CAMBRIDGE UNIVERSITY FIELD TRIP JUNE 2006

EARTHQUAKE AFFECTED AREAS OF PAKISTAN

Dr Stephen Platt and Emily So

19 July 2006

Children of Bedadi village, Mansehra.

The funding for this field trip was provided by the EPSRC.

Dr Stephen Platt is Chairman of Cambridge Architectural Research Ltd and Emily So is a doctoral student at the Martin Centre, Department of Architecture, University of Cambridge.

ACKNOWLEDGEMENTS

We received the most generous help and hospitality from everyone we met in Pakistan. In particular We would like to thank the people we interviewed:

People interviewed

Rachel Lavy, Coordinator, World health Organisation, Islamabad

Anwar ul Haque, Professor of Pathology, Pakistan Institute of Medical Sciences, PIMS

Dr. Syed Fazle Hadi, Consultant Physician and Cardiologist and Head of the Department of Medicine, Pakistan Institute of Medical Sciences, PIMS.

Andrew MacLeod, Relief to Transition Advisor, Earthquake Reconstruction and Rehabilitation Authority, ERRA, Pakistan

Naveed Ahmad Shinwari, Chief Executive, Community Appraisal & Motivation Programme (CAMP), Peshawar

Tahir Ali, Programme Manger, CAMP

Dr Mohsin Shakil. Consultant Urologist, Bradford Medical Mission

Aamir Khawaja, Coordinator Kashmir Charitable Trust in Muzaffarabad

Dr Maryam Mallick, WHO Coordinator, Consultant Physical Medicine and Rehabilitation.

Lieutenant Colonel Abid Hussein, Coordinator ERRA.

Field team

Professor Amir Khan, PhD; Ms Shukria Begum, Ms Nadia, Anwar Khattack, Asim Shahkad, M Ijaz, Malik Zada,

Our drivers

Zaim Khan, Mazhar Ali Zeb.

Colleagues

Dr John Beavis, Consultant Orthopedic Surgeon from 'Ideals'.

Mubashar Lone, from 'Burnley for Kashmir', who accompanied us in Pakistan.

Finally, and not least, to **Professor Robin Spence**, Director of the Cambridge University Centre for Risk in the Built Environment (CURBE) and the principal investigator of this project.

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INTRODUCTION

This is a report of a field trip, 31 May to 7 June 2006, to the areas affected by the Pakistan earthquake of 8 October 2005 by Emily So of Cambridge University and Dr Stephen Platt of Cambridge Architectural Research Ltd. This earthquake claimed 80,000+ lives, injured 100,000 and left over 2.5 million people homeless.

In brief, we interviewed senior people in Islamabad responsible for coordinating the relief and reconstruction and visited the areas affected by the earthquake with Professor Amir Khan of Peshawar University. We also visited reconstruction projects with Mubashar Lone who lives in Burnley, UK, and has been working with KCT, the Kashmir Charitable Trust.

We also implemented a survey of survivors of the earthquake. The aim of the survey is to collect data about injuries and treatment, about building failure and rescue, and finally people's thoughts about the future. This was a unique opportunity to collect information from people who had survived the earthquake in order understand the reasons behind their injuries and the factors that contributed to their survival.

Using our questionnaire, Professor Khan's team of six researchers is conducting household interviews in areas carefully selected by Professor Khan. Findings will be reported and should be of interest to mitigation planning.

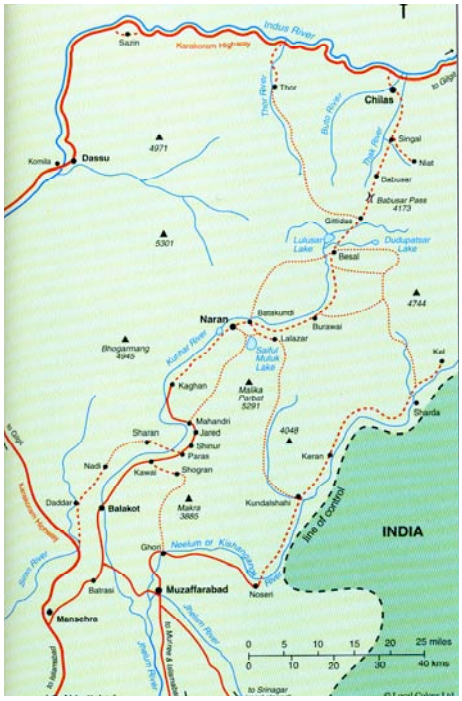

Fig 1: Map of study area – North West Frontier Province and Azad kashmire, Pakistan.

Aims

The field trip had two main aims:

1 to implement a survey of survivors to collect information about their injuries and treatment and to relate these to details about the buildings they were in at the time of the earthquake.

2 to shed light on what is important to long term recovery after a major disaster like the Pakistan earthquake that might form part of a subsequent proposal to EPSRC for funding.

Summary of observations

Muzaffarabad

We saw many signs of commerce returning, rebuilding and life getting back to something approaching normality in the town centre. We visited projects to provide work and training.

In the suburbs of Chella Bandi and Mera Bandi, a mile or so from the centre, we saw disturbing indications that long term help is not arriving. People need money and advice to rebuild their homes and the injured need long term treatment. For example, we talked to a secondary school teacher who has a deep infection and desperately needs remedial surgery, and to a young engineer who is still traumatized after the loss of many members of his family.


Fig 2: Muzaffarabad, Azad Kashmir.

The International Aid organizations and the Pakistan Government, once they realized the scale of the disaster and had cleared the

roads, were well organized and provided effective relief. But on all our travels we saw few signs of them working now, eight months on. We did see lines of white UN jeeps with their satellite aerials waiting for reassignment.

In Kashmir there is a lot of remittance money from the West and some of the richer families have begun rebuilding. But there is a lot of confusion as to what to build and whether the government will intervene.

Fig 3: Balakot, North West Frontier Province.

Balakot

Despite almost total destruction, commerce has returned, debris is still being cleared and materials – stone, bricks, and steel reinforcing rods, are being recycled and stacked and reconstruction has begun. Given its strategic position at the entrance/foot of the Kaghan valley, the town will most likely be rebuilt on the old site despite any plans to move it.

Harrowing tales were told by locals we met: a little boy who refuses to leave his father's grave left one of the interviewers devastated; a family in Kawai who had lost 6 members out of 8; a young engineer who had lost his father, brother and uncle and is visibly suffering from severe mental problems; a school teacher, whose hip was dislocated by a falling concrete beam when he was trying to save his pupils, is still bed-ridden and in acute pain after eleven operations.

Many families here as elsewhere, are still living in tents. They badly need money to be released to rebuild their homes and clear advice and models for recommended construction. In Kawai and Garlat, on the outskirts of Balakot, many people lost their lives and 170 children died when their school slid from a ridge a thousand feet to the valley floor.

The collapse rates of schools, hospitals and other public buildings is shocking – over 75% collapsed. Again and again we saw preventable deaths and poor quality control. The high death toll of children was a scandal and the destruction of local health facilities a tragedy. The level of destruction of public buildings cannot be allowed to happen again.

We experienced wonderful things – the warmth of the local people, their generosity and hospitality, and the beauty of Kashmir and the North West Frontier Province. Everywhere we were greeted with smiles and offers of tea. On the last day in the hills we were stuck in a queue of traffic for three hours while the army cleared an avalanched glacier. People quietly waited and did what they could to amuse themselves, for example a group of men helped each other fix the suspension of a jeep. The community spirit was overwhelming and this is what is getting people through the aftermath of the tragedy.

One positive note, the National Institute of the Disabled, have managed, through the help of an amazing woman called Maryam Mallick from WHO, have increased the level of medical assistance from one occupational therapist working in the public sector before the quake to a full training program to over 100 doctors, 100 physios and 50 psychologists on a certificate course.

