

SECURITY OF SOLAR MODULES

The sustainability of a solar powered water system (SPWS) and the reliability of water services is put to jeopardy when solar components are at risk of being stolen or vandalized. Solar panels especially are an attractive commodity for some users as they can be used to provide power for other uses or be re-sold to get cash, and it is therefore the component most prone to theft.

This is not a concern in camps where a managing agency such as an NGO will be present to guarantee security but can be a big problem at rural community level or more urban contexts. Listed here are measures that implementers and users can take to avert and/or deter theft/vandalism of solar modules (and other components too) some of which can be used in combination for enhanced security. The most appropriate measure should be adopted to fit the needs at hand.

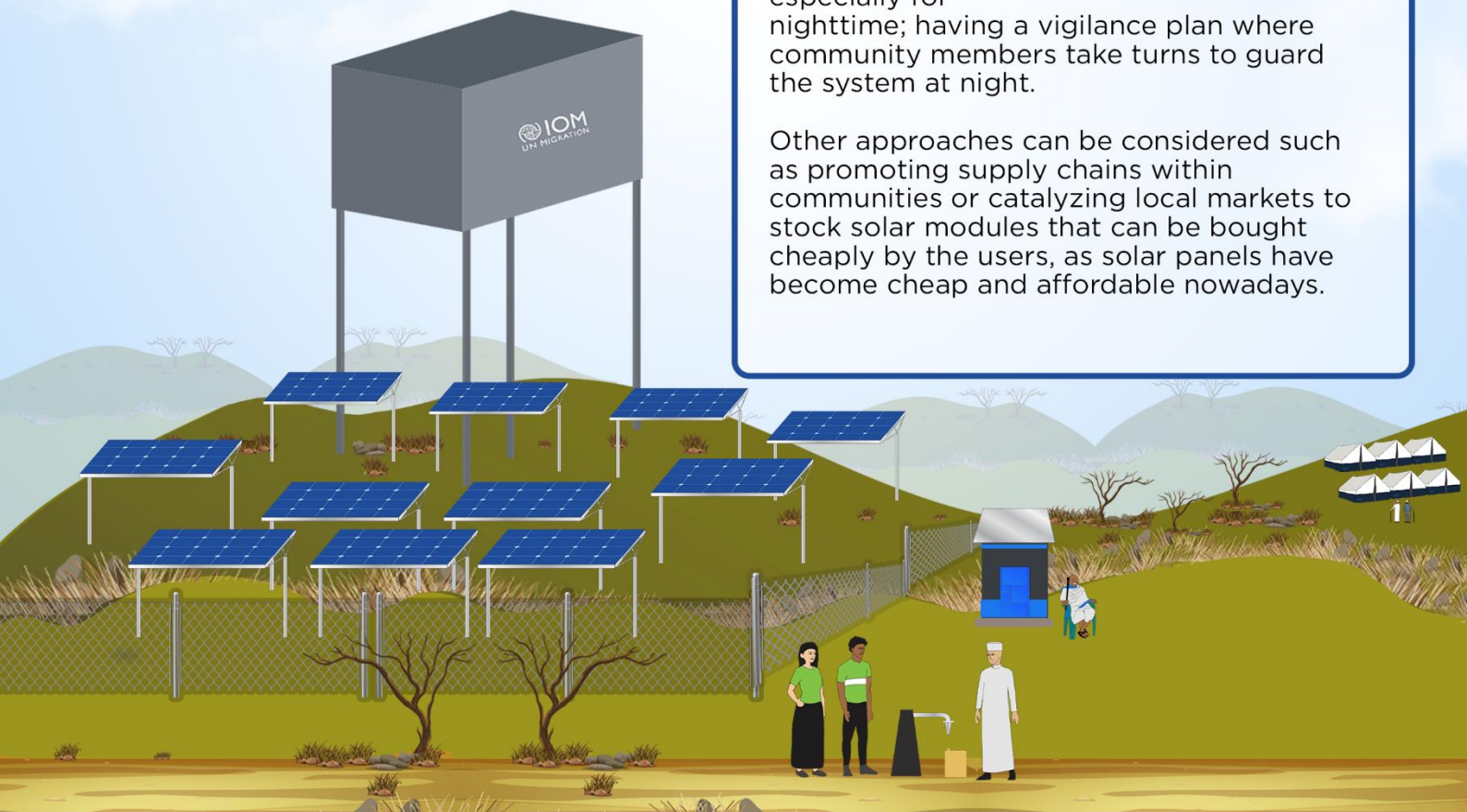
PRE-CONSIDERATIONS

Consider the security of the system from the project onset. For new groundwater wells and boreholes, and where it is feasible in accordance to hydrogeological studies and geophysical prospecting, select a drilling location which is close to the users/beneficiaries, so that the proximity will make theft or vandalism more difficult.

