THE CASE OF FRIULI, ITALY

THE IMPACT OF AN EARTHQUAKE IN A HIGHLY DEVELOPED OLD CULTURE: REGIONAL IDENTITY VERSUS ECONOMIC EFFICIENCY

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Introduction

During the past decade there has been a considerable increase in the number of research publications concerning natural hazards in general and earthquakes in particular. The reports on the 1964 Alaska earthquake [1970], the 1971 San Fernando earthquake [1973] and disasters in Managua, Anatolia and elsewhere provided information which could be used to develop rules for disaster management and reconstruction [Haas et al., 1977], [Friesma et al., 1979], [Wright et al., 1979]. However, the publications show the tendency to apply a systems analysis approach to these experiences and lose sight of the individual characteristics of a particular disaster. Because authors seek to fit their findings into existing models (which are taken mostly from a background of the two Americas), the individual traits of a particular disaster are often neglected, although they might be useful in giving breadth to models which are too narrow. This is especially apparent when disasters happen in the region of a highly developed older culture.

The purpose of this paper on the earthquakes of May 6 and September 15, 1976, in the Friuli area of northeastern Italy is to re-examine and extend existing knowledge about how a regional society behaves in a catastrophe. It is indispensable in doing so to take a careful account of social, economic, cultural and political circumstances in Friuli as they were before and at the time of the disaster, as well as during the period of reconstruction. The paper is intended as a contribution to the quest for a better understanding of the nature of natural hazards and the way in which inhabitants of vulnerable areas respond to them. While it draws upon the findings of research undertaken previously and especially in North America, it attempts to break new ground. Much of the previous work has been devoted to developing models of human reactions to disaster in a single city or parts of a city. In addition, many of the studies have not taken into account the problem of external

influences. The Friuli earthquake affected nearly 100 rural and urban communities spread over 4800 km^2. The impact varied not only with physical circumstances but also with cultural, social and political characteristics. The results of the studies undertaken in 1976 through 1980 with the support of DFG led to the publication of four books [Geipel, 1977], [Steuer, 1978], [Geipel et al., 1979], [Dobler, 1980] and clearly indicate that the cultural context of natural disasters has an important and perhaps critical influence on how they are perceived and dealt with. It seems that, although there is a considerable variation in physical circumstances in North America, there is a certain uniformity in the perception of hazards and human responses to them. Thus, the perception of flood hazards by householders in one city in the United States might resemble very closely that of residents in another city. Similarly, because adjustments relating to such disasters have often been institutionalized (in this case through the U.S. Corps of Engineers), perceived solutions often have a certain uniformity. In the case of Europe, however, there is often considerable cultural diversity, even over very short distances. It is not surprising, therefore, that human responses to natural disasters differ sharply from one region to another and in many instances differ considerably from experiences on the other side of the Atlantic. This has been strikingly confirmed through the Naples earthquake of November 23, 1980. In spite of the fact that Giuseppe Zamberletti, the former deputy Secretary of the Interior (and since June 27, 1981, Italy's first Minister of Civil Protection), the same Emergency Commissioner who had been quite successful in the Friuli disaster was in charge of this second earthquake, the socio-political and psychological situation was totally different. Thus we have a case in which the same person using the same strategies of evacuation to nearby resort hotels in the same country led to different results.

The Events

On May 6, 1976, at 9 p.m., an earthquake with a strength of 6.4 on the Richter scale and lasting almost a minute took place in the area of Friuli in northern Italy. Its epicenter lay only 5 km below the surface. The number of dead and wounded was very much affected by the particular time of day and the weather; most people were at home, but out of doors because of the heat of the early summer evening. Nevertheless, 939 persons perished in the wreckage of the 17,000 collapsing houes, and 2,800 were injured. The homes of 32,000 people were totally destroyed. Several hundred tremors, aftershocks and the heavy rain that set in immediately after the quake pulverized the already badly damaged buildings still further, making the homes of a total of 157,000 people unusable. Altogether, an area of 4800 km^2 embracing nearly 100 communes with a population of half a million, was affected by the catastrophe, and a zone of 25 km across, containing 1766 km^2 was totally levelled. The first, somewhat exaggerated, estimates placed the damage at $6 billion.

The initial relief measures were favored by the fact that around two-thirds of the Italian Army were holding maneuvers in northeastern Italy at the time of the catastrophe, and NATO troops and Austrian and German relief organizations arrived quickly on the scene. Camps with a total of 16,000 tents sprang up, railway cars were brought into the ruined settlements and small mobile campers were set up. An Emergency Commissioner sent from Rome assumed charge of the administration in

Udine and Pordenone Provinces and set up emergency headquarters in the provincial capital of Udine.

PUBLIC DEMAND	zero-hour 1	within 24 hrs	48 hrs	3 days	within 1 week
STATE AID SUPPLIED	9:00 pm 6 May 76	rescue of people from collapsed buildings; life-saving; fire protection measures, safety test of major bridges etc.; provision of tents, camp beds, blankets.	medical aid, operations, amputations, water supply, care of aged, children and the ill. Issuing of emergency decrees.	Burial of the dead. Removal of animal carcasses to prevent epidemic. Sanitary installations. Identification of unsafe structures.	Emergency housing for the able-bodied population Distribution of aid supplies. Closing off of ruined buildings. Public security against looting; protection of artistic treasures.