TRIP JOURNAL

Wednesday, 31 May 2006

At 5.30 am when we got off the plane it is already hot. A man with a sign saying Shalimar is waiting for us and whisks us off to the hotel. Already the streets are thronging with people going to work – nearly all men, in the ubiquitous long shirts and baggy pants, the *shalwar-khameez*. The traffic is a dodgem of bashed yellow taxis, motorized rickshaws and smoke-belching trucks.

Fig 4: Our taxi and chauffeur for next two days.

Got into bed and fell asleep until 7am London time, 1pm local time. We have lunch in the hotel with Dr John Beavis, a trauma surgeon who helped Emily on her last trip in November. He hires a taxi and we set off for our first interview. John has a delightful way of negotiating. He asks the price and then promptly doubles it. This way of offering a bung I name as a 'Beavis'. We negotiate a hire of the taxi for the whole two days for 5,000 R, (£50) a princely sum here.

We head to the World Health Organisation (WHO) headquarters for our first meeting. This sector of Islamabad is quite different to bustle and grime of Rawalpindi where we are staying. Here there are wide tree lined avenues and spacious bungalows housing diplomats, international companies and wealthy locals.

Interview: Rachel Lavy, Co-ordinator, WHO, Islamabad.

A very nice, competent and modest person who took charge of the health cluster responsible for coordinating all medical aspects of the relief effort. She had been running a polio eradication campaign to get all children in the country immunised.

Rachel said: Our role in WHO was to provide temporary facilities and try to assess why 75-80% of health facilities were destroyed. The Ministry of Health were overwhelmed and WHO brought in people to provide support. We overlap with UNDP who provide shelter and camp management.

Since April ERRA, the Earthquake Reconstruction and Rehabilitation Authority, has taken over from Federal Relief Commission, which was responsible for immediate relief. ERRA is military-led and holds the reconstruction purse strings. For example, their guidelines specify that an 'NOC', or No Objection Certificate, is needed to claim compensation. ERRA has set up provincial bodies – PERRA at province level and SERRA at state level. Both are weak still, but will be the authorities responsible for administering government legislation.

Rachel made the following points. The earthquake happened during Ramadan. In general the men were sleeping at 9am on a Saturday morning. There was little communication between military and civilian authorities during the relief phase. ERRA, although headed by General Nadim, now has a civilian deputy and communications with the civilian authorities is better. NGOs are encouraged to communicate with and seek support from ERRA. It can cause delay, but is a good discipline.

WHO's engineering report on building failure showed that cross

bracing and opening lintels were skimped and that health facilities failed because they were badly built. UNICEF planning reconstruction of schools and there maybe a separate report about why they failed.

The tents survived reasonably well. There was a relatively mild and short winter, although at higher altitudes temperatures were well below freezing. But now it's hot, the tents are far from ideal. The government had decreed that all camps be closed by the end of March but many people are still living in tents.

Over 2 billion USD have been donated to Pakistan by international development funds but on the ground, little of this money was evident.

There was no accreditation and approval scheme for volunteers. Donors are beginning to insist that in future volunteers coordinate with WHO. Having said that, some outfits were excellent. For example, INSURAG, an international rescue organization, formed by firemen appalled by the inadequacy of relief efforts after the 1988 Armenian quake, provided a very good response, similar to the WW2 heavy rescue unit rescue units.

Rachel's partner, Kasim, is Anglo-Kashmiri. In Kashmir land is everything. People in the affected areas are intelligent and resourceful and will make provisions for the coming winter. They will cobble together something at any cost to stay on the land. They don't want to be in camps in the valley.

PAK is Pakistan Administered Kashmir. Azad Kashmir means Free Kashmir. It is autonomous province with a Prime Minister and Ministry of Health, but no money. Seat of government in Muzaffarabad was destroyed and government administration decimated. The Federal Government disorganised and this disempowered the Kashmiri government. This was aggravated by a fear that India would use the disaster as a pretext for invading.

In contrast, many people in NWFP, the North West Frontier Province, are still living under a feudal system. They have never owned land. They want to get land. Over time the system is gradually changing and people are able to buy land. Bargaining power of workers is also a factor. It has been decided at the highest level that Balakot will not be rebuilt. Funding will be directed elsewhere since the whole region is prone to landslides.

Muzaffarabad people are Kashmiri. Some work in Islamabad. Our houseboy is from a village near Muzaffarabad, said Rachel. As soon as he heard about the earthquake he took a bus to check on his family. He had to walk nine hours to reach his village because the road was blocked. He found his house flattened and that he had lost 15 members of family. He walked back to get help. Despite everything, his parents wouldn't leave, so he bought five tents to house them. We told him to bring his family here. They stayed three weeks, but they were utterly miserable. They felt they had deserted their community. When his mother felt better, they went back. Community spirit is very strong; it provides huge support. For example the community pooled money to help pay for his wedding. It is a remittance economy with many family members working in the UK and Middle East.

Interview: Anwar ul Haque, Professor of Pathology, Pakistan Institute of Medical Sciences, PIMS

A delightfully warm and compassionate man who seemed thoroughly competent in his job as professor of Pathology and in coordinating all medical relief teams at he Pakistan Institute of Medical Services, PIMS. Dr Anwar's office was open house to people coming and going. Students and young doctors following his diagnosis on a microscope with additional eye pieces and servants and secretaries bringing papers for signing and food and drink.

The hospital staff and volunteers worked day and night over three weeks to accommodate not only the injured but their families, providing support and bare essentials and in their minds, the relief effort was a success although the hospital and medical sector was completely overloaded. In total, tthere were 741 spinal injuries and just over 700 amputees. This is a surprisingly low figure given over 100,000 were injured during the earthquake.

We also met briefly with Professor Hadi, Head of PIMs – a Persian looking tall man with white hair.

Anwar reported that all government buildings collapsed. Most private non-domestic buildings did not. The cause, Dr Anwar suggested, was substandard construction due to corruption. "I'm a very open person and am not afraid of speaking out."

The Margala Towers residential block that collapsed in Islamabad brought the disaster home to people. It was Ramadam and everyone was in high spirits. The earthquake happened at 9am and the first victim arrived at 3 pm. It took so long because the road was blocked from Islamabad. Within hours of learning of the quake we had organised blood transfusions, extra beds, and broadcast on the radio and TV for volunteers. All was ready by the time people began to arrive. It was like the first drops of rain, then a deluge. People have relatives all over the country.

The first trucks left around midnight to go to the affected area. It took them 10 hours. It was not well organised in terms of volunteers. NGOs thought of us as crooks here. Something we learnt about our own people. They did the right thing. They responded with unbelievable charity. For example, a catering company supplied food and a mobile phone company offered free service.

The Government messed things up. We didn't need loans from IMF of $4m. We didn't need loans and the extra burden of interest. Poor people will be paying for this (It used to be 4 Rupees/dollar). Many of the people in Kashmir have families in England. Donations to rebuild the hospital in Muzaffarabad are still pouring in.

The hospital here was initially overwhelmed with fractures – all sorts, including head injuries. Many died. Many women died. They rushed inside to protect children. In general they are at home more than the men. Most of paraplegics were young women.

We established a register of volunteers who were assigned according to abilities and needs to avoid chaos. Maybe there were some bad people. There are stories of abduction of children, of well-

connected people posing as doctors, of people trying to recruit young women for the sex trade. We took a strong stance on this. We needed to coordinate. Mobile phones were crucial in helping coordinate people and equipment. We were dispatching 3-4 vehicles a day laden with medical equipment.

The Pakistan Ministry of Health did a good job. Funds freely available. I was appointed as the overall coordinator because my department, Pathology, is much freer in crisis to take this role. People arriving in PIMs with nothing – no shoes, no underwear, no money. We arranged packs for people. Photographs of people admitted or treated were displayed outside the hospital. The police cooperated. In general people were reunited quickly. People live in close extended families and we didn't need genetic testing. Unique, after a disaster like this, that more people were not lost.

Immediate relief was excellent. Community centres were converted to medical facilities, with beds and food. PIMs provided medical staff. Endless lines of trucks kept arriving from Karachi and the south. Morality, spirituality of Ramadam significant. Very moved by human charity from all over the world. Showed just how good human beings can be. A lot of young people volunteered. We performed 200 operations a day. Arranged training sessions for volunteers. There was a good team from Britain, also Cubans, Koreans, Russians. It was obviously easier with English speaking teams.

