Automatic night lamp

Ever imagined how the street lights would turn on automatically in the evening and go off in the morning?

Is there anyone who comes early morning to turn off these lights? The following circuit based project can perform this job properly. This circuit uses the output from a simple light/dark activated circuit and drives a relay in its output which can be further coupled to switch on/off an electrical appliance in a household.

An appliance can be made dark or light activated by slightly changing the circuit's configuration. This idea finds numerous applications such as, automatic watering of gardens at evening, automatic night lamp, dark activated siren and so on.

A light dependent resistor (LDR) is used in this circuit to provide input to a comparator of LM339 (refer project on Automatic lightdark indicator). The output pin of the comparator goes high depending on the configuration of LDR so that it can be made light or dark activated. This output is connected to a transistor T1 (BC 547) which acts as a switch for the relay.

The high output of the comparator provides the necessary forward bias to the base-emitter junction of the transistor T1. Thus T1 jumps from cut off to saturation state and collector current flows. This collector current energizes the relay coil. The magnetic field produced by the relay coil shifts its connection from NO state to NC. An appliance connected to NC contact gets switched on.

When the output of the comparator is low, it is insufficient to drive the transistor T1 to saturation. Hence T1 moves to cut off and the collector current ceases to flow. Thus the relay coil gets de-energized and its switches the state from NC to NO mode. It is important to note that resistor R2 (20k) is provided at the base of T1 to check the base current.

Circuit Diagram