

Industry Agenda

# Leading Practices Exchange Managing Risk and Building Resilience

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# Preface

**Elaine Dezenski**  
Senior Director,  
Head of PACI  
World Economic  
Forum

**Edward Martinez**  
The UPS  
Foundation and  
Chair, Global  
Agenda Council  
on Catastrophic  
Risks

Whether risks are economic, environmental, catastrophic or systemic, we can all learn from different techniques in leading practices from government, business or international organizations to improve resilience. By studying the experience of how different sectors deal with serious challenges, through different lenses, we challenge orthodox thinking and provide fertile ground for innovative solutions and greater risk resilience.

The Leading Practice Exchange (LPE) is a dynamic, interactive framework designed to share experience for exactly that purpose. It was created in collaboration between the World Economic Forum and experts from the Global Agenda Council on Catastrophic Risks, the Forum's supply chain experts group and members of the Forum's Partnering Against Corruption Initiative (PACI). Practices are, therefore, a reflection of a broad range of risks.

The development of the LPE would not have been possible without the strong collaboration of PwC, the Forum's professional services partner for the project, and its proactive work to identify cases and conduct interviews. We also thank Itonics GmbH for the development of the technical framework to capture the practices.

As an online tool, the LPE allows for the collection, sharing and evaluation of cases from a variety of different sectors, initially those that relate to anti-corruption, cyber, supply chain and other catastrophic risks.

The cases presented in the following pages provide you with the opportunity to reflect on the strategies, techniques, pitfalls and successes of others and how different approaches may be relevant to your work.

We would like to thank all those who helped to shape the project and who have been voluntarily contributing cases and opinions. The input reflects a diverse community of experts and practitioners who have strengthened the community of the Forum through their engagement.

**Anti-corruption Practices**

**Catastrophic Risk Practices**

**Cyber Risk Practices**

**Supply Chain Risk Practices**

# Anti-corruption Practice 1



## Expertise

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Philip Matthey, Chief Compliance Officer, MAN Group

## Compliance risk assessment at MAN Group

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### Summary

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Compliance risk assessment is key to an effective compliance programme. A programme to prevent compliance issues, including corruption and bribery, must be tailor-made to the specific risks of the organization. At MAN Group (MAN), compliance risk assessment is built on both objective criteria (based on the business model) as well as on subjective criteria (taking into account management's perception of the compliance environment). Management must "own" these topics and take responsibility to mitigate the risks within the context of a company-wide compliance programme.

## Experience

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### Objectives

Multinational organizations operate in an increasingly complex and fast-changing regulatory environment. Any effort to ensure "compliance" with applicable laws and regulation must start with a comprehensive, systematic approach to identify and assess specific compliance risks.

Risk assessment provides a baseline to ensure that available resources are devoted to areas where the highest risks prevail. The risk assessment process enhances awareness and understanding of compliance-related topics across the organization.

### Practice example

With a history of more than 250 years, MAN is one of Europe's leading commercial vehicle, engine and mechanical engineering companies. Together with MAN, Rudolf Diesel built the world's first diesel engine in 1893. From this heritage, MAN assumes responsibility towards its customers, employees, investors and the public.

In 2009, investigations by public prosecutors revealed the company was significantly involved in bribery and corruption, and highlighted major weaknesses in MAN's compliance system. Since then, MAN has invested considerable resources to thoroughly redesign its entire compliance programme.

Compliance risk assessments are a core element of the new MAN compliance programme. The rationale is simple – without detailed knowledge about the organization's specific risk profile in compliance areas such as anti-corruption, anti-trust or data protection, the compliance programme cannot be adequate and comprehensive.

The first risk assessment, for which an external consultant was engaged, was practical in nature and based on structured interviews with senior management. The outcome was used to decide in which entities and locations dedicated Compliance Managers should be positioned.

As the company's compliance programme became increasingly sophisticated and mature, the focus of risk assessment evolved. Experts in the Corporate Compliance Office developed a questionnaire covering relevant risk assessment criteria and enabling the Compliance Managers to conduct the assessment in a comprehensive and consistent manner worldwide. Bringing the risk exposure together with information about the implementation progress of the compliance programme gave a clear picture of the compliance status. For example, this helped to identify entities selected for an in-depth compliance audit in cooperation with the Internal Audit department.

In 2013, the approach was further enhanced in terms of relevance, efficiency and IT support. The assessment now contains two main parts. Part one generates risk scores for corruption and other compliance areas based on objective criteria. These criteria include data on business model and sales channels, customer base, country risk (based on Transparency International's Corruption Perceptions Index), procurement volume and setup, use of business partners, and others.

Part two encompasses self-assessments by responsible managers based on their experience and perception of their respective entities' compliance environments. These evaluations cover both the risk exposure and the entity's ability to handle these risks. Combining the results of both approaches reveals powerful insights that can be used to further strengthen the compliance programme. For example, when management's self-assessment provides a positive

compliance assessment, yet objective criteria suggest that the entity operates in a high-risk environment, appropriate follow-up action by the Compliance Manager should be taken, such as providing additional compliance awareness training or anti-corruption workshops.

Conducting a compliance risk assessment in a large, complex organization like MAN is a major effort that may take several months. The key challenge is to ensure that local management starts working with the results. For this purpose, responsible Compliance Managers engage in follow-up discussions with the business units, and support local management in setting up appropriate action plans.

In the future, the corporate Compliance Office is planning to complement the in-depth “vertical” assessment with a broader “horizontal” risk assessment at group level. The aim will be to trigger discussions with other functional leaders (internal audit, accounting, legal, HR, etc.) to identify the full spectrum of potential compliance risks from various angles and with a special focus on emerging issues. Regulatory compliance is a matter that goes far beyond bribery and corruption. The organization needs to ensure that all relevant topics are dealt with, either by the compliance department or by other functions.

## Principal challenges

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- Getting from management unfiltered insights rather than a whitewashed view
- For an employee, determining what the bosses think if they are told there is a high-corruption risk in an area of responsibility
- Finding the right balance between level of detail requested and effort required for the assessment
- Understanding that traditional material considerations may not work as a single case of bribery in a subsidiary may be detrimental across the entire organization
- Ensuring management accepts “ownership” of the identified risks and sets the right tone for appropriate follow-up measures

## Important lessons

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Ensuring the assessment does not become a self-fulfilling prophecy  
Realizing that the company only considers compliance risks that it was already aware of  
Getting the full benefit from the compliance risk assessment needs the courage to set risk-based priorities

### References

*A Guide for Anti-Corruption Risk Assessment*. 2013. New York: United Nations Global Compact.  
*A Resource Guide to the US Foreign Corrupt Practices Act*. November 2012. Washington DC: US. Department of Justice and Securities and Exchange Commission, pp. 57-62.  
*The Bribery Act 2010 – Guidance*. March 2011. London: United Kingdom Ministry of Justice, pp. 25-26.

# Anti-corruption Practice 2



## Expertise

Evert Jan Wijerus, Group Compliance Officer, Royal HaskoningDHV

## Instilling business integrity as a core corporate value at Royal HaskoningDHV

### Summary

As a part of its strategy to mitigate corruption-related risks in its extensive network of offices and operations, Royal HaskoningDHV (RHDHV) introduced a comprehensive integrity management system to provide a process of permanent education and to instil the importance of business integrity at all levels of its business. Defining responsibilities and management accounting across the entire organization is integral to enforcing accountability and creating a paper trail for all key decisions and transactions.

### Experience

RHDHV is one of Europe's leading independent project management, engineering and consultancy service providers, ranking globally in the top 10 of independently owned, non-listed companies. The company carries out 30,000 projects annually in planning and transport, infrastructure, water, maritime, aviation, industry, energy, mining and buildings.

As a worldwide operating company with more than 100 offices and operations in 35 countries, RHDHV encounters compliance issues regularly, relating to internal staff, third parties and clients. RHDHV must also mitigate corruption-related risks in its supply chain network.

RHDHV's corporate philosophy is that business integrity is an intrinsic part of the company and its people. In addition, integrity – as an integrated part of the business process – requires continuous attention. For RHDHV, business integrity goes beyond corruption, collusion and fraud; it also encompasses the personal attitudes and individual behaviour of all RHDHV people.

**Introducing an integrity management system (IMS) as a process of permanent education at unit, project and individual employee level**

RHDHV received external certification of its compliance programme in October 2010 after carrying out an internal project to boost the implementation and enforcement of the company's integrity policy. The project enhanced and developed the company's IMS over the full range of corporate governance, code of conduct, integrity and attitudinal dimensions. Business integrity matters are now required to be discussed at all levels of RHDHV, and are a standing practice within all business units and entities.

### Clearly defining responsibilities and management accounting to enforce accountability and create a paper trail

RHDHV has systematically endeavoured to define and implement clear definitions and parameters at various levels of responsibility and management accounting. At the lowest aggregate level these role definitions are specific, measurable, accepted, realistic and timely. These efforts have been made to improve discipline and control in processing cost and revenue-related information, and to provide guidance, monitoring and control.

An essential component of the company's compliance system is the creation of transparency and a paper trail in decision-making. For example, RHDHV stringently applies the "four eyes" principle in risk verification, meaning that key decisions or transactions must be approved by at least two people. This controlling mechanism is used to facilitate delegation of authority and increase transparency. The company's internal systems create standardized methods and instructions to ensure transparency for electronic and hard copy decision-making processes to promote accountability and curb corruption.

A quarterly report summarizes all compliance issues and dilemmas, including the steps that have been taken, or will be taken, to resolve the issues. RHDHV's commitment to anti-corruption has helped to mitigate the risks of corruption across its 100 offices and 30,000 yearly projects, leading to a best-in-class example of organizational compliance

In response to the risks of corruption, the compliance standards of RHDHV are set at the highest levels and the strict adherence of the company to these standards are audited annually. The Ethics Intelligence Certificate awarded to RHDHV in 2010 and in 2013 bears testament to the company's success in this regard.

### Objectives

- Ensuring business integrity is a key organizational value at all levels of business
- Promoting awareness that transparency and accountability are vital to key decision-making and transactions

# Anti-corruption Practice 3



## Expertise

Antonio Javierre, General Manager, Javierre

## Small companies leading the way for zero corruption

## Summary

The commitment of small and medium-sized enterprises (SMEs) to combating corruption is vital to achieving a business environment free of corrupt and unethical business practices. SMEs can mitigate corruption through strict enforcement of a zero tolerance policy that is communicated widely to the public, thereby generating a collective commitment to anti-corruption for SMEs and their key stakeholders.

## Experience

Corruption and bribery extends its reach throughout the globe affecting multinational corporations (MNCs) and SMEs alike. Unlike MNCs, SMEs often have difficulties tackling this issue due to lack of adequate funding, expertise and know-how for anti-corruption efforts. This is a particularly serious issue in the construction sector in some economies, including in parts of the Spanish construction industry and in the procurement of civil construction contracts with government.

Javierre is an SME in the Spanish construction sector specializing in land moving and excavation in public and private works. The company reports many instances of unfair competition due to favouritism towards its competitors, obtained through bribery and corruption. This issue is well documented in the construction industry and affects both SMEs and MNCs.

Since its founding in 1989, Javierre has sought to position itself as a leader in anti-corruption by ensuring the highest ethical standards in its business negotiations and commercial transactions, and building relationships based on trust and honest collaboration with its stakeholders.

Javierre has a clear zero tolerance policy to combat corruption and bribery that is instilled into its corporate ranks. This policy prohibits bribery as a means of obtaining advantage in the procurement of work, services, permits, licences or authorizations. It also bans gifts, favours and facilitation payments, including financial contributions to political parties.

The policy against corruption and bribery is effective due to its wide dissemination to the company's stakeholders. Employees are trained how best to mitigate risks of corruption and bribery including their obligations under the company policy.

Javierre has established severe penalties for internal corruption, adopted mechanisms that allow reporting of cases of corruption to the highest levels of the company's management, and put in place regular monitoring of implementation of the zero tolerance policy. Cases and experiences of corruption serve as material for analysis and internal training of employees and managers.

The company's anti-corruption policy has been published by Javierre in local, provincial and regional newspapers and communicated to the public to ensure a commitment is generated from the company's stakeholders in the market, industry and relevant government bodies.

Public communication of Javierre's zero tolerance to corruption and bribery complements an annual survey of Javierre's stakeholders, which aims to track perception levels of business honesty, involvement in anti-corruption efforts, and compliance to its zero tolerance policy. This initiative is supported by an annual "Sustainability Report" on the company's performance against its corporate social responsibility values. The purpose of these efforts is to create confidence in Javierre's stakeholders and thus generate a collective commitment to anti-corruption.

Through strict enforcement of a comprehensive zero tolerance policy and its wide adoption by company employees and stakeholders, Javierre has bridged the gap between SMEs and MNCs to create a highly successful anti-corruption initiative in the Spanish construction industry.

# Anti-corruption Practice 4



## Expertise

Jonathan Drimmer, Vice-President, Assistant General Counsel, Barrick Gold Corporation

## Using ICT platforms to overcome due diligence challenges

### Summary

The challenges encountered in manually conducting due diligence on a vast supply chain network are considerable. In this best practice example, Barrick Gold Corporation (Barrick) shows its emerging efforts to employ collective action to bring transparency to the information flows and elevate the effectiveness of the due diligence ability to mitigate corruption and other risks to supply chains.

### Experience

Multinational companies have important obligations regarding the manner in which they manage their supply chains, highlighted by increasing public expectations and regulatory requirements. Whether the risks take the form of potential corruption, forced labour, trafficking or conflict minerals, domestic legislation and international instruments make supply chain due diligence and management a significant responsibility – and a significant demand – upon companies.

As the world's largest gold mining company, Barrick has a supplier network comprising tens of thousands of suppliers, creating significant risks to mitigate. In analysing methods to enhance its third-party due diligence, Barrick recognized three key challenges: scope, validity and cost.

#### Scope

Given the size of the supply chain pool and number of groups in the company that interact directly with suppliers, the vast majority of Barrick's due diligence time and resources could be associated with determining which of the small percentage of Barrick's supply chain pool create elevated risks and how to address them – rather than the actual task of conducting due diligence on those relatively few higher-risk third parties.

#### Validity

Suppliers would challenge specific wording in questionnaires, be reluctant to sign Barrick's certifications or complain about the volume of similar questionnaires they were being required to complete. There was also little assurance that the information provided in questionnaire responses would be true and accurate.

#### Cost

The solutions to such difficulties typically required either significant expense for outsourcing the function or a need to hire additional personnel for insourcing.

The approach Barrick has chosen to resolve these challenges is premised on collective action. Rather than employing a traditional individual questionnaire model for initial due diligence, Barrick is shifting to the TRAC system operated by the non-profit Trace International. Trace International provides resources and support to companies seeking to implement anti-bribery compliance solutions.

With the TRAC system, a third-party supplier enters basic information on its ownership structure and other details, and completes a questionnaire containing the majority of information that companies tend to ask in their own questionnaires, e.g. questions about criminal convictions, labour trafficking, manufacturing conflict minerals and other high-risk areas.

The TRAC system runs the supplier through basic screening and provides the supplier with a TRAC number. The third party provides that number to Barrick and others – it is a "portable" due diligence solution that will enable Barrick and others selected by the supplier to see the information and answers to the questionnaire. Upon providing its TRAC number to Barrick initially and during each subsequent update, the supplier is also required to certify that it complies with Barrick's Supplier Code of Ethics.

Based on the third party's responses to the questionnaire or screening, a risk factor may be identified – reflected in the TRAC number – that will allow Barrick to follow up with the supplier about the reasons contributing to the factor.

Barrick has recently begun its formal programme to migrate suppliers to the TRAC system. It anticipates a number of advantages to moving to the TRAC system for assessing the risk in its supply chains.

Barrick strongly supports a collective action approach to transparency and due diligence as a means of mitigating risks, particularly those associated with corruption. The burden of undertaking annual questionnaires, performing follow up and chasing verification documents will be shifted away from Barrick to the suppliers. Basic screening will be performed as a part of the TRAC system.

As the TRAC system becomes more widely used across industries, suppliers will become familiar with it and recognize it as a standard requirement. This familiarity will reduce resistance to completing questionnaires and reduce the overall transaction cost of doing business with suppliers.

The contents of the questionnaire will allow benchmarking with other companies, and any disadvantage associated with the loss of customization will be made up by advantages in consistency and uniformity. For example, there should be less concern of suppliers challenging perceived ambiguity in language in questionnaires, or objecting to certification questions, which will be largely standardized.

The system will be fully transparent and available on a database for others to see, which should deter the provision of false information. The approach will increase the likelihood that false responses and misleading data are identified by others.

