertainty were separately defined. The reason that separates variability and uncertainty is for the purpose of pursuing more algebraically accurate risk assessment.

Vose's understanding towards risk is an event itself which affects negative impact, on the other hand, NRC have been interpreted risk as a product of the probability of risk occurrence and the severity of the damage caused by the potential event. Since Vose has been proposed to quantify the risk by a product of the probability of occurrence and severity of damage in a risk analysis, the final result of quantitative risk analysis would be same based on the extraction of risk factors even though the slight difference can be seen in terms of expression. Therefore in this study, we follow the definition of risk by NRC and attempt to extract risk factors (the event bringing about negative impact) which would contribute to the risk analysis and occurred

between LLDCs and seaport in TCs.

3. PROMPT LIST

3.1 Advantage of Prompt List

Risk extraction is the first step for risk analysis and most fruitful and constructive step. However, precise extraction of the risk factors is one of the most difficult parts of entire risk analysis (Vose, 2003). To conduct an accurate risk analysis, proper risk extraction must be done. In that sense, we identify prominent risk factors presenting in all sources of risk associated with haulage between LLDCs and the seaport in TCs. There is no established methodology for risk extraction process which reaches consensus on. However, methods like "Brainstorming Method" which is stating numerous opinions by individuals and "Delphi Technique" which is predicting by several independent experts are practically used. After conducting these processes, enumerated opinions will converge gradually (Vose, 2003). These methods are used in several fields. In addition, classical "Interview Survey" and "Literature Survey" are used in general.

"Prompt List" is a list which is classified by various categories, for example, by each project, risk type, risk sources, etc. It is primarily used in the area of business as a powerful tool for risk extraction on each individual project (Vose, 2003). Risk type can be divided by several aspects such as legal system, profitability, and technology type of the project and task types such as design, construction and inspection. In addition, systematic task management which is called as Work Breakdown Structure (WBS) that clearly specifies all the major tasks of project can be utilized as prompt list itself in several cases and fields (Pereta and Renasinghe, 2006). WBS is commonly recognized as a major tool among project managers because it encourages them grasping all the work to be done in order to accomplish project activities. The Project Management Institute (2008) defines a WBS as "A deliverable-oriented grouping of project elements that organizes and defines the total work scope and defines the total work scope of the project". However, most of them are just simple lists of potential sources of risk. A better solution to the structuring problem for risk management would be to adopt the full hierarchical approach (Hillson, 2002) which can be incorporated into prompt list.

Generally, the structure of logistics is quite complex. There are plenty of risk sources and players surrounding the business related to logistics. Prompt list allows us to extract risk factors by concentrating on each risk source, which is commonly recognized as advantage of prompt list. In addition, prompt list is useful tool in the case of which other agency attempt to extract risk factors in the other project. In this study, we expect the developed prompt list to be utilized by LLDCs in practice.

Considering all above factors, it is verified that prompt list can work as a useful tool for risk extraction for not only one player but also other related players who have same objective.

3.2 Methodology

Based on the above section 3.1, this study focuses on each source of risk arises (mainly infrastructure on the route) based on identifying sufferers from the risks. After that, prompt list will be developed. The procedure for developing prompt list based on the study of Pereta (2006) is as follows:

1. To identify sufferers from the risks
2. To identify study range
3. To enumerate risk factors by literature survey
4. To Interview with experts to extract prominent risks
5. To put severity on each extracted risk

To begin with the risk identification, players who are suffered from risks on the route between LLDCs and seaport in TCs should be determined as the first step of developing prompt list. If this procedure were neglected, it will be extremely difficult to extract the appropriate risk factors. Hence, it needs to be carried out as accurate as possible. As a second step, the range of sources of risk factor should be identified based on each sufferer that has been exposed to potential risks. It needs to be enumerated as many risk factors as possible by literature-based survey. Several risk factors which failed to be extracted by literature survey will be added to the list and verified the legitimacy of being in the list by interview survey with experts. Finally, it is needed to put a severity onto each risk factor by face-to-face interview survey with experts again. Severity is an impact of risk occurrence for its sufferers. Putting a severity is important since if there are a lot of risk factors, it is possible to take countermeasures to cope with the risk factor from which has high severity. Moreover, in case LLDCs attempts to identify risk factors, it is possible to get to know which risk factors should be treated first (In general, factors with high severity is the first (Pereta and Ranasinghe, 2006)). As for criteria of severity, we follow the criteria set by Pereta and Ranasinghe (2006) which classified into three levels as shown in Table 1.

