Solar Cookers as a Complement in Traditional Restaurants

Pedro Serrano Rodríguez
Unidad de Arquitectura Extrema
Departamento Arquitectura
Universidad Técnica Federico Santa María, Chile
pedro.serrano@usm.cl

Abstract:

Chile at the last decades, multiple projects have been tried to develop solar restaurants, following the example of the successful Solar Villaseca Restaurants that celebrated 30 years of activity.

Those of Villaseca are in territories with very high annual sunshine and comply with having a high percentage of meals made exclusively with the sun enregy, and that however, in winter periods, they should start the mornings with conventional gas stoves.

This indicates that in reality purely solar restaurants, with the current technology available, must operate in a mixed manner, especially if they want to cover night periods, storms or bad weather. There are technologies to conserve heat adiabatically or through phase transformations, but they are not yet completely solved for the kitchens and solar ovens.

Therefore, following the "Solar Platform Project" associated with this proyect, existing culinary microenterprises and its possible the training of culinary technicians trained in solar cooking, with locally adapted dishes, it is possible to integrate solar cooking in sunny areas to traditional restaurants, where solar cookers are an attractive and functional complement that improves its economic performance and contributes to the diffusion of technology, without pretending to be 100% solar.

Keywords: Solar cookers, Traditional restaurants, Local cuisine

INTRODUCTION

Chile is a remarkably long country, a little over 4400 km long, oriented from north to south, covering latitude 17º30` South and 56º30`Sur. This means that from a sub equatorial latitude, it passes through the Tropic of Capricorn and the Antarctic Polar Circle approaches, therefore if it

is added that in an average of 100km the territory rises from sea level to a mountain range that exceeds its point higher the 6962 meters snm.

This slope between the sea and the heights also generates diverse climates is its cross section, which makes it possible to find the most diverse ecosystems and territories in a few tens of kilometers from west to east.

This multiplicity of climates, including the presence of high evaporations from the Pacific Ocean, implies the presence of dense layers of clouds until after noon on the entire coast of the Atacama Desert and much of the central area of the country. Commonly called "coastal trough". The latter implies serious problems for the development and massification of the use of solar cookers in the Chilean coastal areas, where the main capital cities of the province of Chile are located except for Santiago, 100 km from the coast and 500m asl, the capital , where almost half of the country's population lives.

In summary, they are the valleys and high plateaus of the north central area, where it is possible to find the best daily sunsets that make possible a more prolonged and diversified use of solar cookers and ovens.

This is the geographical climatic reason that helped the success of solar restaurants in the remote rural community of Villaseca that are located 500msnm at the southern gate of the Atacama Desert, the driest on the planet, a place that, due to its pristine skies, It is the location of large astronomical observatories.

In the case of Villaseca, already famous for its solar restaurants, the weather history indicates up to 360 days of continuous sunshine per year with high intensities, which is a very privileged case regarding access to solar energy. The same in Villaseca, during the winter months, due to its mountainous situation, there are periods of shade in the early hours of the morning, which force solar restaurants to go to the pre-cooking with gas of the midday dishes that require longer preparation time, this is because the clientele comes at 1:00 p.m. and the sun appears full near 11:00 a.m.

It should be noted that the success and failures of these initiatives are not only due to the solar supply, it is rather a process managed in economic, socio-cultural and energy precariousness, where a small group of very determined women undertook an idea originally deranged (Open a restaurant in an unknown place in the remote mountains, almost without access) (Serrano, 1994). Idea that by the intervention of national TV, plus the bitter persistence of a group of women who were stubborn in their idea, managed to trigger in a short time the number of international and national tourists who came to see the prodigy of the sun, inaugurating the support for almost thirty years of the first solar restaurants on the planet. (1990-2019).

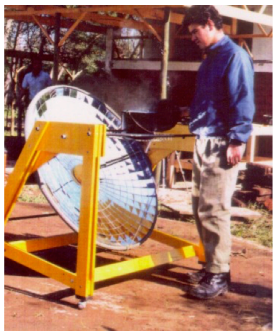

Fig.1 Parabolic cooker Fig. 2 Villaseca restaurante at 1990 Fig. 3 Villaseca Restaurant at 2007

Social events over time also impacted the development of this story. To start legal activities, the first restaurant went to the subterfuge of building a neighborhood organization, with all the neighbors of the small community. That allowed the start but meant a series of subsequent changes, especially when the newly created restaurant began to have good results.

The restaurant was started by only four women, who began to occupy all the work of entrepreneurship, from commercial management to cooking. Very soon the restaurant began to surplus general, which was divided between the investments of the restaurant itself and a balance to distribute among the components of the neighborhood organization. In fact, the majority of the 16 families that were part of the first committee did not work in the restaurant and referred only to supervise the distribution of surpluses. The organization "Villaseca´s solar cookers ", not working in the restaurant and assume a passive role only of recipients of very little money per capita, became a problem for the administration of the venture.

After 2 years of work, the four women, among them three Red sisters, resigned from the restaurant, Lucila, the oldest and leader of the group went to live in Vicuña and the two younger twins opened their own restaurant in their home, a few blocks away Below the original, the "Where Martita" Restaurant. The neighborhood organization began leasing the facilities of the original restaurant to third parties, always receiving a surplus payment, the restaurant declined over time and was leased to different external entrepreneurs.