Long term though the Government "has messed up everything". Reconstruction is beginning to go well. No need to demolish entire home that only has slight damage. Compensation is delayed. It would be much better to use family self-help than government aid. Crooks are taking advantage. Even people with minor injuries are exaggerating to get more compensation.

Government have not started reconstruction and it is eight months after the quake. Children have not been going to school for the whole year. It will be hard for them to get back into a routine after such a long time. Government has created a dependency culture with this unnecessary interference. Kashmiri people are naturally independent and don't need pampering by government. They had good medical provision in Kashmir, but their doctors and nurses were pampered by Government and developed slack habits over a long time and so when the earthquake struck they failed to respond.

They are tough people in the remoter areas of NWFP. They are self-sufficient and well fed. They have plenty of food and it was wrong to dislocate them. Men come down to Islamabad to work and send money back. But the country is so corrupt. With Afghanistan, the area produces 70% of world's heroin.

There was a severe lack of heavy lifting and cutting equipment. British team did good job, but took 3-4 days to arrive and were unable to bring heavy equipment. Initially the Government shut-down the mobile phone network for security reasons.

Here in PIMs we did a very good job. The media also did a good job. But you have to manage them properly. Two classes of people were affected. The elite who can speak English, and common people who don't speak it and are not educated. Training should be with good people, not with government.

Overall 140-150,000 were injured; 75-80,000 deaths; 46,000 hospital admissions, 740 amputations in total. PIMs treated 7,660 people; 6,500 admissions, 230 amputations.

We spend the evening at the French Club in the diplomatic quarter of the city. We were meeting Rachel and an Australian called Andrew MacLeod there for dinner.

As we drive into the heavily guarded complex that houses all the international embassies, security gets tighter and the road blocks are situated every 50m. We pass the British Embassy with its four tiers of barbed wire and then the American Embassy, like a fortress with its double walls. Inside are cinemas, restaurants and shops. Food and water are flown-in and the Americans posted here never have to leave the complex.

Interview: Andrew MacLeod Relief to Transition Advisor to General Nadim, Head of ERRA

Earthquake Reconstruction & Rehabilitation Authority

Energetic, confident. Proud of his achievements in gaining a posi - tion of influence with General Nadim and in coordinating the relief effort. Rachel said he was the driving force in managing the 'clus - ters', for example for health and shelter, that were set up to coordi - nate the relief and in getting things done. Holds rank of , Brigadier General.

He had been Chief of Operations at UNHCR when news of the earth-quake broke and had jumped on a plane. He was at a meeting with General Nadim at the beginning and had pulled him aside and asked to speak with him in private. He told him he had been in the Australian military and that a friend, a Brigadier, had said the worst thing was that no one told you when you were wrong. He offered to do that for General Nadim. Nadim asked him what he meant and Andrew told him that he couldn't just task NGOs as he'd been suggesting in the meeting.

Relief effort was a real achievement. Impossible to distinguish between national and international response because of good coor-dination. Strategy oversight group provided interface for clusters. Very clear lines of responsibility from General Nadim down. Made use of 40,000 military to set up elite rapid response unit.

Andrew described the current debate in ERRA about what types of construction will be approved – traditional or concrete? He asked us if we were prepared to stay on for three or four months and advise ERRA. He said that General Nadim is very enlightened, for example he wants to focus educational funding on girls. But there is a lot of uncertainty still and a need for good communication for people not linked to media. International Red Cross did a good job.

The disaster had one positive outcome, it opened up Kashmir. Prior to the earthquake, only seven people had been allowed into Indian Kashmir. During the relief operations there was a most remarkable absence of bad will between the two sides.

We were introduced to Richard Martin from DFID. Other contacts mentioned by Andrew included: Brigadier Iftikar in charge of military in Mansehra District, Rodney Wynne Pope IRC, Lee Maloney and Mohammad Humayun.

Friday 2 June 2006 to Abbottabad and Thandiani

We catch the Daewoo bus to Abbottabad. It is smooth, comfortable and air-conditioned. We are met by Professor Khan and his driver in a blue Wileys Camioneer – the 'Khan-mobile'. Emily and I are whisked off in one of Ibrahim's taxis.

After dropping our belongings at the Shelton Hotel we have a light lunch at the Government guest house where Professor Khan and his team are staying. I mentioned that I would like to see the hill station near Abbottabad called Thandiani and, since it's a half day on Friday, Professor Khan thinks it's a good a idea to take the whole team there.

It's a nice drive up a paved road through pine woods and meadows to a hill-top with bungalows left by the British. We wander around enjoying the cool air and the views and go for a short walk along the gently rising ridge to an empty bungalow and well-clipped lawn.

Fig 5: Professor Amir Khan and the team of interviewers at Thandiani above Abbottabad.

Saturday 3 June 2006 Field trip to Muzaffarabad

Sitting around the living room in the rest house talking with Professor Kahn and his team of interviewers – four young men and two women. It quickly became apparent that they know what they are doing.

Muzaffarabad

The main street through the town is bounded by a vertical wall of river boulders which by some miracle hasn't collapsed. Some tents are still in evidence, but everywhere there is a huge amount of rebuilding. Commerce is thriving, teeming humanity throng the streets, bumping and jostling into us as we squeeze past, trying to avoid by mown down by taxis and trucks. Tractors crawl along in the heavy traffic hauling heavy duty trailers full of grey sand dug from the bed of the river Jeelum. People making money. Rich and poor making their way in different ways.

Mubashar Lone, our contact from Burnley for Kashmir, takes us to a hotel to meet his friend, a Kashmiri surgeon who also works for KCT, the Kashmir Charitable Trust. The hotel is huge with a wide terrace overlooking the river. There are signs of cracking in the walls that have been patched and inside there is a major repair and refit programme going ahead.

Fig 6: Main street Muzaffarabad.

Chella Bandi, suburb of Muzaffarabad

Chella Bandi is a suburb of Muzaffarabad about a mile from the town centre. We are shown signs of damage from the road side and the interviewers are dispatched in pairs along different side streets. Most of the houses are damaged and some have collapsed entirely.

Many are still in tents. Those that own their houses and land are camped in the cleared ruins of their homes. Those from the land-slide area which completely wiped out their community are in small tented camps.

We are being shepherded around by a couple of young coordinators from KCT who have been working here. We are introduced to a

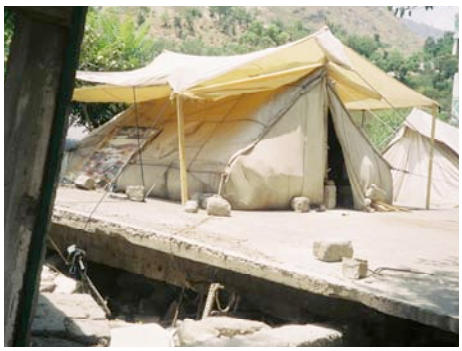

Fig 7: Family camping out on the collapsed roof of their house by the main road in Chella Bandi.

young man in his late twenties called Rajah Kalim who invites us to see his home. His was the richest and most influential family in the community.

He described the horrific moments when the earthquake struck and many members of his family were killed. He was very emotional and kept repeating himself. He described how you couldn't see for dust, how he ran from the house when the quake started. His brother died protecting his mother by covering her with his body. We were well-settled, established people, he said, we had a comfortable life.

I can't prepare my mind about what to do, he said. The temporary shelter (Turkish prefab) we have been assigned is too hot. The aid agencies don't understand the realities on the ground. The Government should explain what people need to do. They have offered 25,000 R compensation to people. That's not enough. I can't see what is ERRA's policy. There has been too much delay. They announced that they would have a plan and would issue advice in a week, then two weeks, then nothing, no action at all. People are finding this so hard.

