

DAMOCLES PROJECT

DETAILED REPORT OF ASSISTANT CONTRACTOR FOR SECOND ANNUAL REPORT
(1 March 2001- 28 February 2002)

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Section 3.1: Objectives of the Reporting Period

The main objectives for the reporting period were:

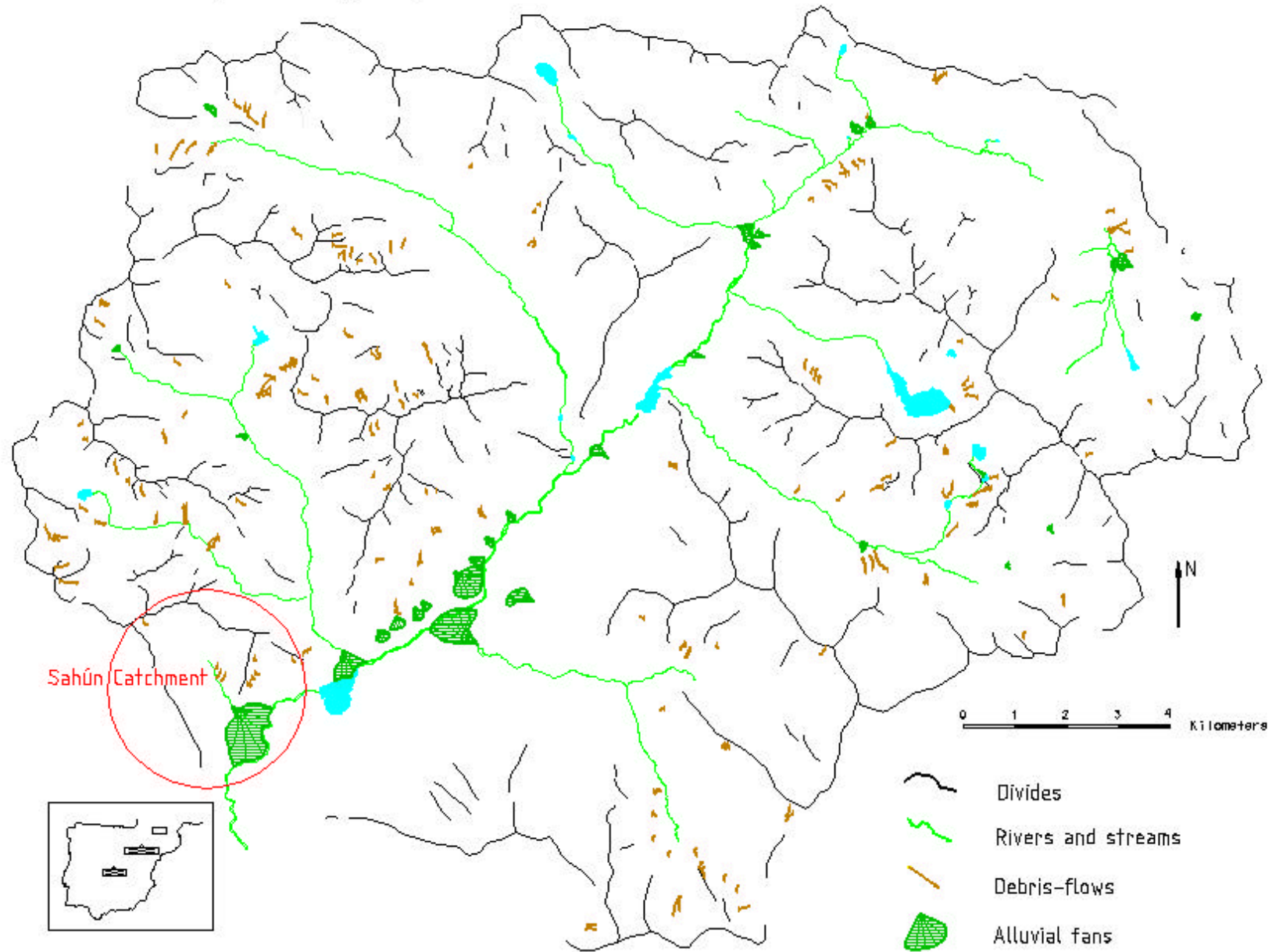
- Finishing the Report and the Benasque Valley 1:25.000 scale Geomorphological Map.
- Selection of several catchments with active alluvial fans for further studies and to apply, if possible, the University of Padova model.
- Attempt to apply some regional analysis: (i) Statistical analysis of debrisflows following the methodology used by both Milan and IPE partners in order to obtain debrisflows Probabilistic Maps. (ii) Statistical analysis of rockfall following the methodology used by Milan partners in order to obtain rockfall Probabilistic Maps.
- Compilation of the necessary data to feed the University of Padova Model.
Geomorphological and Geological studies
Dating events by means of geological and/or biological studies.
- Historical analysis and survey the area population about Avalanches, debrisflows and rockfalls

