

Forestry in Relation to Flood Preservation and Control in West Pakistan.

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Introduction.

Since the last decade or so the intensity and frequency of floods in the Indus river system are on the increase. In 1947 the Sutlej and the Ravi were in spate and in 1948 the Jhelum and the Chenab were swollen. Very severe and synchronised floods occurred in the Ravi and the Chenab in 1950. Unprecedented heavy floods occurred at the same time in the Ravi and the Sutlej in 1955. In 1957 the Ravi and the Chenab together were again in spate and did a great deal of damage. Besides the erratic behaviour of the monsoons, the denudation and deterioration of the catchment areas of our rivers is largely responsible for these abnormally severe floods.

Increasing pressure of population on land leading to breaking up of new land for farming on steeper slopes, shifting cultivation, heavy fellings and loppings, forest fires and excessive grazing and browsing coupled with the adverse climatic and geological factors are responsible for large scale disappearance of the vegetation cover or its deterioration and degradation in the hilly catchments of our rivers. Local protective works such as 'bunds' and artificial drainage ways etc., are gradually becoming inadequate or ineffective in view of the increasing maximum flood discharges of our rivers and silting up of their beds. Mere engineering works such as construction of dams and detention reservoirs, guide and diversion channels, levees and embankments, syphons and sluices, widening and dredging of water-ways will not be adequate to control floods and in any case, cannot provide a more or less complete flood control on a permanent basis. The basic malady responsible for heavy floods—poor condition and ill-management of watersheds of the Indus river system—must be set right. Without improvement and proper management of the watersheds and catchments of the mighty Indus and its tributaries it will not be possible to bring down the increasing crests of floods in our rivers.

Deforestation, Denudation and Erosion in the Indus Basin.

Large scale deforestation, denudation and accelerated soil erosion have occurred over greater proportion of the Indus basin in the

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recent past. A number of Forest Officers, Committees and Conferences have studied and reviewed the state of denudation and erosion from time to time in West Pakistan. It was in the early seventies of the last century that denudation and erosion of the Siwalik hills of Hoshiarpur District attracted the attention of the Punjab Government. Mr. Baden Powell the then Conservator of Forests was asked to tour the district and submit a detailed report to Government. Mr. Baden Powell submitted his report in 1879. In 1883 Mr. Moir, a Deputy Conservator of Forests, made a 'Report on the proposed treatment of the 'chos' of Hoshiarpur'. Amongst other things he also proposed a special legislation for an effective execution of his proposals on privately owned lands. This ultimately resulted in the passing of the Land Preservation ('Chos') Act of 1900. The report of the Punjab Denudation Committee, 1910, the report of the Punjab Erosion Committee, 1932 and comprehensive surveys on the subject by Holland ('A report on denudation and erosion in the low hills of the Punjab, 1928') and Coventry ('Denudation of the Punjab Hills, 1929') dealt with the problem of denudation and erosion in the Indus basin at considerable length. Coventry (1929) concluded his review in the following words :—

"Although the Punjab is prospering under the benefits of irrigation the steady denudation of the hills is a canker slowly undermining the foundations upon which its prosperity depends and it is to be hoped that the good sense of the people will prevail and that they will come to realise the necessity of insurance of the hills against denudation before it becomes too late to save them from becoming completely denuded and reduced to a desiccated condition with disastrous effects on the future prosperity of the Province".

The Garbett Committee (1937-38) found soil erosion prevalent throughout the low hills of the Punjab and to combat the manace recommended the formation of an Anti-Erosion Circle in the Punjab Forest Department. An Anti-Erosion Circle (later re-named as Soil Conservation Circle) was opened on 1st. April, 1939, in the former Punjab Forest Department for reconditioning and reforestation of the denuded and eroded privately owned forests and waste lands. Some studies of run-off and soil losses with different types of soil cover were also carried out about this time in the low hills at Nurpur, Kangra District and at Banni, Gujrat District by the Forest Department of the un-divided Punjab. The results of some of these investigations carried out during 1939-42 are given in Appendix I.

