

EROSION—A MAURITIAN MEASURE FOR PROTECTING WATER-COURSES

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IN tropical agriculture, water-courses are the scene of some of the deepest erosion and the loss of the most fertile section of the soil. In the Colony of Mauritius a simple legal enactment dating from 1875 has been effective, to a large extent, in preserving a vegetative cover on the banks of rivers and streams, and a note on the present position may usefully follow the series of articles on soil erosion published in past numbers of *The Tropical Agriculturist*.

The object of forming a river reserve along the banks of water-courses in Mauritius (see classification in a subsequent paragraph) are (i) to reduce the erosion of the banks and prevent damage by floods (ii.) to discourage the breeding of *Anopheles costalis* by ensuring a complete shade of trees or shrubs over the water (iii.) to improve a defective catchment and maintain a perennial flow without marked seasonal fluctuation and (iv.) to provide a refuge for insectivorous birds.

The desired results can, theoretically, be achieved by defining the river reserves and withholding them from sale when the adjoining blocks are opened up for agriculture: under this system the reserves are much exposed to pilfering of fuel, &c. and to encroachment, and a stage is usually reached at which encroachments have to be surveyed and sold to the owner of adjoining properties. The alternative, adopted in Mauritius, was to apply legal sanction to the use by the owner of the strip of land adjoining each bank and leave these strips in private ownership.

Water-courses are classified by proclamation as "rivers", with a 50-foot reserve on either side measured from the bank, "rivulets" with a 25-foot reserve and "feeders" with a 10-foot reserve. Within these limits no one may destroy or remove a tree, loiter in the reserve with a cutting instrument, set fire to vegetation, or plant other than approved tree species. Only perennial streams can be proclaimed in this way and erosion does, of course, occur in valleys and gullies which have only an intermittent flow. Marshes can be proclaimed as part of the

water-course and owners may clear brushwood, with permission, and plant useful and ornamental trees. The penalty for destroying, cutting, sawing or removing timber is a fine not exceeding Rs. 500 (£ 38) in addition to the payment of 3 times the value of the produce, and under these rules the actual owner of the reserve is as liable to these penalties as any outsider.

The law was probably drafted with direct reference to objects i. and iii. (erosion and catchment respectively enumerated above); malarial control was a later adjunct, and the protection of birds quite a recent after-thought. It is clear that objects i. and iii. can be achieved by a belt of shrubs or low cover, and it is found that *Eugenia jambosa* and *Ligustrum Walkeri* are excellent for the purpose. Tall trees, over 30 feet in height, very often *Tecoma pallida* or *Terminalia arjuna*, are unpopular with the owners of adjoining sugarcane plantations because of the excessive shade they provide and the serious interference of their root systems with the sugarcane crop: these disadvantages are held to outweigh any benefit which may be afforded by protection from wind or by the cooler and more humid atmospheric conditions which result from belts of this kind.

Uniformity is neither possible nor necessary, and after 60 years the 312 miles of 50-foot river reserves show a great variety of vegetation. Some reserves have been frankly encroached upon, others have lost their trees; but in very few cases and over quite short lengths have the banks been rendered liable to erosion. Many reserves for some miles on end have tall trees of *Tecoma* or *Arjuna*: in others which have *Rubus*, *Cordia interrupta*, or bamboo, erosion is as effectively checked. There can be no doubt that the measure has been strikingly successful with a low cost to the exchequer and the minimum of supervision. Control is exercised by a Board comprising the Heads of the Medical, the Police and the Forest Departments with a retired Forest Officer in executive charge while patrolling of reserves is carried out by the Police staff who are better distributed for the purpose than Forest Department staff as well as being more numerous.

A proposal has recently been revived for the re-definition and fuller utilization of some of the 50-foot reserves. Reserves in weeds or scrub of no value or those which have necessarily tall trees will, with the approval of the Board, be cleared in sections and replanted in fruit trees such as mango, litchi or citrus with such subsidiary crops as vanilla or cardamoms beneath them. Here again no uniformity is to be expected and some estate proprietors who protect their reserves at present with *Eugenia jambosa*, prefer the *status quo* to a mixed plantation of fruit which would be liable to pilfering. In the course of this reconstruction, the outer boundary of the reserves would be outlined in *Vetiveria* grass and any encroachments revealed in the

work would be included in the new plantations. Encroachments and areas degraded to a dense growth of weeds probably amount to 15 per cent. of the total and this considerable acreage can thus be reclaimed, restored to full efficiency and made to produce crops of some economic importance.

Viewed from high ground these reserves look like enormous hedges meandering through the cane fields and are a conspicuous feature of the landscape.

Mr. R. Thompson, Deputy Conservator of Forests, India, submitted a report in 1880 in which he stated "The River Reserves are one of the most important institutions in this Colony. Their existence has done much good in maintaining the water supply in the streams and rivers which they protect; and they are therefore worthy of imitation elsewhere."

At that time the reserves no doubt consisted chiefly of indigenous trees which are now less common: *Terminalia arjuna* dates from the time of Mr. Thompson's visit to Mauritius.

Similar rules apply to the protection of mountain reserves and, together, these classes cover about 9,070 acres. Crown forests (economic) and other forests including both mountain and river reserves amount to 97,225 acres or 21 per cent. of the total area of the Colony.