

## Third and fourth-party logistics providers groups formation focused on humanitarian logistics in the face of coastal flooding

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**Abstract.** During recent years coastal flooding in Mexico has increased, due to this situation, it is necessary to have alternative ways to serve the affected population. Government (G), non-governmental organizations (NGOs), civil society organizations (CSOs) and private enterprises (PEs) are the main players involved in humanitarian aid. This aid in Mexico comes through national and international instances. Here the actors meet the needs of the people affected individually and not collectively. Pointing out that sometimes the same population (P) provides help to themselves. This research intends in a qualitative way to help the Mexican government to incorporate the integration of third and fourth-party logistics as actors for humanitarian aid; by proposing the formation of providers' groups focused on humanitarian aid with the aforementioned actors. This would help the population more efficiently by applying horizontal and vertical coordination, to reduce the response time when the affected population is in danger.

**Keywords:** Third Party-Logistics, Fourth-Party Logistics, Coastal Flooding, Humanitarian Organizations.

### 1. Introduction

The Mexican Secretariat of the Interior (SEGOB) is responsible for issuing emergency and disaster declarations in case a hurricane affects Mexican coasts. Once this alert is issued, coordination of activities is carried out by the National Civil Protection System (SINAPROC), "*which is an organic and articulated set of structures, functional relationships, methods and procedures that establish dependencies and entities of the public sector among themselves, with the organizations of the various voluntary, social, and private groups as well as with the authorities of the states ...*" (SINAPROC, 2014). Once the declaration of emergency is issued, humanitarian organizations start their operations with or without international aid. On the Government side, its most immediate action is provided by the Secretariat of the Navy (SEMAR – Plan Marina) and the Secretariat of National Defense (SEDENA - Plan DN III-E) and later on through SINAPROC. In the case of CSOs, collaboration with NGOs and the Government is observed, although in isolation. For example, the preparation of pantries in some cases is carried out by the Mexican Red Cross supported by volunteers. Other evidence is the Committee for Disasters Relief and National Emergencies (CADENA), which is the only CSO to collaborate occasionally with SEDENA by supporting the process of water purification. Catholic Relief Services (CRS) is an NGO that provides economic resources to CARITAS México (CSO) and that in turn can support the Mexican Red Cross in kind or economically during an emergency. Finally the PEs have collaborated mostly on their own initiative as in the case of Interjet, Volaris and Aeromexico, which focus on evacuating its passengers in an emergency. In the case of Eurocopter (PE), it conducts reconnaissance flights at the request of the Government through World Vision International (NGO).

The description made is shown in figure 1, where it can be observed the SINAPROC structure assessment by the Mexican government (area indicated by the red rectangle) and the NGOs, CSOs and PEs, which are not considered within SINAPROC. Here the latest act as satellites not really recognized at the strategic planning for which Mexico can be classified according to Dube, N., et al. (2016) as a selectively accommodating government that affects the lead-times for humanitarian aid. This research intends in a qualitative way to help the Mexican government to incorporate the integration of 3PL and 4PL as actors for humanitarian aid; by proposing the formation of these groups with providers focused on humanitarian aid. This would help the population more efficiently by applying horizontal and vertical coordination, to reduce the response time when the affected population is in danger. In figure 1 outside of the rectangle can be seen that there is vertical coordination between: NGOs and CSOs. These organizations collaborate sporadically with the Government in a selectively accommodating way with its agencies. Likewise there is vertical collaboration between the Government and some PEs. However, there is no evidence of horizontal and

vertical collaboration and coordination with a comprehensive application among all of the actors. It is here that the theory derived from commercial logistics dealing with 3PL and 4PL is appropriate to achieve such integration.

