

FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS
R o m e

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EUROPEAN COMMISSION ON FORESTRY AND FOREST PRODUCTS

REPORT OF THE
WORKING GROUP ON TORRENT CONTROL AND
PROTECTION FROM AVALANCHES

FIRST SESSION

French Alps, 28 June - 8 July 1952

On the recommendation of the 4th Session of the European Commission on Forestry and Forest Products, the Working Group on Torrent Control and Protection from Avalanches met from 28 June to 8 July 1952. Organized by the French Government, the session comprised a study tour through the French Alps.

The Working Group elected as its Chairman, Mr. MESSINE, Inspector-General of Waters and Forests (France), and as its Vice-Chairman, Inspector-General Schlatter, head of the Swiss Forest Service.

Representatives and observers from 11 countries attended the session (Appendix A).

The group considered that the mission conferred upon it by the European Commission on Forestry and Forest Products, was primarily to study the problem relating to the protection from torrent and avalanche of villages, croplands, lines of communication and hydroelectric works in the densely populated mountain areas of Europe and therefore adopted the provisional agenda submitted to it (Appendix B) without amendment. It nevertheless recognized that these problems are closely related to the more general problems of mountain soil conservation and utilization, and can have an effect on rural economy, living conditions and maintenance of highland populations.

GENERAL RECOMMENDATIONS

The Working Group found that in too many countries the effectiveness of torrent and avalanche control was impaired by the inadequacy of the funds made available to the services concerned, which as a result can provide only for the maintenance of existing works, or take only partial control action. Its attention was also drawn to new problems relating to the construction of large dams for feeding power stations and for
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irrigation.

The Working Group therefore RECOMMENDED:

- 1) that the Governments concerned, in the face of a recognized danger, should make available to the appropriate services such credits as will enable them not only to maintain the existing structures but also to undertake all necessary works to safeguard against any such danger;
- 2) that, when plans have been drawn up for the construction of large dams Governments should arrange for close cooperation between all the services concerned and particularly with the forest services, due to their responsibility for conservation of the soil and regularization of the water regime in the torrent catchment areas, which conditions alone can assure the efficiency and permanency of any such proposed installations.

RECOMMENDATIONS FOR RESEARCH

The Working Group heard many reports on a large variety of questions (Appendix C) and considered it most desirable that information be exchanged at an international level on the main problems of torrent and avalanche control.

It particularly RECOMMENDED that research be carried out on the following matters :

- 1) new types of torrent control structures or new methods of designing and installing them, particularly in the light of the need for the most efficient use of the funds made available to the responsible services and for the economical use of manpower that is commonly getting more and more scarce in the mountains;
- 2) methods for the consolidation of the existing torrent control structures with a view to preserving the balance already achieved and enabling their most economical maintenance;
- 3) measures to prevent the accelerated silting of large dams, and on the effect of their construction on torrent control works;
- 4) studies of the snow and origin of avalanches and of protection measures;
- 5) best methods of soil conservation and utilization in the high catchment areas and particularly above the tree line.

THE FUTURE ACTIVITIES OF THE WORKING GROUP

The Working Group considered that its immediate program must concentrate on torrent and avalanche control, including the improvement of grazing land.

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It felt that in the matter of avalanche control the exchange of views that had so far been possible had not enabled it to collect sufficient information on the subject and it therefore proposed that a further session, devoted more particularly to this problem, be held in 1954.

It considered, however, that until then, the members of the Working Group or technicians nominated by the Governments concerned, might exchange information on the first three recommendations of the preceding section on research. Such information could be assembled by the chairman of the Working Group through its secretariat and, on the basis thereof, general reports might be prepared for presentation at the Working Group's second session.

As to research recommendation 5 on soil conservation and utilization in mountain areas, the Working Group, until such time as it may find it necessary to deal with such problems, should keep in close touch with all international agencies concerned with these matters, and in particular with all FAO bodies such as, for example, the Sub-Commission on Mediterranean Problems of the European Commission on Forestry and Forest Products, whose program of work already covers the soil utilization and grazing problems in arid and semi-arid regions.

It would be highly desirable that representatives of the Working Group actively participate in the meetings of such bodies.

The Working Group expressed its satisfaction at the opportunity afforded by its first session not only to forestry technicians but also to all those concerned with the technique of torrent and avalanche control for an exchange of views and experience. It would emphasize that such collaboration is desirable, not only from the national point of view as indicated above, but also from the international standpoint.

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WORKING GROUP ON TORRENT CONTROL AND PROTECTION FROM AVALANCHES

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French Alps, 28 June - 8 July 1952

LIST OF REPRESENTATIVES

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CHAIRMAN :	Mr. MESSINES (France)
VICE-CHAIRMAN :	Mr. SCHLATTER (Switzerland)
SECRETARY :	Mr. FRANCOIS (FAO)
Representative of the Ministry of Agriculture of France	Mr. du VIGNAUX
Representative of the Director-General of FAO	Mr. LÉLOUP

DELEGATES

AUSTRIA : Mr. WEBER, Forest Engineer, Federal Ministry of Agriculture and Forests, MARXBERGASSE 2, Vienna III.
Mr. HAMPEL, Engineer, Torrent and Avalanche Control Section, HERRENGASSE I, Innsbruck.