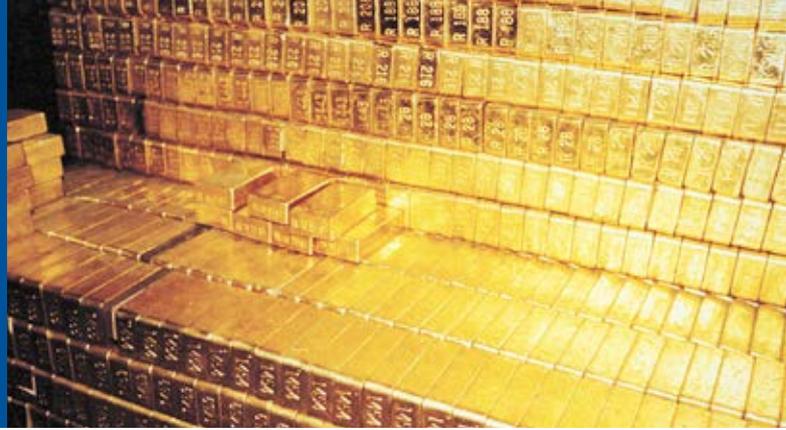
Through the use of the TRAC system, Barrick Gold Corporation is able to curb corruption in its supply chain and improve transparency along its value chain, thus helping to solidify its position as a global leader in the gold mining industry.

## Objectives

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- Increasing the effectiveness and efficiencies of due diligence
- Shifting the burden of performing diligence onto a large network of suppliers
- Bringing greater transparency and information-sharing to the process

# Anti-corruption Practice 5



## Expertise

Jonathan Drimmer, Vice-President, Assistant General Counsel, Barrick Gold Corporation

Using risk assessments to stamp out corruption in the gold industry

## Summary

Risk assessments help companies identify where in their compliance programmes they can strengthen their processes and focus their resources. As the US Department of Justice and the Securities and Exchange Commission stated in their Resource Guide to the Foreign Corrupt Practices Act, “assessment of risk is fundamental in developing a strong compliance programme”.

However, conducting effective assessments can be challenging. Where done using external resources, they may be expensive and disconnected from the company’s business goals, structure and culture. Where done internally, personnel may not have sufficient expertise to conduct the assessments in a manner that yields reliable outcomes, and may not be adequately independent of the business entity being assessed. Therefore, it is important that assessments are well planned, effectively scoped and tailored to reflect the businesses or activities being assessed.

## Experience

### Objectives

- Identifying strengths and weaknesses in anti-corruption programmes
- Creating local and operational ownership and enhanced understanding of anti-corruption issues
- Creating a sustainable risk assessment process or other practices to update the assessment

### Practice example

Barrick has developed a global anti-corruption risk assessment programme designed to take these factors into account. It is overseen by internal corporate counsel to help ensure that privilege is maintained, and relies primarily on internal resources. A small group of corporate head office employees, including forensic accountants and attorneys, helped design the programme and may lead the assessments, typically in conjunction with a local resource.

This structure enables Barrick to:

- Field teams led by resources with knowledge of anti-corruption laws, common fact patterns that lead to problems, and enforcement trends, which are complemented by resources with local experience who have a full understanding of business and cultural nuances, and may maintain greater trust with local employees
- Enhance objectivity and ensure consistency across assessments through corporate resources leading the assessments
- Foster knowledge sharing and learning through combined teams of corporate and operating unit employees conducting the assessments. In the longer term, this contributes to strengthening operational capacity globally on anti-corruption.

The assessments are tailored to areas of the businesses identified as having a higher risk of corruption. They tend to focus on countries with lower scores on the Transparency International Corruption Perceptions Index, and business functions that interface directly or indirectly with governments. Assessment activities consist of documentary reviews, interviews, and reporting.

### Documentary reviews

These are reviews of process-related documentation, relevant internal audit reports and the results of other assessments and inquiries. Documentary reviews may include sampling of certain transaction documents to obtain a sense of how policies and procedures work in practice, such as receipts or invoices, internal approval materials for payment requests, agreements and memoranda of understanding, rosters of individuals and other documents in the areas being assessed. Certain documents, such as audit reports, may be requested ahead of a visit; other documents, such as samples of transaction documents, may be requested during or after a visit. Documentary reviews may help shape and focus the assessments or lead to additional questions or interviews, and are considered in the overall analysis of information gleaned during the assessments.

### Interviews

Interviews are designed to identify the nature, frequency, importance and extent of government interactions; the government officials and agencies with which those interactions occur; the strength of processes and controls, including the familiarity of relevant personnel and gatekeepers with anti-corruption processes and how closely those processes are followed; training and

reporting mechanisms; and the strength of related internal financial controls, for example how payments involving government are booked, the availability and nature of backup documentation and the degree to which delegation of authorities are followed.

Before substantive interviews are conducted, a mapping exercise determines the appropriate personnel who will participate in the assessment. It is important that the interviews are conducted not just of management, but also of those responsible for the day-to-day activities of the business, particularly gatekeepers and those who directly or indirectly engage with the government. It is preferable to conduct interviews live although, where necessary, some can be done by telephone. Although Barrick has considered using written questionnaires or surveys at preliminary phases of assessments, or with lower risk sites or functions, to date they have not been employed as part of the assessments.

To facilitate the assessments, Barrick has created, in conjunction with external counsel, a lengthy template of interview questions to be answered and issues to be addressed during the assessments. The template may be tailored in the case of specific functional units based on the documentary review, local laws and particular risks, particular activities or changes involving the business unit, and other factors. The template, which is in the form of a chart, allows for answers to be recorded directly on the form itself, facilitating the analysis during the report-drafting phase.

The template is used to conduct interviews with a range of supervisors and employees who may:

- Interface with the government
- Retain and monitor intermediaries and other third parties and partners
- Participate in licensing, lobbying, litigation, and tax and royalty activities
- Engage in hiring employees
- Approve government payments or have responsibilities for financial processes
- Be otherwise involved, directly or indirectly, in government interactions or financial activities

The template includes questions designed to identify employees who are or recently were government officials, or are related to government officials; the overall attitude and culture towards anti-corruption; past instances where improper payments may have been requested by an official or third party; and signs that improper payments are or are not being made.

## Reporting

Following the interview and document assessment phases, a report is prepared to identify the nature of the corruption risks the business faces, as well as areas of strength and areas for improvement in internal processes. Individuals and departments responsible for implementing the enhancements are then identified, along with related implementation timelines. Follow-up work is also planned at a future point to assess how the recommendations have been addressed and to consider new issues.

# Anti-corruption Practice 6



## Expertise

Michele De Rosa, Topic Leader, Anti-bribery, Sustainability and Internal Control System, Eni

## Eni's dynamic anti-corruption compliance programme

### Summary

The fight against corruption and efforts to ensure ethical conduct are of primary importance in Eni's activities. This focus contributes to ensuring a high level of involvement at all levels in adopting behaviours that respect these principles and improve Eni's ability manage and mitigate the risks connected to its operational activities.

### Experience

Eni's anti-corruption activities are based on implementation of an anti-corruption system, the central element of which is a dynamic anti-corruption compliance programme. This programme consists of a tailor-made set of rules and procedures for the business areas and processes at risk of corruption, in line with existing and applicable anti-corruption laws, international conventions and international best practices.

The key elements of the compliance programme are:

- Risk assessment to identify the business area with a higher risk of corruption-related practices
- Clear top-level commitment and an internal training programme on fighting corruption
- Continuous monitoring on the correct adoption of the programme
- Effective third-party assessment before entering into a risk agreement and provision of specific anti-corruption clauses
- Appropriate disciplinary measures and contractual remedies.

Eni aims to share and improve its anti-corruption best practices through active participation in collective actions focused on anti-corruption. In 2010, to carry out and oversee these activities, Eni created a centralized, dedicated anti-corruption unit within its legal department. This unit was recently named as one of the “Most Innovative European In-house Legal Teams” for 2013 by the *Financial Times*.

Some of the main challenges that Eni faced during the construction of its anti-corruption compliance programme concern relationships with third parties. Two problems worthy of mention are the relationship with suppliers and the monitoring activities over the joint ventures in which Eni has a non-controlling share or participating interest, considering that the controlled joint ventures must adopt Eni's compliance programme in its entirety.

Eni is addressing these two challenges by implementing a training project addressed to its suppliers and specific guidelines on joint venture agreements.

The supplier-training project foresees a multidisciplinary training programme for both suppliers and employees, to be held in all Eni's main operations sites. The programme will include a dedicated section on anti-corruption conceived and developed by Eni's anti-corruption unit.

The aims of the training programme are to outline and illustrate the anti-corruption laws and Eni's anti-corruption programme; provide basic knowledge and tools to recognize conduct that might constitute a crime and the actions to take; and explain the risks, responsibilities and sanctions that may result, in order to prevent and combat instances of corruption. To date, there have been 20 anti-corruption training sessions, including for suppliers, in the main operations sites – refineries, plants and platforms – in Italy and abroad.

With reference to the joint venture activities in which it has a non-controlling share or participation interest, Eni has implemented a procedure with provisions regulating the negotiation process and subsequent monitoring activities over the contract. The guidelines of the procedure are as follows.

1. Eni will use its influence, to a reasonable extent under the circumstances, to ensure that the joint venture adopts ethical conduct principles and meets standards on adopting and maintaining a suitable internal control system.

2. In case of unincorporated joint ventures, Eni will use its best efforts to include in the contracts commitments by the operators to adopt and maintain, for the duration of the contracts, effective and appropriate internal control systems and the commitment of each partner to supervise and constantly monitor the implementation and effective operation of the internal control system.
3. Best efforts will be made to include in the contract a series of commitments of each partner to act and cause all its personnel in a wide sense to act in compliance with anti-corruption laws and conventions and with Eni's anti-corruption programme standards.
4. The joint venture will select a representative with adequate seniority level, outstanding reputation and specific training on anti-corruption.
5. Eni will require its representatives to make their best efforts to propose adopting procedures and control standards that are consistent with Eni's compliance programme or with Eni's subsidiaries' compliance programme to the board of directors, in case of an incorporated joint venture, or to the body responsible for monitoring and updating the procedures governing the joint venture, in case of an unincorporated joint venture where Eni is not the operator.
6. The anti-bribery unit will annually review all anti-corruption activities carried out by Eni's representatives through a joint venture report and make recommendations on the actions to be taken to fill anti-corruption compliance gaps.

# Anti-corruption Practice 7



## Expertise

Lars Björklund, Vice-President, Ethics, Skanska AB

## Skanska's five-zero policy

## Experience

Skanska is a world leading project development and construction group. Its internal five-zero policy helps to govern the way it does business and eliminates corruption in its supply chain. The five-zero policy focuses on eradicating losses. Its five pillars are: zero loss projects, zero environmental incidents, zero workplace accidents, zero ethical breaches and zero quality defects.

The Nordic Procurement Unit (NPU) preferred supplier programme is a practical tool that helps Skanska reach its five-zero goal in the supply chain. The programme has three stages:

- Pre-qualification – secure legal and Skanska basic requirements before negotiation
- Performance evaluation – assess actual supplier and project performance
- Supplier development – continuous supplier improvement through framework agreements

### Prequalification

The prequalification is a self-assessment filled in by the supplier and consists of questions related to legal requirements and Skanska's five zeros. The majority of the answers must be verified by documents and certificates. The self-assessment must be performed once a year by the supplier and is valid for all Skanska construction sites.

The prequalification information is combined with information from third-party sources, e.g. the tax authority, trade union demands from the construction industry and credit institutes. The combination of information from various sources creates an updated and broad picture of the supplier's status and current risk level. The information gives opportunities to deal with risk early by identifying illegal suppliers, identifying gaps regarding Skanska's five zeros and the possibility of improving suppliers.

Skanska cooperates with the Swedish tax authority to fight against the "grey market" in Sweden by sharing supplier information quarterly. The cooperation is win-win for both parties. The tax authority gets a good insight into the construction industry and can, with Skanska's support, beef up the work against corruption.

### Performance evaluation

Performance evaluation is a systematic way for Skanska to follow up on how well suppliers are performing on the construction sites. The evaluation is done by the site personnel in production-critical areas, and focuses on the five zeroes to ensure sure that ethical breaches are discovered and action taken. The results from the evaluations have a great impact in selecting suppliers for future projects, low-performing suppliers will be visible, and expenditure can go to quality and predictable suppliers. Feedback is given to the suppliers on their scores, so they can make improvements. The suppliers are also able to evaluate Skanska as a customer.

### Supplier development

The objectives of supplier development are to continuously improve performance and develop the long-term relationship between Skanska and selected suppliers, depending on importance and performance. The foundation of supplier development is to measure selected suppliers in terms of quality and delivery. If the performance data deviates from agreed targets, suppliers will go through a process where different actions are implemented and plans jointly decided. Another aspect is to engage selected suppliers on development activities in Skanska supplier teams association where problems are identified and solved by using a structured problem-solving method.

The three-pronged approach of prequalification, performance evaluation and supplier development helps Skanska to weed out problematic suppliers. It has reduced red marked suppliers that do not fulfil regulations from 31% to an all-time low of 9%, quality has risen by over 20% in selected supplier cases, and delivery efficiency has increased on average by 12% since the inception of the programme.

# Anti-corruption Practice 8



## Expertise

Corporate Governance Committee, American Chamber of Commerce in Romania, Member of the AmCham Network

## AmCham Romania Code of Corporate Governance

## Experience

The American Chamber of Commerce in Romania (AmCham Romania) is a non-profit and non-political organization that promotes the commercial and economic interests of the US, international and local business communities in Romania. Established in 1993 by American investors, it is now one of the 115 international AmChams in 102 countries affiliated with the US Chamber of Commerce based in Washington DC, and a member of the European Council of the American Chambers of Commerce (ECACC).

Currently, AmCham has over 350 members, consisting of major US, foreign and local enterprises doing business in Romania, as well as small and medium-sized firms and business executives in the country that support and abide by the policies of the US Chamber of Commerce. The association is entirely autonomous, with no subsidy from any government body, and relies on income from membership dues and other activities.

As part of its mission, AmCham Romania aims to increase awareness of good corporate governance within the business community by promoting and providing access to best corporate governance practices to improve the businesses' competitiveness, integrity and transparency.

The first initiative on this area was the AmCham Romania Code of Corporate Governance, released in 2010, which provides guidance to Romanian joint-stock companies on their day-to-day management, as well as on the relationship between the various corporate bodies, the shareholders and other stakeholders, and best practices on supervision and accountability.

## AmCham Romania Anti-Corruption Guidelines

In 2012, AmCham Romania released the Anti-Corruption Guidelines, a tool meant to contribute to the prevention of bribery and corruption, and to a more efficient approach towards fighting corruption to be embraced by the companies in Romania.

The Guidelines are based on international documents and best practices adjusted in accordance with the legal framework and business environment in Romania. They include key principles and recommendations, as well as a reference book and the instruments needed to apply these practices. The first section of the Guidelines approaches topics such as employment and recruiting; sponsorships; partners and contracting parties; travel, gifts and related expenses; political contributions; facilitation payments; tender process management (public procurement); and failure to prevent bribery by associated persons. The second section defines the means to implement those processes.

"The best practices Anti-Corruption Guidelines aim at grounding a preventive conduct for companies fighting bribery and corruption, while encouraging them to develop their own anti-bribery and anti-corruption policies and provisions, to implement them and monitor their results on a regular basis," said Anda Todor, President of the Corporate Governance Committee, AmCham Romania.

AmCham Romania acknowledges that, although it is mainly the public sector in Romania that is affected by corrupt practices, the private sector is also part of the problem. Hence, private sector stakeholders should share responsibility with the public sector to find ways to effectively fight corruption. AmCham Romania calls on its members to demonstrate leadership by adopting, implementing and sharing effective anti-corruption programmes, including the Anti-Corruption Guidelines, within their companies.

Corruption hinders the predictability and profitability of an economy and damages the reputation of a particular player as well as the general perception of the public and of other players in a given industry sector. Initiatives such as the AmCham Romania Anti-Corruption Guidelines help to curb corruption by providing a level playing field in which companies can operate.

## Reference

AmCham Romania Anti-Corruption Guidelines  
[http://www.amcham.ro/UserFiles/committeePaper/AmCham%20Romania%20Anti-Corruption%20Guidelines\\_06201518.pdf](http://www.amcham.ro/UserFiles/committeePaper/AmCham%20Romania%20Anti-Corruption%20Guidelines_06201518.pdf)

# Anti-corruption Practice 9



## Expertise

Sabine Zindera, Vice President, Legal and Compliance, Siemens AG

## Siemens AG Collective Action – innovative strategies to prevent corruption

## Experience

No single government, company or civil society organization can tackle corruption alone. Because the risk of corruption can only be mitigated through joint efforts, Siemens believes that the Collective Action approach reinforces activities in the compliance field and supports clean business in relevant markets. Collective Action can help to address the issues that act as a barrier for a transparent and fair business environment in which all stakeholders are confident to participate.