Table 1 Risk categories according to the severity

Severity Level	Key to Severity
High [H]	**Significant** stakeholder concern. Significant impact on the organization's strategy or operational activities or finances.
Medium [M]	**Moderate** stakeholder concern. Moderate impact on the organization's strategy or operational activities or finances according to the stakeholder understandings.
Low [L]	**Low** stakeholder concern. Financial impact on the organization likely to be less and low impact on the organizations' strategy or operational activities.

In identifying risk factors, it is preferable to conduct interview survey and/or possibly questionnaire survey with each sufferer. In addition, in order to improve the validity of prompt list, factors which have high factor loading should be selected by factor analysis. Although it is highly preferable to conduct such statistical analysis from multi-diversified and objective view point, this study identifies the risk factors by methodology mentioned above due to the limitation of the study.

4. CASE STUDY

4.1 Hypothetical Route

Hypothetical route is set up as study range from rail or truck terminal in LLDCs till seaport in TCs as shown in Figure 1. This study considers both cases of import and export for container cargo haulage. In this hypothetical route, there are five potential risk occurrence points such as rail terminal or public truck terminal in LLDCs, haulage in both TCs and LLDCs, CY in the border and seaport in TCs. Among the landlocked countries in the world, there are exceptional

countries such as doubly-landlocked countries which are forced to pass through at least two countries to arrive at seaport like Uzbekistan and landlocked countries which possess relatively easy access up to seaport due to the availability of inland waterway by utilizing large-scale river from their own countries like Switzerland through Rhine River. However, most of landlocked countries' cases are utilizing intermodal transport mainly rail and truck. In the access to seaport in TCs from LLDCs, hypothetical route below is likely to be fit. Therefore, this study attempts to develop a prompt list for LLDCs under this hypothetical route.

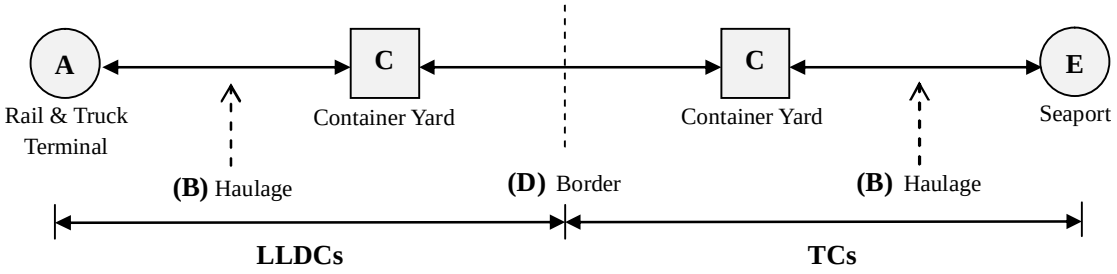

Figure 1 Hypothetical route

4.2 Identifying Sufferers of Risks

a) People in LLDCs:

In case import goods, which are not able to be produced by LLDCs, are come to a standstill or dropped its availability sharply due to some reason, LLDCs people cannot acquire its import goods. It might bring about adverse impact on their economic activities as well as their living. Therefore, people in LLDCs can be one of the sufferers.

b) Stakeholders Related to Logistics:

Logistics players such as shipper, freight forwarder and transport operator are also candidates of risk sufferers. For instance in access to seaport from LLDCs for export, supposed that delay due to traffic congestion occurred in TCs, this would bring about loss for shippers who is the owner of goods due to the existence of freight Value of Time (VOT). Normally the concept of freight VOT can be applicable for "time loss" as opposed to travel-time savings in freight transport (de Jong, 2008).

c) Environment:

In the case of hazardous material (hazmat) transport, environment is also one of the potential sufferers in this hypothetical route. According to Nagae and Akamatsu (2007), large-scaled and long-distance haulage of hazmat are daily operated since location of manufacturing and consumption of hazmat is normally not same. Hazmat here means to explosive substances, liquefied gases, flammable liquids and solids, oxidizing materials, poison drugs, radioactive materials, corrosive liquids, etc. In hazmat transport for these goods, once traffic accident occurred, it would adversely affect not only people's daily living but also environment. However, environmental factor needs not be considered in case transporting normal goods other than hazmat material.