The international community needs to help by creating work and then people could help themselves. My uncle was the chairman of this area. First thing the government needs to assess whether it is possible and safe for people to return and rebuild. Then they need to provide advice about how to rebuild safely. Or help them to migrate to other safer places. 80% of people are mentally disturbed. What can I do?

My cousin was trapped for three days near Chella bridge. He rang his boss on his mobile and told him where he lived and that he was trapped. The rescue team with heavy machinery came after three days. It was awful. Fathers having to cut the legs off children to get them out. We were reliant on self-treatment for my mother and sister. My auntie was treated in Islamabad. She couldn't walk, but got there herself. The home next door was built by my cousin who is a civil engineer. It was undamaged, whilst our house collapsed completely. I believe that the thing is to create awareness of good design amongst people so they will insist on good construction.

Fig 8: Young engineer, still traumatized by the earthquake, outside his temporary home.

Visit to Kashmir Record and Research Council

Interview: Dr Mohsin Shakil. Consultant Urologist, Bradford Medical Mission

KASHMIR RECORD & RESEARCH COUNCIL
KR RC
www.krrc.org

We are taken by Mubashar to meet people at the Kashmir Charitable Trust. Trying to make comprehensive record of event. Designed and conducted survey of survivors including 10,000 photos. Some children were stolen and taken to Pakistan. Only have data that they are missing and don't know what happened to them, they could be dead. It was completely lawless for the first week and the local police didn't start work for seven days. Even the President said "help yourself". It was a credit to local people that we managed. We enrolled young people and set up a routine of checking on every area. There was no medical treatment first two days. Medical team from Mirpur first to arrive. They worked in tents until first field hospital arrived on the tenth day. They did 500 amputations on first day.

Records in Muzaffarabad and PIMs should have data about amputations in local field hospitals.

After two or three days the roads were open and people moved out of the area for treatment. It should be easier to establish true figures from this current survey.

Interview: Aamir Khawaja, KRRC coordinator

When the earthquake struck I called my friends and talked about what we should do. The first thing was to establish security forces. People came from the rest of Pakistan to rob and kidnap children and the police force was out of action.

There is a literacy rate of 70% in Kashmir. People aren't stupid. The government figures of 70,000 dead cannot be correct. I personally buried nine people who were never identified and the cemeteries are full of people who have not been claimed.

We have started a basic computer course and we want to establish a computer company to give more advanced training. The government took 40,000 Rupees duty on the computers we were given from the UK.

Higher up the road in Chella Bandi we visited people in another home. A man in his forties was lying on a bed, being massaged by his wife. He said he was a high school teacher. He was at school teaching when the earthquake happened and was injured trying to save children. His hip was dislocated. He has had 11 operations, all of which have failed to fix it. According to John, he has deep infection. This must be treated before any further operation, which should be by a specialist remedial surgeon.

He has spent 100,000R on operations. He asked for help from the authorities who said he could go back to the government doctor in Muzaffarabad, but 'he doesn't know his arse from his elbow".

He has also had to buy a temporary home for 108,000R that he has erected on the site of his house. His wife was giving him physiotherapy. We joked about his smoking. A sweet poison, he said. A good friend, and a bad enemy.

Discussion about Bedadi village

Professor Khan got the most animated we have seen last night in discussion with Naveed and Tahir, the two men from Peshawar who have been working with John Beavis and his charity Ideals on rebuilding the village of Bedadi. They have been planning to build houses for forty families. Professor Khan said they should provide only the land and basic services.

Naveed seemed taken aback and began a discussion. Clearly they intend to build. He said they had looked at nine sites and selected one. They intend to provide $2^1/_2$ marlas for each house (68m2).

(1 marla equals 272.25ft^2 ie square plot 16.5 x 16.5 ft)

Professor Khan said this was too little for a rural home. Where will people store their wood for fires, the straw for animals, and where will they keep their chickens, he asked. Naveed and Tahir reacted strongly by saying that the government recommended 2.5 marlas

Fig 9: Bedadi Village, Mansehra.

and wouldn't fund more than this. Anyway they couldn't afford twice as much land and still build the houses. Professor Khan said that they shouldn't be building the houses. It was better for people to do it themselves, that building the houses created dependency.

I said that in my experience, in Venezuela, poor people began by invading the land in highly organized coups. They began by building a temporary shack but once they got ownership of the land they gradually improved their homes until after 20-30 years they had a big house or shop.

Professor Khan said that it was important that the site be near the main road. That anywhere along the Mansehra road would allow small shops and businesses to prosper and this income could be invested in community facilities. John, Naveed and Tahir had problems adjusting to the idea of not building the houses. They seem to already have created a dependency by going to the village so many times. Sensitive to the implied criticism, Naveed said, we have just finished distributing food.

Professor Khan thinks that the best thing to do is to distribute funds to households in installments and to return and evaluate their investment according to fixed criteria. If approved they could be given more funding. You have to understand this country. Individually families can be trusted to do the right thing, but collectively, for example giving compensation to a whole community, wouldn't work. Someone would steal it all.

I had a chat with John the following morning. He understands the sense of more land, but is still thinking that they need to build the houses. I said that communities planted like this always retained a uniformity and that it could be better to let people build their own. At first it would be anarchic and ugly, but in the end the village would be more interesting and beautiful through organic growth. And anyway the houses they proposed building – one room with bathroom and kitchen, were very small for families. Later with Professor Khan we discussed how this project might be a model for elsewhere. The problem of tenant farmers needing land to build was widespread. We also thought we might collaborate to document the process, for example, recording how the plots were allocated and distributed.

Sunday 4 June 2006 Field trip to Balakot

Balakot

Mubashar said he is coming with us today. It is Sunday, Mubashar said, and the people I want to see won't be there and places are closed and I want to see this area. I've never been, he says. I want to see what's happening on the other side (geographic, cultural, political). Maybe in Bedadi, if John is putting in £20K we could put £10K and do more.

The main street in Balakot is teeming with people selling and buying, pushing past each other on the crowded sidewalk. All the buildings bar one are collapsed but shop-keepers have erected rude stalls in timber and tin. There are shops selling bags of cement, corrugated steel sheets, plywood sheets and timber.

Fig 10: Bridge over Kunhar River under repair, Balakot.

Everywhere there are people recycling building materials. There are small saw mills by the side of the road with a portable band saw and generator. The are big stacks of mud red brick and concrete blocks. There are piles of steel rods and men are using simple bending frames to straighten them.

The wheat harvest is in and the patch work of tiny fields are pale yellow with stubble. Bearded old men are scattering corn seed for the next maize crop and spreading piles of manure.

There is a Bailey bridge and a ford over the river because the main bridge was damaged in the earthquake. The road climbs steeply and soon we are high above the river on a switch back road, narrowed by landslides to a single lane. Children going to the UNICEF tent school. Many jeeps and transport moving people along the Kaghan valley.

Fig 11: Fording the stream in Balakot.

Kaghan Valley

Herdsmen of the Gujar tribe bring their animals from the plains south of Islamabad to high summer pastures at this time of year. We have to squeeze past herds of goats, sheep, cattle and horses. These people look very hardy. They come from the Punjab and once ruled the whole of northern India. The men have beards and woolen hats and the women wear gold ear and nose rings and colourful scarves. The older men are dark and fierce with beards. They carry their world with them and their fortune is in their flock.

Fig 12: Gujar tribesman moving herds up to high summer pastures in Kaghan valley.

They tend to rest during the day, then in the evening they start off again and travel through the night when the traffic is lighter. Did they suffer less in the quake than agriculturalists? They speak Gujari and our driver is from this tribe. They used to stop at our village to rest, says Professor Khan, and I like speaking their language, so I'll chat with the driver.

Professor Khan tells us about them. They have dogs for security, he says. From what, we ask. People and wild animals – tigers, lions and snow leopards. There are tigers in Nathagali. They had to shoot one recently. The herdsmen usually kill one of their flock when they know tigers are about. But this one developed the taste for humans and they had to kill it.

