Objective

The objective of the project is to make a system where solar panel in the rooftop along with water reservoir under it are used for multipurpose in the ever-growing busy cities.
Normally when there is sunlight and no rain, solar panel will do its usual job, reserving electricity. But when there is rain, solar panels' shaft will close together, making space for the reservoir to collect rain water. When the water tank is full then some water will be moved by pipe to the garden trees.
Collected electricity and water can be used for further purposes on the rooftop.

Social Values

The system will help city dwellers to produce necessary electricity and have ample rain water that can be used according to their needs. They will be able to use the empty space of their roof. Produced electricity and collected water can serve many purposes such as lighting the rooftop, watering the garden, and if needed the water can also be purified into drinking water with the same produced electricity.

Required Components

These following parts and tools are required for building this project

- Arduino UNO
- LCD 32*2
- Battery
- 1 Inch pipe (25 feet)
- Jumper Wires
- Hardboard Sheet
- Servo Motors
- Light Sensor
- Rain Sensor
- Ultrasonic Sensor
- Solar Panel

Working Procedure

The basic components that react to the input are:

- Servo Motors (Panel and Valve)
- LCD 32*2 display

The components that take stimuli from the environment is:

- Rain Sensor
- Light Sensor
- Solar Panel
- Ultrasonic Sensor

Procedure:

- Rain Sensor will be used to determine whether it is raining or not .We will also use a Light Sensor to detect the sunlight.
- When it is not raining and there is sunlight detected, the Solar Panel will get open widely on the water reservoir.
- When rain is detected, the Solar Panel gets close automatically with the help of the Servo Motors. And that's how we will collect pure rain water in the reservoir.
- The Solar Panel will be opened at night if it is not raining for avoiding unwanted dirt or pollute in the water.
- We will use the electric power, consumed from the Solar Panel for running the Servo Motors.
- User can see whether the Solar panel is charging or not via LCD and also the power it has in different time of the day considering the various amount of sunlight. They can also see whether the tank is full or not.
- If the tank becomes full then another Servo Motor, working as a valve, is opened and water goes to the central big container and later can be used for watering the roof garden via pipes.

Estimated budget

Equipment	Quantity	Budget(Tk)
Arduino UNO	1	649
Servo Motor	3	1200
Raindrop Sensor	1	120
Light Sensor	1	100
Ultrasonic Sensor	1	95
Solar Panel	2	500
Hardboard Sheet	2	100
Battery	1	320
LCD	1	160
Jumper Wires	As Required	100
1 Inch pipe (25 feet)	1	100
Total		**3,444 TK**

Conclusion

We hope that our system will help the city dwellers, with congested space, utilizing their rooftops. If this is implemented correctly this can have great impact on our life. Moreover, with extra bit of modification it has lots of possible options to become more beneficial.