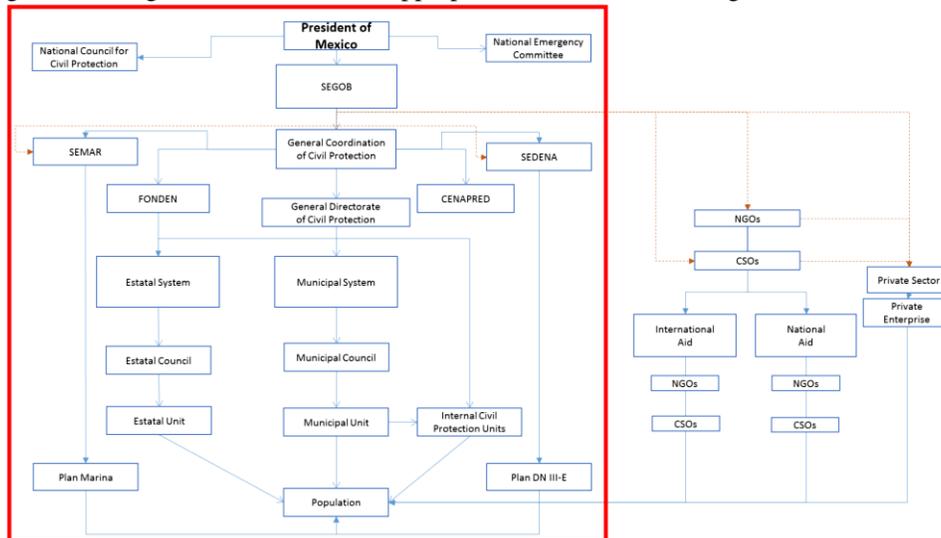


Figure 1. Organic structure of SINAPROC and the extended version including SEMAR, SEDENA, and NGOs, CSOs and PEs. Modified from (OCDE, 2013).

## 2. Literature Review

This section shows the partner proliferation, the factors hampering the coordination of humanitarian aid, the lack of coordination among members of the humanitarian supply chain and the coordination among humanitarian organizations. Likewise, it shows that this depends on information, communication, logistics, organizational learning, health care systems, evaluation and education (Haselkorn and Walton, 2009).

The number of natural disasters and people affected by them has increased in the last decade. When a disaster occurs somewhere and there are several humanitarian actors with a wide range of capacities in the affected area, there is the problem of proliferation of actors. This proliferation can have several effects in disaster operations, such as unmanaged independent efforts leading to duplication and confusion of efforts (Hasani et al., 2016, UN-OCHA, 2014). Similarly, for the proliferation of actors (Inomata, 2006) is considered as an over-supply of uncoordinated and inexperienced humanitarian aid of partners. In fact, when actors enter the area affected by the disaster, a chaotic pattern is observed (Confort, 2007). As can be observed above, lacking long-term planning during the disaster response phase, limits the contribution of actors in humanitarian supply chain, this in terms of collaboration is an adequate structure for the response stage in the short-term. Here, for example, in practice it has been seen that partnerships between G and NGOs are sporadic, and would be strengthened with long-term partnerships, seen as a commitment to support society in the stages of mitigation, preparation and recovery.

There are several factors that hamper aid coordination, such as the chaotic environment, the large number and variety of actors involved in aid operations, and the lack of resources. These factors create a scenario where humanitarian organizations do not make the effort to collaborate, since they find it difficult (Fenton, 2003). In addition other studies are needed (Balcik et al., 2010) to address more broadly and systematically the coordination of the humanitarian supply chain. For Simatupang et al., (2002) the lack of coordination among members of the commercial supply chain has shown that it increases inventory costs, lengthens delivery times, and jeopardizes customer service. Similarly, in the case of the humanitarian supply chain, this translates into inadequate deliveries and quantities of the requirements of the affected population. Humanitarian aid organizations rely on donations for their activities and even compete for resources provided by United Nations agencies (Stephenson Jr, 2005).

Coordination among humanitarian actors also depends on information, communication, logistics, organizational learning, health care systems, evaluation and education (Haselkorn and Walton, 2009). This coordination (Balcik et al., 2010) has to be seen both vertically, for example, an NGO to coordinate with Government, as well as horizontally, for example, an NGO coordinating with another to provide the aid assets. In fact, one of the most important activities to meet the demand for help during support operations is inventory and logistics. Prior to the disaster, the pre-positioning inventory is prepared in each shelter to meet the post-disaster

support demand. However, the amount of inventory is just enough to satisfy short-term demand after a disaster (Mulyono and Ishida, 2014); which for the case of Mexico is only 4 days (FONDEN, 2008).

