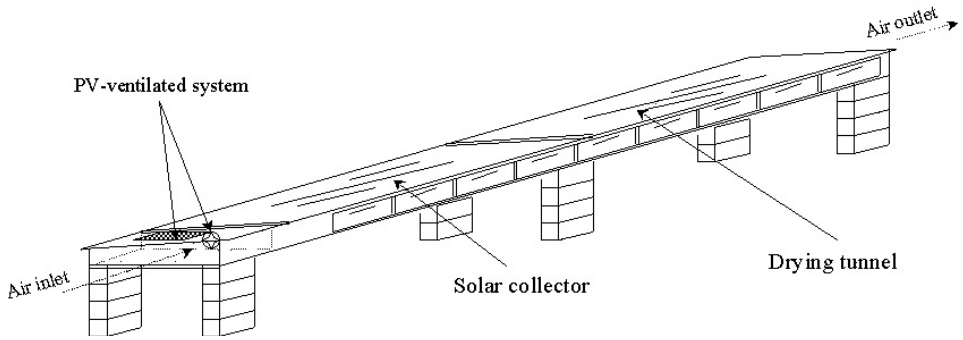
## Projects for student competitions

**Project1:**

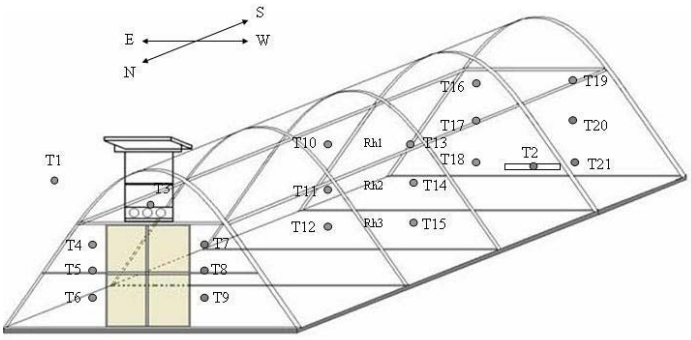
***Using solar energy for Drying of fruits, vegetables, spices, medicinal plants:***

**Problem:**

The traditional heat drying methods consumes a lot of energy and poor quality of the product also the traditional sun drying yield a low quality product, and the product is not protected against dust, rain and wind.




*Schematic diagram of the solar tunnel dryer with polycarbonate cover*




*Schematic diagram of the greenhouse type solar dryer with polycarbonate sheet*

**Objective:**

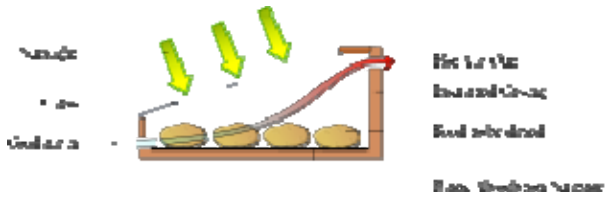
Introduction of suitable solar drying technologies and improvement of product quality and reduction of losses.

**Solar drying:**

Solar dryers are devices that use solar energy to dry substances, especially food. There are two general types of solar dryers: Direct and indirect.

***Direct***

Direct solar dryers expose the substance to be dehydrated to direct sunlight. Historically, food and clothing was dried in the sun by using lines, or laying the items on rocks or on top of tents. In these systems the solar drying is assisted by the movement of the air (wind) that removes the more saturated air away from the items being dried. More recently, complex drying racks and solar tents were constructed as solar dryers.



***Indirect***

*Industrial indirect solar fruit and vegetable dryer*

In indirect solar dryers, the black surface heats incoming air, rather than directly heating the substance to be dried. This heated air is then passed over the substance and exits upwards often through a chimney, taking moisture released from the substance with it. One of the advantages of the indirect system is that it is easier to protect the food, or other substance, from contamination whether wind-blown or by birds, insects, or animals. Also, direct sun can chemically alter some foods making them less appetizing.

**Project 2:**

***Recycling of non used rubbers or tiers:***

**Problem:**

The tires are among the largest and most problematic sources of waste, due to the large volume produced, their durability, and the fact they contain a number of components that are ecologically problematic.

**Objective:**

Introduction of new recycling technology for used and old tiers.

