

*This is a modified version of an article appearing in the
Global Construction Report 2005: Transparency Inter-
national Berlin pp23-30*

www.globalcorruptionreport.org

Earthquakes may not be preventable but disasters are. The percentages show that by the removal of all corrupt practices, homelessness, injuries and deaths could be drastically reduced by the same amounts. From the earthquakes of the past fifteen years and by the lowest estimate, 6.5 million people would still have their homes, 7.75 thousand would not have been injured, and 20.75 thousand would still be alive.

Seventy-five percent of all earthquake deaths can be attributed to corruption. In the past fifteen years, there have been more than 400 recorded earthquakes in 75 countries rendering almost nine million people homeless, injuring 584,000 and causing 156,000 deathsⁱ. Earthquakes are responsible for thirteen percent of homelessness caused by all natural disasters and sixteen percent of all deaths. Although earthquake incidence remains roughly constant and whilst overall deaths from all disasters appear to be decreasing, the wider social impacts of the numbers of people affected by loss of their homes, crops, animals, livelihoods or their health, has almost doubledⁱⁱ. Ninety percent of natural disaster related deaths occur in less-developed countries.

Earthquakes expose in buildings the shortcomings that are the real cause of their damage and destruction. A Turkish civil engineer, Alpaslan Özerdem, has stated of the 1999 Kocaeli earthquake that widespread destruction occurred despite measures being in place to ensure buildings were earthquake resistant: shortcomings involved "...inadequacies in the control mechanisms of local municipalities for checking the work of local building contractors. It is common knowledge that some...are corrupt and 'economise' on cement and iron bars in order to increase their profit margin (although this increase cannot be more than 5 to 10 percent)"ⁱⁱⁱ. "Measures in place" are regulations, codes and guidelines; "inadequacies in control mechanisms" are the lack of trained inspectors of work in progress. Professor Polat Gulkan states: "It is a problem of enforcement, not of codes."^{iv}

Earthquakes are frequent in Turkey: 22 have occurred since 1990 killing 19,000 people and inadequate construction has frequently been blamed for high death tolls. At the Bingol earthquake of May 2003, the Turkish Prime Minister Tayyip Erdogan, promising to investigate state building contracts, acknowledged that "we might suspect that there was stealing from the materials...we have seen similar things in other earthquakes. We must learn the lesson as a society and those guilty of this must face justice"^v. Meanwhile, whole areas of poorer neighbourhoods of inadequately constructed apartments have collapsed due to earthquake ground motion a fraction of that allowed for in construction codes^{vi}. In more affluent areas, appropriately constructed tall buildings survived as did

government offices^{vii}. The capricious nature of earthquake faults could be the cause but locals' opinions are more sinister. Six apartment blocks, which had been cheaper than others, collapsed and killed twenty people, but "the self-taught engineer and building developer" had fled to Germany to avoid recrimination^{viii}.

Intentional deceit, not lack of knowledge or guidance, and complicity by low-paid inspectors, compound the issue of on-site corruption. Building construction is a process of legitimate physical covering. Starting in the ground with foundations, it proceeds with superstructure of walls, columns, floors, staircases and roofing. Each stage is concealed - from foundations under the ground, steel reinforcement before concrete is poured, to the last coat of paint. Mistakes and omissions - accidental and intentional - have to be identified and rectified within each stage. Pressures on builders to complete on time, increased by financial incentives and impeded by late deliveries and weather, create circumstances in which temptations are rife for expediency and shortcuts. Intentional deviations from required standards exacerbate normal requirements for inspection and control. Given the endemic "in-built" opportunities for deviation in building, it is not surprising that in some countries, including developed ones^{ix}, the construction industry is a hot-bed of illicit practice. The term "cover-up" no doubt derives from the construction industry.

Reinforced concrete is relatively cheap and a convenient though rigid construction, whereas timber is more flexible but requires skills and materials not always locally available and is inappropriate for larger buildings. Flexibility responds to earthquake motion where rigidity does not; it has to be designed to resist instead. Earthquake resistant reinforced concrete requires conformity to design standards and controlled quantity, material, mix and application by vibration to ensure penetration throughout necessarily complex steel reinforcement. Controlled concrete is best achieved by specialist and centrally inspected off-site suppliers; less easily inspected on-site mixing is subject to expediency, substitution and omission: "Concrete that was mixed on site was a major problem...one contractor admitted using unwashed sea sand in the mix"^x. Local unwashed beach sand, contains salt, reduces strength and encourages steel corrosion; water has to be clean, not saline; too little water impedes maximum strength and penetration, too much water - to achieve penetration without vibration - washes out cement. Vibrators require on-site generators or mains electric power - additional costs; centralised supply involves sequenced and scheduled deliveries on time by transportation on often inadequate road and traffic systems.