Employment of 3PL and 4PL providers for humanitarian logistics has not been treated in Mexico and all the research found related to these is applied to commercial logistics as indicated in 2.1 and 2.2. Evidence of the use of 4PL logistics services is only found for humanitarian supply chains as indicated by Abidi H. et. al. (2015), Jensen, L-M. (2012) and for 3PL and 4PL in Vega D. and Roussat C. (2015). This last work points out the lack of academic research about these topics. On the other hand the main difference of these works with ours is that they considered 3PL and 4PL in a not joint integrated way, applied to humanitarian logistics, and certainly not in Mexico. In this work we consider the main focus as the integration of the 3PL (operative provider) and 4PL (planning design provider) as well as for transport of goods and its distribution.

### **2.1. Third Party Logistics Providers (3PL) focused on humanitarian aid**

3PL activities, which are important in humanitarian logistics are those involving transport, storage, inventory and distribution (Bagchi and Virum, 1998); as well as information related to the flow of different external organizations. Activities carried out by third parties (G, NGOs, CSOs and PEs) can cover the whole process of humanitarian logistics or selected activities within it. Here collaboration is understood as a commitment between actors, which envisions a logistic alliance, and will serve to take advantage of the full range of services that each one can provide, so that their interaction adds value to the humanitarian supply chain. Currently in Mexico the way humanitarian aid actors work in the face of a disaster does not contemplate the vision of 3PL logistics as indicated above, nor the horizontal collaboration and coordination, which could in turn help vertical integration. Therefore, in this document, the proposal will be developed in point 3.

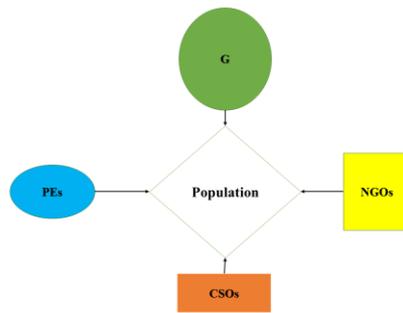
### **2.2. Fourth Party Logistics Providers (4PL) focused on humanitarian aid.**

Four-party logistics (4PL) differs from 3PL because it is considered an integral perspective of the humanitarian supply chain, as it is a combination of different types of knowledge, management consulting, IT and 3PL activities ( Skjøtt-Larsen, 2000). Likewise, a 4PL is a supply chain integrator that gathers and manages the organization's resources, capabilities and technologies with complementary service providers to deliver a comprehensive humanitarian supply chain solution, defined by Andersen Consulting and referred to by Pinna and Carrus (2012). Currently in Mexico the closest thing to a 4PL is included in the structuring of SINAPROC and SEGOB would act as an integrator in gathering and managing the resources, capacities and technologies of the Government, to offer support to the affected population. Because of the above, there is only coordination and sporadic collaboration with NGOs, CSOs and PEs. However, the vision of this proposal on fourth-party logistics is applied to humanitarian logistics and it is developed in the following section.

## **3. Proposal**

### **3.1. Population needs and actors requirements**

Within humanitarian supply chain planning, it is necessary to identify the needs of the affected population, which will require mainly: 1) food, 2) water, 3) sanitation, 4) shelters, 5) transportation, 6) clothing, 7) information and communications technologies, and 8) special items. In the case of actors within their planning, they will require: 9) economic and in-kind resources, 10) logistics, 11) storage and distribution centers, 12) shelters identification, 13) groups of volunteers, 5) transportation, 7) information and communications technologies and 13) cluster leaders. This proposed classification of group formation is the basis of this work, however because its extension it will not be developed in detail. In addition to this, it is necessary to consider certain challenges to the design and management of the humanitarian supply chain (Balcik and Beamon, 2008), such as: unpredictability of demand, demand for large quantities suddenly, associated risks (supply, people, technology, transport capacity and money), pre-positioning of supplies in strategic locations, procurement of supplies and delivery to local or international suppliers, which generally are time-consuming and costly for establishing effective and efficient humanitarian aid networks through humanitarian organizations.



