

It will not be out of place if we say the reason why we have roads in dilapidated and devastating condition in Africa is as a result of lack of adequate drainage systems or that the drainages are clogged, or the drainages have nowhere to drain to. When too much water remains on the base and subgrade, combined with traffic actions, potholes, cracks and pavement failures occur. To reduce water damage to roads in Africa, good water drainage should be included during the design of the pavement,



tant part of a rural road construction and maintenance works. A good drainage needs to be taken into consideration at the early design stages in order to secure a long life for the roads.



not after roads have been designed and built. The transportation bulletin of Wisconsin states that, one dollar spent on drainage will save two dollars on maintenance. An efficient drainage system is therefore essential to allow water to flow off and away from the road as quickly as possible. This is achieved by a system consisting of the following components.

- 1) Roadsurface drainage which enables the water to flow off the road surface.
 - 2) Side drains and MITRE drains which collect and lead the water away from the road.
 - 3) Catch water drains which catch surface water before it reaches the roads.
 - 4) Road embankment in flood prone terrain, lifting the roads surface above the flood levels.
 - 5) Scour checks, preventing erosion in the ditches by slowing down the flow of water.
 - 6) Culverts which lead water from the side drains under the roads to the other lower side.
- All these components need to work well together. If one component of the drainage system breaks down, it will not only compromise the drainage in that specific location, but may lead to overloading other drainages which in turn may lead to more damage. An efficient drainage system is the most impor-

In the United States for example, whenever there is resurfacing, restoration and rehabilitation of roads, drainages are replaced, some are raised to align with the road section, while in some cases the culvert pipes are replaced and those that clogged are cleaned. This is a very good method of maintenance that every nation should emulate, it helps to keep record of all drainages that a particular area has and what condition they are in. Inadequate drainage systems does not just shorten the life of a road, it jeopardizes the lives of people and the economic viability of any nation; businesses are slowed down and travel time is longer than envisaged, thereby traumatizing not just the indigenes, but also, investors become reluctant to invest and tourist will never return after a visit. This is why drainage systems should be included in the design stage of pavement design.