Ensure that there is acceptance and ownership of the SPWS at community level before starting any work on the ground, through an engagement process to understand the local context and find locally acceptable solutions to identified water problems or challenges, while aiming for equitable provision of water.

Identify the risk and have the users commit to a security plan such as: the community can donate land for a few families to build their homes in the vicinity of the solar system; making arrangements for someone (e.g. a water operator) to live at the site; staffing the PV module area with a guard, especially for nighttime; having a vigilance plan where community members take turns to guard the system at night.

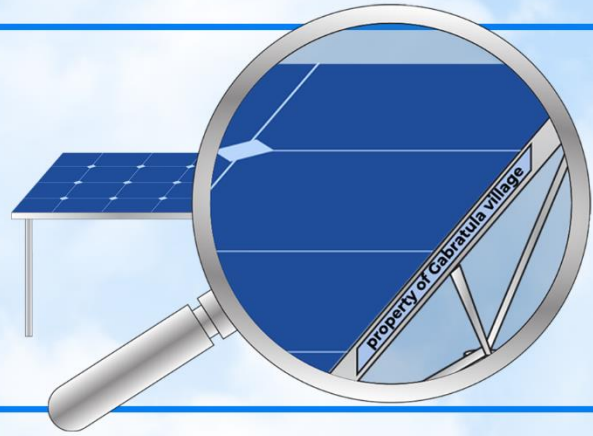
Other approaches can be considered such as promoting supply chains within communities or catalyzing local markets to stock solar modules that can be bought cheaply by the users, as solar panels have become cheap and affordable nowadays.



PHYSICAL MEASURES

1

MARK on the side of the module frame in large conspicuous non-removable letters with the owner's or community name and/or location to deter resale and reuse. Permanent ink can be used, or the letters can be engraved with a sharp object such as a screwdriver or similar tool. Care should be taken not to scratch or mark the solar cells. The back of the modules should not be marked, scratched due to current technology that uses bifacial power production on some modules.



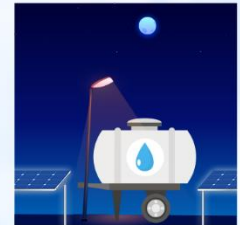
2



FENCE around the solar array installation and secure it with a lock. Electric fences and razor wiring have been adopted in large installations, including motion activated sirens that go off when an intruder is in close proximity to the scheme.

3

LIGHT the solar array and water point at night using solar lights to act as a deterrent and to make it easy to spot any intruders.



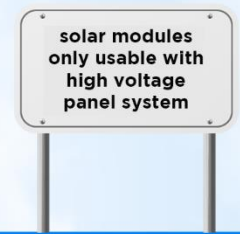
4

PUT UP warning signs such as "NO TRESPASSING" "DANGER" "HIGH VOLTAGE" to deter access.



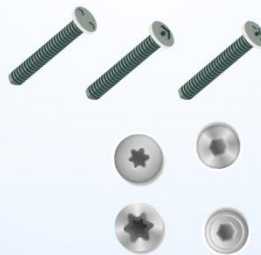
5

GIVE the impression that the modules cannot be used elsewhere by putting up signs saying that these modules are not usable in other installations.



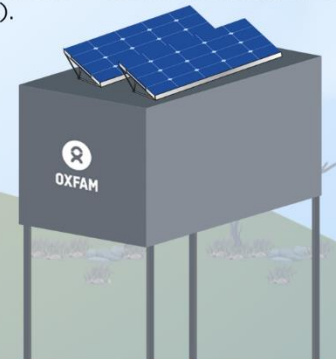
6

FASTEN the modules onto the module support frame using one-way bolts or security screws that require special tools to remove; Angles bars can also be used to secure the panels but ensuring that they do not introduce any shadows on the solar cells, or cause excessive mechanical stress on the module.



8

ELEVATE the modules on steel poles (using a well secured foundation appropriate for the local soil and wind conditions), to make it hard for thieves to reach them. The modules can also be installed on top of an elevated water tank (but keeping in mind access will be needed for regular cleaning of the panels).



7

WELD the steel bolt/screw to the steel support frame (but taking into account that it will be difficult to remove the modules in case of replacement need).



In spite of all these measures and the best efforts, there are instances where security can be problematic, such as situations of war or conflict where modules are stolen or destroyed by armed groups; or systems that are cited remotely due to hydrogeological considerations where thieves have the tools and time to remove panels. Local authorities and communities should always be consulted to determine the most appropriate approach to securing the solar system, while ensuring the safety of the users. If necessary, alternative more secure means of providing water to the users should be explored.

Further information and resources: www.thesolarhub.org