After the 1954 Orleansville earthquake in Algeria killed 1,400 people and rendered 300,000 homeless, Jean-Pierre Rothé, then Director of the French Bureau International de Séismologie, wrote: "...it would be appropriate for the attention of administrators and architects to focus on Algeria's seismicity, so that they are able to adopt preventive measures. Every thirty or forty years, an

earthquake...causes significant destruction"^{xi}. Twenty-six years later in 1980, Orleansville, reconstructed and renamed El Asnam, was again destroyed by earthquake killing a further 4,500 people, injuring 8,000, and rendering 330,000 homeless by the destruction of 33,200 dwellings. El Asnam was rebuilt and renamed as Chleff.

Rothé should have included geophysicists, geographers and planners; **where** building and rebuilding are, is as crucial as **how** buildings are built. "One of the El Salvador 2001 earthquakes caused a landslide on a slope destabilised by deforestation and slope mining, burying almost 500 people living in ill-placed communities ..." ^{xii}. "Earthquake responsible development", with corruption-free control of powerful commercial operations as well as its associated housing, can prevent such occurrences ^{xiii}.

Turkey's 1999 earthquakes occurred in the north-west where one-fifth of the population live having increased exponentially since 1945, as centralised government has attracted migration to the capital (the population of Istanbul has increased fifteen times in thirty years). Other Turkish cities, now so devastatingly destroyed, tripled their populations in recent years as millions of refugees have fled poverty and conflict. Thirty years ago three-quarters of Turkey's population were rural; today three-quarters is urban. The population density of Kocaeli, offshore of which was the biggest earthquake's epicentre, was amongst the highest in Turkey^{xiv}. Builders have responded to consequent demand for rapid and cheap housing in a dangerous free-for-all engendered by inadequate overstretched control systems and the need for bribes to obtain permits to build.

Özerdem continues: "It is essential that local municipalities have the financial resources and trained personnel to be able to inspect the work of contractors" and that "proper building inspection is...difficult in the context of possibilities for corruption - obtaining building permission is achieved largely through bribes and political favours" - and the official concerned with building projects may be the covert owner of a construction company with which he places contracts. Bribery to achieve permits is necessitated by slow procedures of poorly staffed and overloaded authorities.

Polat Gulkan hesitates to join the "well established ritual of blaming unscrupulous contractors and their colluding control engineers" and identifies another issue: it is routine, he says, for government buildings of hospitals, clinics, offices and schools, to be built from "template designs" to ensure closer quality assurance. Standard buildings have been constructed "all over the country" without due regard for variable seismic risk and "transmitting...possible design errors...from location to location."^{xv}

Over 95 percent of all deaths in earthquakes result from building failures^{xvi} but not all building failure is attributable to corruption. Engineered buildings design-in an additional "earthquake factor" for earthquake resistance, the degree of which is a matter for regulation or professional analysis, but the factor can be exceeded by actual earthquakes of greater magnitude. Even inspected buildings can

fail; older and decayed buildings may collapse as older people with prevailing medical or physical conditions may die. Though 65 percent of buildings in Turkey are constructed without a permit^{xvii} and 90 percent of casualties occurred (1999) in mid-rise reinforced concrete apartment blocks^{xviii}, corruption may not always be the reason for inadequate construction and even corrupt regimes might conceivably inspect some buildings. Not all of these percentages can be blamed on corrupt practices. The proportion in some countries and in some earthquakes of buildings that collapse due to inadequate inspection by corrupt regimes and consequent inadequate construction, is conceivably as high as 95 percent, but in others it could be 75 percent.

Acts and omissions by the Turkish state have been causally linked to the catastrophic 1999 Kocaeli earthquake in Turkey^{xix}. Researchers identified "organizational deviance" in the pursuit of risk-laden policies, corruption tolerated or tacitly encouraged to serve organizational goals, failure to develop regulation in the construction industry, encouraging or forcing land settlements in hazardous zones, post-disaster cover-up and concealment of evidence, and promotion of policies directly contributing to corrupt practice in the construction industry. Responsibility for the disaster was placed on individual building developers and contractors who allegedly cut corners, used poor quality building materials, failed to employ safety checks and ignored earthquake-resistant regulations; all in a political climate of authoritarian statism, disregard of safety issues, human rights violations, and corruption.

