
PASSIVE SOLAR GREENHOUSES IN MONGOLIA

AN INNOVATIVE TECHNOLOGY FOR A SUSTAINABLE DEVELOPMENT IN COLD REGIONS

Mongolia is characterized by a harsh continental climate, with extremely cold and long winters. Temperatures generally start to drop below 0°C in October, sink to -30°C in December/January, and remain below freezing until April. The growing season only lasts 100 to 120 days, and is limited by cold, arid and windy conditions. Therefore, agriculture is a real challenge and vegetable production a major stake for national food sovereignty. Despite the active promotion of the government on vegetable growing, domestic production supplies only half of the vegetables needs, so the country is highly dependent on importation. 50% of the vegetables come from China. But fortunately, with more than 260 sunny days a year, Mongolia is justifiably known as the 'Land of Blue Sky'.

Using the sun as a main source of energy is a concept deeply studied by GERES. Indeed, GERES has developed the concept of Passive Solar Greenhouse in North India, Afghanistan, and Tajikistan years ago. It is now acting in Mongolia to adapt this innovative and efficient tool to local specific conditions in order to extend the growing season up to 8 months minimum, only by using solar energy, and to diversify horticultural production.

The Passive Solar Greenhouse design principles relies on a south-facing structure, constructed with 3 walls built with locally-sourced materials, which absorbs solar energy during the day and releases the absorbed heat during the night. Walls are insulated for a better efficiency and the south face is covered with double UV-stabilized polythene.

In Mongolian cold but sunny climate, this tool is innovative as (1) it saves energy in comparison with conventional greenhouses; (2) it is the only solution regarding local context, where there is no available conventional energy; (3) the concept is sophisticated - it maximizes solar energy collection, it stores and preserves the heat as much as possible - but it is simple to implement, using local materials, simple to use, to maintain, and thus, simple to duplicate.

The Passive Solar Greenhouse has aroused large interest from individuals, cooperatives, non-governmental organizations as well as governmental ones for mainstreaming and scaling-up. It enables people (i) to advance the growing seasons by producing early seedlings (vegetables or flowers), (ii) to extend the season of fruit vegetables and saplings, (iii) to produce leafy/root vegetables in spring and fall.

GERES activities include the whole vegetable production chain, from seed management to cooking class in order to address the needs of the beneficiaries both for the vegetable production and the nutrition knowledge and know how (awareness, cooking classes). These two aspects are considered as major pillars to improve food security, notably with a view to the National Program for food Security.



© GERES / Pierre Thiriet

Beneficiaries growing radishes and other vegetables under one of the solar passive greenhouses implemented in Mongolia