PUBLIC DEMAND	within 1 month	1/4 year	zero-hour 2	24 hrs	48 hrs..
STATE AND FOREIGN AID	Clearing of rubble under reconstruction plan. Systematic application of foreign relief supplies. Major administrative regulations and regularized law-making.	Selection of areas for rebuilding. Restoration of infrastructure (schools, hospitals). Foundations laid for prefab cities.	11:30 am 15 Sept. 76 second earthquake	mass evacuation to the Adriatic Coast	

Figure 1

Synopsis of Demand and Supply
for Aid Measures

There was no mass flight from Friuli, despite the extent of the damage, even though after centuries of emigration many Friulians live all over central and western Europe, the United States, Canada, Australia and South America, keeping close connections with their homeland, and on this occasion offered their hospitality and suggested their kin leave Friuli and join them. On the contrary, the people wished to begin reconstruction forthwith and to bypass the phase of merely temporary accomodations.

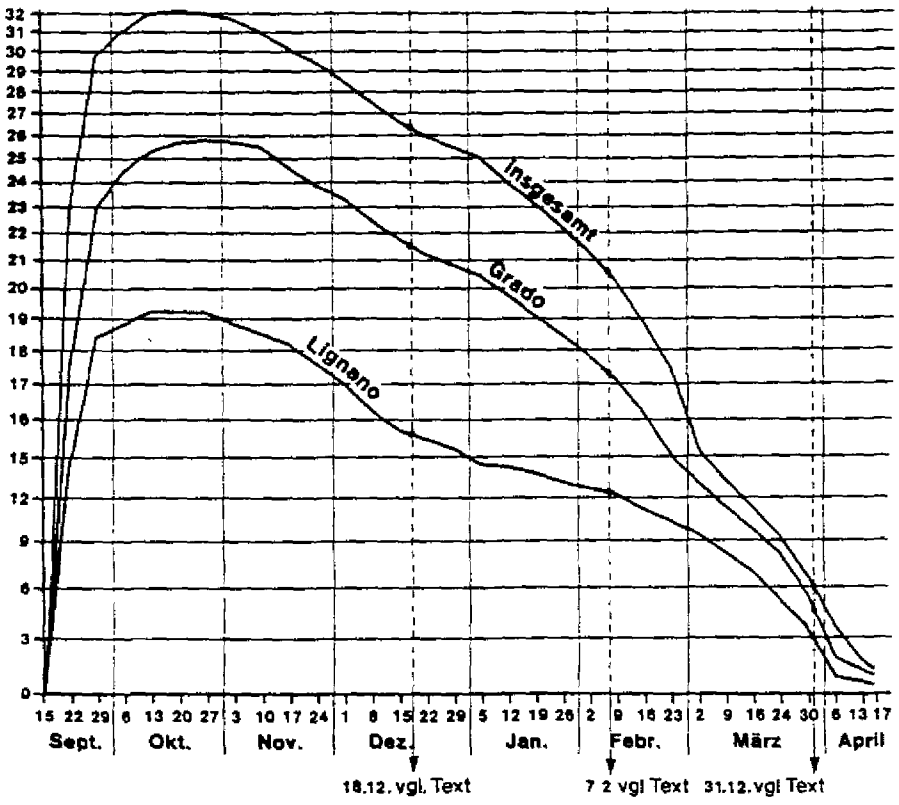


Figure 2

The Sequence of the Evacuation Operation

The fears of Friulians that the fate of victims of Sicily's Val Belice earthquake of 1968 might be repeated in their case gave rise to the motto "Dalle tende alle case" (straight from the tents into the houses and not into barracks first), a strategy that was followed by the Yugoslav authorities just across the border [Adamic, 1979]. An end came abruptly, at 11:30 a.m. on September 15, 1976, to the four and a half

months of continuous and energetic rebuilding of houses and especially factories. After numerous light shocks a second earthquake, at a strength of 6.1 on the Richter scale, struck Friuli again. The number of homeless, which had decreased by the beginning of September to 45,000 because of the repair of less badly damaged buildings and because people found shelter with friends and relatives elsewhere, swelled again to more than 70,000.

Even though the quake was weaker than the first on May 6, the psychological effects on the people were much worse this time. Bad landslides and rockfalls blocking escape routes out of the mountains, the loss of savings that had already been invested in reconstruction, the dangers of the severe mountain winter in prospect, all overwhelmed the resistance capacity of a mountain population accustomed to privation. Although the loss of life this time was much less (only 11 additional fatalities) and despite the fact that nearly 400 tremors between the May and September earthquakes had made the inhabitants aware of the riskiness of the ruined buildings, it was only at this point that the great exodus from the afflicted area began.