I am in the outside seat and as we squeeze past, the men whacking are the beasts out of the way with switches, I look out of the window, hundreds and hundreds of feet down to the boiling river. The driver from Ibrahim's taxi, Mazhar Ali Zeb, is fantastically good, but we are inches from the edge and it is all so unstable after the quake. Above us, for hundreds of feet, are steep tottering slopes of scree with boulders as big as houses perched ready to fall. I begin to understand why Professor Khan intersperses nearly every sentence with *Insha'Allah* – God willing.

At Jared there is a makeshift roadside cafe, the plastic table and chairs sitting inches deep in a stream. The owner waves us in, but we are on a mission to reach Kawai where we will hire a jeep to continue.

The valley is wooded – tall stately pines. The slopes on the far side of the valley are green and undamaged whilst on our side where the new road has been widened six or seven years ago, all is devasta-

Fig 14: Wooded west side of Kaghan Valley.

tion and ugliness. The steep slopes are fenced into tiny plots and there is stubble from a recent harvest. Professor Khan says the area is famous for potatoes, which are delicious. They are about to plant maize and we have seen old men scattering seed on the fields in Balakot and spreading muck on top to feed the new plants.

In the distance we can see snow covered peaks. Not Nanja Parbat, that's further up the valley a day's journey away and we probably won't get that far. But they are still 5,000 metres and their glaciers reach the valley floor. The river looks cold and deadly. The flow is very fast and we debate whether anyone could raft or canoe down.

Fig 13: Landslides on the main Kaghan Valley road.

Kawai-Garlat

In Kawai we saw, that when a community loses over half its population, the survivors are traumatised. They literally don't know what to do. When asked about their hopes and fears for the future they said that their hope is in God and their fear is that the earthquake would come again. 120+ children were killed when the school slid a thousand feet down the mountain side and was buried under a rubble mountain that blocked the stream. We heard about many families who had lost all their breadwinners and children who been orphaned.

There is a clear difference between people who owned their homes, who now camp out on their land in shacks and tents and are beginning to rebuild, and tenants who are living in tented villages.

It would be interesting to know if the tented villages that have been disbanded, like those in Peshawar and those we saw in Balakot catered for people from remote areas, who have now returned, and if the villages that remain have different types of people – perhaps those without land.

Fig 15: Village of Kawai.

Shogran and Paya

We soon leave the main highway in Mubashar's car and head up a side valley to Shogran – an alpine style resort in meadows and pine woods at 3,000m. Only the older timber bungalows are undamaged. The newer concrete hotel complex is badly affected, either collapsed entirely or severely damaged. We meet a couple who are here as tourists. Mubashar and Professor Khan think they are maybe from the diplomatic set.

We change to the jeep we have hired in Kawai and go on to the Alpine meadows of Paya. The road is blocked by a fallen tree, so we get out and walk the last bit which is more pleasant than being rattled around in the jeep and we saunter up the track between the trees.

The tiny restaurant at Paya has been destroyed, but the owner has rebuilt his kitchen and there are rude benches to sit on. We stop for a rest and Mubashar and Amir order lunch. Emily and I are keen to walk on, but Professor Khan persuades us to stop and just taste. So we wait. It is pleasant looking across to the meadows and the lake. The food when it comes is quite delicious – dahl and a vegetable curry that Emily says tastes like fresh crab, all eaten with the fingers and naan bread, almost the best food we have on the whole trip, and cooked in a shack on a wood fire like in Venezuela.

We have just an hour for a walk as Professor Khan suggests we

Fig 16: Professor Khan, Mubashar Lone and Emily So, at Shogran.

need to be back by four as it is a long journey back and we have promised to take the team of interviewers out for dinner in Abbottabad. We set off, taking a path to the lake rather than the main track. This winds round the mountain and crosses the watershed into the Neelum Valley before dropping down to Muzaffarabad. Our driver says it would take three days to walk there. I'd like to do it, but another day. The grass is cropped short, but the path gives and we scramble through white peonies to the roadway. There are wild iris and the sky is blue with big thunder clouds to the north west and we wonder if, like yesterday, we will have a storm. We can see Malika Parbat (5291) to the north, but not Nanga Parbat as the guidebook promised. Too soon we reach a point where we will have to return. We go on a few hundred yards and are rewarded with a view of nearby Mount Makra (3885). The slopes are still snow-covered, but not as deeply as in the posters we have seen in the guest house.

It's companionable sauntering back. Neither of us have felt the altitude and it is delightfully cool after the heat of the plains. At the rest house we have green tea and set off with Professor Khan and Mubashar for the jeep. Emily and I continue walking rather than climb aboard the jeep. But after a while Amir says he's worried about the time and we climb aboard for a bumpy ride back to Kawai. The interviewers are waiting for us by the side of the road in Kawai. They are upset and disturbed by what they had heard from the villagers.

We get back late to find that Major Munir has invited us to dinner. His research is on women's roles in a modern Pakistan, but we still eat apart from the women. The major tells stories about his early training, but either the students are shy or they aren't as funny as he thinks. I could hear Emily in the other room talking football to the children because the women were talking Urdu. The food was good, but Professor Khan piled up our plates and it is hard to eat this late.

Monday 5 June 2006 Field trip to Kaghan Valley

We get another early start and repeat our journey of yesterday, this time without Mubashar, who drove last night to Lahore.

The Kaghan Valley is the old Silk Road from China to India and Arabia, or that part of it crossing the high Himalaya. It goes from Balakot in the south to Chitral and Gilgit in the north. The epicentre of the 2005 earthquake we have come to research was just north of Balakot.

This is the mythic North West Frontier, home, in imagination at least, of armed Pakistani tribesmen and site of the Great Game. Amir Khan was as excited as I was at the prospect and Emily, having satisfied herself that the survey was proceeding well, was keen to go too. My Pakistan Handbook had said this was a beautiful area, but Emily thought it might have been destroyed in the quake.

The interviewers have gone back to Chella Bandi today. Professor Khan has decided they need a break after yesterday. They are going to visit the upper part of the community they didn't reach before.

The whole valley is owned by one man and his property stretches for

Fig 17: Professor Khan and Stephen Platt on traditional charpoy rope bed, Paya, above Shogran.

Fig 18: Steve Platt, lake at Paya.

Fig 19: Lake Saiful Maluk, Photo by Miriam Malick.

Fig 20: Traffic jam crossing a glacier, Kaghan Valley.

130 miles. These people are tenants and have been badly hurt by the quake. Many of the stone houses have collapsed and we see lots of tents still. There are quaint square pagoda style houses which may be holiday homes of the rich.

We reach Kawai and climb aboard a jeep. Our aim is to reach a beauty spot – Lake Saiful Maluk. Our driver is the same as yesterday. His name is Zaim Khan. He is Gujar, like the herdsmen and Professor Khan chats with him while Emily and I are thrown about on the back seat. Most of the other jeeps fill up with 10 or 12 people so they are usually packed tight.

From Kawai the road is much worse since they haven't scraped down to the road surface. There are huge random boulders to negotiate and stream beds to cross. And every few minutes we meet oncoming traffic or fight our way past a slower vehicle. The drivers are fantastic, especially the ones driving the huge Bedford trucks. These are often old and belching black smoke but they seem to get everywhere a jeep can.

The truck beds are locally made, high sided steel structures painted all over in colourful murals and arabic prayers. They often have winking coloured rear lights and all have chains hanging from their rear bumpers like exotic necklaces.

The valley is very beautiful – narrow, steep, wooded – a patchwork of bits of pasture and tiny ploughed terraces awaiting replanting. There is still a lot of damage – trees with scars from stone fall high up on their trunks. The road is still blocked in places and the army is working on glacial slides.

We have to queue with many jeeps and trucks and in the event there isn't time to reach the lake. We meet the couple from Shogran again that Professor Khan thought were diplomats. We are waiting in the queue and see the man struggling across the glacier, his shoes covered in mud. He is having difficulty walking, maybe he's had a stroke, but despite this he's determined to find out what's happening.