Over recent years, Siemens has successfully introduced and implemented a comprehensive global Collective Action programme to jointly fight corruption and promote integrity in business transactions. The ultimate goal is to establish fair and sustainable market conditions in collaboration with other companies, governments and non-governmental organizations for the benefit of all market participants. Collective Action at Siemens is an integral part of “ONE Siemens”, which is the overall strategy framework for Siemens.

Collective Action is a process of cooperation among various stakeholders with the aim of countering corruption. Through such alliances of like-minded organizations, the problem can be approached and resolved from multiple angles and the impact of individual action can be increased. Collective Action not only combats corruption, but also helps to develop markets that are characterized by difficult underlying conditions for clean business, thus making them more accessible. The ultimate goal is to create fair and equitable market conditions, a “level playing field” for all market participants that eliminates the temptation of corruption for all those concerned. Collective Action helps to establish the conditions for fair competition and promotes innovation, ensuring that bidders are selected solely on the basis of price, quality and capacity to innovate.

At Siemens, Collective Action encompasses project-specific and sector-wide methods as well as long-term initiatives. Long-term initiatives, which constitute the final driver, are particularly effective in countries with a higher risk of corruption, as they pave the way for establishing a true anti-corruption culture. Collaboration between government, commercial companies and society in the fight against corruption helps to raise awareness among politicians and the general public.

An example of a long-term initiative is the Turkish non-profit organization, Ethics and Reputation Society (TEID). TEID aims to develop and encourage compliance with defined business ethics principles and disseminate them to Turkish businesses through its member companies. TEID aspires to cooperate closely with public authorities with regards to legislation to ensure that companies can conduct clean business in compliance with defined business ethics principles and legislation and, at the same time, stay competitive. Siemens is one of the 10 founding members of TEID, which was launched in May 2011. The organization now has more than 50 corporate members.

Integrity Pacts are an example of a project-specific method. Developed by the non-governmental organization Transparency International, they are intended to guarantee transparency in the order-awarding process and to rule out bribery in the awarding of public sector contracts.

Transparency International Bulgaria aims to test the integration of Integrity Pacts in the tender procedures of several government ministries. The project’s key objective is to enhance integrity standards and transparency in the awarding of contracts with significant public interest through policy change in Bulgaria. The project achieves this by analysing the legal framework, adapting the concept of Integrity Pacts to the Bulgarian context, promoting the Integrity Pact concept and organizing working meetings and public discussions with representatives from the private sector and public administration. Two Integrity Pacts have been signed with the Ministry of Health and the Ministry of Labour and Science Policy, and a memorandum of understanding has been signed with the Ministry of Development and Public Works. The Siemens Integrity Initiative funds this project.

Since 2009, the US\$ 100 million Siemens Integrity Initiative has played a leading role in expanding Collective Action. The initiative is part of a comprehensive settlement that was announced by the World Bank Group and Siemens on 2 July 2009. As part of the settlement, Siemens agreed to

cooperate in changing industry practices and cleaning up procurement practices, as well as to engage in Collective Action with the World Bank Group to fight fraud and corruption.

The Siemens Integrity Initiative supports organizations and projects that fight corruption and fraud through Collective Action, as well as education and training that achieve its main objective of creating fair market conditions for all market participants. The initiative focuses on projects that have a clear impact on the business environments, business sectors and countries in which Siemens is active; projects that can demonstrate objective and measurable results; and projects that have the potential to be scaled up and replicated.

To attract a wide range of proposals, the Siemens Integrity Initiative launched a global call for expressions of interest in 2009, for which it received overwhelming feedback. After thorough due diligence and presenting a shortlist to the World Bank Group, more than 30 projects from over 20 countries were selected for funding in the first round. They represented a balanced portfolio and are distributed across all regions of the world with a focus on high-growth markets and higher-risk markets from a corruption point of view. They will receive overall funding of up to US\$ 40 million. A global project management system was established to support the implementation of the projects.

Collective Action helps to create fair market conditions for all market players, thereby making clean business possible throughout the world. Although the idea behind this is simple, its implementation is often highly complex and challenging. Siemens' compliance efforts extend beyond the boundaries of the company and its direct business relationships. Within Siemens' wider sphere of influence, there is engagement with various multistakeholder and cross-sectoral initiatives that aim at jointly combating corruption in markets in which it does business. It is thus Collective Action, bringing a singular voice on the issue, which makes inroads to improving the relations between the public and private sector to eliminate corruption.

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# Catastrophic Risk Practice 1



## A “one-stop-shop” for post-tsunami relief

### Expertise

Lilianne Fan, Research Fellow, Humanitarian Policy Group, Overseas Development Institute, United Kingdom

### Summary

Following the devastating 2004 Indian Ocean tsunami, Indonesia exemplified resilience setting up a “one-stop-shop” to lead all the recovery and reconstruction efforts in Aceh Province.

### Experience

On 26 December 2004 an underwater earthquake off the western coast of Indonesia triggered a devastating tsunami affecting the coastlines along the Indian Ocean. Aceh Province in Indonesia was severely affected with over 126,000 lives lost and more than 93,000 people declared missing; 500,000 people lost their homes.

The relief effort received an unprecedented amount of international assistance through funds from donors, non-governmental organizations, and the public and through support from foreign militaries. The existing government and institutional frameworks were not adequate to coordinate an effective response to a disaster of that scale. There was a serious problem in allocating the significant funds effectively and providing a high level of accountability over the use of the funds. In addition, there was an armed conflict in the area mostly affected by the tsunami, whereby Aceh was under civil emergency and martial law.

The Government of Indonesia set up a central level government agency, the Rehabilitation and Reconstruction Agency (BRR), to take the lead, oversee and coordinate all of the recovery and reconstruction efforts in Aceh Province. It was a single agency that would be a “one-stop shop” that would interact with the all the relief effort stakeholders involved and ensure, as much as possible, that efforts were not duplicated.

After the tsunami, three months were spent defining the mandate, empowerment, and the management model for the agency before its initiation. The agency was directly under the authority of the current President of Indonesia, Susilo Bambang Yudhoyono, and led by a capable team, headed by Kuntoro Mangkusubroto, former Minister for Mining and Energy.

Three key aspects of the BRR’s approach significantly contributed to Aceh Province’s resilience:

1. BRR was set up as a pragmatic, task-focused agency with a clear vision for recovery. The culture within the agency was focused on the issues and crisis at hand, aiming to stay politically neutral. It established a target-driven recovery and reconstruction plan, using methods from the private sector, which were innovative from previous governmental agency methods.

The targets, linked to the vision, were the primary drivers in the agency. The BRR enforced this through monitoring teams on the ground and keeping track of every project within a central database so that the tangible contribution to the targets could be measured. This enabled BRR to identify gaps in the relief efforts, analyse how effective the projects were, and provide transparency to donors on the effective use of funds.

2. BRR employed a decentralized management model organized into multiple geographical sectors. The BRR headquarters were located in the local area, Banda Aceh. BRR co-ordinated the regional projects and acted as a clearinghouse for projects. This regional approach enabled the agency to be community focused and listen to the views of the local communities to bring sustainable outcomes.

3. The organizational and management model aimed to have flexibility to respond the community’s needs and the changing nature of the crisis. As a result, the management model was continually reassessed and the organizational model was redesigned at least once every year. This enabled the agency to focus on the crisis at hand.

BRR has influenced practices nationally and in the wider Association of Southeast Asian Nations (ASEAN) region. Because of government secondments into ASEAN countries and because many BRR employees now work for the Indonesian government, BRR has helped to transfer these practices and help others learn from the experiences.

## Objective

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- To recover, reconstruct, and rehabilitate Aceh Province after the 2004 Indian Ocean earthquake and tsunami

## Main challenges

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- Unprecedented amount of international assistance
- Inadequate existing government and institutional frameworks
- Providing a high level of accountability for the funds
- Armed conflict in the area affected by the tsunami

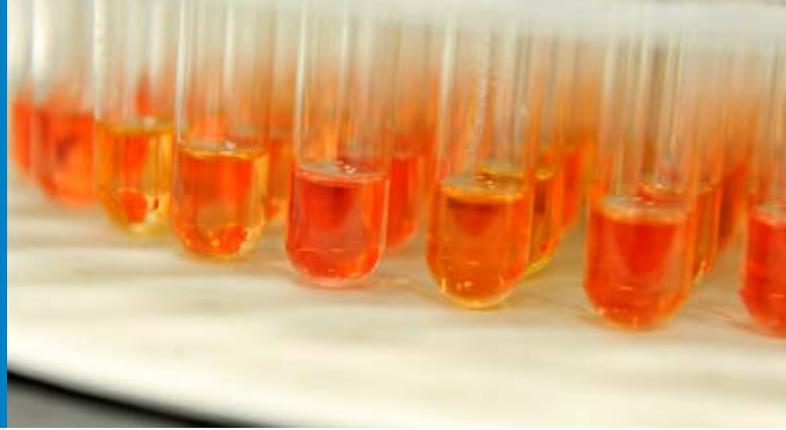
## Main lessons learned

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- Using a task-focused agency with a clear vision for recovery
- Employing local centres to address the needs of the communities
- Having flexibility in the organization to change in light of the evolving nature of the disaster

# Catastrophic Risk

## Practice 2



### Expertise

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Bill Helming, Managing Director, PricewaterhouseCoopers

### Challenging flu vaccine production assumptions to afford access to all

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### Summary

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In an ever-changing world, it is likely that key assumptions underlying a safeguard will ultimately become invalid, and responses to crises based on flawed assumptions will compromise rapid recovery and adaptation. Therefore, processes must exist to monitor and challenge the validity of the assumptions underlying safeguards.

### Experience

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Questioning the underlying assumptions behind pandemic influenza vaccine manufacturing is a continuing part of World Health Organization (WHO) strategies. For example, the 2009 H1N1 pandemic led WHO to challenge the assumption that large multinational pharmaceutical companies could ramp up production fast enough for all affected populations. The pandemic demonstrated that low-income nations would be supplied only after the wealthy nations had ensured adequate coverage for their own populations. As a result of challenging the assumption, a new vaccine-manufacturing scheme was created to enable developing nations to establish domestic vaccine manufacturing capabilities and ultimately to reduce their dependence on wealthier nations.<sup>1</sup>

The output of the microprudential approach and the potential speed of flu vaccine production are both examples of assumptions that needed to be questioned to make financial and health systems more resilient to future crises.

#### Endnote

<sup>1</sup> "Report of the second WHO Consultation on the Global Action Plan for Influenza Vaccines (GAP)". World Health Organization, [http://whqlibdoc.who.int/publications/2012/9789241564410\\_eng.pdf](http://whqlibdoc.who.int/publications/2012/9789241564410_eng.pdf), 2011.

# Catastrophic Risk Practice 3



## Expertise

Sara Pantuliano, Head of Humanitarian Policy Group, Overseas Development Institute, United Kingdom

Co-authored with Eleanor Davey and Joel Kinahan, Overseas Development Institute

## Coordinating Nepal's disaster prevention programme

### Summary

Nepal is exposed to significant risks of natural disasters, from large-scale flooding to earthquakes. The Nepal Risk Reduction Consortium (NRRC) aims to increase disaster resilience through coordinating prevention projects with a range of actors, including humanitarian organizations, bilateral donor agencies, as well as multilateral United Nations agencies.

### Experience

Nepal is one of the most at-risk countries in the world, exposed to a high risk of flooding, landslides and earthquakes. This risk is compounded by negligible disaster preparedness measures, poor search and rescue capacities (there are only three working fire engines in Nepal) and the absence of other disaster vulnerability reduction strategies.

NRRC, established in 2009 by the Government of Nepal with a small group of international organizations, coordinates a range of actors including, humanitarian organizations, bilateral donor agencies, as well as multilateral UN agencies. NRRC's aim is to identify, coordinate and divide work between different agencies, and integrate the process of identifying and combating risk in Nepalese civil society and the Nepalese government.

While there has been a long history of multilateral coordination under schemes such as the Sector Wide Approaches (SWAPs), many initiatives developed under these schemes have tended to be smaller in scope, lack consistent standards of implementation or have been excessively bureaucratic. NRRC pools together a diverse range of more than 40 development and humanitarian international non-governmental organizations (INGOs), seven major UN agencies, official donor agencies, the government, military actors and civil society.

NRRC has identified five programmes to improve disaster resilience: school and hospital safety,<sup>1</sup> emergency preparedness and response,<sup>2</sup> flood management in the Koshi River Basin,<sup>3</sup> community based disaster risk management,<sup>4</sup> and policy/institutional support for disaster risk management.<sup>5</sup>

The five programmes, led by programme working groups, outline the precise cause of vulnerability and establish projects that can address the identified vulnerabilities. Although partners are responsible for individual projects, the implementation is planned collectively by each working group.

NRRC coordination aims to ensure that partner organizations complement, as oppose to compete with, others so that projects are not duplicated. In addition to coordination, NRRC has set minimum quality standards to ensure consistency across the programmes.

It also ensures that the government is involved in each part of the project planning and application by making relevant government ministries responsible for planning, alongside two or three key outside agencies. The intention is that, notwithstanding the relative lack of experience or resource gap of some ministries, by operating in conjunction with skilled agencies they will become more skilled and ultimately self-reliant. The outside partners carefully manage budgeting and evaluation, reducing the risk of corruption.

By taking a holistic approach, NRRC prevents these projects from merely shifting risk from one geographic region or community to another. It additionally provides a clear framework for donors who may choose to fund one programme over another depending on internal priorities, bridging the humanitarian-development-finance divide.

NRRC's strong leadership is evidenced by the wide ranging international financial institutes that support the flagship programme and the support it has received both from INGOs, such as Save the Children, and from the active participation of local NGOs.

There has already been significant progress. A number of hospitals have been successfully retrofitted; an early warning system is operating at many of the 1,000 village councils targeted; and significant progress has been made in dividing responsibility for emergency relief when the next disaster strikes.

The scope, ambition and clarity of focus of NRRRC, as well as a structural mechanism that carefully divides work and provides a space for agencies to apply their knowledge and funding has already led to the successful implementation of resilience strategies. NRRRC's organizational structure could be replicated in other high-risk, less economically developed countries.

### References

Kenny, C. "Disaster risk reduction in developing countries: costs, benefits and institutions". *Disasters*, 2012, 36:559–588. doi: 10.1111/j.1467-7717.2012.01275.x.  
"The Nepal Risk Reduction", NRRRC Secretariat, *Humanitarian Exchange Magazine*, 2012, 53.

### Endnotes

<sup>1</sup> For school and hospital safety, the Asian Development Bank (ADB), Nepalese Ministry of Education, the World Health Organization (WHO) and Ministry of Public Health cooperate to retrofit hospitals and schools and ensure they can withstand earthquake and floods.

<sup>2</sup> For emergency preparedness and response, the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) and the Ministry of Home Affairs aim to enhance Nepal's response capacities and coordinate relief with the military, police and outside humanitarian agencies and actors.

<sup>3</sup> For flood management in the Koshi River Basin, the World Bank and the Ministry of Information are tasked with designing early warning systems that will allow exposed communities to safely evacuate and building water management and flood mitigation structures.

<sup>4</sup> For community-based disaster risk management, the International Federation of the Red Cross and Red Crescent Societies (IFRC) and Ministry of Local Development work with 1000 village-level committees, enhancing the resilience of their villages through a range of tools including better housing and food planning.

<sup>5</sup> For policy/institutional support for disaster risk management, the United Nations Development Programme (UNDP) and Ministry of Home Affairs act together to write institutional, policy and legislative frameworks including building codes that will ensure better building practices and more appropriate city planning.

## Objectives

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- Addressing the chronic risks and increasing resilience to natural disasters in Nepal
- Organizing global and local actors to fund and deliver risk reductions strategies

## Main challenges

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- Lack of comprehensive disaster management and risk reduction planning in Nepal with little coordination
- Poor infrastructure and challenging terrain
- Intersecting chronic risks
- Lack of government resources to pursue disaster mitigation and preparedness or resilience measures

## Main lessons learned

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- Bolstering weak government institutions by bringing skills, knowledge and financing from major agencies
- Adopting a broad alliances among international agencies, government and civil society to prevent further weakening of government bodies
- Adopting a holistic approach to resilience and risk reduction strategies to strengthen resilience across Nepal

# Catastrophic Risk

## Practice 4



### Expertise

Sara Pantuliano, Head of Humanitarian Policy Group, Overseas Development Institute, United Kingdom

Co-authored with Eleanor Davey and Joel Kinahan, Overseas Development Institute

### Disaster recovery planning – businesses supporting employees that support their business

### Summary

Hurricanes and other natural disasters, on top of the immediate casualties and damage inflicted, cause ongoing disruption for businesses and communities. Hurricane Andrew, which struck Florida in August 1992, showed that for businesses to be resilient, they need to ensure their workforce is resilient, either through disaster recovery planning or direct post-disaster support.

### Experience

While the resilience of supply chains and infrastructure is often analysed in disaster recovery planning, little attention is paid to business' vulnerability to the flexibility, size and availability of the workforce after a disaster. Yet, central to a business's ability to recover after a disaster are the employees who can rebuild and restore normal production and service delivery.