The Emergency Commissioner installed on May 7, who had planned relief measures only until July 27, was nevertheless reappointed on September 13 because the regional administration was totally overwhelmed, and he received expanded powers once more after September 15. He was thus able to requisition hotels and apartments in the Adriatic coastal towns, occupied only during summer and standing empty in winter, as housing for the elderly, the disabled and women and children.

Many able-bodied people were also evacuated to the coast, however, and had to contend with a long daily journey to their jobs within the disaster area. Farmers who did not wish to leave livestock unattended, as well as persons who were determined to get on with the rebuilding of work places and homes, mostly refused evacuation, however, and spent the unusually cold winter of 1976/77 in primitive emergency quarters. Illness due to the cold and to overwork was common not only within the disaster area but also in the coastal towns, foggy, chilly, and inhospitable in winter, where many of the hospitals simply had no heating. Lignano and Grado bore the brunt of the evacuation.

Reconstruction plans after the first earthquake were hampered by the Italian parliamentary elections set for June 20, 1976, discouraging politicians from carrying out unpopular measures such as identifying and requisitioning areas suitable for building barrack settlements, or from deciding not to plan for the reconstruction of places that were too remotely located. At the end of 1976, 2,500 people were already living in newly erected prefabs, temporary shelters and railway cars; 15,000 were occupying small camping trailers; 1,000 still dwelt in tents despite the hard winter; and 25,000 remained in the evacuation centers on the Adriatic Coast. Thus housing space had to be created for some 66,000 people. A major prefabricated housing program made provision for about 21,000 units. Despite the hindrance of an extremely severe winter, the evacuees were successfully returned from the coast towns by mid-April, just before the beginning of the tourist season. At that period the Department of Geography of the Technische Universitat München started a survey among the occupants of prefabricated houses with a questionnaire: 6,568 of them, representing households with a total of

20,538 members, were returned for data processing. This 40% response rate can be regarded as reasonably high in a disaster area and under the prevailing circumstances. We will discuss the results of this survey later.

The Importance of a Specific Geographical Location

Friuli occupies the northeastern corner of Italy, wedged between Austria and Yugoslavia. Ethnic minority groups speaking German and Slovenian live within the Italian territory, which may account for the exceptionally high degree of aid given to the disaster area from the adjacent countries. At the same time, being geographically remote from the central government in Rome, the local inhabitants, 400,000 of whom were native Friulians of Romance (rhaetoromanic) language, tended to be uncertain about the roles that should be or were played by outside aid-giving agencies from Switzerland, Austria, West Germany and Yugoslavia. Such influences, overtly or otherwise, could indeed lead to a loss of authority by the central government.

The peninsular state of Italy at the moment of disaster was evidently seen by a large part of the population of Friuli as far more remote than the neighboring countries in the Alps. Since links to the Italian nation as a whole were not very strong, the previous struggle for more autonomy for the Region of Friuli--Venezia Giulia--started to become even more emphatic, and the earthquake did not appear as an Italian but as an Alpine catastrophe. The criteria for efficiency in disaster management were derived from the performance of Swiss, Austrian and German rescue and reconstruction teams and NATO troops and less from the performance of the Italian government for which the earthquake in Val Belice, Sicily, of 1968 was used as a negative example. The Friulians, in a situation of disaster, literally speaking, were looking more to the North than to the South, the more so since quite a few economic problems such as farming in high altitudes, small family farms, or possibilities of mountain tourism seemed to have more in common with the overall Alpine than with the normal Italian environment.

This can be illustrated by the example of the border settlements at high elevations. The boundary area lies relatively high in comparison to peninsular Italy and is in some cases (Sauris; Prossenico) inhabited by members of ethnic minorities. This location of settlements at high altitudes has developed over the centuries on the basis of farming in the valleys and on the slopes and of cattle raising at still higher altitudes.

This lifestyle, in the meantime, has become obsolete because of the smallness of farm units and the economic pressure from the Common Market. These villages in higher altitudes were populated mostly by elderly people, frequently single, using agriculture for self-subsistence only and living from pensions or the remittances of younger members of the family who had not emigrated. High costs for the maintenance of roads and a not very effectively used infrastructure of cribs and schools, etc., made it reasonable for the government in Rome to think of radically modifying this obsolete settlement pattern,

especially since the catastrophe had put an abrupt end to the most important argument to keep the remote villages viable at all--houses and apartments. Thus, a process which might have taken two more generations to accomplish has been accelerated remarkably.

These concepts which derived from a "standpoint in the plains" conflicted with the wish of the Friulians and still more so of the other ethnic groups to stay in their harsh mountain environment; wish that was supported by the Swiss, South Tyrolian (German-speaking Italian citizens), Austrian and German aid-giving organizations for whom (in another sociocultural context) the maintenance of the border settlements at higher altitudes was an emotional value in itself, as it was across the border in Yugoslavia. So aid was concentrated on those poor, overaged and remote mountain communities which resembled the environments of the donors and which indeed might have needed it most. But it was spent in the opinion of some Italian planners in a counterproductive way. The coalition between homesick Friulians and emotionally engaged mountaineer helpers from outside outmaneuvered plans to abandon remote villages.