**Recycling**

Recycling is the process of converting waste materials into reusable objects to prevent waste of potentially useful materials, reduce the consumption of fresh raw materials, energy usage, air pollution (from incineration) and water pollution (from landfilling) by decreasing the need for "conventional" waste disposal and lowering greenhouse gas emissions compared to plastic production. Recycling is a key component of modern waste reduction and is the third component of the "Reduce, Reuse and Recycle" waste hierarchy.

There are some ISO standards related to recycling such as ISO 15270:2008 for plastics waste and ISO 14001:2004 for environmental management control of recycling practice.

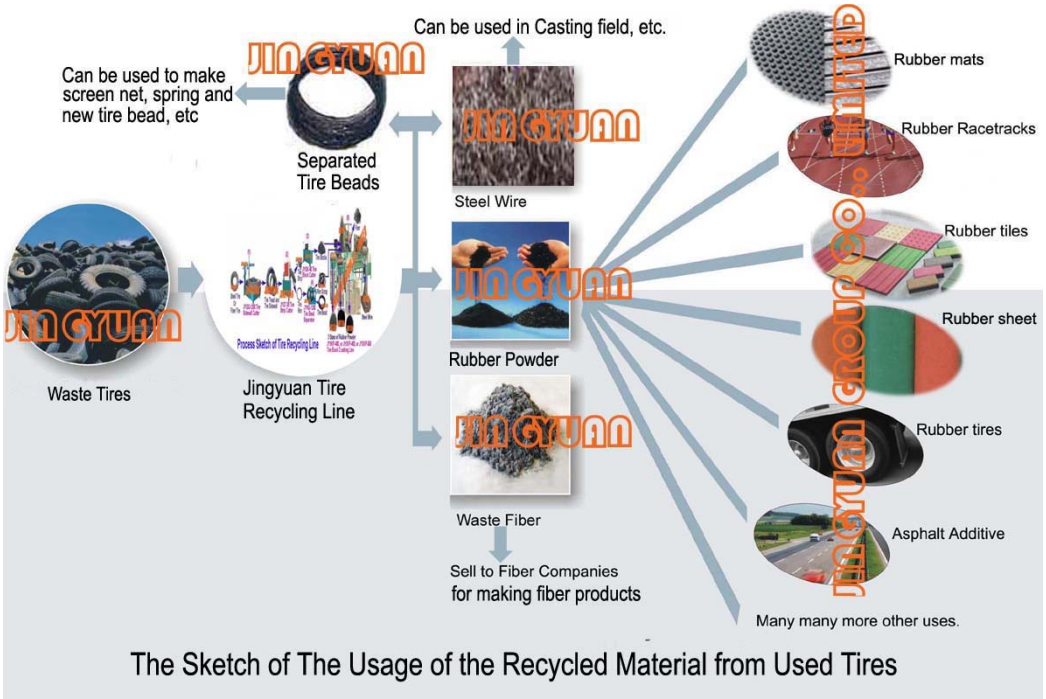
Recyclable materials include many kinds of glass, paper, metal, plastic, tires, textiles and electronics. The composting or other reuse of biodegradable waste such as food or garden waste is also considered recycling. Materials to be recycled are either brought to a collection centre or picked up from the curbside, then sorted, cleaned and reprocessed into new materials destined for manufacturing.

Tires can be recycled into, among other things, the hot melt asphalt, typically as crumb rubber modifier—recycled asphalt pavement (CRM—RAP), and as an aggregate in portland cement concrete..

**Tire-derived products**

One stage of tire recycling involves the production of alternate products for sale. New products derived from waste tires generate more economic activity than combustion or other low multiplier production, while reducing waste stream without generating excessive pollution and emissions from recycling operations.

**The Recycled Rubber Powder** is the best surrogate products of Natural rubber, it is the it can be used to make almost any rubber products, some products can made of 100% recycled rubber, such as Rubber Mats, rubber cushion mats, rubber coil mat, rubber playground, livestock floor and wall mat, roof tiles, rubber racetrack, various rubber tiles, etc, some products can use some percent of recycled rubber as addictive, such as making new auto tires, motor tires, bike tires, road pavement, etc. If using recycled rubber as addictive, it will improve the products quality, for example, the auto tires use recycled rubber as additive will be more wearable, and road paved with recycled rubber as additive will lower noise and enlarge the road life, etc, many more other uses.




The Sketch of The Usage of the Recycled Material from Used Tires