The need for a flexible workforce is particularly crucial after a disaster, which can be difficult to achieve for smaller businesses with few employees, as they are less able to redistribute work. Large businesses have more flexibility due to larger workforces, access to better insurance and the use of existing disaster recovery plans. This is rarely the case with smaller businesses, which may lack the resources, capacity or contacts to establish comprehensive disaster risk management plans.

These dynamics were evident in the wake of Hurricane Andrew. Causing an estimated US\$ 48 billion of damage in today's terms, Hurricane Andrew is the fourth most costly hurricane in US history. Over 600,000 businesses and homes were destroyed or severely damaged and 1.4 million people suffered electricity disruption. Even though the

hurricane missed Florida's business districts, the destruction of vast swathes of residential areas meant that the business recovery was slow, taking more than a decade.

Studies found that those businesses whose employees were least vulnerable and who suffered little damage were more likely to recover quickly. In contrast, businesses whose employees were more heavily affected or whose location made it difficult for employees to access the workplace faced higher capital and asset losses and were more likely to fail.

Wasileski et al. (2011), observed three factors that impact workforce flexibility:

- Employees unable to get work
- Employees missing work to attend to personal matters such as damage to residences, injury, family bereavements
- Damage to the owners' or managers' residences

While short-term disruption to labour patterns is expected after a disaster, disasters have an impact on the medium to long term as well, with employees less likely to work extra hours if there are pressing personal issues such as repairing and rebuilding residences. By assisting their employees, businesses can increase the probability of a faster recovery.

After Hurricane Andrew, local businesses, notably the Premium Bank in Baton Rouge, assisted their employees in a variety of ways. The majority of these measures were not planned in advance but invented on an ad hoc basis after the hurricane struck. They included:

- Advancing salaries
- Providing low interest loans
- Acquiring construction material and pooling employees to assist with clean up and reconstruction
- Providing alternative commuting and working arrangements
- Sourcing and distributing emergency food supplies to employees
- Providing trauma counselling

It may seem counter-intuitive for businesses already suffering disaster losses to take on further risk or spend additional capital on behalf of their employees. However, the evidence shows that without the prompt return of employees who are fully committed to restoring the capacities of business, it is likely that companies will face a longer recovery period and may fail altogether. By increasing the resilience of their employees after a disaster, businesses ultimately increase their own resilience and ability to weather catastrophic disaster.

## Main challenges

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- Disasters destroy the social and physical infrastructure upon which both business and employees depend.
- Community and small businesses have generally poor disaster planning and are more vulnerable to post-disaster labour shocks.
- It is difficult to prove why businesses fail after a disaster, as there are a number of factors that coalesce simultaneously.

## Main lessons learned

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- By assisting employees businesses can encourage a quicker return to production and service delivery.
- Flexibility in labour markets dictates the recovery and rehabilitation of local economies.
- Businesses need to understand the range of the vulnerabilities and not simply rely on financial insurance mechanisms to mitigate.

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# Catastrophic Risk Practice 5



## Expertise

Michael Useem, Professor of Management and Director, Center for Leadership and Change, Wharton School, University of Pennsylvania, USA

Additional collaboration and contributions from Herman (Dutch) B. Leonard (Harvard Kennedy School/ Harvard Business School), Victor Meyer (Deutsche Bank), and Larry Knafu (Deutsche Bank)

## The importance of independent assessments over unfolding disasters

### Summary

Timely and reliable information assessments are vital in the midst of a crisis, the very time when data, impartiality and confidence are hard to come by. In the Fukushima Daiichi disaster, Deutsche Bank saw the need to run independent assessments on information gathered from the unfolding crisis when there were questions on the reliability of other sources. With confidence in its crisis assessments, Deutsche Bank was able to make reasoned decisions on the need for evacuation and other crisis issues.

### Experience

On 11 March 2011, the Tōhoku earthquake, the largest in Japanese history (at 9.0 magnitude on the Richter scale) shook much of the country. But, far more devastating was the earthquake's after effect, felt approximately 15 to 20 minutes later.

Just 45 miles off the peninsula of Tōhoku, a 10-foot upward thrust of the seabed caused a catastrophic tsunami that resulted in extensive damage to the Fukushima Daiichi nuclear power plant risking a meltdown that, at the worst case, could have had an impact similar to that experienced in the Ukrainian Chernobyl nuclear disaster. Companies at risk had no real-time information on the rapidly worsening condition in the Fukushima plant's reactors, but the situation seemed to be, at best, highly uncertain.

Deutsche Bank AG (Deutsche Bank), one of the world's largest banks with offices in countries spanning the globe, has a significant presence in Japan, concentrated mainly in

Tokyo where most of its 1,500 staff was located when the disaster struck. Deutsche Bank's Japanese operations were at risk.

Deutsche Bank's crisis efforts were led by its Corporate Security and Business Continuity (CSBC) team. Over the course of the crisis, the team became sceptical of the government regulatory appraisals, information essential to inform crisis management and evacuation decisions.

The unreliability and variability of reports from external sources forced CSBC to quickly gather primary information to establish a set of key risk indicators (KRIs) to carefully monitor for any movement and inform the crisis strategy. This information and trend analysis was used to brief the Deutsche Bank Board on a daily basis.

CSBC drew its own indicators. Were the crews battling to stabilize the stricken plant on-site or had they been evacuated due to excessive radiation levels? How low were the water levels in the reactors and over the fuel rods? What were the forecasts by independent experts?

Information provided by competitors was one source that proved especially valuable. CSBC participated in regular conference calls with counterparts at rival banks where the team learned that public declarations were not always in accord with private actions. While some banks were publicly asserting that they were operating business as usual, CSBC learned that they were covertly evacuating employees out of Tokyo.

Because of the bank's global footprint, CSBC continued this intelligence gathering around the clock. As night fell in Japan, the process continued in Singapore, then Frankfurt, and New York. This enabled Deutsche Bank to obtain and timely use more reliable data to inform decisions.

In the middle of a crisis, reliable and targeted real-time information is essential. Securing this information, which is vital for informing significant crisis decisions, is difficult. Obtaining the information sometimes depends on pre-existing relationships.

In the Japanese earthquake, the media overstated the risks and provoked anxieties while the information released by the government downplayed the risks. Both elicited distrust. It is critical for organizations to provide informed and accurate appraisals of their own for effective crisis management decision-making.

# Catastrophic Risk Practice 6



## Expertise

Niyati Sareen, Corporate Social Responsibility, Hindustan Construction Company, India

Additional contribution by Gagandeep Singh Bedi, Secretary to the Government, Animal Husbandry, Dairying and Fisheries Department, Government of Tamil Nadu, India

## Local community disaster warning

### Summary

Cuddalore District in Southern India established an early warning communication system to provide local communities with warning and preparation procedures for imminent disasters.

### Experience

In catastrophic risk prevention, the ability to generate more reliable forecasts and detect disaster events needs to be combined with effective communication systems that can provide local communities with advanced warning of oncoming disasters, allowing them to make emergency preparations. In Southern India, public address systems in remote local communities have been established to deliver advanced warnings to people at risk.

Cuddalore District lies next to the Bay of Bengal in Southern India, an area prone to extreme events and disasters, such as cyclones, heavy rains, floods and droughts. The district was severely affected during the 2004 Indian Ocean tsunami. More than 500 lives were lost and many villages were destroyed.

The 2004 tsunami was a rare event of extreme severity that allowed only for very small window of opportunity for emergency preparation. This emphasized the need for a timely and effective early warning system particularly in hard to reach locations. In remote communities, experience has shown how challenging it is to set up warning information communication networks.

The recovery and reconstruction programme following the tsunami provided the opportunity to implement such a communication network. The Tamil Nadu Government together with the United Nations Development Programme initiated a project to establish effective Early Warning Systems (EWS) around the coastal areas affected by the tsunami.

Public address systems were installed in 54 vulnerable communities, consisting of speakers, microphones and amplifiers. These systems have back-up power supplies lasting for 48 hours to cope with power shortages common during many disasters. The public address systems are connected through very high frequency radios to the Cuddalore District central control room, where disaster communications are managed.

During the monsoon period, from 1 October to 31 December, a 24-hour manned flood control room is activated. As well as disseminating early warnings, it also operates as an information gathering centre to provide emergency coordinators with up-to-date information.

Easily understood procedures are important to ensure the effectiveness of early warning systems. Cuddalore District developed local disaster contingency plans and mock drill procedures. The mock drills are coordinated every six months to instil commonly understood procedures with the local communities.

Early warning systems can save lives. To be effective they need to reach vulnerable areas, be reliable in disaster situations, and understood by local communities.

# Catastrophic Risk Practice 7



## Expertise

Henry Ristuccia, Global Leader for Governance, Risk and Compliance Services, Deloitte, USA  
Aida Demneri, Director, Risk Services, Deloitte Netherlands

## Managing and mitigating the impact of catastrophic risk

### Summary

#### The nature of catastrophic risk

Companies confront a host of potentially catastrophic risks. These are major risks that could undermine an organization's strategy, its broader mission and, sometimes, the very organization itself. Catastrophic risks are of two principal kinds: those risks and events that can be foreseen to some degree; and those that are beyond control. In both cases, effective strategic thinking, planning and managing can make a difference.

In the wake of the events of 9/11, former US National Security Adviser Zbigniew Brzezinski remarked that the horrible tragedy was the result of a "failure of imagination", not the failure of intelligence. In terms of leadership, his comment has two implications: Management should constantly listen for signals and indications of catastrophic events – from the full array of economic, business and political developments to natural or human-made disasters. Management should challenge the assumptions behind its strategy and operations. Experience is the ultimate teacher, but it can also lull leadership into a false sense of confidence. Management should use imagination to think broadly about the many risks the company faces now and the new risks it may face tomorrow.

## Experience

### Imagining the unimaginable

How can organizations imagine the unimaginable? One avenue is to use a paradigm developed by the disciplines of logic and philosophy – Thesis-Antithesis-Synthesis (TAS).

#### Thesis

Begin with a proposition that captures a life or death reality for an organization. For example, assume that a massive earthquake or tsunami destroys a major warehouse or plant belonging to an Asian vendor in your supply chain, bringing your operations to a halt.

#### Antithesis

What if the assumption is wrong? Say the earthquake or tsunami only incapacitates a particular vendor but has a minor effect on your operations?

#### Synthesis

Create a unified and different approach. Carefully review and examine your supply chain to accurately assess all of your vendors' earthquake and tsunami readiness plans and precautions. If conditions and plans do not meet your standards, either replace that vendor or have procedures in place to contract with an alternate vendor in the event of a disaster.

The most difficult part of the TAS process is the challenge of identifying one's assumptions and making them explicit. For example, you may assume that an earthquake is the only threat to your vendor and believe that the damage will be entirely manageable. But what happens if a tsunami follows soon after and washes your vendor's plant away? This presents a radically different scenario and invalidates the previous assumption.

#### Cultivating a mindset

To develop a keener sense for plausible catastrophic risks and their consequences, organizations should foster the right mindset, not only among senior leaders but also among their workforce at large. They could:

- Develop the ability of their employees to detect emerging or catastrophic risks that have yet to appear on the radar
- Identify potential risks that may present opportunities to discover options or shortcomings that the enterprise may otherwise have missed

- Develop multiple options for any potential catastrophe
- Managing catastrophic risk involves maximizing risk strategy by weighing various options and not limiting the company to one course of action in a given circumstance

### **Planning for and managing a catastrophe**

Because certain catastrophic risks cannot be averted, enterprises must set the right priorities and create appropriate plans to mitigate the effect of catastrophes on their operations. They need a plan for crisis management as well as procedures for making condition-specific, on-the-fly decisions. Following are some suggestions based on recent actual experience.

- Focus on your people. Help them get back on their feet with food, emergency shelter and appropriate communications plans.
- Develop detailed emergency plans. Clearly spell out details and chains of command.
- Plan for different magnitudes and durations. Be prepared to deal with “outages” from as little as two days to up to several months.
- Do not rely on your peoples’ ability to function remotely. They may encounter electricity shortages, no Internet access, etc. Be ready to relocate vital employees.
- Arrange for two alternate data centres. Have one near headquarters; the other farther away.
- Remember the cloud is not a panacea. Your provider’s servers may be down, thereby denying your people access to information systems.
- Understand your interdependencies and supply chain risks, as well as the plans to address them. Understand how the risks impacting your suppliers – including catastrophes – may also impact your enterprise. Learn about suppliers’ recovery plans and factor those into your plans.
- Do not just rebuild. Rethink. Once your organization has recovered from a disaster, consider alternate locations and plans. Fix more than the structural damage.

### **Conclusion**

Managing catastrophic risk begins with a strong risk management culture – one that is embedded in the strategy of the organization and for which senior leadership is responsible. Only educated imagination, effective planning and appropriate crisis management can enable a company to deal with the worst of situations. The investment pays off when the unimaginable occurs.

# Catastrophic Risk Practice 8



## Expertise

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Edward Simmons, Project Manager, Risk Response Network (on secondment from PricewaterhouseCoopers), World Economic Forum

## Open research centres to tackle developing world diseases

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### Summary

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Developing countries suffer disproportionately from the effects of rare and tropical diseases. To combat these diseases, GlaxoSmithKline (GSK), set up a dedicated research and development centre at its Tres Cantos facilities in Madrid, Spain. The centre provides grants to academic researchers, allows use of the GSK facilities, and enables researchers to work in an open environment.

### Experience

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Developing countries suffer disproportionately from the effects of rare and tropical diseases such as tuberculosis and malaria. These are life-threatening diseases, or can cause permanent disabilities or debilitation. In areas of poverty, there are significant challenges in providing successful treatments due to expense, availability, and antibiotic resistance. The development of new medicines globally is isolated and disconnected, one reason for slow progress.<sup>1</sup>

In 2010, GSK set up its Tres Cantos research and development centre focused on medicines for combating diseases in the developing world.<sup>2</sup> The Tres Cantos Open Lab provides grants to academic researchers, and use of GSK resources. Researchers can use the GSK facilities, processes, expertise and scalability. Additionally, GSK helps researchers with mentors.

Tres Cantos encourages researchers to work in an open environment and to share ideas and findings. This arrangement drives collaborative innovation. Tres Cantos has funded and supported many project focused on diseases, including tuberculosis, malaria and chagas.

Private sector pharmaceuticals have opportunities to collaborate closely with academic institutions to provide resources to tackle developing world diseases, and encourage open environments for researcher to efficiently develop new medicines.

### Endnotes

<sup>1</sup> [http://www.eurekalert.org/pub\\_releases/2013-01/wcmc-wca011013.php](http://www.eurekalert.org/pub_releases/2013-01/wcmc-wca011013.php).

<sup>2</sup> <http://www.openlabfoundation.org/>.

# Catastrophic Risk Practice 9



## Expertise

Michael Useem, Professor of Management and Director, Center for Leadership and Change, Wharton School, University of Pennsylvania, USA

Additional collaboration and contributions from Herman (Dutch) B. Leonard (Harvard Kennedy School/ Harvard Business School), Victor Meyer (Deutsche Bank), and Larry Knafu (Deutsche Bank).

## Oversight and local action in the Fukushima Daiichi disaster

### Summary

In global organizations, local crises can have extensive repercussions on global operations but require significant management decisions to be made at the local level. Organizations need to strike a balance between global oversight and local action. In the Fukushima Daiichi disaster, Deutsche Bank was able to delegate decisions to Japanese risk managers while having oversight from senior management boards.

### Experience

On 11 March 2011, Japan suffered the largest earthquake in its history, the Tōhoku earthquake, shortly followed by a devastating tsunami that resulted in substantial damage to the Fukushima Daiichi nuclear power plant. Concerns at the time were that, in the worst case, it could have effects similar to the Ukrainian Chernobyl nuclear disaster. The effects could be catastrophic and could seriously affect the region, including cities such as Tokyo.

Deutsche Bank has a significant presence in Japan, particularly in Tokyo, where most of its 1,500 staff was located when the disaster struck. It had to respond quickly to the crisis for the safety of its employees and its operations. Companies at risk, such as Deutsche Bank, had no real-time information on the rapidly worsening condition in the Fukushima plant's reactors, but the situation seemed to be, at best, highly uncertain.

Deutsche Bank's crisis efforts were led by its global Corporate Security and Business Continuity (CSBC) team. Although the bank is headquartered in Frankfurt, CSBC decided to devolve as much of the crisis decision-making as possible to management in the local region.

CSBC depended heavily on the local CEO and COO, who held formal roles as crisis managers in the bank's Crisis Management organization, plus various other key local personnel reported directly into CSBC.

CSBC built a risk team in Japan, who could assist locally and stage a rescue within one hour if necessary. The local network worked because local managers were better positioned to appraise the risks on the ground. It was their own operations that would be affected, as well as their own health and safety. They had the greatest stake in making optimal decisions.