Regional Identity versus Economic Efficiency

The settlement pattern in Friuli consists of small towns and large villages in the plains, the hilly zone and the major mountain valleys. There are, in addition, hillside villages, hamlets and isolated groups of farmsteads in the mountains. This settlement pattern arose over a millenium of natural resource exploitation, mostly centering on agricultural land use. The catastrophe provided an opportunity to change this pattern thoroughly into a more modern one, bringing commuters, whose homes were destroyed anyway, closer to the industrial parks in the plains and provide a much more rational and economic layout for both the provinces of Udine and Pordenone, at least in their northern parts. In the most extreme case, planners could conceive of not returning large proportions of the population to their home communes from the coastal towns after the evacuation, but concentrating the people where possible in new towns. Outside the destroyed area and away from the zone in which there is a high risk of repetition of seismic disasters, away from the mountain districts that can hardly be served by an adequate infrastructure, one or several such "new towns", perhaps along the development axis of Pordenone-Udine-Gorizia-Trieste or simply just "New Udine", would be conceivable. A building program to provide emergency accomodation in temporary housing to 65,000 persons by May 1, 1977 would have been able to accomplish this, and need not be dispersed over 95 communes, but could be used to implement a growth pole theory at one or a few places. Our survey questionnaire therefore asked 'Could you imagine yourself living for the rest of your life in a town like Udine or Trieste?' The response is shown in Table 1.

Of course, rural people could be expected to say 'no,' but many of them had migrated to and lived in big cities previously and one could expect the younger ones to agree to living in a city. (It should be noted in passing that it might have been better to name other, preferably smaller, cities along with Udine and to omit Trieste completely because of the hostility in Friuli against the regional capital.) Obviously, Friuli was not to be turned into 'another monotonous suburb of Milan'. In contrast to a much more mobile society

in North America, linkages to the home community are very strong. Analyzing the data from our questionnaire for relationships between (1) demography and social situation, (2) impact of the earthquake, and (3) reaction to the catastrophe, Figure 3 indicates that owning one's own house and land within the commune predisposed respondents strongly to remaining there and proceeding with reconstruction. Of the respondents, 77.3% owned a house. Most desired the reconstructed house to be of stone. Latin people are masters of stone construction and resort naturally to this native building material because of the scarcity of

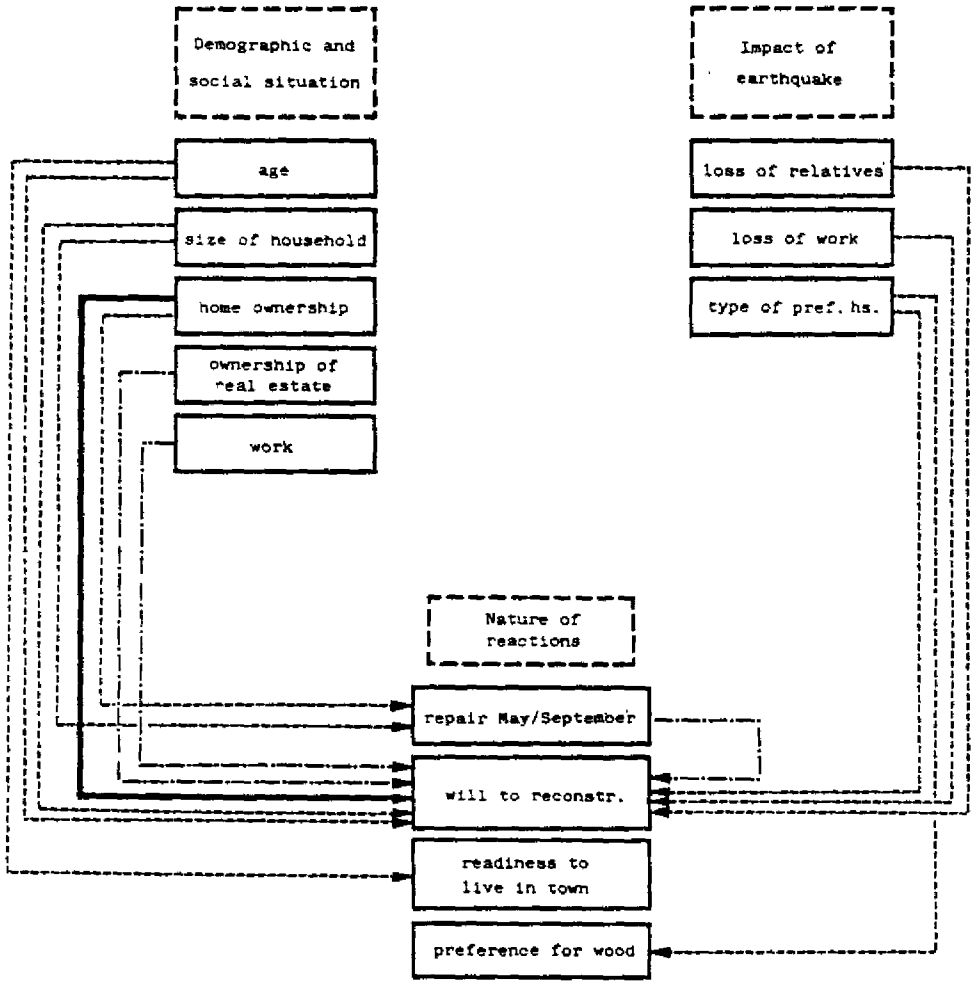
Table 1

Rural Household Interest
in Relocation to Large
City Environment

Response	Number of Households	Percent
No reply	261	4.0%
Yes	610	9.3
No	5,697	86.7
Total	6,568	100.0%