We invite him to have tea from a roadside stall. He tells us his story. His father was head of PIA and wrote books on aeronautics. His wife arrives, she's been waiting in the car and is a little annoyed having been left so long. She says there is a saying, if you stand too long you grow roots. He is very tolerant of her. It seems unusual for Pakistan that she is so outspoken with strangers. Then we hear she lived in Germany for many years, as a translator and then ran a clinic giving Raike massage etc.

She tells Emily that they were childhood sweethearts, but married other people. Her husband died and she contacted him knowing he was divorced. They have been married six months. Her two grown up children did not approve. But now, seeing them happy, they have come round. We invite each other to visit Karachi and Cambridge.

Although we fail to reach the lake, we achieve our secondary objective – a meal of fresh trout. Professor Khan has been thinking about this. He was last here in 1976, before any of the tourism and hostels.

We find a man who says he can get us fresh trout. After some time he returns looking furtive with his hands across his chest. Once out

Fig 21: Glacier blocking the road to Naran.

Fig 22: Young men playing cricket in main road Naran.

Fig 23: Professor Amir Khan and Stephen Platt eating fresh trout in Naran.

of sight of the road he unzips his fleece and reveals the fish. There are police and government officials about and it is prohibited he says – maybe it is out of season. We drive up the valley a little way and return to delicious brown trout out of newspaper. Professor Khan teaches me to eat trout with the skin – crispy and tasty. The trout were introduced by the British. They brought eggs from Scotland. The man asks if I have been fishing and I tell him yes. In Scotland, he asks. He knows about this from the many English from the British High Commission have been here for the fishing and to eat trout.

Tuesday 6 June 2006 Islamabad

Interview with Lt Colonel Abid Hussein, Coordinator ERRA.

Earthquake Reconstruction & Rehabilitation Authority

We have an appointment with General Nadim at ERRA. It has been arranged by Andrew McCloud and Rachel Lavy. We get the 9:30 bus from Abbottabad having been seen off royally by Amir and the Ibrahim taxi drivers. The journey is equally smooth and we are able to get a rest before taking a taxi to the guest house. We have time for a sandwich and we make notes about what we'll say to General Nadim. The plan is for Emily to describe the project and for me to give a summary of our observations.

In the event General Nadim is unavailable. We are met by Major Mushtag Hussain who introduces us to Lt Colonel Abid Hussein. He says that we should give our report to him, implying that we will get to see General Nadim later.

He ushers us into a grand conference room and we squeeze in past overcrowded gilt chairs and sit down. Rachel says she is from WHO and introduces us as her guests. The Colonel contradicts her, saying we are his guests and the guests of Pakistan.

Emily explains the purpose of the survey and I ask him if he has time to hear our summary report. He says yes of course, if we have come all this way he has more than enough time to hear us out.

Summary of observations and recommendations to ERRA.

We talked to people in their homes in Chela-Bandi, Muzaffarabad and in Garlat-Kawai, Balakot. We also interviewed doctors, relief and reconstruction people in Islamabad and Muzaffarabad.

In terms of preparedness it might help to send people to work with Emergency Response and Search & Rescue Teams in order to set up elite units in Pakistan.

Reconstruction is going ahead – commerce is returning, people are starting to rebuild their homes and local NGO's are rolling out model housing designs. People are recycling building materials – stacking bricks and concrete blocks, straightening steel rod and piling up lumber for re-use.

Commerce has returned and is thriving in both Muzaffarabad and Balakot.. The main streets in both towns are thronged with new shops, including those selling building materials. The cost of building materials has nearly doubled. Cement has gone from 250 Rs a bag to 400. The cost of blocks has similarly increased.

Most people we spoke to were confused about what to do and were waiting for assistance and advice.

We report Professor Khan's advice about distributing assistance, that the home is very important to Pakistani families and that very little compensation money would be wasted or go astray.

Advice about recommended construction forms would ideally be graphic since most people rebuilding will not be trained construction workers.

As well as rebuilding homes and public buildings, livelihoods are also important. We saw a number of projects by local NGO's in Muzaffarabad aimed at training and job creation.

The Colonel picks up on one or two issues, in particular he is surprised about the cost of building materials and says that the information they have been getting is that there has been little increase in prices and that inflation is under control.

Lt Colonel Hussein says forcibly that Balakot will not be rebuilt and that any new buildings will be removed. He also asks our opinion of pre-fabrication. The question is in the context of a discussion about rebuilding homes so we understand he refers to houses. We say that independent of what materials or forms are used the important thing is quality of construction. We saw instances of buildings that had failed of all types of construction and evidence that buildings that survived were well-built. It was also difficult to control for quality, especially in joining pre-fabricated panels and that in any event pre-fabrication would only have a very marginal impact given the scale of rebuilding required. It only became apparent later that he was referring to proposals to re-build medical facilities using pre-fabricated concrete panels. He ends the meeting abruptly and we leave feeling dissatisfied.

Interview: Dr Maryam Mallick, WHO Coordinator

Our last interview is with Maryam Mallick, a doctor and coordinator at WHO who has been responsible for founding and running rehabil - itation centres for earthquake victims. A very pleasant women with a direct manner and smiling eyes.

We began immediately collecting data to assess the magnitude of the disaster. Our assumption was that there would be many casualties. We visited hospitals and camps.

In all there were: 741 Spinal injuries and 713 Amputees

Patients shifted from earthquake zone and moved to four cities – Peshawar, Islamabad, Lahore. 21 patients sent to UAE. 65% of spinal injuries were women. Living in poverty. Most of the men living away from home. Most of the women at home.

The way they were moved and transported had a major impact on the severity of spinal injury. Patients should have been immobilised during transport, but this didn't happen. Many people suffered incomplete paralysis injuries. People reported that, while waiting for rescue, they could move their legs. For example one man, an academic, reported that he was dragged down stairs from first floor and then along road to transport. Rescuers thought they were doing good to the patient. A lot of amputations resulted from infection. Many complex fractures. They had to wait 7-8 days for medical

attention, and by this time gangrene had set in. In a few cases this could have been prevented. Field hospitals managed to control infection once people arrived. Those coming late from remote areas were obviously more badly affected.

There was also a wide-spread misconception that lots of artificial limbs would be needed. 1,000 arrived as international aid. But limbs need to be custom fitted. Have to take cast of stump to get exact contours. Shops opened selling protheses for $4-500. It was thought that this would be very profitable.

There were no checks on volunteer doctors – on their qualifications and training. The capacity of the hospital system proved to be inadequate for what was required. They were flooded with patients. There was an acute shortage of everything, of nurses, doctors, equipment, supplies.

Spinal injuries need specialised care. Patients were scattered all over the place in different hospitals and wards, on verandas and in corridors, with no special care. WHO immediately built a 100 bed prefab clinic and started bringing patients together for treatment. They organized 100 medics, 50 psychologists, and shifted all the patients under one roof.

We set up three centres: 2 in Islamabad and 1 in Rawalpindi, plus a military unit. There were about 100 spinal injuries amongst military personnel that were treated separately. It was a holiday for the army. Many were in their barracks sleeping. The army hasn't released the exact number of casualties. They estimated 2-3,000, but the true figure is likely to be much higher.

The total of 713 amputees includes all kinds of amputation from small finger to whole leg. The true total could be little higher. With proper documentation the total could be 900-1000, but not any higher. Major amputations, requiring artificial limbs, were 550. Only 38 cervical spinal injuries and of these only 4 total quadroplegic. The rest partial or quadriparetic.

Many agencies working in provision of protheses. For example, ICRC provided a 100 bed orthopedic prosthetic workshop in Abbotabad. Limbless Foundation Handicap International, Mansehra.

There were also many nerve injuries – foot drop, hand drop. People often waited 3-4 months before seeking medical help, wondering why they hadn't got back full use of their limbs and assuming that they would eventually get better naturally. Also problems of post-fracture contraction – due to lack of movement during splinting/cast. People were not told clearly that they needed to get limbs exercised. Many of these patients now need physio help.