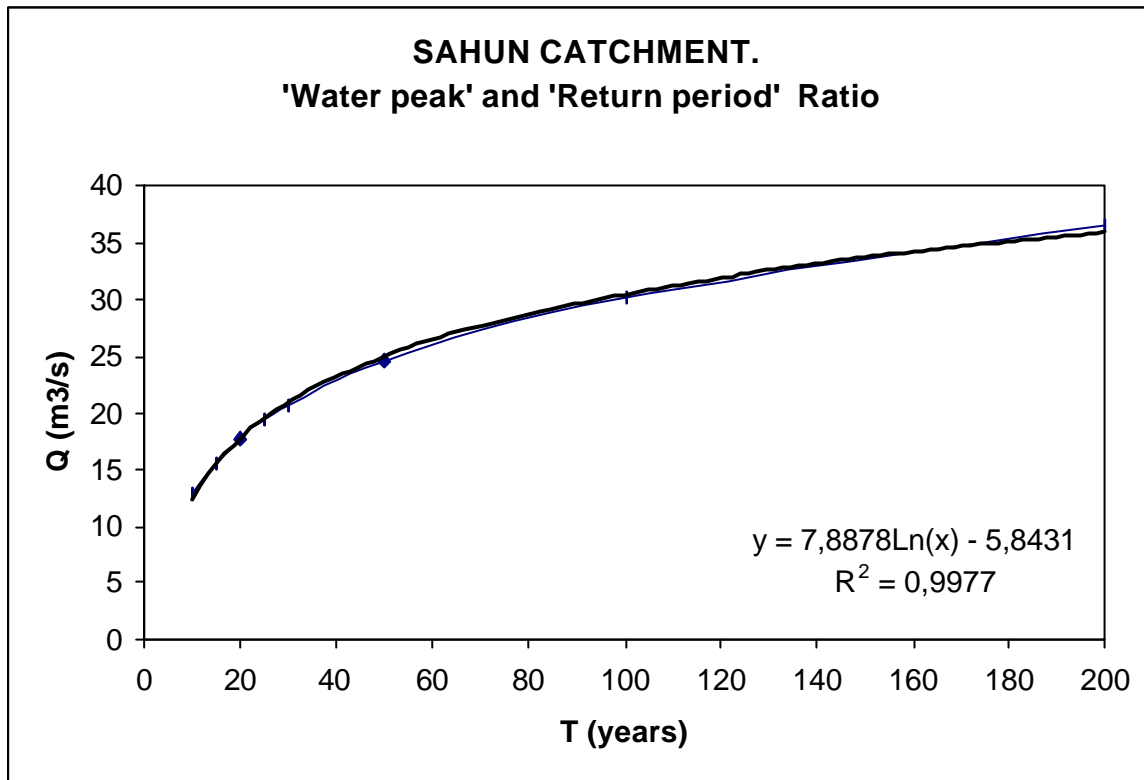
Section 3.2: Methodology and Scientific Achievements Related to Work Packages