Because this was a crisis with global consequences for Deutsche Bank, strategic oversight from headquarters was required, but the tactical-level crisis management was run from Tokyo. Despite some advantages of a fully local approach, central oversight could provide support and, as fatigue set in, the local decisions could be given independent oversight.

The Japanese government appeared to be downplaying the crisis and its direction, suggesting that the power plant was under control while other factors suggested the contrary. The central oversight helped to temper possibilities of local patriotic stoicism and inaccurate assessment of the situation.

During the crisis expatriates and foreign employees on business travel were given the choice to evacuate. For local staff contingencies were considered for a full evacuation. In all, 100 bank employees were moved offshore.

A final lesson of the Fukushima plant experience for Deutsche Bank was global dependency. Though the bank is headquartered in Germany, an earthquake on the other side of the globe sent Deutsche Bank senior management and the CSBC team into crisis mode for more than one month.

In the future, the bank's footprint may be more extensive, including more offshore staff and satellite operations that would make the bank more vulnerable to disruption. It is important to obtain the right balance between central, independent oversight and local, responsive tactical decision-making.

# Catastrophic Risk Practice 10



## Expertise

Aasim Siddiqui, Founder and Trustee, Organization for Social Development Initiatives (OSDI), Pakistan

## Pakistan food security in flood catastrophes

### Summary

Sindh Province in Pakistan suffered from widespread destruction and displacement after the 2010 Pakistan floods. For communities to remain resilient against future floodwaters, the Organization for Social Development Initiatives (OSDI) provide integrated community projects to rebuild robust housing, establish self-sufficient and income-generating farming, set up health clinics, and ensure reliable water supplies. The integrated projects allow communities to be healthier, less burdened with debt, and with a breadth of farming knowledge enabling them to be resilient in future catastrophes.

### Experience

After the countrywide floods in 2010 that caused extensive devastation and displacement, national and international stakeholders in Pakistan launched immediate relief and rehabilitation initiatives. OSDI was involved in livelihood assistance and community development projects in 11 villages in the Province of Sindh.

OSDI has a long-term approach to poverty alleviation that aims to empower rural communities through increased economic activities and greater access to services. The urgent nature of the catastrophe in OSDI's focus villages necessitated immediate relief activities such as setting up medical camps, providing food rations, and reconstructing damaged houses applying Disaster Risk Reduction (DRR) principles. However, as the adversity unfolded it was evident that a more sustainable and integrated strategy for risk management had to be incorporated in OSDI's overall model for poverty alleviation.

In light of recurring floods and excessive rains that damage crops each season, OSDI initiated its Food Security Programme in all its focus villages to provide a safety net against socio-economic shocks that render rural communities vulnerable to unpredictable incomes, poor health and hunger.

Under the programme, the following integrated initiatives were aimed at improving income in a sustainable way so as to ensure asset creation and savings:

1. Providing vital skills to vulnerable communities in rearing livestock animals to provide meat and dairy and income generation
2. Enabling self-sufficiency through kitchen gardens and vegetable cultivation to decrease household expenditure, provide income streams and encourage more nutritious dietary intake
3. Offering finance facilities for communities to buy the basic tools and assets to establish self-sustainable farming
4. Alleviating water poverty by facilitating access to water for irrigation of crops and providing water purification tablets for safe consumption
5. Providing access to crop, livestock and health insurance

Projects are designed to provide multiple layers of social protection against crises such as natural disasters, crop failure and loss of employment. This ensures that rural communities are better equipped to manage disasters with their available pool of assets and insurance.

An example of a successful project that incorporated long-term security and risk management under the programme is the Kitchen Gardens Programme, which gives households seeds and fertilizer to grow seasonal vegetables. These vegetables help provide balanced nutritious diets intake and incomes. The trickle-down effects were seen when neighbouring households started cultivating their own kitchen gardens after observing OSDI's focus families implementing the project. The benefits of this approach will extend to the entire community through the multiplier effect.

The Food Security Programme is applied at the village level. Once the village is foreseeably food secure for the next year, OSDI can exit its projects from a village. This is also dependent on other objectives of sustainable income, asset protection, and access to healthcare, education, clean drinking water and sanitation. Together these indicators complement each other to achieve the overall aim of sustainable poverty alleviation. With this approach, OSDI ensures that communities are better equipped with the resources and skills needed to deal with disasters and are able to mitigate shocks to their income and assets.

# Catastrophic Risk Practice 11



## Expertise

Edward Simmons, Project Manager, Risk Response Network (on secondment from PricewaterhouseCoopers), World Economic Forum

## Pandemic data sharing with the Chinese H7N9 virus

### Summary

The 2013 H7N9 influenza outbreak in China highlighted the importance of transparency to avoid and contain pandemics. The EpiFlu database, core to the response efforts, shared viral and clinical information aiming to improve understanding of the transmission and severity of the virus and informing actions to prevent further contagion.

### Experience

On 31 March 2013, Chinese officials confirmed cases of a new strain of avian flu, H7N9, causing concerns worldwide that this outbreak could become a pandemic. Transparency through sharing viral genome and clinical information with leading experts globally was vital to ensuring a fast response and containing the outbreak.

The strain, likely originated from diseases found in ducks, geese and other birds, caused severe pneumonia in humans. Over the following month at least 100 people were confirmed to have been infected, and about 25% of the cases resulted in death. Cases were concentrated around Shanghai and the east coast of China, reaching as far as Taiwan.

Unlike previous avian flu outbreaks, this new strain causes no serious symptoms in birds, which makes it extremely difficult to contain in animals. "This means stopping animal-to-human transmission is impossible," noted Masato Tashiro from the Influenza Virus Research Center in Tokyo.<sup>1</sup>

As yet, there is no evidence of human-to-human transmission, a prerequisite for pandemic. However, new cases are appearing without having a close contact with poultry or other birds.

In the H7N9 outbreak, Chinese officials were prompt in disclosing initial cases and the details surrounding them, allowing for nations and international organizations to prepare for contagion, a lesson learned from the 2002 Chinese SARS outbreak.

In addition, the viral genome sequences and clinical data from cases reported were made freely available on the EpiFlu database. As part of the Global Initiative on Sharing All Influenza Data, the EpiFlu database was established in 2006, after the H5N1 pandemic, to better understand the spread of influenza viruses.

The EpiFlu database is used to assess the transmission of the virus, its pathogen properties, and to inform the development of antivirals. As it is difficult to monitor the spread in animals, understanding the spread of H7N9 from human infections is even more important, particularly identifying mutations causing human-to-human infection.

Similar viral genome sequences in human infections indicate human-to-human transmission, and hence require preparation for a pandemic. Responsive and reliable signs of pandemic are vital to prepare properly and contain outbreaks, hence the need for transparency.

### Endnote

<sup>1</sup> <http://www.nature.com/news/urgent-search-for-flu-source-1.12762>.

# Catastrophic Risk Practice 12



## Expertise

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Rodrigo Pérez Mackenna, Minister of Housing and Urbanism of Chile

## Post-Earthquake Reconstruction Programme in Chile

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### Summary

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Practice describing the Post-Earthquake Reconstruction Programme implemented by the Chilean Government, in collaboration with the private sector in an effort to reconstruct the area affected and to build resilience going forward.

### Experience

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In February 2010, an earthquake measuring 8.8 on the Richter scale, followed by a tsunami, struck Chile. The area affected is inhabited by almost 13 million people, 75% of the Chilean population. The earthquake damaged more than 50 cities and 900 towns and rural and coastal communities. More than 200,000 homes were seriously damaged or destroyed. Over 4,000 schools were badly damaged, which meant that more than a million young people were unable to start the school year. In addition, 40 hospitals were damaged – 17 of them were rendered unusable – and public infrastructure was damaged at more than 2,000 locations across Chile. The greatest harm was the death of 799 people and the injury of 500.

The response to the disaster was divided into two phases: emergency and reconstruction. The emergency phase focused on helping those affected, covering basic needs and re-establishing the economy and connectivity. The reconstruction phase focused on providing permanent solutions. The challenge was not only the physical recovery but also social reconstruction for the people affected.

# Catastrophic Risk Practice 13



## Expertise

Sara Pantuliano, Head of Humanitarian Policy Group, Overseas Development Institute, United Kingdom

Co-authored with Eleanor Davey and Joel Kinahan, Overseas Development Institute

## Pre-disaster planning using statistical and econometric models

### Summary

In an era of limited funding for disaster preparation and mitigation, an econometric approach to measuring and predicting global and local vulnerabilities can enable efficient deployment of resources.

### Experience

Predicting disasters and identifying vulnerabilities are complex tasks that demand synthesizing qualitative and quantitative data. Catastrophes are rarely caused by environmental factors alone. Any model that predicts risk must successfully combine social, economic and political conditions with environmental threats.

Various methodological approaches can aid planners and governments. The United Kingdom Department of International Development's Risk to Resilience agenda has been applied to Gujarat in India by constructing a Vulnerabilities and Capacities Index (VCI) that assesses which communities and individuals in Gujarat are most vulnerable and the nature of their vulnerabilities. While much cost-benefit analysis regarding identifying at risk infrastructure and the importance of creating state emergency funds has focused on macroeconomic measures, the VCI addresses the manner in which vulnerability is socially constructed and depends on individual traits.

The VCI divides vulnerability into three subsets: material, institutional and attitudinal. These subsets are broken down further, scoring individuals and communities on 12 indicators, ranging from education, assets, probability of exposure and social networks. Every positive attribute that increases resilience is subtracted from those conditions that increase vulnerability, tallying to produce a score in which 100 is the most vulnerable and 0 is the most impervious to risk. In Gujarat, for instance, institutional vulnerabilities including the underlying infrastructure are very heavily weighted, meaning that those who do not have access to electricity, roads and well-built dwellings will score highly on the vulnerability index. The index is thus able to assist planners to mitigate the effects of a catastrophic event by identifying the chief drivers of vulnerability and analysing who is most in need once a disaster has hit.

The key challenge for practitioners is making these indexes relevant to their own contexts, something the VCI addresses by creating an adaptable data modelling system. Different contexts will demand slightly different grading schemes but vulnerability indexes and the statistical modelling of vulnerability and disasters preparedness can guide practitioners as to where resources are most needed and where disasters are likely to have the greatest impact on affected populations.

Gathering data for the VCI modelling depends on a combination of making educated estimates as well as using data that is already present or available through surveys. In Gujarat, practitioners used existing measures such as census data, the location of villages relative to infrastructure and the main income source or industry of those villages, alongside participatory rural appraisals and surveys conducted through community based organizations and non-governmental organizations that had been trained in data collection and analysis. In Gujarat, the fieldwork was conducted by two researchers to increase objectivity. They then designed a village or community VCI that would be compared against other VCIs across Gujarat. The simplicity of the VCI enabled local staff without any formal data gathering qualifications to be trained as fieldworkers. Social ties, which are more difficult to gauge than fungible assets, were deduced by looking at the ethnic and caste make up in Gujarat.

Different vulnerabilities emerged in different geographical areas, allowing practitioners to target specific causes of vulnerability. The initial application of the VCI revealed that vulnerability funding was being poorly targeted, with those in coastal villages who had measured higher on the VCI being neglected in favour of more secure inland cities. The VCI was also able to differentiate between the different types of vulnerability each community faced, showing that certain villages, while being at greater risk of disaster, were less vulnerable due to diversified income streams and stronger familial ties. By mapping vulnerability, NGOs and the local government in Gujarat have been able to spatially and sectorally identify areas of high risk and fund specific strategies such as targeted flood relief as opposed to general flood relief. The value of the VCI is evidenced by its adoption into the state's disaster risk reduction strategy, although the effectiveness of the resulting programmes remains to be tested.

The key challenge for practitioners is making these indexes relevant to their own contexts, something the VCI addresses by creating an adaptable data modelling system. Different contexts will demand slightly different grading schemes but vulnerability indexes and the statistical modelling of vulnerability and disasters preparedness can guide practitioners as to where resources are most needed and where disasters are likely to have the greatest impact on affected populations.

# Catastrophic Risk Practice 14



## Expertise

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Anthony Ho, Engagement Manager,  
PricewaterhouseCoopers

## Public-private co-funding to encourage long-term flu vaccine investments

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## Summary

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To foster resilience, safeguards should strike a balance between protecting society from risk, such as by enhancing the ability to recover from crises, and enabling society to benefit from risk-taking. This can often best be achieved by using incentives when feasible rather than restricting or directing activities. In particular, funding set-ups in the production of long-term flu vaccines can encourage private investment.

## Experience

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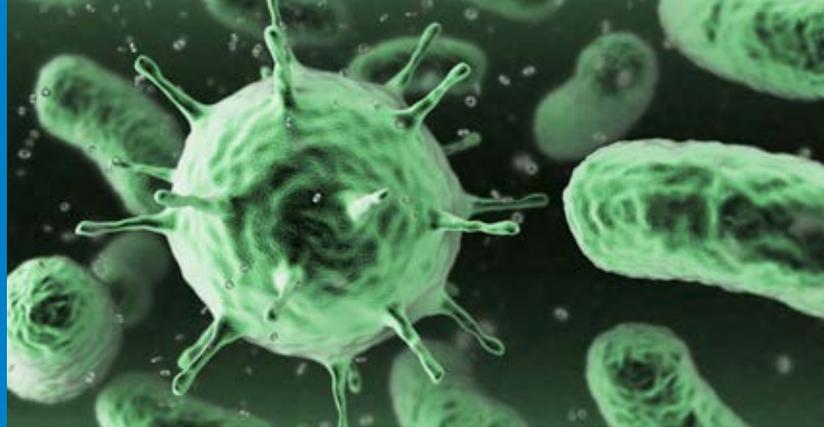
Separate funding from the US government increased economic incentives for the pharmaceutical firm Novartis<sup>1</sup> to make additional long-term investments in seasonal influenza vaccine programmes. Without this government support, the private sector alone lacks clear incentives to make such long-term investments. This funding initiative provided a cost-effective means to ensure domestic vaccine production capacity in the event of a pandemic flu outbreak, and it provided mutual benefits to both the US government and Novartis.<sup>2</sup> The action to adjust incentives – through providing economic incentives to invest in vaccine production – increased resilience without the need for restricting or directing activities.

### Endnotes

<sup>1</sup> “HHS creates new centers to develop, manufacture medical countermeasures”. US Department of Health & Human Services, <http://www.hhs.gov/news/press/2012pres/06/20120618a.html>, 2012.

<sup>2</sup> *Reengineering the Influenza Vaccine Production Enterprise to Meet the Challenges of Pandemic Influenza*. August 2010. Washington DC: Executive Office of the President, President’s Council of Advisors on Science and Technology, <http://www.whitehouse.gov/sites/default/files/microsites/ostp/PCAST-Influenza-Vaccinology-Report.pdf>.

# Catastrophic Risk Practice 15



## Expertise

Michael Useem, Professor of Management and Director, Center for Leadership and Change, Wharton School, University of Pennsylvania, USA

Additional collaboration and contributions from Herman (Dutch) B. Leonard (Harvard Kennedy School/ Harvard Business School), Victor Meyer (Deutsche Bank), and Larry Knafu (Deutsche Bank)

## Real-to-life crisis training

### Summary

Deutsche Bank has built an extensive crisis management training programme that puts risk managers in real-to-life mock crises, with high pressure and incomplete information. Using as realistic as possible training situations, risk managers improve their ability to make improvised decisions, which are essential to manage effectively in a crisis.

### Experience

Deutsche Bank is one of the world's largest banks with offices in more than 70 countries around the world. The largest financial institution incorporated in Europe, the bank employs more than 100,000 people. In 2010, Deutsche Bank generated US\$ 43 billion in annual revenue, ranking just behind Citigroup Inc. and ahead of HSBC Holdings.

Deutsche Bank, through its global Corporate Security and Business Continuity (CSBC) team, has built an extensive crisis management training programme that aims to ingrain crisis response actions into the firm's DNA, not only for operational events such as natural disasters, but also for financial risks. CSBC focuses on countries where the sovereign risk rating is weakest, natural disasters most frequent, or where the headcount is largest.

Exercises are incorporated into the Risk Division's flagship development programme for managing directors, the International Center for Risk Management. Crisis management exercise components are designed to assess candidates' ability to make decisions under pressure and with incomplete information. Candidates participate in two-day crisis simulations, where they formulate responses to major crises, such as a pandemic or a hurricane passing

in close proximity to a major city. Senior observers from external companies and service providers are included to enhance realism.

To prioritize delivery of the crisis management exercises by location, the company has created a three-tier training regimen. Tier 1, the most critical, consists of operations with significant annual revenues, an extensive workforce, or based in a location with a high country risk rating. Tier 1 operations are required to undergo an annual crisis management exercise and train their most critical employees in catastrophic risk response.

Tiers 2 and 3 are at lower critical levels. Tier 2 operations are required to conduct the exercise every other year and train critical employees. Operations in Tier 3, the least critical, do not conduct the simulation but are required to provide the training.