Many spinal patients have bladder/bowel control problems. Literacy level is low. We need to train patients in the use of the catheter. They are told to put in the bladder every four hours, but do it every half hour or not for 6-8 hours and have problems. One man even put his catheter into a Pepsi bottle. Those with head injuries suffered no neurological deficit. Surprising, but most patients with severe head injuries didn't survive. Left or right paralysis.

In summary I believe we adopted a well organised approach. We gathered data about the scale and nature of injuries

A spinal unit was built quickly. We set up rehabilitation centres in Muzaffarabad and Abbottabad.A workshop was established with stakeholders involvement and comprehensive plan for patient rehabilitation. This was one of recommendations of the National Regulatory Authority that got immediate approval.

We developed manuals. There was no training material for paramedics. Special manuals for mid-levels physios. We started training workshops. Occupational therapy to make patients independent. We had only one occupational therapist in the country before earthquake. Had lots of expats coming back to help and we organised a certificate course.

We developed strategy to address the long-term problem of reintegrating people back into the community. The strategy includes primary level community workers and a Regional Resource Centre with occupational therapists etc. At a national level we have the National Institute of Handicap. This structure has already been implemented successfully in Afghanistan. We devised a manual for the families and for the community to help them understand how to help people integrate back into society. This is part of a comprehensive community based rehabilitation programme.

CONCLUSIONS

Casualty rates and building failure

A lot of people died in the 2005 Pakistan earthquake. The latest figures are 90,000 dead and over 100,000 injured. These may be an underestimate, it is impossible to know. This relatively high death toll was due to widespread building failure and delay in providing immediate rescue and medical aid.

Fig 23 shows a typical catastrophic collapse of a two storey house that pancaked killing the occupants. Fig 24 shows an example of partial failure where people survived.

Irrespective of building type, materials or site conditions, the main reason for building failure was poor construction. We saw examples of buildings that had survived of all types of construction – traditional and modern, timber and stone, or concrete and brick. Whilst close by, buildings of the same construction type had collapsed. The difference was, quite evidently, poor construction.

Site selection also must play a part in a minority of collapses. In Muzaffarabad whole settlements had been caught in huge landslip. In Balakot, houses on a ridge above the town had slipped and in Kawai the school had been taken by a landslide. But these instances of collapse are in the minority. Most of the houses on flat land in Balakot and Chella Bandi, Muzaffarabad, had also pan-caked, the walls collapsing inwards or outwards into rubble leaving the flat concrete roof-slab unsupported.

The wide-spread failure is clearly due to poor wall construction. The walls collapse inwards or outwards leaving the flat concrete roof-slab unsupported. Typically the concrete columns have no cross bracing and, although we didn't investigate properly, the steel reinforcement is likely to be under-speced and inadequately tied at corner joints.

Infill masonry is poorly bonded and not tied to the surrounding concrete frame. We were told that the concrete blocks, which are used for much of the infill masonry, are made with only a quarter of the required amount of cement. (1:40 mix) The mud bricks we saw everywhere are also likely to have very low strength. Masonry is often poorly done with rounded stone and few through stones.

This was all in marked contrast to the few examples of traditional construction we saw using heavy timber posts and beams in the walls, well-done dry stone walling infill and heavy roof timbers supporting a clay roof.

Figs 25-26 some examples of well-built traditional houses. Note the large section timbers used to support the earth roofs and the quality of the walling in the example bottom left. The house top right, in the lower Kaghan Valley, is propped. So it must have suffered some damage. But the roof didn't collapse. But we also saw some examples of poor traditional construction, where roofs had collapsed when the poor masonry walls failed. Clearly old houses that have survived the passage of time are more likely to be well built. But it is also clear that it is easier to build strongly with large section timbers than it is with reinforced concrete.

Fig 23: The ground floor of this house in Chella Bandi pancaked, killing the occupants.

Fig 24: This roof stayed up, unlike many others. Chella-Bandi, Muzaffarabad.

Fig 25: Traditional timber and stone house is undamaged, Ghanool, Balakot.

Fig 26: Road side shop of traditional construction undamaged, Jared, Kaghan Valley.

Traditional construction relies heavily on large section timber for its strength. The availability of timber is, however, a major issue for the Government. There is acute concern about the extent of deforestation over the past thirty years which has exacerbated the risk of landslides. We saw a number of small Government tree nurseries in the Kaghan Valley near Naran. However, there is clearly an urgent need for a much bigger reforestation programme and for the creation of long-term managed forests that could provide a locally grown sustainable supply of timber for construction. This will be a very long-term solution, since trees will take a least fifty years before they can be harvested.

Fig 27: Stone and timber house in Khaghan Valley. Propped but still standing .

To help understand why this happened and what might be done we have posed three simple questions: why did buildings fail so comprehensively; why was there a delay in providing aid; what can be done, if anything, to assist with long-term recovery?

Why did so many buildings collapse?

Many houses collapsed. This is one of the poorest parts of the world, and people don't have large disposable incomes to spend on housing. Pakistan also had, until recently, one of the highest birth rates in the world and this rapid population increase might also help explain poor construction.

Fig 28: Very poor building, Bedadi village.

Earthquakes are relatively infrequent. One of this severity might not be expected in less than one or two hundred years. So people may be gambling that it won't happen in their lifetime or that of their children and grand-children.

In general traditional houses survived better than modern concrete houses. But traditional houses use a lot of timber but the Government, worried about the dangers of deforestation, has been discouraging the use of timber in building. And most people prefer a concrete home, which is seen as more modern and desirable.

But the most compelling reasons for building collapse may be to do with the remittance economy. In the past, men with the know-how to build well, might have been available between sowing and harvest to build and repair homes. But skilled men no longer work on the land because they are away working the city or abroad. In the early 80s over 3 million men worked in the Gulf States. Many of these were from the affected region and many were working in the building trade. (In 2005 half this number, about 1-5 million men, worked in the Gulf.)

Between 75-80% of medical facilities and possibly a greater proportion of schools and other public buildings, such as police stations and local government offices, were destroyed. The WHO engineering report on hospital collapse highlighted lack of cross bracing and inadequate lintel support as two main reasons for failure.

The question is did these public buildings collapse because they were badly designed or because they were badly built? We don't have any evidence either way. But they are likely to have been designed to building codes but will have been built badly. We heard how engineers stick to their desks and never do site visits. We were also told by our interviewees that the reason for poor building was cost cutting and corruption. Maybe all the skilled building tradesmen work in the Gulf States.

Why was immediate relief so slow in arriving?

We saw lots of evidence that the aid agencies and Pakistan Government had done a good job in providing relief in the form of shelter, basic services and temporary schools etc. (See Fig 29) We were also told about the quality of the medical relief.

The tents provided as immediate shelter survived reasonably well after the winter as they were lucky in that this year, they had a relatively mild and short season, although in the higher reaches, temperatures were still way below freezing.

The government had decreed that all camps be closed by the end of March but the organisation set up to guide reconstruction and rehabilitation (ERRA) has yet to finalise the building codes and designs! Over 2 billion USD have been donated to Pakistan by international development funds but on the ground, none of this money was evident.

But everyone we spoke to admitted that immediate relief was slow to arrive. Many people had to wait a week or more. We were told that in Muzaffarabad, which isn't remote, there was no medical treatment for the first two days. The first medical team to arrive was from Mirpur, and they worked in tents until the first field hospital arrived on the tenth day. We were also told that the police didn't appear for a week and that people from outside the area took advantage of the complete lawlessness.

The official reason for delay is remoteness. Roads were blocked by landslides, there was a lack of Chinook helicopters and bad weather limited flight time. But there were other contributory factors.

Initially, the attention of the national relief teams was focused on the Margalla Towers, modern apartment block that collapsed killing most of the rich inhabitants in Islamabad.

It is also fair to say that people were unprepared for this scale of disaster. There was a lack of trained search and rescue teams with heavy lifting and cutting equipment. Volunteer rescuers, typically surviving neighbours and family, were quite naturally untrained and ill-equipped to drag people out of collapsed buildings and render appropriate aid: for example the need to immobilize people with back injuries before moving them. But then how useful would sensible advice about immediate aid be if professional teams don't arrive for over a week?