wood in their lands. The torrential streams of Friuli produce a specially dangerous construction material in the form of rounded river boulders often used in place of quarrystone which is superior but costs more. These rounded river stones laid up with little mortar customarily form the outer walls of older houses, mostly occupied by the older, poorer people. But even more modern houses proved to have inadequate roof-support systems, so that total collapse occurred in them as well. Furthermore, the double-rowed tile roofs sealed with mortar were very heavy and were particularly prone to collapse.

Would the people draw conclusions from the disaster that would influence rebuilding? Were the beginnings of acceptance of the wooden houses present in other Alpine regions and, of course, in earthquake-prone areas such as California, or had the unpopular wooden barracks had a negative effect? The response to the question 'In what type of house would you prefer to live in the future?' is shown in Table 2.



Shown are the significant relationships according to the contingency coefficient Cramer's V.

0,05 - under 0,15

0,15 - under 0,25

0,25 and above

Figure 3

Significant Relationships

In spite of the fact that families today are much smaller and the style of the rural economy has changed, Friuli evidently will be rebuilt in the traditional form. Elements of its material culture with a symbolic meaning, such as the fogolar (an open fireplace in the middle of the room) are experiencing a renaissance. "In time of stress, nations safeguard the physical legacy that embodies their communal spirit" [Lowenthal, 1975].

Table 2

Type of House Desired

Response	Number of Households	Percent
No Reply	347	5.3
In a wooden house resistant to earthquakes	1,110	16.9
In a cement/brick house resistant to earthquakes	5,111	77.8
Total	6,568	100.0

A similar issue, at the larger scale of reconstructing cities not only rebuilding houses, is to prevent further urban sprawl by bringing people closer together and back into the medieval cities. Venzone is an excellent example of this strategy. As a medieval city of rare completeness, Venzone enjoyed a certain income from tourism. The old town was surrounded by a high wall, Venzone's especial pride, which was strictly protected as an historic monument. Pierced by only four fortified gateways, during the earthquake it turned into a fatal trap. All four gateways became blocked with debris, and the people, for the most part advanced in years, were unable to escape from the closely built streets. Most of the 49 fatalities in Venzone died beneath the ruins of the medieval city. Hence the demand was widely expressed to fill in the city moat with the material of the wall. In the stress of the disaster the symbol and token of the city underwent a change in value. But now it will be reconstructed, together with the old town

itself. This reconstruction will be based on module-elements derived from units and multiples of the classical Friulian measure of 7 m, a unit in turn determined by the length of logs used in rafts on the Tagliamento river. When such modular elements are assembled and earthquake-proof methods of building applied, the reconstruction of

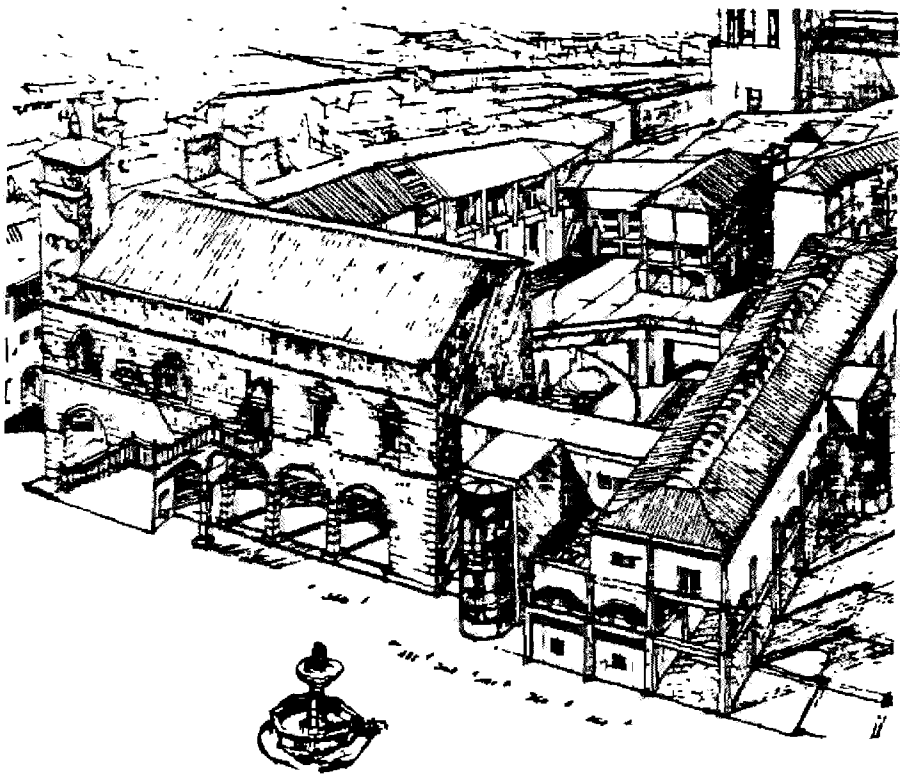


Figure 4

Modular Elements Used for the
Reconstruction of Venzone

(Courtesy of R. Pirzio Biroli. In: 'documenti sulla ricostruzione. Monografie di ricostruire, 3. Udine 1977, vol. 1 nr. 3, p.5.)