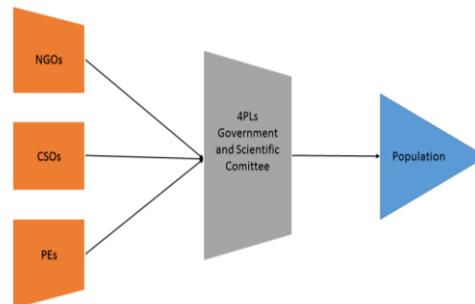
**Figure 2. Current model of operation for actors in a disaster. Own elaboration.**

This paper attempts to address the last challenge mentioned above; since having the design of a humanitarian supply chain plan that addresses the needs of the population, as well as the challenges that the actors will face, would improve the response time of these to the affected population. Here, a scheme of network formation is visualized to guarantee stocks and deliveries of aid to the vulnerable population. These networks include: early warning system, location of demand points of vulnerable people's needs, evacuation points, clustering and transport mode, information flow between demand-actor area and location of distribution and collection centers.

### 3.2. Response planning

This considers the evacuation, search and rescue of the population where it is required the support of humanitarian organizations. In the case of Mexico, the actor in charge of providing shelters, distribution centers and collection centers is the government with its different levels, with sporadic alliances between private companies and other humanitarian aid organizations. With regards to the planning and distribution of food, medicine, medical aid, latrine, etc., it has been observed that some humanitarian aid organizations are involved. Here we highlight the cases of management of collaborative actions and vertical and horizontal coordination among them. Figure 2 shows the present form of operation of the actors in a disaster.

Therefore, the formation of groups based on the expertise of each actor is required for planning coordination of the activities for humanitarian organizations, as well as designating the leader of the humanitarian group to represent it and be part of the National Council for Civil Protection (CNPC). On the other hand, from the point of view of humanitarian logistics, a 4PL would mainly involve G and the CNPC, this last one consisting of university groups and research centers, as well as advisors (scientific committee) as presented in figure 3. Here the proposal starts from an integrative model, where it is highlighted how a 4PL could be visualized, in order to plan the operation of the actors before disasters.



**Figure 3. Integrative model of operation in the short term. Modified figure of (Büyükoçkan et al., 2009)**

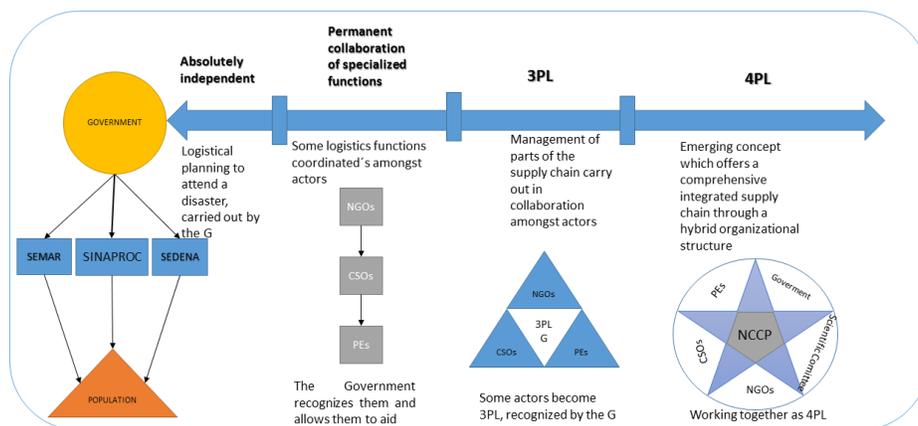


Figure 4. 4PL is responsible for improving the performance of the humanitarian supply chain. Modified figure of (Büyüközkan et al., 2009)

Summarizing the form of operation for humanitarian aid actors and how it would be carried out on the basis of the above proposal, figure 4 shows that with the 3PL and 4PL approach the response to the affected population due to coastal flooding could be improved. On the left side of the figure, it is shown that for planning purposes the G only involves its own actors within its structure (SEMAR, SINAPROC and SEDENA) to support the population, and does not directly consider NGOs, CSOs and PEs. However, there is evidence that collaboration channels are established sporadically for the latter to provide assistance to the population. This is not considered permanently in the G structure. In the central part of the same figure, emphasis is placed on permanent collaboration through the specialized functions of the three previously excluded actors. On the right side, the integration of the 3PLs and 4PLs, which includes the CNPC, is included for the planning of how to operate in the event of a disaster, in order to improve the response time of the actors towards the affected population.