"Considering the rate of growth in housing in Turkey", says Özerdem, "it is a daunting task to carry out proper building inspections even assuming the necessary political and ethical will". He suggests another approach would be to increase public awareness and make potential house buyers the "inspectors"; "if people showed as much interest in earthquake safety...as they show in the type of tiles, doors and taps...building contractors would stick to the rules and regulations".

Corruption throughout all government services is the likely context for corruption in construction. Of corruption generally, Leslie Palmier states: "Corruption can justly be called a disease of bureaucracy... found in government organisations of all kinds, irrespective of policies, place, or time. It is so widespread that, factually speaking, it can be regarded as normal"^{xx}. He identifies three major causes: opportunities for involvement with lucrative activities, poor salaries, and low probability of detection and punishment. Exposure, he says, is the best deterrent, public opinion is more effective than a prison sentence, and political will, sufficient resources and comprehensive anti-corruption legislation are the prime prerequisite for probity^{xxi}. Probity begins with careful selection in appointments, leadership and maintenance of morale, appropriate conditions of service, drastic sanctions, and exclusion of officials from commercial transactions.

Three former Turkish government ministers were exposed in 2002 as having allegedly been "involved in serious energy and construction corruption cases". Their public exposure caused their loss of all three seats in parliament^{xxii}.

In Bangladesh, during five years of the 1990s, a major internationally funded project for the construction of hundreds of cyclone shelters was planned and prepared up to the point of seeking tenders. The shelters were designed for normal use as primary schools and would have repeatedly saved thousands of lives in cyclones and associated massive storm-surges. Government go-ahead was not forthcoming, the only hint of explanation being "we all know what is required to kick-start the process again".

Rothé knew that earthquakes don't kill people but that collapsing buildings do. Codes for earthquake resistant construction are available, due to the work of international agencies such as UNESCO^{xxiii} and UNHabitat^{xxiv}, for example. The collapse of many recently constructed buildings, including schools and hospitals, indicates that codes are not being applied. International demands for improved construction are repeated after every earthquake: the *UN Chronicle* has recently carried a plea for "the enforcing of internationally accepted standards of safety for schools and hospitals everywhere in the world" - but as is asserted in the same exchange and sharing of the same despair, standards exist but international enforcement is not very popular. It has to be a nationally indigenous process^{xxv}.

Those processes demand:

- that for the removal of ingrained quasi-cultural improbity, sectoral changes are less feasible until people themselves take responsibility for the actions of their politicians: "the will of the people shall be the basis of the authority of government"^{xxvi};
- independent reporting on the performance of governments on bribery and corruption standards;
- legislation enforcement and provision of adequate, trained and empowered inspection of construction on progress, ensuring that both the opportunity and perceived need of bribery for the achievement of objectives are removed;
- control of building construction by local governments should be re-evaluated and redefined;
- all development should be made "disaster responsible" by linkage to disaster mitigation strategies; eg: urban concentrations of population need to be countered by rural development, until such time as zones of earthquake risk can be geologically and geographically identified;
- participation in earthquake insurance should be encouraged and become a vehicle for requiring independent certification of conformity with construction codes;
- the training, licensing and regulation of engineers and architects should ensure their capability in earthquake resistant construction;
- standardised design of government buildings should be re-examined with a view to more stringent applications;

- restriction of overcrowding and upper-storey extension of existing buildings; and maintenance of old, damaged and poorly maintained buildings; and
- facilitation of access to controlled provision and supply of (off-site) ready-mixed concrete.