Deutsche Bank mounted 26 major crisis management exercises worldwide in 2011, with simulations entailing responses to crises such as financial collapse, cyber attack, flu pandemic, fibre optic break, and terrorist assault.

Deutsche Bank built the company's crisis management training programme on several premises that had emerged from recent company experience. Specific plans are of less use than an ability to develop an impromptu plan. While catastrophic risks are increasingly global by virtue of greater degrees of interconnectedness, local response is also vital.

# Catastrophic Risk Practice 16



## Expertise

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Bill Helming, Managing Director, PricewaterhouseCoopers

## Responsive global flu strain tracking

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### Summary

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For a safeguard to strengthen resilience in the face of a dynamic and evolving risk, regulators must look over the horizon to be able to recognize issues early and mobilize quickly to recover from crises. An example of this is the biannual monitoring of flu strains by the World Health Organization (WHO).

### Experience

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Safeguards against pandemic influenza employ forward-looking elements, consistent with the dynamic nature of the risk. Because new strains of flu virus evolve quickly, the WHO's Global Influenza Surveillance and Response System (GISRS)<sup>1</sup> meets twice each year to analyse monitoring data and to project which influenza strains are most likely to infect populations in 6 to 12 months. Based on those projections, suitable strains are recommended for inclusion in the influenza vaccines for each new flu season.

Forward-looking safeguard elements, such as projections in vaccine planning, help to identify areas of emerging risk and enhance resilience by enabling early response to emerging risks.

### Endnotes

<sup>1</sup> Formerly Global Influenza Surveillance Network  
[http://www.who.int/influenza/gisrs\\_laboratory/en/](http://www.who.int/influenza/gisrs_laboratory/en/)

# Catastrophic Risk Practice 17



## Expertise

Sara Pantuliano, Head of Humanitarian Policy Group, Overseas Development Institute, United Kingdom

Co-authored with Eleanor Davey and Joel Kinahan, Overseas Development Institute

## Securing informal settlements in disaster prone areas

### Summary

Ensuring careful reconstruction in informal settlements after a disaster, in conjunction with rehabilitation and relief aid, is essential to improve the resilience in disaster prone areas. The Dominican Republic and Venezuela are contrasting examples of “building back better” in informal settlements.

### Experience

The majority of people most at risk from chronic catastrophic events and disasters reside in informal settlements. The main risk to those residing in informal settlements is loss of life and the destruction of shelter and infrastructure. It is difficult to increase resilience in an informal settlement in preparation for a disaster, but a “build back better” response to a disaster can lead to greater security for those living in such settlements. A comparative analysis of flood-related disasters in informal settlements in Venezuela and the Dominican Republic illustrate the importance of careful reconstruction. There are three features of the “building back better” approach:

1. Adopt a participatory process that is flexible enough to carry the needs of the community and that is capable of adapting future infrastructure to their perceived needs. This process must communicate clearly and explain any zoning or land use strategies to those living in a disaster prone region. In the Dominican Republic the communication strategies employed, while not perfect, allowed communities to understand why certain sites were prohibited. In contrast, poor communication with people displaced by a disaster in Venezuela resulted in many of the survivors returning to rebuild dwellings on unsuitable land.
2. Maintain institutions that will prevent land that is deemed most at risk from re-incorporation back into the informal settlement. The repeated resettlement of at-risk land

is the main reason why informal settlements are so vulnerable to natural disasters. In Venezuela, reluctance to enforce zoning laws has meant that specific informal settlements have to be continually rehabilitated despite the known threats related to building on at-risk land. Not only is this a poor use of resources, but also it can lead to further vulnerability by implicitly legalizing the status of chronically at-risk land to the detriment of investing in more secure sites.

3. Realize tenancy agreements that will result in the residents of informal settlements being willing to invest resources into building more resistant structures. The Venezuela analysis reveals that without the security that tenancy agreements give, householders are reluctant to invest their own resources in more expensive construction materials if they believe the state could move them from their land. Design assistance and subsidized building materials are likely to create an incentive for better disaster adaptation.

These three elements of “building back better” can be applied across informal settlements. In the Dominican Republic, a response based upon incorporating local knowledge and preferences into planning prevented the recreation of the pre-disaster conditions that made the informal settlement vulnerable and has resulted in minimal disruption during subsequent floods. However, the less successful response in Venezuela is likely to lead to repeated losses for the survivors in the future.

The impact of catastrophic disaster can in the short term lead to high levels of suffering and insecurity for the residents of informal settlements, especially as they are likely to face high levels of chronic risks over the long term. Nonetheless, catastrophes provide an opportunity to physically and socially redesign informal settlements that should be seized by policy-makers and planners if meaningful resilience is to be realized.

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# Catastrophic Risk Practice 18



## Expertise

Satoru Nishikawa, Director General of Audit, Japan Water Agency, Japan

## “The Day before the Disaster Struck” education programmes

### Summary

Disaster prevention educational programmes with real human elements and scalability can encourage personal responsibility for preventative action, increasing disaster resilience on a wide scale. In Japan, an educational initiative, named the Ichi-Nichi-Mae (the Day before the Disaster Struck) project, highlights personal stories of real people seriously affected by natural disasters, recounting what they would do differently if they could return to the day before the disaster.

### Experience

Japan faces many natural disaster risks such as large-scale earthquakes, tsunamis and floods caused by torrential storms. Much has been done to protect its people and minimize losses, including the Disaster Countermeasures Basic Act (1961), which introduced various disaster reduction measures from flood control works to anti-seismic building codes.

Raising public awareness around preventative action is a main pillar of disaster reduction policy in Japan. Japanese educational programmes have primarily targeted children, and have not been taken seriously by adults. As a result, there is a growing concern that adults, especially working men and women, are ill prepared for natural disasters.

In response, an educational initiative for adults was established in 2005, called the Ichi-Nichi-Mae (the Day before the Disaster Struck) project. It aims to highlight, through local disaster reduction workshops, personal stories by real people, who have been seriously affected by natural disasters, on what they would do differently if they could return to the day before the disaster.

The project provides guidance, free of charge, for download on Japan’s Cabinet Office Disaster Management website, for local governments and media organizations. The guidance contains advice for interviewing, story development, and how to run the disaster reduction workshops. It encourages organizers to carry out interviews with a cross-section of people affected, and over a wide variety of disaster risk reduction activities.

The stories with the most impact are selected for use in the seminars. Stories can be also used as short articles in community papers and for use in schools and adult education centres.

This project has been taken up by local prefectures, companies and mass media organizations. As of March 2012, a total of 546 stories have been collected and posted on the Cabinet Office Disaster Management website, covering 10 earthquakes, 14 torrential storms and typhoons, and two volcanic eruptions.

At disaster awareness seminars, the project instils urgency among participants to take preventative action. Given the human element to these stories, participants find characters resembling themselves, which makes the stories very real.

Self-preparedness is vital to resilience against natural disasters. Individuals must take responsibility for their self-preparedness and education campaigns are one of the main means to encourage responsibility.

“Ichi-Nichi-Mae” is an example of a successful, cost-effective education project that can be scaled up. Disaster prevention educational programmes with real human elements and scalability can encourage personal responsibility for preventative action, increasing disaster resilience on a wide scale.

### Objective

- To instil a sense of personal responsibility for preventative action against natural disasters

### Main challenges

- Editing the personal stories into a short, interesting format
- Being objective in selecting the most appropriate stories
- Obtaining the right information from interviews, particularly when covering significantly affecting, personal stories
- Recognizing that Japanese educational programmes have primarily targeted children and have not been taken seriously by adults

### Main lessons learned

- Educational programmes benefit from having human stories that resonate with the audience.
- Local communities can run their own educational programmes using central guidance and the programmes can be scalable.
- Personal story sharing could be used for other industries that deal with crises.

# Catastrophic Risk Practice 19



## Expertise

Edward Simmons, Project Manager, Risk Response Network (on secondment from PricewaterhouseCoopers), World Economic Forum

## Working together to create new drugs for bad bugs

### Summary

Collaborative laboratories among competing pharmaceutical companies and public-private partnerships can help tackle the future antibiotics shortages. In July 2012, Europe set up an antibiotics research programme, NewDrugs4BadBugs, funded jointly by the public and private sectors.

### Experience

Due to the misuse of antibiotics and a lack of incentives for pharmaceutical companies to develop the next generation of antibiotic drugs, there is a significant risk that future antibiotic supply will not be able to meet global needs.

Antibiotic overuse has encouraged a surge in antibiotic resistant bacteria, such as the hospital-acquired infection, methicillin-resistant staphylococcus aureus. Antibiotics require significant development costs for minimal profits in the pharmaceutical sector. It can cost more than US\$ 1 billion and over 10 years in development time to launch successful medical drugs.

Public-private financing partnerships can create the right incentives for investment into developing antibiotic drugs. An example of this in practice is the establishment in July 2012, of a €224 million European antibiotics research programme, NewDrugs4BadBugs, funded jointly by the public and private sectors. The investment has been provided with €115 million from the European Commission, via the Innovative Medicines Initiative (IMI), and in-kind contributions from pharmaceutical companies, including AstraZeneca, GlaxoSmithKline, Janssen, Sanofi and Basilea Pharmaceutica.

NewDrugs4BadBugs aims to advance research on new antibiotics, encourage development of pipeline antibiotics and increase the efficiency of clinical trials.

NewDrugs4BadBugs will establish an information hub to enable the sharing of knowledge and data among pharmaceutical companies to create efficiencies and speed up drug development time. The programme will

share results from clinical trials and their approaches. This information sharing helps to avoid duplication of efforts and can provide vital information to advance research.

The low monetary return on investment into antibiotic development does not provide the pharmaceutical industry with incentives to establish antibiotic initiatives above other projects. However, with the additional social return in developing needed antibiotics and potential financial savings across the health system, governments can play an essential co-funding role.

## Does the practice strengthen resilience?

The initiative aims to deliver new antibiotics to improve society's resilience to pandemics and spread of deadly bacteria. Without government funding, there are not the market incentives for private pharmaceuticals to invest into antibiotic development. The government support enables pharmaceuticals to make in-kind contributions that are more attractive to leading pharmaceuticals. Additionally, the collaboration among pharmaceuticals enables information sharing on research breakthroughs and testing procedures to speed up time to market.

## Objectives

- Reducing costs and shortening the development time in bringing effective antibiotics to the marketplace
- Establishing a laboratory jointly-run by leading pharmaceuticals

## Main challenges

- Lack of incentives for pharmaceutical companies to develop the next generation of antibiotics drugs
- Antibiotic overuse
- Fragmented antibiotic development

## Main lessons learned

- Information sharing helps to avoid duplication of efforts and can provide vital information to advance research.
- In-kind contributions can be more attractive to pharmaceuticals.
- Government funding creates incentives for private pharmaceuticals to invest.

# Cyber Risk Practice 1



## Expertise

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Edward Simmons, Project Manager, Risk Response Network (on secondment from PricewaterhouseCoopers), World Economic Forum

## Alerting critical infrastructure to cyberthreats

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### Summary

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Cybersabotage – where cyber viruses infiltrate into the heart of critical infrastructure causing damage and potentially shut down vital services – is emerging as a primary threat in cybersecurity. Given the increase in number and severity of cyberattacks on corporations, it is becoming more imperative that they can respond quickly to emerging threats. Governments should provide alerts of emerging cyberthreats and mitigation strategies for critical infrastructure organizations so they have the right information to defend themselves quickly.

### Experience

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Unfortunately, cyberattacks are now a routine part of doing business. According to one poll, 31% of US CEOs believed that a cyberattack or a major Internet disruption was likely to occur in 2013. CEOs of critical industries that provide vital services fear that a cyberattack would have a negative impact on their businesses, including industries such as banking, power and utilities, and healthcare.

Cyberattacks on critical industries are increasing in number and severity. In the most severe breaches, rather than being a means for cyber espionage, where viruses aim to obtain private information from organizations, cybersabotage is rising fast as a primary concern.

Reports of cybersabotage, where viruses aim to seize control of operating systems and cause major damage, are starting to emerge more frequently and are targeting critical industries. Cybersabotage rose to the top of the cybersecurity agenda in 2009 following the Stuxnet cyberattack on Iranian nuclear facilities where the attack destroyed large parts of the nuclear power station infrastructure.

In early 2013, the US government highlighted emerging viruses that can attack the heart of energy infrastructure causing critical systems to fail. In a worst case, this could lead to power failure on the electricity grids and a prolonged outage could bring hospitals and other vital services to a halt.

Corporations can protect themselves against emerging threats and vulnerabilities with advanced knowledge of nascent attacks and how to mitigate them.

Governments should set up agencies to provide alerts on emerging cyberthreats and mitigation strategies for critical infrastructure organizations. The United States Computer Emergency Readiness Team (US-CERT) has established an Industrial Control Systems arm (ICS-CERT) that looks to increase resilience to cyberthreats through providing such alerts. The agency delivers a feed to critical infrastructure owners and operators that highlights emerging threats and provides actions for mitigation on each identified threat. To obtain vital and timely information on cyberthreats, the agency collaborates with law enforcement agencies, intelligence services, cybersecurity vendors, critical infrastructure and other government agencies.

ICS-CERT has highlighted threats from hacktivist organizations, cybercriminals and individuals ICS-CERT has highlighted threats from hacktivist organizations, cybercriminals and individuals, describing the targets and virus mechanisms they have used. The alerts can be accessed by everyone through the ICS-CERT website, and additionally through RSS and Twitter feeds.

Governments can collaborate with many organizations to gain a fuller picture of cyberthreats. In providing alerts of emerging threats, critical organizations can protect themselves against cyberattacks and avoid the risk of failure in vital services.

# Cyber Risk Practice 2



## Expertise

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Neal Pollard, Director, PricewaterhouseCoopers

## Assign top-level responsibility for cyber resilience

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### Summary

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Resilient cyber strategies should be developed at the board level within each organization to enable effective identification of trends, adaptation to changing business contexts, efficient response to systemic shocks and continuity of business operations.

### Experience

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Many large banks have transferred responsibility for cybersecurity from IT divisions to group security, along with crisis management, and have provided board-level oversight. Fortune 500 corporations have created Chief Information Security Officer positions, not only in their chief information office, but in their general counsel offices, reflecting the need for top-level accountability and the consideration of a variety of key corporate functions: contract review, enterprise risk management, assurance and compliance, human resources and workforce management, and regulatory reporting. These shifts reflect the degree to which cybersecurity decisions involve much more than technology management. They also include risk and liability management.

These trends highlight the importance of strategic perspectives and cross-functional collaboration at the most senior levels. Such collaborative decision-making can guide corporate-wide investments and capabilities – not just technology investments – to anticipate and adapt to emerging trends, respond to shocks and decrease recovery time. These strategies improve corporations' abilities to respond to crisis by marshalling enterprise-wide resources and strengthening collaborative, cross-functional processes.

# Cyber Risk Practice 3



## Expertise

Martin Caddick, Head of BCM Services,  
PricewaterhouseCoopers

## Cyber-crisis arrangements between governments

### Summary

Established arrangements between governments to combat cyberattacks together are critical to respond to cyberthreats quickly and avoid misunderstandings. South Korea, in varying degrees, has engaged with other governments, including China, Japan, and the United States, to establish cyber-crisis communications channels and perform cyberattack testing between governments.

### Experience

Formalized bilateral procedures between governments, which could be used in the event of a cyber crisis, are important to facilitating fast, decisive action and limiting damage from cyberattacks.

In light of this recognition, the United Kingdom held formative talks with China and Russia in 2012 to establish cyber-crisis communication channels.<sup>1</sup> The proposed communication channels could help identify the sources of cyberattacks and limit misunderstanding that may lead to escalation. Such channels are becoming ever more important with the increased ability of cyberattackers to use proxy servers to mask their identities online as “agents of the state”.<sup>2</sup>

South Korea has entered into bilateral cyber-cooperation agreements with other nations, including China, Japan and the United States.<sup>3,4,5</sup> These bilateral agreements include procedures that provide for formal cyber-crisis coordination, realistic bilateral cyberattack testing and the ability to share technical information between government agencies in the event of a cyberattack. Such elements allow for advanced preparation and the ability to share crucial information to identify attack sources and coordinate responses quickly across national borders.

Documented success stories of these strategies are scarce, due in part to the confidentiality surrounding both testing exercises and real cyberattacks. Nonetheless, established formal communication channels between governments in a crisis are crucial to enable quick and clear collaboration to avoid damage and prevent escalation through miscommunication.

### Endnotes

<sup>1</sup> Hopkins, N. “Britain in talks on cybersecurity hotline with China and Russia”. *The Guardian*, 4 October 2012, <http://www.guardian.co.uk/politics/2012/oct/04/britain-cybersecurity-hotline-china-russia>.