### 3.3. Group formation based on 3PL and 4PL

Returning to the elements indicated in figure 4, group's formations are proposed to bring humanitarian aid to the affected population collectively. For this purpose, 13 clusters are proposed of which it is only shown food and water in tables 1 and 2. It should be noted that each group must have a leader to represent them for decision-making.

These groupings are based on the evidence of collaboration that has been identified for different actors for each group; it is worth noting that table 1 only shows 8 out of 38 actors that have been identified so far. Table 2 shows all of the actors that have been detected. Also because of the extensive display of the 11 remaining tables, only the most prominent ones were selected as they represent basic needs. Based on what is observed in each of the tables, it is noted that there are efforts to help the population in an individual and not in a collective way, with little communication among actors, especially the government; which causes a waste of resources that could be taken advantage of in the purchase of more articles required by the population, preparation of shelters and distribution centers, among others. Therefore, it would be better to organize groups where they are classified by the needs of the population they cover.

Table 1. Food grouping. Own elaboration.

Actor type	Actor's name	Acronym	State/Event	Kind of help
NGO	Ayuda en Acción	AeA	Tabasco, Chiapas y Veracruz/Floodings 2010-2011	Delivery of corn 14.5 tons and beans 2.94 ton
CSO	Comité de Ayuda a Desastres Y Emergencias Nacionales	CADENA	México /Flooding events 2005-2015	120 tons of food
CSO	Cruz Roja Mexicana	CRM	Tabasco, Chiapas y Veracruz/Floodings 2010-2011	Delivery of corn 14.5 tons and beans 2.94 ton
G	Fondo de Desastres Naturales	FONDEN	México / Flooding events	Food pantries for 4 días

CSO	Fundación del Dr. SIMI		Guerrero, Tamaulipas among others/ Hurricane Manuel	10 tons of humanitarian help
CSO	Fundación Telmex		México/ Flooding events 2008	179 tons of humanitarian help
G	Gobierno del Estado		Baja California Sur/Odile 2014	70,000 food pantries
EP	Interjet		Baja California Sur/Odile 2014	Humanitarian aid

In this paper, the proposal is based on the formation of the 13 groupings proposed in section 3.1, which meet the needs of the population during an emergency, and which will have to be coordinated by government actors, with CNPC planning, in such a way as to establish the collaboration and coordination with the actors involved. In the case of food grouping, once the government manages to convince each actor of the advantages of working collaboratively and coordinated both vertically and horizontally, the government would put its resources at their disposal as indicated in the logistics management information from the CNPC, to implement the activities derived from national and international humanitarian aid.

### 3.4 Organic Structure Proposal of SINAPROC

In this proposal we consider at strategic and operational planning levels that SINAPROC should incorporate within its structure as actors the NGOs, CSOs and PEs, following the group formation based on 3PL and 4PL. Figure 5 shows the proposal of the organic structure of SINAPROC, and indicated with an asterisk those actors that belong to the National Council for Civil Protection, which includes 4PL as group leaders. In order to carry out the implementation of the Marina and DN III-E plans, the 4PL group leaders are considered to direct the strategic planning of these. In addition, group leaders coordinate international aid with NGOs and CSOs, which in turn bring aid supplies to the disaster-affected population. The tactical planning includes the international aid if it is required. Finally, in the case of the PEs, in the proposal there are no changes to bring relief to the victims due to the presence of the event. Incorporating this proposal to the actual structure of SINAPROC could bring the opportunity to make better the response of the government by employing the resources and capacities of all of the actors.