The "Where Martita" solar restaurant began with new solar cookers, axes by themselves, a sustained family administration and economically traced over the original restaurant. The Red twins, had all the experience of the origin, involved their families in the process, until today, 2019, is the emblematic solar restaurant of Villaseca.

All of the above is to indicate that a solar restaurant is not something that depends on the solar technology they use, but rather on the capacity of recovery, persistence, organization and entrepreneurship of their managers, in this case of women, highlighting the value of gender in a historically macho environment. In this case too. family management has worked better, than that of a company of associates and only with neighborhood links, where the presence of money lends itself to high conflict.

With all this accumulated experience, the purpose arises to interest traditional restaurants, located in the central area of Chilean territory, in using solar cookers as an alternate means of cooking to the extent that the solar offer makes it possible, according to the parts of your menu that apply to solar cooking.

This means, among other things, that each restaurant, according to its own recipes or preparations, must rehearse its entire bill or by parts in solar cookers. This learning is obviously trial and error and will depend on each restaurant in question and the support of a solar change agent.

The interesting thing is that each restaurant can develop a mixed kitchen, that is, using traditional methods such as gas, electricity and even firewood, mixed with cookers and solar ovens, the important thing here is to highlight the contribution to the commercial appeal that kitchens can make solar well designed, to work well it is worth cooking the particular recipe, last well and look good.

Durable Cookers (+ 10 years), washable and quality.

It is important to emphasize here that a Chilean commercial restaurant is not a project of social interest, which is the field in which most of the projects in solar cookers of the past have been carried out in Chile. It is not the emergence of a refugee camp or a club interested in a quick training workshop.

For this to work with the necessary quality and dignity, ergonomically designed designs are required, so that they incorporate, by design, the standard working height of the cooking surface in Chile (80cm). This should normally be associated with some furniture designed for this, considering also that some models can be indoor and that most of the models should operate on outdoor terraces of the restaurant. The latter because one of the notable benefits of exposing solar

cookers in a commercial restaurant is the interest that they arouse and the contribution that this makes to the solar education and culture of customers.

Villaseca solar cookers are durable for 30 years running non-stop, they are solid, simple to maintain and require painting, glass or mirror cleaning and maybe a new hinge. This durability is possible using to build durable, solid and weatherproof materials, in space ultraviolet radiation, similarly, transparent and refractive surfaces should be able to be cleaned until washed for at least a couple of decades, without losing their refractive qualities or translucency The latter leaves a good amount of plastic materials out of the possible choices

Fig. 6 glass mirrors, lavables por 10 años

Fig 7. Adequate Working surface

There are also factors of Professional Industrial Design, which are related to ergonomics, hapticity (of haptic)

The use of color and appropriate shape designs and usage details. This in itself is a challenge for professional designers of equipment and systems.

A French example from the south: Le Présage Located in Aubagne, near Marseille, it has become the first solar restaurant in France. Fig. 8

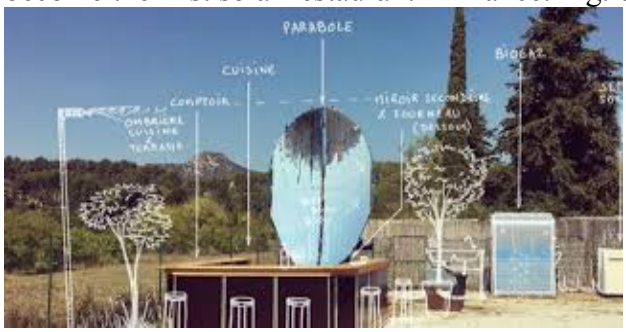

Fig.8 Schematic from“Le Présage”

Fig.9 “Le Présage” like portable unit

Not all kitchens, not in all places

Finally, in the book “A Treatise, Solar Cookers” by Dr Ashok Kundapur, of 2018, it is possible to see a huge number of models and designs of solar cookers from Africa, Asia, Oceania, Europe, Latin America, USA. Models that meet different needs, from cardboard panels, cheap

and quick to produce with reflective coating, metal parabolic, folding, stamped, stamped, wooden and glass boxes, parabolic troughs, vacuum tubes, the parabolic ones of steel or polyester or cardboard, small medium or giant, with pots of different sizes according to cultures and needs, the concentrating lenses, using air water or oils as heat transporting fluids, with or without use of greenhouse effect, etc. . A very large variety product of the ingenuity and creativity of hundreds of inventors and craftsmen designers from all over the planet.

None works for any place and every place in the world according to their culture, resources and needs, can adopt some model, create a new one and try ...

It is important here to stop where to cook. Each Culture has its own dishes and meals, many countries cook in water, others tend to fry in oil, others roast on open fire, others bake at high temperatures, etc. (González Avilés, 2014) ,. In some countries, such as Chile for example, it is customary to cook a single main course on a daily basis, there are places in India where food is many different small dishes with their sauces, cooking fish is not the same as cooking beef or cooking potatoes or rice All this is mentioned because in the specific case of restaurants, the topic of which cooking is vital to choose the kitchen models and it is also very important to test the organoleptic qualities of what is produced according to the particular cultural palates.

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