4.3 Identifying Study Range

As mentioned before, we consider risk lurks within the range between A (LLDCs) and E (seaport in TCs) of hypothetical route as shown in Figure 1. The main issue on freight transport of LLDCs is the access to the seaport. In this sense, risk factors which would arise in other countries are considered as out of this study even though LLDCs incurred damage from

delay in countries other than LLDCs and TCs. A seller bears responsibility for any risks and costs up to loading cargo onto the vessel in the seaport, and then, buyer has responsibility for post-haulage, which is called Free on Board (FOB), one of the International Commerce Terms (Incoterms). Considering all above factors, study range in this study can be determined as between LLDCs and seaport in TCs. Potential risk sources in the hypothetical study route are followings;

(A) Rail terminal, (Public) Truck terminal (LLDCs)
(B) Haulage (LLDCs and TCs)
(C) Container Yard and/or Warehouse (LLDCs and TCs)
(D) Border
(E) Seaport (TCs)

4.4 Extracting Risk Factors

As for enumerating risk factors, we utilize secondary sources such as literature, internet, report, etc and exclude catastrophic risks such as earthquake, Tsunami, strike, lockout, wars, terrorism, flu, exchange rate, etc. MIT research group insists drastic decline of demand and supply as risk factors (Pochard, 2003), however, this study pursues to identify risks essentially caused from cargo haulage. Hence, we keep them out of this study. Based on all of above necessary procedures, prompt list for LLDCs' access to seaport has been developed. Interview survey was conducted with UNESCAP officer who is currently charge of and familiar with freight intermodal transport especially land transport in Asia. The developed prompt list includes prominent risk factors. In the cargo haulage in this study range, there might be other risk factors damaging each sufferer, however, we leave only remarkable risk factors for LLDCs in the prompt list. The reason is that too many factors in prompt list would be a cause of confusion for users of prompt list. In that sense, the factors affecting small impact were excluded from the prompt list. The prompt list developed by literature and interview survey is summarized in Table 2.

5. SUMMARY AND CONCLUSION

In this study, prompt list for identifying risk factors in freight transport between LLDCs and seaport in TCs has been made. In case practitioners and/or researchers attempt to identify their risk factors, they can now follow this prompt list. From developed prompt list showing in Table 2, it is obvious that environment would be suffered only in the accident with hazmat transport. Hence, in the case of practitioner and/or researcher identifies risk factors they are facing in the cargo haulage other than hazmat, they can exclude this item.

It is undeniable fact that developed prompt list does obviously not have sufficient objectivity and validity. Therefore, further research activities for improving validity is highly required. In order to improve it, interview and questionnaire survey with each sufferer are considered as effective way to improve it.

Table 2 Prompt list for prominent risk factors

Risk Sources	Prominent Risk factors	Consequence of Risk Occurred	Sufferer[i)]	Severity[ii)]
(A) Rail and Truck Terminal (LLDCs)	- Lack of space of handling facility for storage and accumulation (loading facilities)	Delay, Damage	b	M
	- Vibration (handling, etc.)	Damage	b	H
	- Pilferage	Disruption	a, b	H
	- Damage by worm, rat, etc	Damage	b	H
	- Lack of freight car (container) and space	Delay	b	M
(B) Haulage (LLDCs and TCs)	- Traffic congestion	Delay	b	M
	- Traffic accident with hazmat (clash, turning over)	Delay,	a, b, c	H
	- Vibration (degradation of rail and road)	Disruption	b	H
	- Pilferage	Damage	a, b	H
	- Leakage of rain and snow	Disruption	b	M
	- Suspension of service due to decrepit in railway	Damage Delay, Disruption	a, b	H
(C) Container Yard (LLDCs and TCs)	- Degradation of marshaling yard and insufficient function	Delay, Damage	b	M
	- Increase in waiting by lack of sufficient space	Delay	b	M
	- Pilferage	Disruption	a, b	H
	- Undelivered and dead stock by change in quarantine system	Delay	b	M
(D) Border	- Delay by difference of language (i.e. cargo checklist)	Delay	b	M
		Delay	b	M
	- Waiting time by difference in opening timing of gate	Delay	b	L
	- Strict immigration standard for drivers	Disruption	a, b	H
	- Refusal of cargo by change in quarantine	Delay	b	M
	- Transshipment due to difference in gauge size			
(E) Seaport (TCs)	- Disabled, degraded and insufficient each facility (gantry crane, straddle carrier, transfer crane, etc.)	Delay, Damage	b	H
	- Waiting time due to lack of space	Delay	b	M
	- Delay of berth of vessels due to lack of tugboat	Delay	b	M
	- Lack of fuel for vessels	Delay	b	M

i) Sufferer: a (People in LLDCs), b (Stakeholder and enterprises of logistics), c (Environment)
ii) Severity: H (High), M (Moderate), L (Low)

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