The run-off losses from bare soil were about 5 to 9 times the run-off losses from grass covered, and grass and bush covered soil at Nurpur. At Banni in the Pabbi Hills the run-off losses from bare soil were 1½ to 3 times the run-off losses from grass covered, and grass and bush covered soil. Similarly, the cumulative soil losses from bare soil trays at Nurpur and Banni were about 12 times and 5 times the soil losses from grass covered soil trays, respectively, at the two places. Thus it will be seen that excessive deforestation and denudation not only result in heavy losses of precipitation in the form of surface run-off but they also result

in much heavier loads of silt and detritus in flood waters of our rivers.

Brief Review of Attempts made for Forest, Soil and Water Conservation.

The 'Rules for the conservancy of Forest and Jungles in the hill districts of the Punjab Territories' were promulgated in 1855. These were followed by the passage of the Indian Forest Act, 1878, under which Reserved and Protected Forests were constituted and the rights of user in the forests were defined. The Indian Forest Act was considerably modified and amended in 1927. The Punjab Land Preservation ('Chos') Act, was enacted in 1900 especially for the treatment of 'chos' and denuded Siwalik hills in Hoshiarpur and Amballa Districts. This Act was later amended, amplified and made applicable to the whole of the Punjab in 1944. A cattle tax was imposed in Kangra District in 1916 by the Punjab Government in order to discourage and restrict excessive and indiscriminate grazing by local cattle. The rates of 'Tirni' or grazing tax, realised from the Gujjar and the Gaddi nomads for their heads of buffaloes and flocks of sheep and goats were also slightly increased.

The Soil Conservation Circle formed in April, 1939 started soil and water conservation operations on a provincial basis when a number of Soil Conservation Divisions were organized in Hoshiarpur, Kangra, Ambala, Karnal, Attock and Gujrat Districts of the un-divided Punjab. A number of regional and catchment plans were prepared and put into execution either under the direct supervision of the Forest Department or under the co-operative soil conservation societies with the technical guidance of the Forest Department. Private and common lands were taken up under proper treatment and management under the provisions of either the Forest Act, 1927 or the Chos Act, 1900. Mechanical soil reclamation of gullied and ravine lands with bulldozers and heavy earth moving machinery was also started about 1946 in the Soil Conservation Circle of the un-divided Punjab and has been continued ever since on a limited scale. A Soil Conservation Division was also organised in the former N.W. F. P. on the Punjab lines about this time.

After the partition of the Punjab in 1947, the special Soil Conservation Circle in the Forest Department was abolished as soil and water conservation work was now considered as a normal part of the duties of all Forest Officers. Soil and Water Conservation operations are therefore now being executed and looked after by all the Divisional Forest Officers of the Forest Department in their territorial jurisdictions. It may, however, be stated here that so far the soil and water conservation work being carried out by the Forest Department merely touches a fringe of the huge problem of deforestation, denudation and soil erosion in the vast Himalayan and foot hill catchments of our rivers.

In 1954 a pilot project, named as the 'Erosion Control and Soil Conservation Project, Rawalpindi', which has a more comprehensive

approach towards tackling the problem of denudation and soil erosion in our upland districts was started by the Forest Department in conjunction with the help of the I.C.A. of the U.S.A. It is a research-cum-demonstration project and envisages treatment of 5 demonstration areas each occupying about 15-20 thousand acres on most up to date lines. At present work on this project is being done in four centres in Attock, Rawalpindi, Jhelum and Gujrat Districts. It is now proposed to extend this project to other upland districts in West Pakistan. A similar research-cum-demonstration project for range land improvement, called the 'Range Improvement and Management Project, Baluchistan' over about 1,00,000 acres in Maslakh area of Baluchistan has also been started recently in conjunction with the I.C.A.

Catchment Areas of our Rivers.

From the foregoing account of the Himalayan water sheds it will not be difficult to visualize that the condition of the catchments of our rivers must be in a deplorable state. Except the demarcated state forests which are managed properly under working plans, throughout the Himalayan catchments the undemarcated and privately owned forests and waste lands are burdened with the rights of user and are heavily grazed and browsed. Vast herds of buffaloes and numerous flocks of sheep and goats are ruining the forests and scanty vegetation which is still persisting in some places. Soil erosion is rampant in many areas.

The following table which has been adapted from Stebbing (1951) gives some estimates of the condition of the hill catchments of the Indus and its major tributaries :—

Distribution of Forests in the Hill Catchments of the Indus River System.