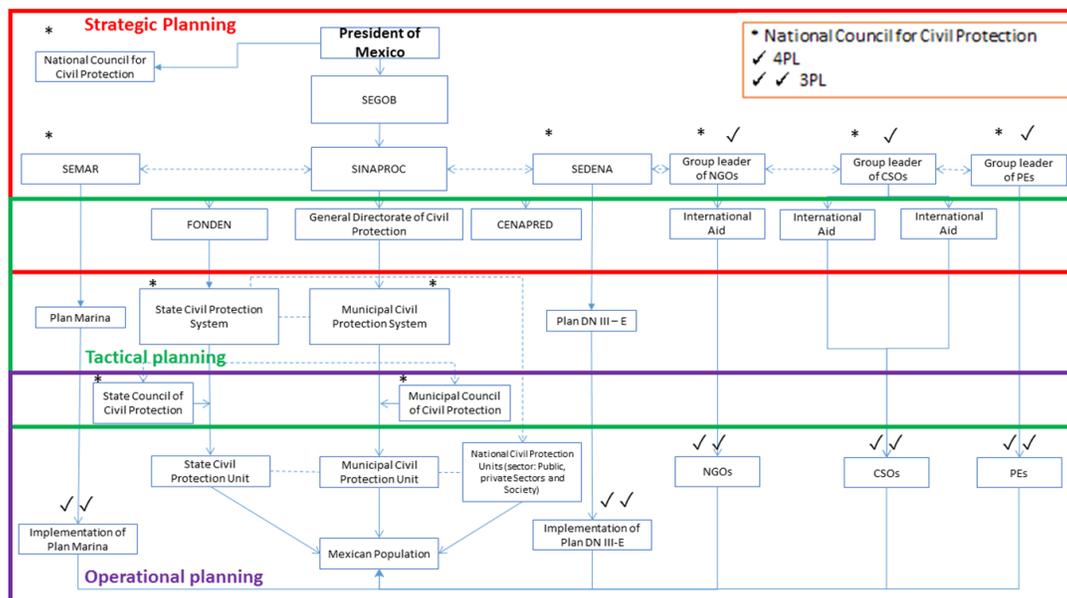


Figure 5. Organic Structure Proposal of SINAPROC. Modified from (OCDE, 2013).

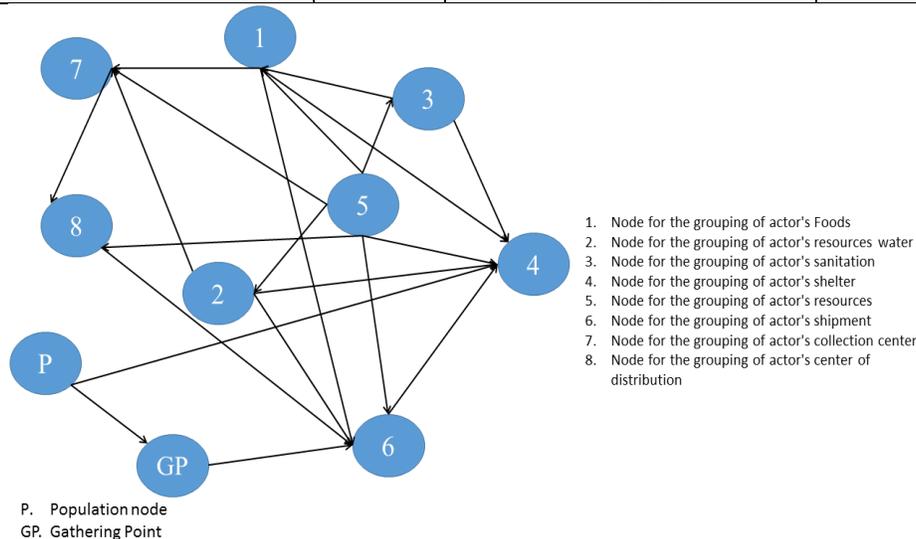
### 3.5. Idealized network of the relations

The figure 6 shows an idealized network of the relationships that are generated in the proposal of group formation, and in which is contemplated several actors. It represents a subset of the 13 proposed pools, which includes the affected population and

evacuation points. It should be noted that each clustering node contemplates the flow of information that will be required to establish the relationship with other clusters. For example, food grouping, shelters and distribution centers require information on the type of food to be delivered, as well as distribution centers and shelters that would be demanded on the basis of capacity. Finally this proposal does not contemplate the decisions on the quantities demanded by each grouping.