FRANCE : Mr. du VIGNAUX, Directeur Général des Eaux et Forêts.
Mr. DALLIER, Chef du Service des Forêts d'Algérie.
Mr. BOURGEOIS, Inspecteur Général des Eaux et Forêts
Mr. JOLAIN, Inspecteur Général des Eaux et Forêts
Mr. MESSINES, Inspecteur Général des Eaux et Forêts
Mr. QUESNEL, Inspecteur Général des Eaux et du Génie Rural
Mr. de VAISSIERE, Conservateur des Eaux et Forêts
Mr. CHERREY, Conservateur des Eaux et Forêts

- FRANCE (continued) : Mr. RENEUVE, Conservateur des Eaux et Forêts
Mr. ROLLEY, Ingénieur des Eaux et Forêts
Mr. BRAUDEAU, Service des Etudes et Recherches
Hydrauliques de l'Electricité de
France, Laboratoire National
d'Hydraulique.
Mr. MARQUENET, Service des Etudes et Recherches
Hydrauliques de l'Electricité de
France, Laboratoire National
d'Hydraulique.
Mr. REYNAUD, Société hydrotechnique de France
- GERMANY : Mr. LECHNER, Oberregierungstrat LECHNER,
Ministry of Agriculture and Forests,
BONN 12.
Mr. KIRWALD, Tübingen, Württemberg, FORST DIRECTION.
Mr. LOHR, Wasserwirtschaftamt, Kempten/Allgäu.
- ITALY : Mr. SACCHI, Directeur Général des Forêts, ROME.
Mr. PALMA, Chef de Division, Direction Générale
des Forêts, ROME.
- MOROCCO : Mr. PRUVOST, Ingénieur des Eaux et Forêts
- SPAIN : Mr. NAJERA, Ingénieur en Chef, Section de
l'Hydraulique, Instituto Forestal de
Investigaciones y experiencias,
N.º 51 de Balboa 51, Apartado 1265,
MADRID.
- SWITZERLAND : Mr. SCHLATTER, Chef de l'Inspection Fédérale des
Forêts Chasse et Pêche, à BERNE.
Mr. IN DER GAND, Ingénieur Forestier,
collaborateur de l'Institut Fédéral
pour l'étude de la neige et des
avalanches au WEISSELHOF S/ DAVOS.
Mr. SCHMID, adjoint à l'Inspection Fédérale des
Travaux Publics à BERNE.
- TURKEY : Mr. TUNGER, Président du Groupe Technique,
Direction Générale des Forêts,
Orman Genel Müdürlüğü, ANKARA.

- TURKEY (continued) : Mr. SANVER, Membre du Groupe Technique,
Direction Générale des Forêts,
Orman Genel Müdürlüğü, ANKARA.
- UNITED KINGDOM : Mr. CHAPMAN, Conservator of Forests, Government of
Cyprus.
- YUGOSLAVIA : Mr. ROSIC, Prof. à l'Université de Belgrade,
Faculté Forestière, BEOGRAD.
- FOOD AND AGRICULTURE
ORGANIZATION OF THE UN : Mr. LELOUP, Director Forestry Division
Mr. FRANCOIS, Chief Policy and Conservation
Branch, Forestry Division.

OBSERVERS

- FRANCE : Mr. GENET, Conservateur des Eaux et Forêts à
DIGNE (Basses-Alpes)
- Mr. GOBERT, Conservateur des Eaux et Forêts à
GRENOBLE (Isère)
- Mr. GRABER, Conservateur des Eaux et Forêts à
ANNECY (Hte-Savoie)
- Mr. MONNET, Conservateur des Eaux et Forêts à
GAP (Htes-Alpes)
- Mr. PARLIER, Conservateur des Eaux et Forêts à
CHAMBERY (Savoie)
- Mr. ANCHIERRI, Ingénieur des Eaux et Forêts à
CHAMBERY (Savoie)
- Mr. BARDEL, Ingénieur des Eaux et Forêts à THONON
(Hte-Savoie)
- Mr. BOSIO, Ingénieur des Eaux et Forêts à NICE
(Alpes-Maritimes)
- Mr. BOUVEROT, Ingénieur des Eaux et Forêts à
ANNECY (Hte-Savoie)
- Mr. GRAC, Ingénieur des Eaux et Forêts à DIGNE
(Basses-Alpes)

FRANCE (continued) : Mr. MICHEL, Ingénieur des Eaux et Forêts à
PERRIGNAN (Pyr. Orient.)

Mr. PONCET, Ingénieur des Eaux et Forêts à
BRIANCON (Htes-Alpes)

Mr. WIDMANN, Ingénieur des Eaux et Forêts à GAP
(Htes-Alpes)

IRAN : Mr. SAEBI, Directeur de la Section Commerciale et
Industrielle de l'Organisation
Forestière, Gouvernement de l'Iran.