<sup>2</sup> “Bilateral Discussions on Cooperation in Cybersecurity”. China Institute of Contemporary International Relations (CICIR) – Center for Strategic and International Studies (CSIS), <http://www.cicir.ac.cn/chinese/newsView.aspx?nid=3878>, 2012.

<sup>3</sup> Ibid.

<sup>4</sup> Soyon, K. “S. Korea, US Discussing Combined Cyber Warfare Drills”. KBS World Radio News, [http://world.kbs.co.kr/english/news/news\\_Po\\_detail.htm?No=93141&id=Po](http://world.kbs.co.kr/english/news/news_Po_detail.htm?No=93141&id=Po), 2012.

<sup>5</sup> “South Korea, US Hold Defense, Foreign Affairs Talks”. US Department of Defense, <http://www.defense.gov/News/NewsArticle.aspx?ID=116749>, 2012.

# Cyber Risk Practice 4



## Expertise

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Neal Pollard, Director, PricewaterhouseCoopers

## Design resilient electronic devices and online systems

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## Summary

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Encryption is a crucial element of resilient information sharing. Design and use of properly encrypted devices and online systems will improve the resilience of information sharing against malicious attacks or simple human error when systems protection fails.

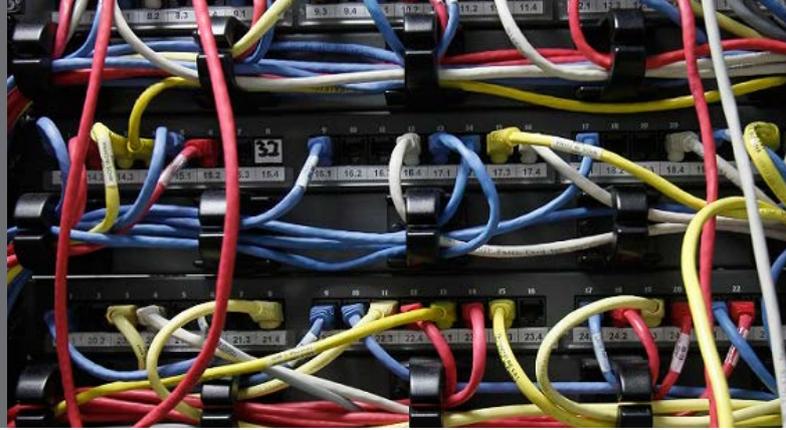
## Experience

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BlackBerry® devices, for example, provide secure, encrypted communication. Apple's latest products include similar security technology. Half of businesses that have outsourced processes over the Internet ensure their data is encrypted. Trusted Platform Modules (TPM) provide both device encryption and device authentication, embedded in the hardware of the device. This assures data protection as well as device authentication even when software-based digital certificates are compromised or forged. TPM chips are used by nearly all personal computer and notebook manufacturers, yet relatively few corporations take advantage of these chips to authenticate devices on corporate networks throughout the enterprise.

Tools such as encrypted communication and enterprise-wide TPM strengthen resilience by protecting data as it moves across systems, irrespective of uneven system security. Such trust infrastructure, crucial for information-sharing resilience, enables enterprises to adapt over successive generations to emerging consumer technology, which can change as rapidly as the next trend in smart phones. It also fosters resilience by ensuring a general level of reliability by minimizing disruptions if one link in the chain fails.

# Cyber Risk Practice 5



## Expertise

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Martin Caddick, Head of BCM Services,  
PricewaterhouseCoopers

## Trusted public-private cyber- knowledge sharing

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### Summary

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Business, organizations and governments face increasing and more threatening cyberattacks that create risks of severe operation disruptions. For critical infrastructure organizations, there can be severe knock-on disruptions across the supply chain and impacts on other industries. Both the Australian and United Kingdom governments are creating trusted networks to share vital information on cyberthreats and defence strategies between the government, industry and cyber experts.

### Experience

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Cyberattacks on large organizations are increasing in sophistication and frequency. In the United Kingdom, 93% of large organizations suffered a cyber breach last year, with each on average being attacked 113 times – rising sharply from the previous year.

Cyberattacks can cripple targeted corporations, and cause disruption across supply chains and in related industries, especially in critical infrastructure. In March 2013, the computer networks of three of the major banking groups in South Korea were paralysed by cyberattacks causing a breakdown in ATM and mobile payment systems. The computer network outage resulted in disruptions in other industries during the attack, including Seoul's "cashless" retail services.

Trusted knowledge sharing between public and private stakeholders improves understanding of and response to cyberthreats that can affect critical infrastructure. For instance, the Australian government has established the Trusted Information Sharing Network (TISN), a network of government representatives, business stakeholders and cyber experts, to address the risks of cyberthreats to critical infrastructure that could severely damage Australia's economy, social systems and national security.

TISN uses the network to increase awareness of cyber risks to critical infrastructure, share strategies to reduce cyber risk, and provide a feedback mechanism to highlight private sector cyber issues to the government. It allows for resilience practices to be shared across supply chains so that there is mutual benefit in avoiding the failure of a key link in the chain. TISN also enables critical infrastructure organizations to improve understanding of risks and provides a platform for responding quickly when cyberthreats materialize.

Many other countries are following suit. In March 2013, the United Kingdom government announced an expansion of the Cyber Security Information Partnership (CSIP) 2012 pilot project. The project allows for the sharing of information about cyberthreats and defence strategies in a secure virtual environment between the government, industry and the intelligence services. Already in the pilot project there have been success stories where companies were able to gain knowledge from other organizations of nascent attacks and protect against them before they were attacked themselves.

Due to the rapidly changing nature of cyberthreats, governments and the private sector need mechanisms to share knowledge in trusted networks so that critical organizations have the latest information to respond quickly and effectively to cyberattacks. Responsiveness to shocks is at the heart of cyber resilience.

### Objective

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- Establish trusted cyber knowledge sharing between government and industry to protect against cyberattacks

### Main challenges

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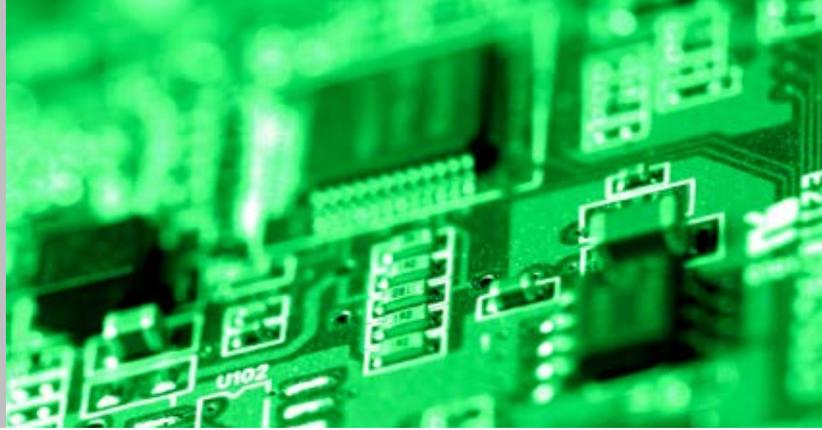
- Information on cyberthreats, compromises and strategies can be sensitive for organizations.
- Critical infrastructure failure can impact other organizations.

### Main lessons learned

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- Cyber information sharing networks need to be trusted and secure.
- Special attention to sharing cyber information must be paid to critical industries and supply chains.
- Public-private partnerships work well as a model for cyber information sharing.

# Supply Chain Risk Practice 1



## Expertise

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Charles Lane, Project Manager, Risk Response Network, World Economic Forum

## Building supply chain resilience through information and data sharing

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### Summary

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To build resilience in supply chains, firms must leverage technologies to create systems that facilitate information and data exchange. Data exchange between businesses can become more efficient and governments can facilitate trade, thus increasing overall competitiveness.

### Experience

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Highly interconnected supply chains have many touch points, each of which have their own set of data. Availability of shared data and information is the number one vulnerability to supply chains based on the World Economic Forum's Supply Chain Risk Radar.

Many firms have a lagging and incomplete view of their supply chains that is caused by the lack of shared data across business and regulation partners. Human error in manual data entry causes productivity and financial loss, which is especially apparent in time-sensitive transactions. This leads to decreased competitiveness.

The cornerstone of IT-based resilience is data and information sharing. Business continuity is enabled through access to real-time data, followed by rapid dissemination of data-driven supply chain fixes. However, information-sharing infrastructures depend on a resilient core network, appropriate communication tools and redundancy. This requires systems that are scalable, secure and re-routable should system failure occur. A key benefit of improved data and information sharing is combining the specificity of business data with the public sector's capability to scale application for systemic benefit.

An example of collaboration on increased availability of shared information is Singapore's TradexChange. TradexChange is a neutral and secure trading platform that facilitates the exchange of information within the trade and

logistics communities. It provides seamless interconnectivity to commercial and regulatory systems by offering a single electronic window for integrated workflow, submissions and enquiries to seaports, airports, maritime authorities, and customs and control agencies.

The single interface to multiple systems consolidates trade information between parties, which leads to faster document processing, reduction of errors and minimized data re-entry. These benefits translate into improved efficiency, lowered business costs and increased global competitiveness across TradexChange's connected network.

Accessing and contributing to available data streams can advance supply chain resilience. Government and industry must access and apply data wisely, and also consider making data available for overall systemic benefit. Configured correctly, intergraded information exchanges such as TradexChange can provide significant resilience gains.

Information sharing is a strategy for achieving cohesion cross-functionally among supply chain members to provide improved accuracy and visibility of global activities. Through streamlined systems and processes, companies are able to share and reuse common data for B2G (business-to-government) and B2B (business-to-business) transactions. The end result is higher productivity and business agility.

### References

TradexChange: <http://www.tradexchange.gov.sg>.

Supply Chain Risk Initiative: <http://www.weforum.org/issues/supply-chain-risk>.

### Main challenges

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- Ability to interconnect pre-existing IT systems
- Data security for sensitive material
- Ability to test IT systems in times of systemic events

### Main lessons learned

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- The cornerstone of IT-based resilience is data and information sharing. Data-sharing infrastructures depend on a resilient core network, appropriate communication tools and an element of redundancy.
- Single interface to multiple systems consolidates the trade of information between parties.
- Benefits include faster document processing, reduction of errors and minimized data re-entry.

# Supply Chain Risk Practice 2



## Expertise

Taylor Wilkerson, Supply Chain Risk and Sustainability Expert, LMI, USA

## Greenhouse gas mitigation over the supply chain

### Summary

For an organization looking to reduce its greenhouse gas (GHG) emissions, it is crucial to develop a mitigation strategy that establishes objectives and aligns supply chain actions with the organizational mitigation objectives.

## Experience

### Challenges

Every ship needs a rudder. Without a strategy, an organization risks inconsistencies and conflicts, which lead to lower confidence in partners, higher programme costs and overall poor results.

Managing greenhouse gas (GHG) emissions in supply chains involves multiple decisions, from the standards for measurement to how to engage partners in achieving reductions. Failing to engage partners in a way that makes them comfortable can make them less likely to participate in mitigation programmes. Decisions made outside an overarching plan result in inconsistent or conflicting actions in the mitigation programme.

### Solution

An effective supply chain, GHG emissions mitigation programme needs a guiding strategy, which should be a dynamic document regularly modified with new information and business priorities.

Before embarking on a mitigation programme, companies need to understand the context of GHG management in their supply chains and the right approach for mitigation. This starts with an understanding of the overarching organizational GHG-management strategy. A well-defined strategy must cover two elements: mitigation objectives and supply chain scope.

Once mitigation objectives are set, the next step is to define the supply chains where the company will mitigate GHG emissions. Defining supply chains involves identifying their scope and products, along with the geographies to be included. These decisions should flow from the mitigation strategy.

Supply chain mitigation analysis can have two basic scopes: cradle-to-grave and cradle-to-gate. A cradle-to-grave approach looks at both ends of a supply chain – upstream, up to raw material extraction, and downstream, all the way through a product's use and disposal. Cradle-to-gate captures a supply chain from raw materials to a specific point in the supply chain, typically is where the product is leaving the company's property.

The scope of a mitigation programme should fit with the company's ability to influence emissions and the scope needed to achieve its objectives. For some organizations, this can mean including only tier one or even a select subset of tier one suppliers in the mitigation programme.

Companies often use a cradle-to-gate approach if they are only interested in the emissions impacts of the materials they buy. In most cases, this means that they are taking a risk management or cost efficiency approach to GHG mitigation. For brand management purposes, a company want to capture the full life cycle down to the customer. This allows it to verify that it is measuring and managing all of its associated GHG emissions.

To decide how far upstream or downstream to manage GHG emissions, companies should consider the practicality of capturing emissions data from partners or customers with which they do not have a direct relationship. In most cases, organizations directly conduct business with their tier one suppliers and customers. However, the most GHG-intensive activities in a supply chain can take place several tiers away from a company's organization, even at the point of its product's use or disposal. However, taking mitigation actions where companies do not have direct control is still possible. This can be accomplished through coordination with tier one suppliers, education and outreach programmes, and other methods.

## Example

The US government is embarking on a programme to manage GHG emissions in its supply chains. The US General Services Administration (GSA) leads this effort, which is based on the sustainability and climate change strategy outlined in President Obama's Executive Order 13514.<sup>1</sup> The President's plan articulates an overall strategy of positioning the federal government as a leader in GHG management. Furthermore, it is intended to serve as an example to the rest of the US economy.

To support this leadership strategy, GSA developed a suggested approach to managing government supply chain emissions. GSA has focused on working with industry to measure and reduce tier one supplier GHG emissions. In its feasibility study, GSA includes defined outreach and training efforts for industry to improve capabilities for accurately measuring GHG emissions. GSA also identifies tools for making reductions.

GSA hopes the programme will support full cradle-to-gate emissions management.<sup>2</sup> It expects suppliers and the government to see cost savings from the programme that would demonstrate leadership through mitigation.

*Article extracted from Climate Change: What you can do now, by LMI, [http://www.lmi.org/Markets/Energy---Environment-\(1\)/Climate-Change-Book.aspx](http://www.lmi.org/Markets/Energy---Environment-(1)/Climate-Change-Book.aspx)*

### Endnotes

<sup>1</sup>The White House, *Executive Order 13514*, "Federal Leadership in Environmental, Energy, and Economic Performance", *Federal Register* Vol. 74, No. 194 (8 October 2009), pp. 52115–52127.

<sup>2</sup>US General Services Administration, *Executive Order 13514 Section 13: Recommendations for Vendor and Contractor Emissions* (April 2010).

# Supply Chain Risk Practice 3



## Expertise

Charles Lane, Project Manager, Risk Response Network, World Economic Forum

## Summary

Governments can help build resilient supply chains through trade, security, investment or other policies that directly or indirectly foster resilience.

## Experience

Regulations, by definition, restrict freedom of action and therefore may reduce the flexibility required for building stronger resilience. Conversely, governments can shape actions to benefit the public through trade, security and investment policies that directly or indirectly affect resilience.

Two key dimensions of resilience are the ability of the policy and institutional framework to (1) cushion the initial impact of systemic disruptions and (2) reduce the persistence of the ensuing output gap. Policy can enable resilience through two main channels: automatic stabilizers that dampen the expected and mainstream impact of shocks; and discretionary policies to remedy less probable but material impacts.

Governments can foster cooperation and marshal resources needed for major responses. Governments should aim for maximum flexibility during times of disruption while providing incentives for resilient behaviour during times of stability. Governments also can act as information brokers; administrations that provide strong information flow are real guardians of resilience.

Singapore is an example of policy resilience in action. It is a logistics hub of choice in Asia owing to its trade-friendly political structures. In 2011, the World Bank listed Singapore as the leader in supply chain performance, with punctuality a key strength. Three factors that distinguish Singapore as the Asian hub of choice stem from the country's dynamic and collaborative approach to trade policy:

1. The dynamics of global trade. Singapore Customs developed five strategies under its Customs 2015 outlook. These strategies explore ways in which Singapore Customs could respond to environmental drivers and respond to new developments.

2. Cross-border collaborative efforts. Singapore Customs has mutual recognition arrangements with Canada, China, Japan and South Korea to strengthen the global supply chain and facilitate legitimate trade.
3. Quick responses to external shocks. Singapore is actively involved in developing international supply chain standards, such as the World Customs Organization Trade Recovery Guidelines and the Asia-Pacific Economic Cooperation area's Trade Recovery Programme.

On 11 April 2012, US Secretary of Homeland Security Janet Napolitano and Singapore's Deputy Prime Minister Teo Chee-Hean signed a joint statement reaffirming the commitment of both countries to strengthening global supply chains to ensure they operate effectively in times of crisis, recover quickly from disruptions and facilitate international trade and travel.

## Does the practice strengthen resilience?

The strength and redundancy of infrastructure are typically strong components of resilience. Extra capacity is usually hard to add quickly. Governments have the ability and responsibility to encourage the development of alternatives to potential choke points. Harmonized policies and regulatory standards can develop such infrastructure and also minimize knock-on effects of disruptions.