Name of River.	Hill catchment area in India and Pakistan in sq. miles.	Area still under Forests inside the hill catchments in sq. mile.	Forest Area ruined by human misuse in sq. miles.
1	2	3	4
1. Ravi.	3,560	2,580	380
2. Beas.	5,400	3,740	130
3. Chenab.	10,540	2,590	2,010
4. Jhelum.	16,280	10,520	1,250
5. Sutlej.	12,660	3,110	710
6. Indus.	79,440	11,760	10,710
Total	1,27,880	34,300	15,240

According to the estimates given in this table about 31 percent of the area under forests had already been destroyed by human interference and mis-management. A considerable proportion of the area

which is still under forests is not being managed properly. About 60 per cent of the bare area of hill catchments of our rivers which is not classed as forest land is either cultivated or is lying bare as grazing grounds or waste lands. A proper and careful management of all such lands in the Himalayan catchments whether owned by state or privately is very essential especially in view of the adverse climatic, topographical and geological factors.

The monsoons are very erratic so that the annual precipitation in the Himalayan catchments varies considerably from year to year and from place to place. Rainfall from the monsoons generally occurs as heavy downpours in short intervals and occasionally in the form of severe cloud bursts. As suggested by Ranganathan (1950) lands exceeding 20 per cent slope should not be cultivated and should preferably be put under grass or forest. Puri (1950) found that in the Kulu Himalayas, which form the source of the Beas, the northern aspects usually coincide with gentler dip slopes and carry more luxuriant vegetation whereas the southern aspects with steeper scarp slopes are poorly covered with xerophytic vegetation. Thus the management of the hotter and steeper southern slopes in the north-western Himalayas is very difficult.

Need of International Co-operation in Flood Control on the Indus River System.

As it is, the greater proportion of the hill catchments of the West Pakistan rivers lies in our neighbouring countries of India, Tibet and Afghanistan. This aspect of flood control problem was also considered by the Punjab Forest Conference, 1951, who in this respect resolved as follows :—

“WHEREAS the frequency and intensity of floods are on the increase in the Punjab and no enduring and long term solution is possible without proper afforestation of the catchment areas of the rivers, major parts of which lie beyond the political borders of Pakistan.

This Conference Resolves :

- (i) that the attention of the Central Government be drawn to the desirability of approaching the Economic Commission for Asia and the Far East for arranging international co-operation for flood control in the Punjab”.

However, in view of the recent resolution on Flood Control (Appendix-II) passed by the 8th Session of the F.A.O. Conference held at Rome in November, 1955, we have again requested the Government of Pakistan to write to the Government of our three above mentioned neighbouring countries through the F.A.O. to cooperate with us in taking action on various flood control measures in their respective territories. We have also requested the Central Government to approach the F.A.O. to lend us the services of a watershed management expert from

abroad for a period of two years for initiating and organising forest influences and watershed research under our local conditions.

Suggestions for Proper Forestry and Land Use Programme for Flood Control in West Pakistan.

In order to be able to effectively tackle the gigantic problems of widespread accelerated soil erosion and the more recent abnormally high floods, with which West Pakistan is faced at present, we must have a well considered and comprehensive programme of scientific watershed management and proper land use in our river catchments. In this connection the following matters which need our immediate attention are briefly discussed and explained below :—

(1) Forest Influences and Watershed Management Research.

Foresters, engineers and hydrologists need to join hands together to conduct research on forest influences for the development of suitable watershed management techniques. As summarised by Kittredge (1948) forest cover has no appreciable effect on cyclonic precepitation but the orographical effect of forest may increase local rainfall upto 3 percent in temperate climates. Forests are also known to increase the rainfall in clearings within the forest by about 1 percent compared with open sites. As stated by Harper (1953) forest cover intercepts 10 to 25 percent of the average annual precipitation depending upon the size and character of the storms and the nature and density of the forest cover. In certain cases interception may be as high as 35 percent. In the U.S.A., annual transpiration losses of upland forest stands vary from 5 to 15 inches but may be as high as 35 inches in heavy stands in the more wet parts of the country. Infiltration of precipitation into soil is greatly influenced by the presence or absence of a covering of litter or grass and a layer of decaying organic matter on top of the soil. However, as pointed out by Hursh (1951) the above mentioned results need to be found out for specific areas in different parts of the world as otherwise that may be misleading in the solution of local problems.