**Table 2. Water grouping. Own elaboration.**

Actor type	Actor's name	Acronym	State/Event	Kind of help
NGO	Ayuda en Acción	AeA	Tabasco, Chiapas y Veracruz/Floodings 2010-2011	5 purifying water drinking plants
CSO	Comité de Ayuda A Desastres Y Emergencias Nacionales	CADENA	México /Flooding events 2005-2015	1471 water filters
CSO	Fundación Azteca		Guerrero/Manuel 2013	5 millions liters of drinking water
CSO	Fundación Coca Cola		Guerrero/Manuel 2013	30000 liters of drinking water and 48000 liters of drinking water respectively
CSO	Fundación Telmex		México /Flooding events 2008	16 purifying water drinking plants
CSO	Fundación Gonzalo Río Arronte		Guerrero/Manuel 2013	1000 water filters
CSO	Oxfam México		Tabasco, Chiapas y Veracruz/Floodings 2010-2011	purifying water drinking plants



**Figure 6. Idealized network of the relations that are generated with the formation of groups. Own elaboration**

#### 4. Conclusions and Future Work

Coordination between the different actors applying integration of 3PL and 4PL as has been indicated will improve humanitarian aid which in turn is a key element in avoiding duplication of aid efforts and helps providing what the affected population really needs. This collaboration should be seen as a commitment among actors that in Mexico could initiate agreements in favor of the affected population. The formation of groups with 4PL suppliers corresponding to the humanitarian logistics, integrated by the CNPC; may focus on prevention, mitigation, alert and alarm for disaster planning. The formation of groups with 3PL suppliers corresponding to humanitarian logistics will focus mainly on transport and storage of the needs of the population.

Implementation of this proposal to the actual structure of SINAPROC is a long-term activity that can be accomplished by the Mexican government if it gathers all of the actors of humanitarian aid to better its response employing the resources and capacities of all of these actors. This implementation will require the use of surveys to estimate the response time of the individual actors (NGOs, CSOs, PEs and G), with this information it would be possible to formulate and validate a mathematical model that would estimate as close as possible the response time of all of the actors considering as the main focus the 3PL and 4PL providers. Actual implementation of the proposal is being worked as future research.

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## References

1. Bagchi, P. K. & Virum, H. 1998. Logistical alliances: trends and prospects in integrated Europe. *Journal of Business Logistics*, 19, 191.
2. Balcik, B. & Beamon, B. M. 2008. Facility location in humanitarian relief. *International Journal of Logistics*, 11, 101-121.
3. Balcik, B., Beamon, B. M., Krejci, C. C., Muramatsu, K. M. & Ramirez, M. 2010. Coordination in humanitarian relief chains: Practices, challenges and opportunities. *International Journal of Production Economics*, 126, 22-34.
4. Büyüközkan, G., Feyzioglu, O. & Ersoy, M. Ş. 2009. Evaluation of 4PL operating models: A decision making approach based on 2-additive Choquet integral. *International Journal of Production Economics*, 121, 112-120.
5. Comfort, L. K. 2007. Crisis management in hindsight: Cognition, communication, coordination, and control. *Public Administration Review*, 67, 189-197.
6. Dube, N., et al., Host government impact on the logistics performance of international humanitarian organizations, *Journal of Operations Management* (2016), <http://dx.doi.org/10.1016/j.jom.2016.05.011>
7. Fenton, G. 2003. Coordination in the great lakes. *Forced Migration Review*, 18, 23-24.
8. FONDEN. 2008. Anexo VIII fichas técnicas b [Online]. Protección Civil. Available: [http://portal.proteccioncivil.gob.mx/fonden/fondoRevolvente2008/ANEXO\\_VIII\\_fichas\\_tecnicas\\_b.pdf](http://portal.proteccioncivil.gob.mx/fonden/fondoRevolvente2008/ANEXO_VIII_fichas_tecnicas_b.pdf).
9. FONDEN. 2012. Resumen Ejecutivo [Online].
10. Hasani, S., El-Haddadeh, R. & Aktas, E. 2016. The Partner Proliferation Problem in Disaster Response Networks. *Advances in Managing Humanitarian Operations*. Springer.
11. Haselkorn, M. & Walton, R. 2009. The role of information and communication in the context of humanitarian service. *IEEE Transactions on Professional Communication*, 52, 325-328.
12. Abidi H., de Leeuw S. and Klumpp M., (2015), "The value of fourth-party logistics services in the humanitarian supply chain", *Journal of Humanitarian Logistics and Supply Chain Management*, Vol. 5 Iss 1 pp. 35 - 60
13. Inomata, T. 2006. Towards a United Nations Humanitarian Assistance Programme for Disaster Response and Reduction: Lessons Learned from the Indian Ocean Tsunami Disaster. Joint Inspection unit, Geneva.
14. Jensen, L-M. (2012). Humanitarian cluster leads: lessons from 4PLs. *Journal of Humanitarian Logistics and Supply Chain Management*, 2(2), 148-160
15. Mulyono, N. B. & Ishida, Y. 2014. Clustering inventory locations to improve the performance of disaster relief operations. *Procedia Computer Science*, 35, 1388-1397.
16. Pinna, R. & Carrus, P. P. 2012. Reverse logistics and the role of fourth party logistics provider, INTECH Open Access Publisher.
17. Simatupang, T. M., Wright, A. C. & Sridharan, R. 2002. The knowledge of coordination for supply chain integration. *Business process management journal*, 8, 289-308.
18. SINAPROC. 2014. Protección Civil: Organización [Online]. Available: <http://www.proteccioncivil.gob.mx/es/ProteccionCivil/Organizacion>. [Accessed September 9 2016].
19. Skjott-Larsen, T. 2000. Trends in European Logistics in the New Millennium. Business Briefing.
20. Stephenson JR, M. 2005. Making humanitarian relief networks more effective: operational coordination, trust and sense making. *Disasters*, 29, 337-350.
21. UN-OCHA. 2014. OCHA | Coordination Saves Lives [Online]. Available: <http://www.unocha.org/>. [Accessed August 28 2016].
22. Vega D. & Roussat C., (2015), "Humanitarian logistics: the role of logistics service providers", *International Journal of Physical Distribution & Logistics Management*, Vol. 45 Iss 4 pp. 352 - 375