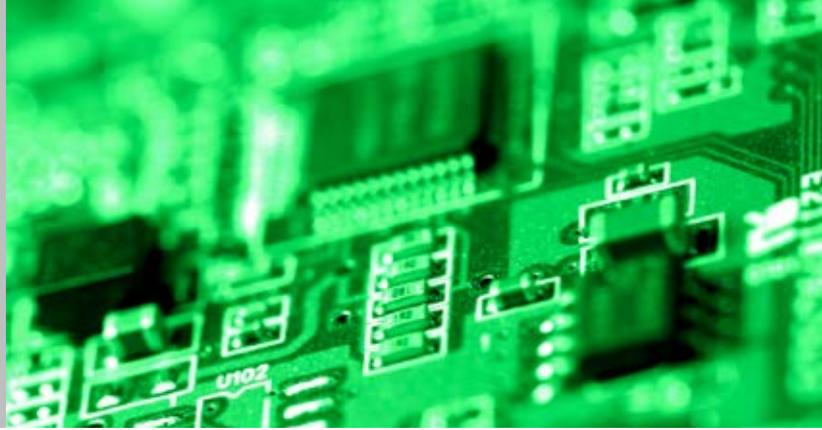
## Main challenges

- The private sector fears the complexities and unintended side effects of government actions.
- Tight regulatory environments may restrict freedom of action and reduce the flexibility required to build stronger resilience.
- There is non-alignment among governments regarding prioritization of harmonizing regulatory environments.

## Main lessons learned

- Governments build resilient supply chains through trade, security, investment or other policies.
- The public and private sectors can collaborate to drive new system-wide standards.
- International standard bodies can develop, harmonize and encourage the adoption of resilience standards.
- The private sector needs incentives for adopting resilience standards.

# Supply Chain Risk Practice 4



## Expertise

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Charles Lane, Project Manager, Risk Response Network, World Economic Forum

Increase customs and border sophistication to enhance resilient supply chains

## Summary

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The public and private sectors must collaborate to build resilience into supply chains when facing risks associated with customs and border sophistication.

## Experience

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Highlighted as one of the top 10 vulnerabilities by the World Economic Forum's Supply Chain Risk Radar, underdeveloped customs and border sophistication is a growing concern to global businesses and organizations operating in new supply channels. This lack of sophistication creates uncertainty in tracking cargo and causes risk of significant delays, as freight whereabouts and delivery dates can be difficult to ascertain and manage. The results can be catastrophic for organizations in crises, such as the delivery of aid in humanitarian disasters.

Supply chain trends show a move away from adhoc outsourcing towards long-term partnerships as companies take a vested interest in their supplier networks. In such relationships, resilience can be built to improve customs and borders sophistication. Benefits from collaboration between the public and private sectors help to improve security, information sharing and knowledge exchange, which will ultimately help ease port congestion.

An example is Authorized Economic Operator (AEO) programmes developed by customs authorities worldwide. AEO programmes qualify companies by adhering to stringent guidelines regarding shipping of goods across borders. In return, customs organizations have the ability to fast-track AEO certified cargo. Due to this partnership, borders are becoming more secure and AEO certified companies have increased flexibility and agility in their supply chains.

Since its launch on 1 January 2008, the European Union AEO programme has been quickly enacted among its member states and is now firmly established as the cornerstone of importer and exporter security practices. The aims of the AEO programme include upgrading the security of the supply chain, while contributing to trade facilitation and reforming and modernizing customs around the world to maintain or develop national competitiveness in international trade. The AEO guidelines:

- Ensure common understanding and uniform application of AEO customs legislation
- Guarantee transparency and equal treatment of economic operators
- Provide a tool to facilitate the correct and harmonized application

Both government- and business-driven partnerships must retain open architectures with harmonized standards to allow accessibility and competition. Partnerships need to be broadened to incorporate greater transparency with small and medium-sized enterprises and more local actors across supply chains, especially in new and emerging markets.

As supply chains have multiple touch points, there are compelling reasons for business and governments to form partnerships to build resilience in supply chains. Partnerships help in times of systemic natural disasters by providing much-needed agility and flexibility to supply chains when they are most needed and offering safer borders to countries and increased competitive advantage to companies. Forming public-private partnerships is one of the four recommendations from the World Economic Forum's 2013 Supply Chain Risk Initiative in creating a blueprint for resilience.

## References

Supply Chain Risk Initiative: <http://www.weforum.org/issues/supply-chain-risk>.

Authorized Economic Operators: [http://ec.europa.eu/taxation\\_customs/customs/policy\\_issues/customs\\_security/aao/index\\_en.htm](http://ec.europa.eu/taxation_customs/customs/policy_issues/customs_security/aao/index_en.htm).

## Does the practice strengthen resilience?

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Public-private partnerships enable targeted risk management through a better knowledge of counterparts in the supply chain through increased transparency and collaboration.

## Main challenges

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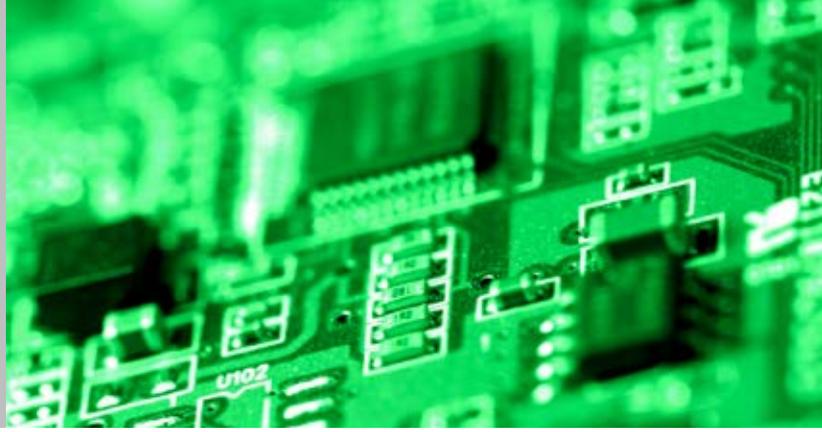
Incentivizing the private sector to join a public-private partnership  
Addressing public and private sector concerns about proliferation of proprietary data

## Main lessons learned

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The public and private sectors must collaborate to build resilience into supply chains to tackle issues arising from customs security.

# Supply Chain Risk Practice 5



## Expertise

Taylor Wilkerson, Supply Chain Risk and Sustainability Expert, LMI, USA

## Target greenhouse gas-intense processes along the supply chain

## Summary

Supply chain greenhouse gas (GHG) mitigation should start by focusing on GHG intense processes in an organization's supply chain. Patagonia, a maker of outdoor equipment, screens its supply chains for GHG intense processes through a cradle-to-gate analysis. This has enabled Patagonia to reduce the footprint of its products and influence future product design.

## Experience

### Challenge

A review of a company's supply chain for greenhouse gas emissions, including tier two suppliers and beyond, can significantly increase the number of organizations involved. Engaging all these organizations in meaningful GHG mitigation actions is not practical in most cases.

Supply chains often include hundreds, sometimes thousands, of direct (tier one) suppliers and partners. Hewlett-Packard, for example, has identified about 400 contracted manufacturing suppliers, 80% of them outside of the Americas.<sup>1</sup> Ford Motor Company has more than 1,400 production-related suppliers in more than 4,400 locations in 60 countries. This is in addition to more than 9,000 non-production-related suppliers.<sup>2</sup> When companies start to mitigate supply-chain GHG emissions, they often struggle in scoping the programme.<sup>3</sup>

### Solution

Reduction is often a question of quality or quantity. Assume a company has 100 suppliers. It can go the route of quantity in reducing emissions from the source – for example, achieving reductions in 75 of those partners, resulting in a robust, impressive number to tout.

The reality, however, may be that the 25 of the company's suppliers that did not make reductions actually contribute

98% of the supply chain's entire GHG emissions output. In this case, the search for quality would lead to targeting fewer partners, but achieving greater gains in the process.

Effectively mitigating supply chain GHG emissions requires the wise use of resources – people, tools, and funds. Organizations or processes in the supply chain that emit few GHGs do not offer significant mitigation opportunities. This may also be true of those already subject to aggressive GHG reduction programmes. Resources must be applied to areas that will reduce GHG emissions.

A phased approach to GHG mitigation can help. The most common strategy is to start with a general measurement approach that allows an understanding of the GHG emissions in the supply chain. It is then possible to target future activities based on the initial profile.

Focusing actions means understanding where the GHG-intense activities are in the supply chain. Starting mitigation activities with a GHG emissions screening provides the opportunity to estimate the emissions throughout the supply chain. Screening methods are not completely accurate, but they are still good for identifying GHG-intense activities.

One GHG screening method is the use of an economic input-output life cycle analysis, such as the Carnegie Mellon Green Design Institute's Economic Input-Output Life Cycle Assessment (EIO-LCA).<sup>4</sup> This approach combines US economic data with industry-specific GHG emissions, allowing for an estimation of the GHG emissions associated with the financial output of an industry.

Because the EIO-LCA model links all of the industry connections across the US economy, the result is a very comprehensive estimate of the cradle-to-gate life-cycle emissions for a commodity. Where this model falls short is in understanding a particular supply chain. Specifically, these macro-level data lack details on a particular supply chain and its operations, including real-time data on the supply chain's impacts in current terms.

This lack of specificity means that EIO-LCA is a good tool for screening supply chain emissions, but not for tracking reductions. It also does not provide direction as to where to focus reduction efforts. In addition, EIO-LCA data are collected on a national level, and national economic tables tend to vary in quality, detail, and timeliness. No EIO-LCA data set is globally integrated, which does not mesh well with the global nature of today's supply chains.

However, for most screening uses, the US data can produce reasonable estimates for similar processes in other countries if the technology or power sources do not significantly differ. When using the EIO-LCA data for non-US operations, care should be taken to ensure that the data are a reasonable approximation for the target operations.

A second approach is to identify potential GHG emissions-intensive activities in a supply chain through reference documents. A number of resources are available; they use a range of methods for identifying GHG emissions or energy-intensive industries and processes.<sup>5</sup> In most cases, energy intensity is a reasonable proxy for GHG emissions because most energy derives from fossil fuel, especially in the United States.

These tools can help identify GHG-intensive processes in the supply chain that may warrant mitigation action. However, there is a reason for using a variety of tools: this is not a one-size-fits-all process. This is especially true if your company's partners are environmentally and climate change conscious.

Once a supply chain has been screened and an understanding has been gained of the points at which emissions occur, resources can be focused on the most egregious offenders. The more GHG intensive an activity is, the more likely opportunities for emissions reduction can be found. The exact points of the supply chain to focus on are in large part governed by the mitigation resources available. A screen-and-focus approach helps ensure that these resources are effectively used.

### Example

Patagonia, an outdoor equipment company, wanted to understand GHG emissions and other sustainability drivers in its product supply chains. Rather than analyse the full life cycle of its entire product catalogue, Patagonia screened its supply chains through a cradle-to-gate analysis of representative products. By choosing one backpack, dress or jacket, Patagonia gets a good idea of what drives GHG emissions in similar products. It now has a better perspective on the best actions for reducing the footprint of its products.<sup>6</sup>

Patagonia has taken the process a step further and now uses this information to influence future product design. It shares the details of its assessments with customers through a programme called the Footprint Chronicles.<sup>7</sup> As part of this programme, it offers candid opinions on the sustainability of its products.

### Note

This article was extracted from "Climate Change: What you can do now". LMI, [http://www.lmi.org/Markets/Energy---Environment-\(1\)/Climate-Change-Book.aspx](http://www.lmi.org/Markets/Energy---Environment-(1)/Climate-Change-Book.aspx).

### Endnotes

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# Acknowledgements

## Primary Authors

Lars Björklund

Vice-President, Ethics  
Skanska AB

Martin Caddick

Head of BCM Services  
PricewaterhouseCoopers

Aida Demneri

Director, Risk Services  
Deloitte, Netherlands

Jonathan Drimmer

Vice-President, Assistant General Counsel  
Barrick Gold Corporation

Lilianne Fan

Research Fellow, Humanitarian Policy Group  
Overseas Development Institute, United Kingdom

Bill Helming

Managing Director  
PricewaterhouseCoopers

Anthony Ho

Engagement Manager  
PricewaterhouseCoopers

Antonio Javierre

General Manager  
Javierre, Spain

Charles Lane

Project Manager, Risk Response Network,  
World Economic Forum

Rodrigo Pérez Mackenna

Minister of Housing and Urbanism of Chile

Philip Matthey

Chief Compliance Officer  
MAN Group, Germany

Satoru Nishikawa

Director General of Audit  
Japan Water Agency, Japan

Sara Pantuliano

Head of Humanitarian Policy Group  
Overseas Development Institute, United Kingdom

Neal Pollard

Director  
PricewaterhouseCoopers, USA

Henry Ristuccia

Global Leader for Governance, Risk and Compliance  
Services  
Deloitte, USA

Michele De Rosa

Topic Leader, Antibribery, Sustainability and Internal Control  
System  
Eni, United Kingdom

Niyati Sareen

Corporate Social Responsibility  
Hindustan Construction Company, India

Aasim Siddiqui

Founder and trustee  
Organization for Social Development Initiatives (OSDI),  
Pakistan

Edward Simmons

Project Manager, Risk Response Network  
(on secondment from PricewaterhouseCoopers)  
World Economic Forum

Michael Useem

Professor of Management and Director, Center for  
Leadership and Change  
Wharton School, University of Pennsylvania, USA

Evert Jan Wijerus

Group Compliance Officer  
Royal HaskoningDHV, Netherlands

Taylor Wilkerson

Supply Chain Risk and Sustainability Expert  
LMI, USA

## Catastrophic Risk

Lilianne Fan

Research Fellow, Humanitarian Policy Group,  
Overseas Development Institute, United Kingdom

Bill Helming

Managing Director  
PricewaterhouseCoopers, USA

Sara Pantuliano

Head of Humanitarian Policy Group  
Overseas Development Institute, United Kingdom

Michael Useem

Professor of Management and Director, Center for  
Leadership and Change  
Wharton School, University of Pennsylvania, USA

Niyati Sareen  
Corporate Social Responsibility  
Hindustan Construction Company, India

Henry Ristuccia  
Global Leader for Governance, Risk and Compliance  
Services  
Deloitte, USA

Aida Demneri  
Director, Risk Services  
Deloitte, Netherlands

Edward Simmons  
Project Manager, Risk Response Network  
(on secondment from PricewaterhouseCoopers)

Aasim Siddiqui  
Founder and trustee  
Organization for Social Development Initiatives (OSDI),  
Pakistan

Rodrigo Pérez Mackenna  
Minister of Housing and Urbanism of Chile

Anthony Ho  
Engagement Manager  
PricewaterhouseCoopers, USA

Satoru Nishikawa  
Director General of Audit  
Japan Water Agency, Japan

### **Cyber Risk**

Neal Pollard  
Director  
PricewaterhouseCoopers, USA

Martin Caddick  
Head of BCM Services  
PricewaterhouseCoopers, United Kingdom

### **Supply Chain Risk**

Taylor Wilkerson  
Supply Chain Risk and Sustainability Expert  
LMI, USA

Charles Lane  
Project Manager, Risk Response Network  
World Economic Forum

### **Anti-corruption**

Philip Matthey  
Chief Compliance Officer  
MAN Group, Germany

Evert Jan Wijerus  
Group Compliance Officer  
Royal HaskoningDHV, Netherlands

Antonio Javierre  
General Manager  
Javierre, Spain

Jonathan Drimmer  
Vice-President, Assistant General Counsel  
Barrick Gold Corporation, USA

### **Primary Curators and Editors**

Charles Lane, Project Manager, Risk Response Network  
World Economic Forum

Edward Simmons, Project Manager, Risk Response  
Network (on secondment from PricewaterhouseCoopers),  
World Economic Forum

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ITONICS GmbH*

### **Forum Project Team**

Andrew Andrea, Associate Director, Academic Affairs,  
Academic Networks, World Economic Forum

Elaine Dezenski, Senior Director, Head of Partnering Against  
Corruption Initiative (PACI)

Phuong Duong, Senior Project Manager (PACI), World  
Economic Forum

Charles Lane, Project Manager, Risk Response Network,  
World Economic Forum

Edward Simmons, Project Manager, Risk Response  
Network (on secondment from PricewaterhouseCoopers),  
World Economic Forum

Wessel Van Kampen, Associate Director, Network of Global  
Agenda Councils, World Economic Forum

### **Creative Design**

Floris Landi, Graphic Designer, World Economic Forum







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**World Economic Forum**  
91–93 route de la Capite  
CH-1223 Cologny/Geneva  
Switzerland

Tel.: +41 (0) 22 869 1212  
Fax: +41 (0) 22 786 2744

[contact@weforum.org](mailto:contact@weforum.org)  
[www.weforum.org](http://www.weforum.org)