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A G E N D A

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PROGRAMME OF WORK :

I. - TORRENT CONTROL :

- 1) Soil moving torrents :
 - a) Control of the major torrent and of its secondary ravines by dams, sills, jetties, revetments, enrockment and protection of banks, dykes, cleaning of beds, drainage of banks.
 - b) Diversion tunnels.
 - c) Work on the alluvial fans, drainage channels, dry-stone walls, débris collection areas, etc.
 - d) Afforestation for protection purposes, minor forestry operations: wattling; fascine-revetments; revetments by other materials; planting of trees on, and revegetating, banquettes and blocks.
 - e) Sodding and restoration to natural conditions of catchment areas above the tree line, improvement of pastures, reservation.
- 2) Boulder moving torrents - Areas of boulder origination - Areas of boulder accumulation :
 - a) Control of the major torrent and of its secondary ravines by dams, sills, jetties, revetments, enrockment and protection of banks, dykes, cleaning of beds.
 - b) Fixation of cliffs, preventive blasting and consolidation of unstable rocky areas.

3) Land-slides :

- a) Drainage by open ditches and tile drains
Diversion and channeling of water
Combined drainage and fixation of the beds by dams
- b) Afforestation and sodding of slipping land

II. - PROTECTION FROM AVALANCHES :

- a) Prediction and detection of avalanches - study of the snow.
- b) Passive defense - Dykes - Tunnels, etc.
Causing avalanches by artificial means.
- c) Active defense, halting blasts, terraces, banquettes,
barriers and snow-sheds - various kinds of barriers -
reservation - clotures.

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- A - List of the reports presented by the various countries prior to the session and published by the National School of Waters and Forests, Nancy, France.

(It follows the order of the Agenda)

TORRENT CONTROL

1. SOIL MOVING TORRENTS

General Report (France)

Engineers of Waters and Forests BOUVEROT, ANCHIERRI and ROLLEY

- a) Control of the major torrent and of its secondary ravines by dams, sills, jetties, revetments, enrockment and protection of banks, dykes, cleaning of beds, drainage of banks.
- b) Diversion tunnels.
- c) Work on the alluvial fans, drainage channels, dry-stone walls, débris collection areas, etc.

Summary in English

Individual Reports

- A propos de la correction torrentielle. Torrents à eaux.
P. MONNET (France)
- Quelques précisions sur les tunnels de dérivation construits dans les Alpes Françaises.
J. ROLLEY (France).
- Circulation des laves torrentielles sur les cônes de déjections torrentielles.
J. CHERREY (France).

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General Report (Italy)

- d) Afforestation for protection purposes, minor forestry operations: wattling; fascine-revetments; revetments by other materials; planting of trees on, and revegetating, banquettes and blocks.

Summary in English

Individual Reports

- Torrent control and forest management (Biological control in areas surrounding torrents). Pr. Dr. Ing. Eduard Kirwald (Federal Republic of Germany).
- Correction torrentielle des "chalades" des Pyrénées Orientales. A. MICHEL (France)
- Torrent control and protection against avalanches. (Federal Republic of Germany)

General Report (Italy)

- e) Sodding and restoration to natural conditions of catchment areas above the tree line, improvement of pastures, reservation.

Summary in English.

2. BOULDER MOVING TORRENTS - AREAS OF BOULDER ORIGINATION - AREAS OF BOULDER ACCUMULATION.

General Report (Spain)

Engineer José GARCIA NAJERA.

- a) Control of the major torrent and of its secondary ravines by dams, sills, jetties, revetments, enrockment and protection of banks, dykes, cleaning of beds.
- b) Fixation of cliffs, preventive blasting and consolidation of unstable rocky areas.

Summary in English.

3. LAND-SLIDES

General Report (France)

Conservator of Waters and Forests P. RENEUVE.

- a) Drainage by open ditches and tile drains.
Diversion and channeling of water
Combined drainage and fixation of the beds by dams
- b) Afforestation and sodding of slipping land

Summary in English

Individual Reports

- Glissements survenus à Menton (Alpes-Maritimes) les 24 et 25 avril 1952. M. BOSIO (France)

PROTECTION FROM AVALANCHES

General Report (Switzerland)

- a) Prediction and detection of avalanches - study of the snow.
- c) Active defense, halting blasts, terraces, banquettes, barriers and snow-sheds - various kinds of barriers - reservation - closure.

Summary in English

General Report (Austria)

- b) Passive defense - Dykes - Tunnels, etc.
Causing avalanches by artificial means.

Summary in French

MISCELLANEOUS

Individual reports

Sur quelques emplois de la Photographie aérienne dans un service de restauration des terrains en montagne (Pyrénées). Ingénieur Principal des Eaux et Forêts P. CHABROL (France).

Avalanches de l'Herpie et de Tignes (8 et 10 février 1950).
Météorologie Nationale.

- B - The reports presented by the various delegations during the session are being published by the National School of Waters and Forests, Nancy, France.