### Table 1

23. AEA. 2010. Ayuda en Acción abre un número de cuenta para apoyar a la población afectada por las inundaciones en México.
24. AEROLINEASMEXICANAS. 2015. Interjet, historia y datos [Online]. Available: <http://aerolineasmexicanas.mx/lista-de-aerolineas-mexicanas/interjet-historia-y-datos>. [Accessed October 7 2015].
25. CADENA. 2015. Tabasco 2007 | Cadena [Online]. Available: <http://www.cadena.org.mx/mano-a-mano/tabasco-2007/>. [Accessed August 7 2015].
26. CRM. 2015. Historia | cruzrojamexicana.org.mx [Online]. Available: [http://cruzrojamexicana.org.mx/?page\\_id=140](http://cruzrojamexicana.org.mx/?page_id=140). [Accessed August 21 2015].

27. FONDEN. 2008. Anexo VIII fichas técnicas b [Online]. Protección Civil. Available: [http://portal.proteccioncivil.gob.mx/fonden/fondoRevolvente2008/ANEXO\\_VIII\\_fichas\\_tecnicas\\_b.pdf](http://portal.proteccioncivil.gob.mx/fonden/fondoRevolvente2008/ANEXO_VIII_fichas_tecnicas_b.pdf). [Accessed October 23 2015].
28. FUNDACIÓN, D. S. 2014. Simi informa por un país mejor ¡Ayuda! México.
29. TELMEX, F. 2008. Transformando vidas.
30. UNIVERSAL, E. 2013. Envían 70 mil despensas a BCS para damnificados. El Universal.

**Table 2**

31. AEA. 2010. Ayuda en Acción abre un número de cuenta para apoyar a la población afectada por las inundaciones en México.
32. Angélica, R. D. P. 2013. Confianza en el gobierno de la república, pide Angélica Rivera de Peña a damnificados [Online]. Available: <http://sn.dif.gob.mx/prensa/item/page/34/>. [Accessed August 28 2016].
33. CADENA. 2015. Tabasco 2007 | Cadena [Online]. Disponible: <http://www.cadena.org.mx/mano-a-mano/tabasco-2007/>. [Accessed August 7 2015].
34. FUNDACIÓN, C. C. M. 2014. Informe de Sustentabilidad 2014. México.
35. México., O. 2012. Atención a la emergencia en Tabasco, Chiapas y Veracruz 2010-2011 | Oxfam México [Online]. Available: <http://www.oxfamMexico.org/atencion-a-la-emergencia-en-tabasco-chiapas-y-veracruz-2010-2011/#.Vt8On-bNs-o>. [Accessed August 9 2015].
36. TELMEX, F. 2008. Transformando vidas.