3.2.1 WP1 Development of functional relationships for rapid slope failures.

- We have finished the 1:25000 scale Geomorphological Map of the Benasque Valley (300 km²) and the corresponding report. 188 debrisflows have been mapped. See attached figure “Spatial distribution of Debrisflows and Alluvial fans”
- Selection of one small basin with alluvial fan (Sahún Catchment, 4 km²) to apply the local scale debrisflow model developed by the U. of Padova team. To do this, we have collected some required information:
 - (i) IPE colleagues have provided us vegetation and land use maps.
 - (ii) From the National Meteorological Institute: Rain fall record from a few weather stations close to the basin.
 - (iii) Assessment of the water discharge peak for several return periods; in this task, we have worked with the “Escuela de Ingenieros de Montes” (Madrid Polytechnical University). We have used the Rational Method and the results can be viewed in the attached figure “Sahun Catchment. Water peak and Return period Ratio”

Benasque Valley. Spatial distribution of Debrisflows and Alluvial fans





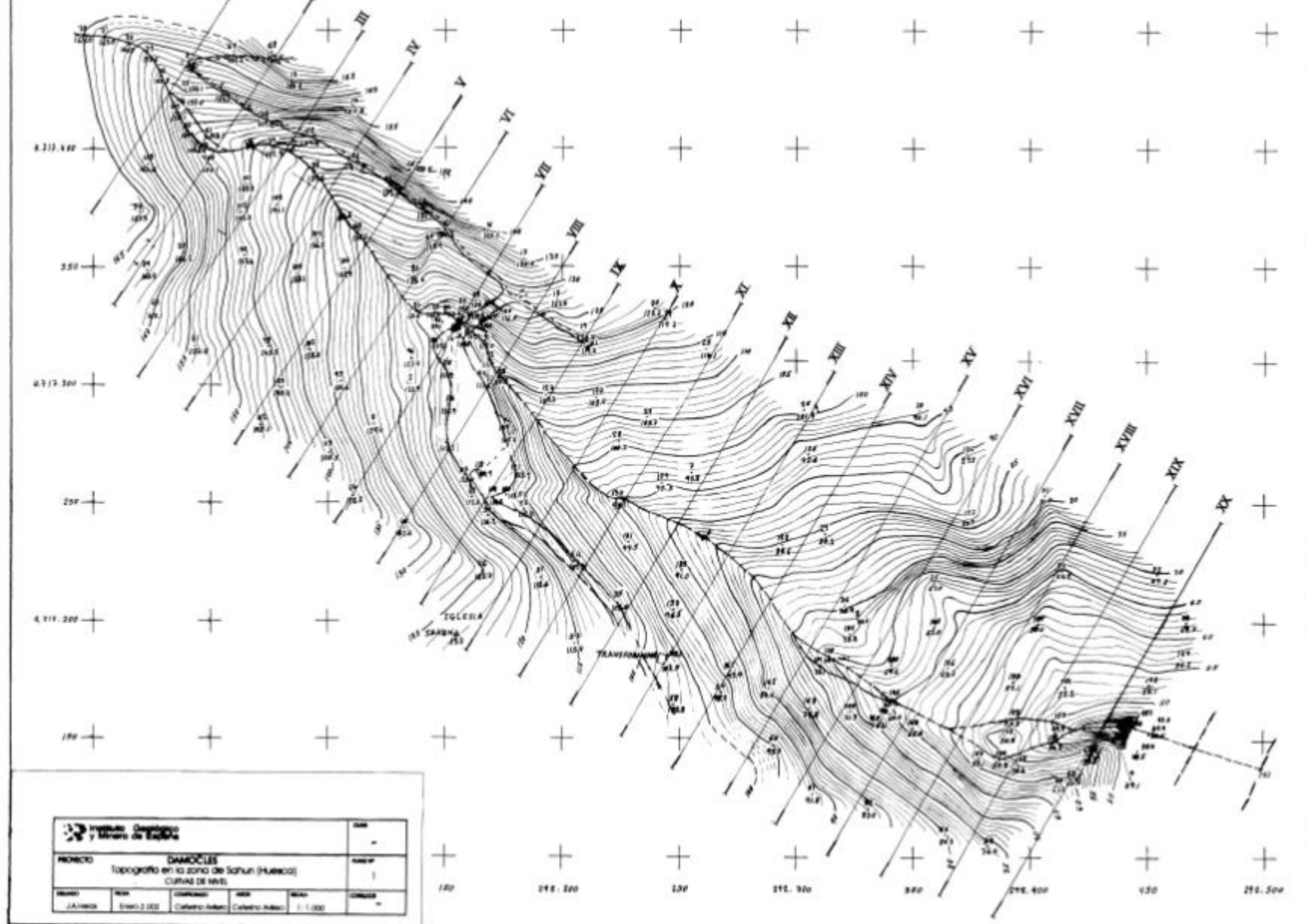
- Regional scale debrisflow modelling is not yet made. We have prepared some data: all the coverages (debrisflows, vegetation, lithology and land use maps) are ready but the DTM (we are currently working on this topic). In this task we are working very closely with the IPE team and with some IGME's central services.