But perhaps most significantly many people told us that there was a delay in the regional and federal government's response. In contrast medical staff in hospitals unaffected by the earthquake, most particularly PIMS in Islamabad, reacted within hours.

Two key areas of command and control were temporarily disabled by the earthquake. Pakistan has a military government and the army was badly hit and suffered massive casualties. This diverted attention and disrupted the chain of command. The general collapse of public buildings in the affected areas also meant that medical staff and civilian authorities in the affected areas, including the police, were out of action.

The civilian authorities in the region were completely disabled by the collapse of government buildings. And the military was also hard hit. The earthquake struck on a Saturday morning during Ramadan and

Fig 29: Example of temporary shelter and water supply, Balakot.

many soldiers were still in barracks. The military death toll may be as high as 30,000 and the army was traumatized by the scale of its own casualties. This initial vacuum in civilian and military authority and direction may have been main reason for the delay.

Long-term reconstruction

The UN Sphere Guidelines on recovery after disaster suggest three key indicators of long-term recovery: return home; opening of transport links and renewal of livelihoods.

Everywhere we went we saw signs of life returning to normal. Local people are rebuilding their lives and reconstructing their homes. But to date, this process is largely self-helped rather than government inspired.

There was widespread evidence of people returning home and starting to rebuild. Most of the large camps have been disbanded and many people are camping out on their own plots. Building materials are being recycled and sand and gravel is being hauled from river beds to make concrete. But we were unable to establish if any of the houses that are being rebuilt are of sound earthquake resistant construction.

The main roads are cleared and traffic is flowing. Only in the mountains, were the roads are continually re-blocked by landslides and glaciers, does road clearance need to continue. (As an example of people's ability to trust in Allah or luck despite strong evidence of evident risk, we went up and down the Kaghan Valley on two successive days driving for hours under thousand foot precipitous slopes of unstable scree and glacial ice.)

Everywhere there were signs of a wheat harvest just in and re-sowing and manuring for a second crop of maize. In the majority of cases it was old men and women who were working in the fields. Note the orderly terraces ready for sowing in Fig 32.

As they have done for generations, Gujar tribespeople were moving there herds from the plains in Punjab up to summer pastures high in the Kaghan Valley. And what little undeveloped tourism there is in the region is struggling to re-establish itself.

Most significantly the town centres of Mansehra, Muzaffarabad and even Balakot, which was totally destroyed, are bustling with people and commerce. The rubble has largely been cleared and, in a makeshift way, the shops have been repaired or rebuilt and things are getting back to normal.

Eight months on we are coming to the end of the transition phase between relief and recovery. ERRA, the Earthquake Reconstruction and Rehabilitation Authority took over from the Federal Relief Agency in April. But the promised government assistance and reconstruction programme is slow to appear. People badly need money to be released to rebuild their homes and clear advice and models for recommended construction.

Government fears that compensation payments might be misused is, according to Professor Khan, totally unfounded and the best thing would be to release the funds immediately, perhaps as staged payments, so people can reconstruct their homes before the next winter.

Fig 30: The stone platform has been rebuilt and a temporary shack built, Balakot.

Fig 31: Concrete frame under construction, Balakot.

Fig 32: Terraces plowed and awaiting replanting, Balakot.

Fig 33: Infill masonry finished on ground floor, Balakot.

There is also an acute delay in providing advice about approved building methods. Eight months on there is still a debate raging in ERRA about recommended forms of earthquake-proof construction. The delay in issuing clear simple advice is causing uncertainty and confusion.

Local NGO's are filling the vacuum with their own models and people are starting to rebuild their homes with the materials to hand. Both these outcomes are unsatisfactory and will produce inadequate or downright dangerous homes. Advice should be given in clear graphical form, on handouts and posters, rather than the complex engineering drawings currently on the ERRA website.

Professor Khan said that he thought that International NGO's were no good at helping with long-term recovery. I suggested that it needed different skills and possibly quite different personalities to manage long-term recovery as opposed to immediate relief.

In summary, local people are rebuilding their lives and reconstructing their homes. But to date, this process is largely self-helped rather than government inspired.

FURTHER WORK

As mentioned earlier, the field trip had two objectives: to implement a survey of survivors and to make observations about long-term recovery.

Field survey of survivors

The aim of the survey is to gather information from survivors of the earthquake about their injuries and subsequent treatment, and to relate these to where they were and the type of building they were in when the earthquake struck. This data will be used to help devise a method of estimating earthquake casualties in future earthquakes.

The survey is part complete. Some 350 questionnaires have been completed in Chella Bandi, Muzaffarabad and Garlat-Kawai, Balakot. Professor Khan, who is leading the field work intends to extend the survey to two or three new sites in Azad Kashmir, one new site in North West Frontier province and a site on south side of the Balakot valley. This will add a further 150 to 200 questionnaires.

Fig 34: Professor Amir Khan, Peshawar University and team of interviewers from CIET.

Land not houses

As Ian Davis stresses in the excellent UN document *Shelter after disaster: Guidelines for assistance* (1982) it is land tenure that is crucial to successful recovery after disaster rather than the provision of houses. He also points out that disasters, although devastating and tragic in personal and individual terms, can be opportunities for positive change.

Bedadi, is a village on the Karakoram Highway north on Mansehra that was badly damaged by the earthquake, John Beavis and his charity, Ideals, has been working with a local NGO in Peshawar called CAMP to provide forty families made homeless with shelter, clothing and food. It was the intention of these two charities to move from this relief effort to buy land and build new homes for these people.

However, in discussion with Professor Amir Khan, an urban planner from Peshawar University, it became clear that it might be more sensible to provide land and basic services rather than build new homes for the people of Bedadi.

It is worth enumerating some of the key benefits of land ownership identified by Mitchell and Hanstad (2004) .

Fig 35: People from Bedadi village living in tents.

Benefits of land ownership

Residence	incentive to improve build quality
Status	major motivation to betterment
Home garden	major contribution to nutrition
Wealth generation	generates wealth and income
Access to credit	ownership facilitates borrowing
Functional activity	storage drying, threshing, storage
Bargaining power	removes feudal dependency

Owning a plot on one can build a home provides an obvious incentive to build well or to at least improve the dwelling over time. Many studies have demonstrated that people's key motivation is the increased status that ownership confers.

A plot of sufficient size to allow intensive cultivation of fresh vegetables makes a huge contribution to child and household nutrition. As the plot improves with building and planting, it becomes an increasing source of wealth that can be used, for example, to raise credit. The plot can also be a source of income in non-agricultural activity. In a rural economy the plot is important for post-harvest activities and for essential storage of fuel and fodder.

Finally, and not least, the plot takes the household out of the feudal dependency relation with the landlord and dramatically improved the agricultural labourers bargaining power.

Professor Khan identified the main problem with proposal to build homes was that the plot size of 68 m2 recommended by the Pakistan Government was much too small for rural housing. People in rural areas need space to feed for animals and wood for cooking and heating, as well as space for hens and livestock. Nor did this plot size allow any room for expansion from the initial single room dwelling recommended by ERRA.

Professor Khan also cautioned that building homes created dependency and advised that it would be preferable to provide at least twice as much land, together with basic services, and allow people to build their own homes. This is the model that has been adopted in South America since the fifties.

In the light of this advice CAMP and Ideals have now revised their plans and are exploring the idea of buying more land. Naveed, Chief Executive of CAMP, is now working closely with Professor Khan on site selection and a place-making strategy for the new community, and Emily and Steve have been invited to join the Board of Trustees of Ideals, the UK Charity.

The main research interest is how far ideas about long-term development in poor communities, that come from experience Central and South America, might be transferred to rural communities in Pakistan like Bedadi. These ideas revolve around land ownership, community organization, the provision of services and self-build housing. Insight from a documented case-study of Bedadi would be of relevance to many other rural communities trying to move out of feudalism after a major disaster like the Pakistan earthquake.

Fig 36: The authors, Emily So and Dr Stephen Platt, above Naran.

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