Venzone is supposed to combine facade elements, such as arches, portals, balconies, elaborate stone window frames etc., rescued from the debris, with modern elements in a way that reflects the city's character but increases its functional qualities. Of course, this reconstruction

process takes more time and money than just building houses, but it preserves the regional identity.

Trends Accentuated and Accelerated by the Disaster

The 'laboratory conditions' of a disaster not only bring sudden change in the physical landscape but in the potentiality of change in the social environment also.

Community Activities

Competitive political elements seek to govern the reconstruction process. Different concepts of reconstruction plans can be traced to political power relationships. Political factions struggle to control the "right" future. For example, the charitable organizations from countries providing relief were sometimes embarrassed by the task suggested to them by conservatives to "stabilize the system" by providing support primarily for single family houses on their own parcels, while elsewhere leftist communal governments were trying to achieve a decrease in the "bourgeois" character of the population by means of larger collective buildings.

Secularization

In communes that had anti-clerical majorities there was sometimes a tendency to eliminate the church as the ruins were cleared away. The Catholic Church was foresighted enough, in view of the need in which the population found itself, not to press for the collection of funds for rebuilding the churches. It spread the motto, "Prime i case, dopo i chiese" ("houses first, churches afterwards"). But the secularization that had taken place between the construction of a church in, say, the 17th century and its reconstruction in 1980 became quite evident. People had to decide for themselves and sacrifice; they could not just follow tradition.

Agriculture

Processes long overdue were set into motion, for example, abandoning farming on uneconomically small units. Once the stables were destroyed and cattle had to be slaughtered before the evacuation to the coastal areas, a development became irreversible which might have taken at least one generation to accomplish.

Industry

Industry seems to have entered a stage of accelerated development in spite of and perhaps even because of the earthquake. Factory equipment was modernized. Since the catastrophe was widely publicized, national and international credit institutions could be counted on to be sympathetic. State subsidies and low-cost loans promoted additional investments and increased the number of jobs, especially in the construction and building materials industry.

Loyalty of workforce

Friulian workers are industrious, have an enormous capacity for hard work, and are intensely loyal to their companies. This was an important factor. Being skilled do-it-yourself craftsmen, they switched from their destroyed regular work places and themselves repaired the damage to the plants. While their own dwellings lay still in ruins, the rebuilding of plants was accomplished in an astonishingly short time. This was found by Fritz as early as 1963:

> The renovation of the actors within the system and the consequent total concentration of societal energy on the goals of survival and recovery usually result in the rapid reconstruction of the society and, beyond that, often produce a kind of "amplified rebound" effect, in which the society is carried beyond its pre-existing levels of integration, productivity, and capacity for growth [Fritz, 1963].

Search for more autonomy

The earthquake stimulated the emotional feeling of identity among the Friulians. Their status as a frontier folk between three countries colors their historical experience and unifies them. The Comissario Straordinario (Emergency Commissioner) became the symbol of Roman Centralism pitted in this situation against a heightened sense of regional autonomy. The role of this public servant in the emergency brought into focus all the problems and tensions between political centralism and aspirations for regional autonomy in Italy. There is a separate regional political party that tries to channel and cultivate this sentiment. The greatest gains of the Movimento Friulano during the elections of 1978 were in the disaster area, and greater in the north than in the south of the area populated by Friulians. There is a desire for a regional university in Udine, independent of the larger one in the capital of the region, Trieste.

Integration into another spatial context

Friulians interpreted their region as the "gateway to Central Europe" and not just a northeastern appendage of Italy. On occasions, they have revealed through poster campaigns their belief that in reality they belong to a growing new transnational federal union. (Some of the posters, to the astonishment of neighboring Austria, proclaimed affection for the Austro-Hungarian Empire, 60 years after its dissolution following World War I or declared "We want a German government"). This idea of "European Federalism" was accentuated by the fact that all of the aid-giving neighbors already had a federal structure (Switzerland with its cantons, the Federal Republics of Germany, Austria and Yugoslavia). Federalism is intended to grant more individuality to distinct regions.

These seven trends discussed briefly above did not uniformly apply to Friuli as a whole. Regional differentiation followed pre-quake trends. They can be summarized in a map (Figure 5) and a model (Figure 6).