3.2.2 WP5 Dissemination of the project deliverables, mainly the project models to be applied for end-users

We have contributed with the description of our study area to the Web site:
(<http://damocles.irpi.pg.cnr.it/>).

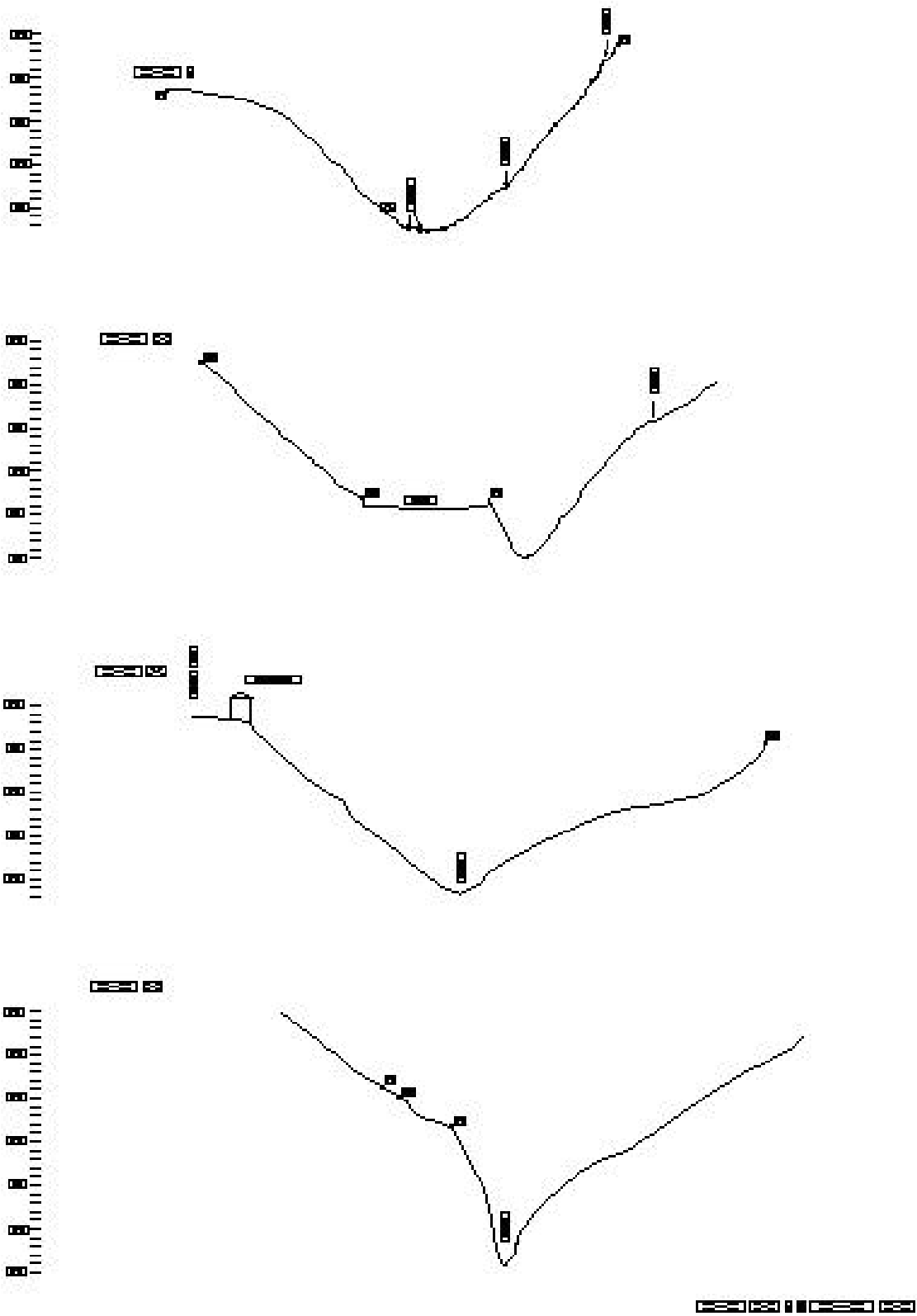
We received the visit of the Padova team in order to select the best catchment to attempt to apply the model developed in the WP3. We visited the Benasque field area and we selected the Sahun area in which we made detailed topographic works. See the attached map "Sahun channel topographic survey" and the figure "Cross sections".

