

APPENDIX 5

Inqua EEE Scale field survey form

Notes on the application of the Inqua EEE scale

This document is a first draft proposal of a form aimed at summarizing in the field the main elements characterizing each environmental effect of an earthquake, so that a local intensity can be assigned to the site.

Instructions on how to use this form are not provided here, being most of the keys self-explaining (hopefully). The form is conceived in such a way to be filled in the field with a minimum effort even by a not trained specialist, although a specific experience is highly advisable.

At this stage, all the information has been packed in a single double-faced sheet. However, more information (sketches, notes, photographs) can be provided in additional sheets. Anyway, a longer form may be adopted in the future, if needed. Another goal of the working group is the realization of a sort of database of environmental effects of earthquakes, so changes to this draft form might result necessary to make it more suitable to this end.

Critical evaluation by earthquake geologists, especially by their field testing during surveys after an earthquake, is clearly necessary to bring this draft form to a factual efficiency. To this end it is proposed here. Feedback is therefore not only expected, but it will be greatly welcome.

Earthquake

Region _____ Time _____ Magnitude *MI Ms Mb Mw* _____
 Intensity *MM EMS MSK JMA* _____ Latitude _____ Longitude _____ datum _____

Observation point

Nr. _____ Date/hour _____ Surveyor _____ Locality _____

Lat _____ Lon _____ Km from epicentre _____ Local Intensity *MM EMS* _____ Site PGA _____ Photos *yes no*

Geomorphological setting - *mountain slope – mountain valley – hillslope – alluvial fan – bajada – delta – alluvial plain – marsh – sea/river cliff – river/lake bank – sea/lake shore – arid-semiarid flat – desert – other:* _____

Brief description _____

Main effects of seism on artefacts *damage/collapse of single/multiple buildings bridge viaduct tunnel railway highway paved/unimproved road* _____

Environmental effect

Geologic

origin: *tectonic / ground shaking*

newly formed / reactivated

Surface faulting – *open fissures in bedrock – mole track – ground crack – slope movement – sinkhole – ground settling/liquefaction/lateral spread – hydrologic anomaly – gas emission – moved/overtaken stone*

Other _____

Non geologic *noise light-emission fire vegetation: burnt grass, swinging trees, broken branches, fallen fruits...*

Brief description _____

Major affected lithology rock *densely cleaved massive stratified intrusive metamorphic volcanic lava/pyroclastic sedimentary shale/sandstone/conglomerate/limestone/salt hard/semi-pseudo-coherent – loose sediment soil/clay/silt/sand/gravel colluvium backfill* – **Sedimentary environment** *marine shore fan deltaic alluvial lacustrine marsh slope arid/temperate/humid*

Notes _____

Frequency of observed feature in the area

single/multiple number _____ over _____ km² *Already/never triggered by earthquakes*

Maximum dimension length _____ m width _____ m area _____ m² volume _____ m³

Average dimension length _____ m width _____ m area _____ m² volume _____ m³

Notes _____

Sketch

Earthquake Observation point Region _____ Time _____

Nr. _____ Date/hour _____ Surveyor _____ Locality _____

Surface faulting strike _____ dip _____
 normal/reverse/oblique/strike-slip dextral/sinistral - total length _____ km - nr of segments _____ - aligned/en-echelon right/left stepping
 maximum vertical offset _____ cm horizontal offset _____ cm - average vertical offset _____ cm horizontal offset _____ cm
 displaced feature for direct measurement _____
 single/multiple scarp – other features *push-up/pull-apart/gravity graben*
 Notes _____

Ground cracks strike _____ dip _____ Displacement _____ cm sense of displacement _____
 Type fracture - mole track
 Maximum length _____ m - number of features _____ over a distance of _____ m – maximum opening _____ cm
 Shape straight/sinuuous/curvilinear _____ - Possible origin surface faulting/slide/ground settling/detachment
 Notes _____

Slope movement
 Type rock fall – deep-seated slide (sackung) - rotational slide – slump - earth flow - soil slip – other _____
 Maximum dimension of blocks _____ m³ over a distance of _____ m – Total volume _____ m³ - Humidity *very/moderately/no wet*
 Age *very old/recent/new* Activity *partial/total already active/quiescent*
 Velocity *extremely/very/moderately rapid/slow* Time delay for manifestation of motion _____ hours
 Notes _____

Ground settlement - collapse
 Type liquefaction – compaction – lateral spread - subsidence – bulge – sinkhole – other _____
 Maximum diameter _____ m - number of features _____ over a distance of _____ m – maximum lowering/uplift _____ cm
 Shape round/elliptical/elongated/squared _____ positive/negative cone - Humidity *very/moderately/no wet*
 Depth of water table _____ m – water/sand ejection –
 Velocity *extremely/very/moderately rapid/slow* Time delay/advance for manifestation of feature _____ hours
 Notes _____

Hydrologic anomaly
 Effects *overflow/drying up/appearance of springs/waves/water fountain/variation of water table/discharge rate/temperature/chemistry/turbidity* where *spring/river /lake/well/fountain/aqueduct other* _____
 Temperature change _____ C° – Discharge change _____ l/s
 Changed chemical component/s _____ - Permanent/temporary change lasted for _____ hours
Tsunami: maximum wave height _____ m length _____ m Extent of affected coast _____ km
 Velocity *extremely/very/moderately rapid/slow* - Time delay/advance for manifestation of feature _____ hours
 Notes _____

Intensity attribution IV V VI VII VIII IX X XI XII

Based principally on existing INQUA tables/other Intensity scale/new assessment and _____