The watershed management research is only of recent growth (Hursh 1951). The Immen vally study instituted in 1900 by the Forest Research Institute of Switzerland was probably the first catchment area research who under taken. It was followed in 1909 by the Wagon Wheel Gap Studies in Clorodo, U.S.A. by the U.S. Forest Service in co-operation with the Weather Bureau. Since then watershed studies have been started in the U.S.A. at a number of places such as at San Dimas and North Fork in California and at Coweeta Hydrologic laboratory in North Carolina, etc. Watershed research studies were also later started in the Union of South Africa and in Java.

As stated by Hursh (1951) and Griffith (1952) catchment area research is a long term research and the studies carried out in the U.S.A. so far have only indicated some of the possiblities that lie ahead in the

field of watershed research. Griffith (1952) also emphasised the need of intensive research on watershed studies in tropical and sub-tropical countries as the application of results obtained in the U.S.A. to other countries would be very doubtful. Thus, it is very essential that watershed research be started by us in West Pakistan without losing any more time.

According to Bailey (1951) abnormal floods are always caused by the destruction of the natural vegetation and the denudation of the catchments. As stated by Burrage (1943) there may be certain watersheds where it may not be feasible to build storage reservoirs which could be used for the control of floods. In such cases improved watershed management and restoration of the vegetation cover would offer the best hope for the lowering of flood heights. Moreover, the effect of the improvement of watersheds will also influence the design of engineering structures for flood control lower down on the streams. Kittredge (1948) states that peak flows from forested areas generally do not exceed 60 second feet per square mile where as from eroded or denuded watersheds they may be 500 to 1,000 or even more second feet per square mile.

(2.) Existing Land use and Land Capability Classification Surveys.

Soil surveys to ascertain present land use and land capability classification for potential land use are most essential for a proper management of our river catchments. In the Rawalpindi Erosion Control and Soil Conservation Project a suitable system of land capability classification has been evolved to suit our local conditions. For the four project areas land capability maps have been prepared and a set of recommendations for each land capability class have been developed. The entire area lying in the catchments of our rivers needs to be surveyed and mapped in this manner.

The survey work in the Rawalpindi project had to be done by plane-tableing the area and this entailed much expense in time and labour which could probably be reduced considerably by using base maps prepared from the aerial mosaics which are now available for most parts of West Pakistan. The soil and land capability classification surveys are the first step towards scientific watershed management.

(3.) Grazing Control.

About half of the land area of the hill catchments of the Indus and its tributaries is lying bare and is either under cultivation or it is being used as grazing grounds. There is no doubt that there is a heavy incidence of grazing in the hill catchments by the local cattle populations and this is further accentuated by the migratory herds of camels and buffaloes and large flocks of sheep and goats owned by 'Powindha', 'Gujjar', 'Bakarwal' and 'Gaddi' nomads, most of whom come down into West Pakistan from the neighbouring countries of Afghanistan, Iran and Azad Kashmir.

The carrying capacities of the grazing lands in our hill catchments need to be determined and the maximum numbers of cattle that they can support on sustained yield basis should be worked out and a rigid grazing control in them should be introduced. The browsers, especially goats and camels, are known to be the worst enemies of natural vegetation and it may be necessary to evict them from very badly eroded and devastated areas. There is a provision for the exclusion of browsers from badly eroded closed areas under the Punjab Land Preservation Act, 1900.

Some restrictions must be imposed on the admission and movements of migratory cattle owned by the nomadic tribes. The enhancement of grazing fee is a dire need of the moment. As a matter of fact our country should have a comprehensive grazing policy which is essential for a proper development and management of grazing lands in the hill catchments and other range lands lower down in the plains which together occupy more than half of the total land area of West Pakistan.

(4.) Reafforestation of Denuded and Eroded Lands.

As estimated by Stebbing (1951) about 31 percent of the land area under forests in the Himalayan catchment has been completely ruined by human misuse, such as excessive fellings, heavy loppings, shifting cultivation and forest fires, etc. Except for the demarcated state forests which are being managed under working plans there are still many natural forests owned by individuals and village communities which have not been managed on scientific lines so far and are gradually deriorating with the increasing pressure of population. The only way to save these forests in the hilly catchments is to put them under regular management and work them on a sustained yield basis.

The forests which have already been denuded and are degraded must be rehabilitated as soon as possible in order to check soil erosion and excessive surface run-off. It is generally not difficult to reafforest such areas except when the top soil has been completely washed away and the bare rock has been exposed. The proposed watershed management research is likely to be useful in refinig our reafforestation techiques for these denuded areas.