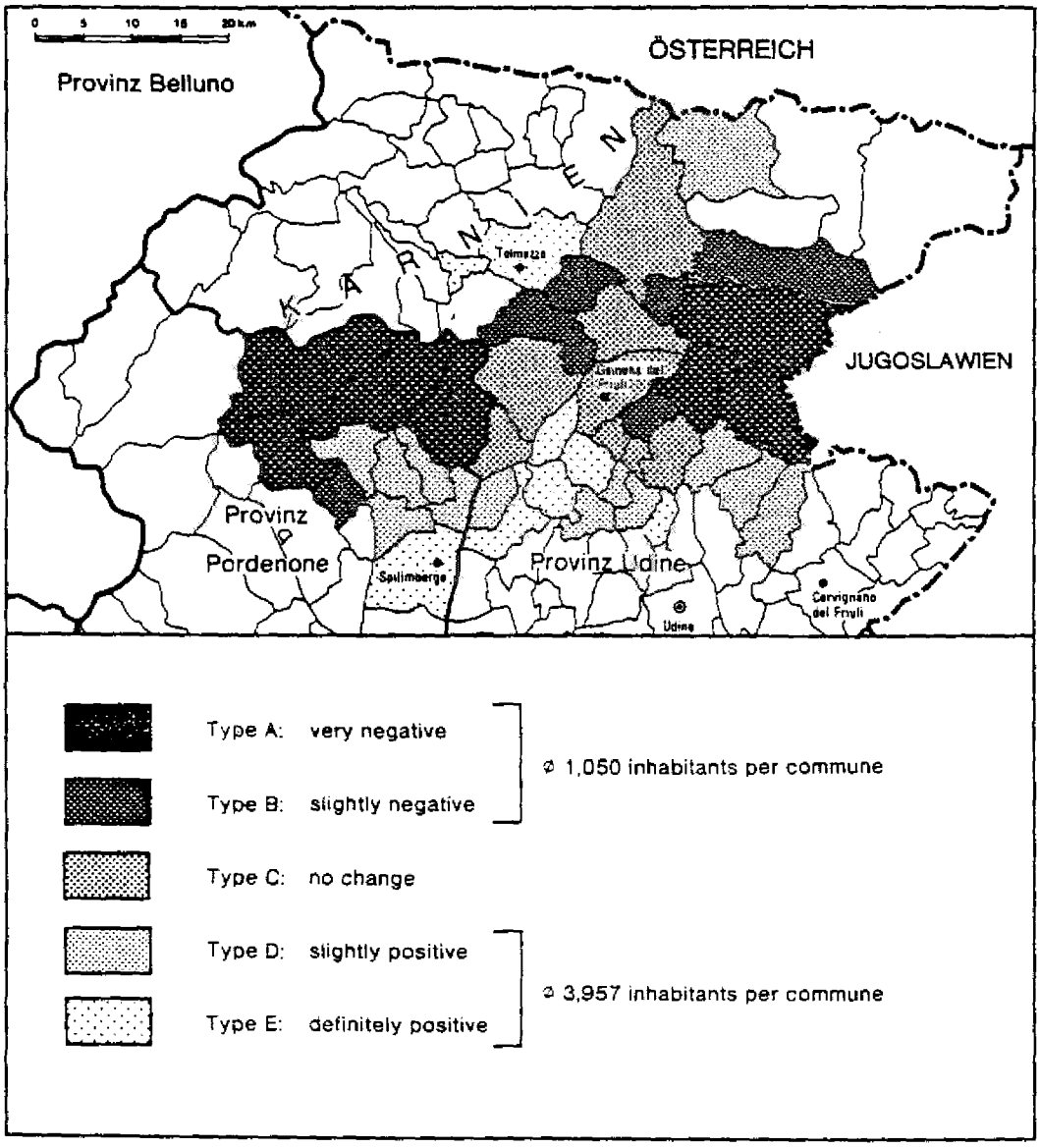


Figure 5

Supposed Future Trends of Destroyed Communes
in the Opinion of 96 Planners (1980)