SAHUN CHANNEL TOPOGRAPHIC SURVEY



Instituto Geológico y Minero de España		No. 1
PROYECTO DAMOCLES Topografía en la zona de Sahun (Huesca) CURVAS DE NIVEL		
Nombre J.A.HERRERA	Escala 1:500	Fecha 1950
Elaborado por C. ALBA	Revisado por C. ALBA	Aprobado por J. L. GARCIA

Topographic survey in Sahun channel CROSS SECTIONS



Section 3.3: Socio-economic Relevance and Policy Implication

As potential end-users we are very interested in applying the regional and local models of predicting and characterising the debrisflows and rockfalls. These are goals that a good land use planning ought to take in account and we hope, that in the next period, we will be able, with the help of the training courses that the Project will develop, to know better

Section 3.4: Discussion and Conclusion

Some particular areas of rockfall and debrisflow events have been located into the area that has been mapped. We would like to apply some regional models in order to estimate the occurrence of debrisflows in Palaeozoic shale and rockfalls in granitic and Palaeozoic limestone to try to validate this kind of models on the referred lithologies in our Pyrenean conditions. In doing so, our role of end-user will be optimised.

Section 3.5: Plan and Objectives for the Next Period

The works and objectives planned for the next year of the Project are listed below.

- 1) Field data trying to characterise geologically the occurrence of the debrisflows observed and the potential rockfall areas. Consideration of more detail observations of biotic factors (vegetation and land use) will be carry out.
- 2) Applying the regional models for predicting areas of debrisflows in the Benasque valley trying to deep into more detailed geological and biological conditions. We will try to apply the WP1 and WP2 methodologies.
- 3) Applying the Milan team regional model (WP2) for predicting areas of rockfalls in the Benasque valley.
- 4) More detail studies in Sahun Catchment: Improve the thematic maps (geomorphology, lithology, vegetation and land use) at 1:5000 scale. Keep on with the survey to the population of Sahun and close villages and collect information from the town halls about historical events.
- 5) Running the Padova team local model (WP3) on the Sahún fan area.
- 6) For doing 3) and 5) activities, is planned the assistance to the training courses of the Damocles Project to be celebrated in Padova and Milan.

	march 02	april	may	june	july	august	sept	october	nov	dec	jan 02	feb 03
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Section 3.6: References

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