REFERENCES

- i EM-DAT (2004) OFDA/CRED International Disaster Database: Université Catholique de Louvain, Brussels, Belgium www.em-dat.net
- ii ISDR (2003) Living with risk: Turning the tide on disasters towards sustainable development United Nations International Strategy for Disaster Reduction. ISDR Geneva (p49)
- iii Özerdem, Alpaslan (1999) *Tiles, taps and earthquake-proofing: lessons for disaster management in Turkey* Environment and Urbanisation 11/2 pp177-179 October. Hawaii
- iv Gulkan, Polat, professor at the Middle East Technical University, speaking of the 1999 earthquake on BBC News (audio recording) <http://news.bbc.co.uk/1/hi/world/europe/422773.stm>
- v www.alertnet.org/thenews/newsdesk/L01243493.htm (2003)
- vi Erdik, Mustafa *Rehabilitation, Recovery and Preparedness after 1999 Kocaeli and Düzce Earthquakes*. Bogaziçi University, Istanbul http://www.proventionconsortium.org/files/wharton_010801/erdik.pdf
- vii Jones, Shannon (1999) *Thousands die in Turkey earthquake: unsafe construction blamed for high death toll* World Socialist Website 19 August <http://www.wsws.org/articles/1999/aug1999/turk-a19.shtml#top>
- viii Bowcott, Owen & Traynor, Ian (1999) *Survivors turn anger on cowboy builders* The Guardian 25 August <http://www.guardian.co.uk/print/0,3858,3895404-103681,00.html>
- ix An *ad hoc* Google search has revealed references to corruption and corruption reform in the construction industries of: Australia; Burma (Myanmar); China; Japan; Lesotho; Netherlands; Taiwan; Thailand; Turkey; the United Kingdom and the USA
- x Natali Sigaher, doctoral candidate in earthquake engineering at the State University of New York at Buffalo and a native of Turkey who was home in Istanbul during the recent quake: <http://whyfiles.org/094quake/7.html>
- xi Lewis, James (2003) *The Algerian Earthquakes of May 2003: Some precedents for reconstruction* RADIX http://online.northumbria.ac.uk/geography_research/radix/algeria2.htm
- xii ISDR (2003) Living with risk: Turning the tide on disasters towards sustainable development United Nations International Strategy for Disaster Reduction. ISDR Geneva (p13)
- xiii Lewis, James (2003) *Housing construction in earthquake-prone places: Perspectives, priorities and projections for development* The Australian Journal of Emergency Management 18/2 May. Mount Macedon (pp35-44)
- x_{iv} Lewis, James (2002) *Disaster vulnerability reduction: Foresighting development for survival in natural hazards* Submitted for publication
- xv Gulkan, Polat, professor at the Middle East Technical University A Preliminary Engineering Report on the Bingöl Earthquake of May 1 2003 (with Akkar, Sinan & Yazgan, Ufuk) Middle East Technical University, Department of Civil Engineering and Disaster Management Research Centre. http://www.eeri.org/lfe/pdf/turkey_bingol_preliminary_report_gulkan.pdf
- xvi Wisner, Ben; Blaikie, Piers; Cannon, Terry; Davis, Ian (2004) At Risk: Natural Hazards, people's vulnerability and

-
- disasters (Second Edition) Routledge. London (p277)
- xvii Turkish Chamber of Commerce reported by *Agence France-Presse* and quoted in World Socialist Website <http://www.wsws.org/articles/1999/aug1999/turk-a19.shtml#top>
- xviii Erdik, Mustafa *Rehabilitation, Recovery and Preparedness after 1999 Kocaeli and Düzce Earthquakes*. Bogaziçi University, Istanbul http://www.proventionconsortium.org/files/wharton_010801/erdik.pdf
- xix Green, P, al-Husseini, A & Curry, C (2001?) *Disaster prevention and the 1999 Turkish earthquakes* RADIX http://online.northumbria.ac.uk/geography_research/radix/turkey-bingol5.htm
- xx Palmier, Leslie (2000) *Corruption and probity* Asian Journal of Political Science 8/1 June www.bath.ac/~exx1hp/Corrn&Prob.doc
- xxi Palmier, Leslie (1985) The Control of Bureaucratic Corruption: Case Studies in Asia Allied Publishers. New Delhi www.worldbank.org/html/extdr/offrep/eap/eapprem/govquah.pdf
- xxii Cevic, Ilnur (2003) *Yilmaz and Ciller have to explain* Turkish Daily News 22 May
- xxiii eg: Vickery, D J (1982) School buildings and natural disasters UNESCO. Paris
- xxiv eg: Kuroiwa, Julio (1982) *Studies on the prevention of earthquake disasters and their application in urban planning in Peru* Workshop on Planning for Human Settlements in Disaster-prone Areas UNHabitat 1983. Nairobi
- xxv Wisner, Ben and Lewis, James (2003) *Exchange* UN Chronicle Vol XL No 3 September-November p49. New York <http://www.un.org/Pubs/chronicle/2003/issue3/0303p49.asp>
- xxvi The United Nations Universal Declaration of Human Rights: Article 21/3