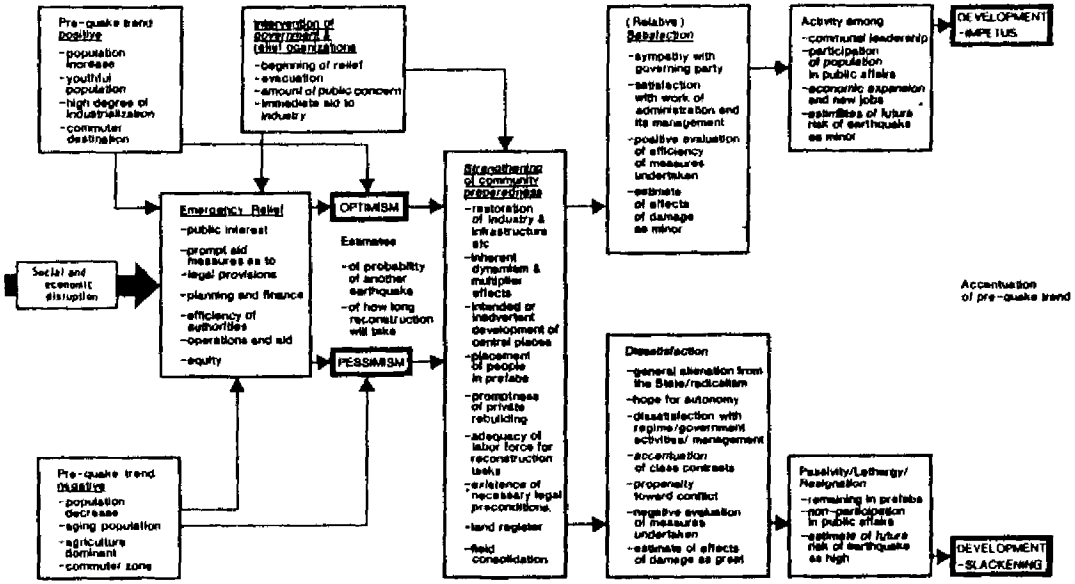


Figure 6

The Principles that Govern Regional Differentiation in the Reconstruction Process

Conclusion

The New World has supplied not only the locus for most hazard research but also the concepts and models to understand the impacts of disasters. A very rational model has emerged but it does not account for some of the imponderabilities of people's perceptions of disaster in the Old World. Some of the assertions made by some scholars [Haas, et al., 1977] apply broadly to the events here too, but based on the work in Friuli additional generalizations can be made.

a) The persistence of the previously established spatial structure increases with the strength of the historical tradition and cultural importance of a disaster area.

b) When there are ideological tensions in a country, political groups apply their ideas about society, most notably those having to do with property rights and reconstruction plans derived from them, to communes where they can realize their political ideas. This produces competitive reconstruction planning and takes advantage of the tabula raza laboratory situation for socio-political experimentation.

c) The spatial solution (the 'three-country-corner') and the peculiar cultural and linguistic status of an area, expressed in the Autonomy Statute, intensify its sense of identity and weaken the leadership authority of central government initiative. The latter is forced to compete in some cases for the loyalty of its citizens, particularly if national minorities like Slovenes or Austrians live in a disaster area.

d) Long periods of seismic inactivity within the area of a very traditional culture allow the existing stock of buildings to go for hundreds of years without proper maintenance and restorative tests of stress-loads. Since mostly the older and poorer populations are in the oldest and least maintained buildings of the city cores, the hypothesis that a catastrophe and its consequences are extremely 'inegalitarian' events hitting the most helpless hardest is confirmed.

e) If a disaster happens to coincide spatially with the approximate settlement area of a given ethnic group (in this case the 400,000 Friulians), it is extremely important not to forget the cultural identity of the people affected, which manifests itself in numerous features of the social spatial situation, when dealing with the problems of geological security and architectural form. Reconstruction planning on the part of the central government should try to incorporate regional character as much as possible into its projects. This aids regional identity and avoids fostering uniformity and anonymity.

f) Societies, as has been noted by other scholars [Friesma et al., 1979] [Wright et al., 1979] recover rapidly after disasters. The case of Friuli shows that a catastrophe may actually inspire the population of an area to a heightened self-awareness and determination to take their fate into their

own hands. The return of many emigrants from abroad, the emergence of a Friulian Regional University in Udine, increased enthusiasm for a more extensive regional autonomy, and even the appearance of an avowedly ethnic Friulian political party, attest to this effect.

Table 3

Comparison of Earthquakes in Friuli 1976 and Southern Italy 1980

Facts	Friuli	Southern Italy
Date	May 6, 1976	November 23, 1980
Time	9:00 p.m.	7:35 p.m.
Magnitude	6.4 R	6.7 R
Depth	ca. 5 km	ca. 20 km
Duration	55 sec.	90 sec.
Epicenter	2 km W of Venzone	5 km E of Teora
Affected Area	4,800 km^2	28,000 km^2
Number of Communities	119	314
Deaths	1,000	3,500 ?
Homeless	100,000	300,000
Damage in $ billion	4.45	15.9 ?

In the meantime, on November 23, 1980 another even more severe earthquake of 6.7 on the Richter scale occurred in Southern Italy. The same emergency commissioner as in Friuli was again in charge of the operations in the Naples area. But there were markedly different responses to the same disastrous event, not only because of physical characteristics (Table 3) but also because of the characteristics of the inhabitants, their attitudes and beliefs.

Evidently variables such as civic maturity, neighborly solidarity and administrative integrity (difficult to measure as they are) should be given more important weighting in all models of disaster assessment. Even events in the same country and under administration of the same emergency commissioner are not guaranteed to take the same course.

On the basis of our studies, we are in agreement with the injunction that "...hazard management policy stands to gain considerably from sound comparative research" [Torry, 1979]. We believe, moreover, that our discussion of the spatial differentiation of earthquake effects and responses is the sort of study which in the future might bring a geographical view into hazard research which may be lacking now because of too much abstraction from the real world of disaster areas and their victims. Social geographers should work more closely with social psychologists, anthropologists and sociologists and perhaps less with economists and systems analysts. In this manner social geography can help to redirect hazard research from what can be a dangerously naive preoccupation with administrative technologies and procedures and bring it closer to the mainstream of humanistic geography.

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