In certain cases it may become necessary to transfer rural populations from the hilly catchments to other places such as irrigated lands in the plains which are not so heavily populated as yet. In places like the Murree Hills the pressure of population on existing land resources has grown to such an extent, that, for proper land use, there is no other alternative but to transfer some of the local population elsewhere.

(5.) Torrent Control and Training of Small Streams.

Torrent control and formation of natural embankments of small streams have been attempted by foresters in many places with a considerable degree of success. This type of work is neccessry for the reclama-

tion of torrent ruined land especially at places of debouchment, where torrents come out of the hilly country and during flood deposit their loads of sand and gravel in the adjoining cultivated fields. Many such areas devastated by 'Cho' action in Hoshiarpur District of the undivided Punjab had been reclaimed by planting live belts along their banks and by confining them within well defined embankments formed by the deposition of silt. Species like **Arundo donax**, **Vitex nagundo**, **Saccharum munja** and **Ipomea sps.**, etc. have been successfully employed for the consolidation of torrent banks and species like **Dalbergia sissoo**, **Acacia arabica**, **A. catchu**, etc., were also raised as a second line of defence behind the belts of the above mentioned species.

Natural embankments by deposition of silt have also been successfully formed on a small river like the Rangoon river in Burma (Leete, 1924, Cheyne, 1941). In Burma, however, they used bamboo stake fences instead of live vegetation hedges to cause the deposition of silt to form embankments. Torrent control work will be rendered much easier with the reforestation and proper management of the watersheds of small streams.

(6.) **Proper Land use on Privately Owned Lands.**

The most difficult part in any scheme of watershed management for our hill catchments would appear to be the introduction of proper land use in the privately owned lands. As far as possible cultivation of steeper slopes with more than 20 percent slope should not be allowed. Such lands must be put either under forest or used as pasture grounds. Contour cultivation and bench terracing must be the rule on cultivated lands in the hill areas. Proper attention should also be given to provide adequate drainage ways and outlets in the cultivated fields for the passage of excessive rain-water during storm and cloud bursts.

Control on grazing and lopping would also be necessary on lands owned either by individuals or village communities. However, in view of the small holdings in many cases, proper management of small bits of land in hill catchments could be done best on cooperative basis by organizing land management cooperative societies as was done in Kangra District of the un-divided Punjab. The management of privately owned forests and waste lands can however, be taken up by the Forest Department under either the Forest Act, 1927 or the Punjab Land Preservation Act, 1900. The latter enactment may best be made applicable to the whole of West Pakistan now.

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APPENDIX—1

RESULTS OF THE EXPERIMENT CONDUCTED AT NURPUR And Banni Research Stations To Determine Run-Off and Soil Losses.

Station	Particulars.	Grass Cover (Trays 1 & 2)	Grass and Bush (Trays 3 & 4)	Bare Soil Grass Clip- ped Every 8 Days (Trays 5 & 6)
1	2	3	4	5
1939 - 1940				
Nurpur (Kangra Distt.)	A—(i) Percentage of rainfall which ran off on 63 wet days for the total rainfall of 42.26" from 1st. April, 1939 to 31st. March, 1940.	10.2	10.0	59.5
	(ii) Weight of soil (in lbs.) lost per acre during 63 storms from 1st. April, 1939 to 31st. March, 1940.	1,343	1,214	24,455
	B- Weight of soil (in lbs.) lost per acre during 198 storms from 9th July, 1937 to 31st. March, 1940.	6,204	6,192	68,630
Banni (Pabbi Hills, Gujrat Distt.)	A—(i) Percentage of rainfall which ran off on 52 wet days for total rainfall of 21.92" from 1st. May, 1939 to 31st. March, 1940.	20.0	18.0	47.4
	(ii) Weight of soil (in lbs.) lost per acre during 52 storms from 1st. May, 1939 to 31st. March, 1940.	7,262	6,328	32,752

1940—1941

1	2	3	4	5
Nurpur (Kangra Distt.)	A-(i) Percentage of rainfall which ran off on 58 wet days for total rainfall of 43·26" from 1st. April 1940 to 31st. March, 1941.	7·5	8·5	62·5
	(ii) Weight of soil (in lbs.) lost per acre during 58 storms from 1st. April, 1940 to 31st. March, 1941.	1,025	1,560	17,961
	B- Weight of soil (in lbs.) lost per acre during 256 storms from 9th July, 1937 to 31st. March, 1941.	7,230	7,735	86,590
Banni. (Pabbi Hills Gujrat Distt.)	A-(i) Percentage of rainfall which ran off on 48 wet days for total rainfall of 24·82" from 1st. April, 1940 to 31st. March, 1941.	21	18·5	47
	(ii) Weight of soil (in lbs.) lost per acre during 48 storms from 1st. April, 1940 to 31st. March, 1941.	9,353	7,194	61,046
	B- Weight of soil (in lbs.) lost per acre during 100 storms from 1st. May, 1939 to 31st. March, 1941.	16,615	13,522	93,798

1941—1942

Nurpur (Kangra Distt.)	A-(i) Percentage of rainfall which ran off on 18 wet days for total rainfall of 9·85" from 1st. April, to 30th June, 1941.	5·5	10·0	52·5
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	1	2	3	4
	(ii) Weight of soil (in lbs.) lost per acre during 18 wet storms from 1st. April to 30th June, 1941.	178	281	5,217
	B- Weight of soil (in lbs.) lost per acre during 274 wet storms from 9th July, 1937 to 30th June, 1941.	7,408	8,034	91,808
Banni (Pabbi Hills, Gujrat Distt.)	A-(i) Percentage of rainfall which ran off on 58 wet days for total rainfall of 43.77" from 1st. April 1941 to 31st. March, 1942.	46.4	20.1	64.5
	(ii) Weight of soil (in lbs.) lost per acre during 58 wet storms from 1st April 1941 to 31st March, 1942.	29,398	11,371	130,362
	B- Weight of soil (in lbs.) lost per acre during 158 wet storms from 1st May, 1939 to 31st. March, 1942.	46,013	24,894	224,160

APPENDIX II

F. A. O. RESOLUTION ON FLOOD CONTROL

Agriculture and forest land uses in water shed management.

In discussing agricultural and forest land use problems in watershed management, the Conference emphasised their extreme importance.

The Conference took note of a letter presented by the Observer to the Conference for the International Union for the Protection of Nature, pointing to the desirability of considering the consequences of large scale river engineering works on the natural flora and fauna of the affected areas.

As a result of its discussion on watershed management the Conference strongly drew the attention of Government to :—

- (a) The fact that the management of watershed was a basic activity in agricultural and forest production ;
- (b) the fact that the aims in watershed management were directed toward the application of soil conservation and the control and use of water ;
- (c) the importance of conservation practices in the use of lands for agriculture, grazing and forestry. The consequences of overgrazing and dismanagement of range lands and the disappearance of plants valuable for forage production and soil conservation, can be devastating ;
- (d) the seriousness of shifting cultivation in both the agriculture and forest economics, particularly of tropical areas ;
- (e) the tremendous magnitude of the problem of watershed management. FAO could only furnish advice and guidance in this field and the real action on corrective measures must be taken by Governments ;
- (f) the highly variable conditions around the world and the need for research in watershed management and hydrology as well as for education programmes to aid individual land owners ;
- (g) efforts by FAO to organize training centres and related educational activities for the benefit of technicians concerned with watershed management.

The Conference recommended that the Organization, in continuing its studies on watershed management and related problems, draw

up a specific programme indicating priorities for implementation by Governments and by FAO, in order to achieve tangible improvements.

While accepting the great importance of watershed management in flood prevention and control and adopting the following resolution the Conference recognised that there were other objectives in watershed management, for instance the elimination of stream pollution including siltation and the improvement of domestic and industrial water supplies.

Inter Divisional Consultations. The Conference commended the inter-divisional approach to this subject adopted by the Organization.

The Conference adopted the following resolution :

Resolution No. 22/55

FLOOD CONTROL

The Conference :—

Realising that floods in certain regions constitute a recurring and serious threat to the productivity and general economy of these, Recognising that action by individual countries in the regions cannot be sufficiently effective.

Recommends.

1. That FAO encourage on a regional basis work in improving watershed management to reduce or prevent flooding in the affected areas ;
2. that FAO render such technical assistance as may be necessary and possible to implement such work ;
3. that these activities be coordinated with the flood prevention and control work of other appropriate national agencies.