SEED COMMUNICATIONS

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INDIAN INNOVATIVE SOLAR CABINET DRYER MAKES JOURNEY TO ZANZIBAR FOR TECHNOLOGY & BUSINESS INCUBATOR CENTRE IN EAST AFRICA

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Zanzibar Technology and Business Incubation Centre (ZTBI) is the unique initiative of Ministry of Empowerment, Social Welfare, Youth, Women & Children of the Revolutionary Government of Zanzibar. ZTBI was the result of National Development Framework i.e. Zanzibar Development Vision 2020 (ZDV 2020) and the Zanzibar Strategy for Growth and Reduction of Poverty 2010-2015 (ZSGRP 2010-2015), Business environment Lab (Result 4 Prosperity) which put emphasize on the need to address youth unemployment through, among other things entrepreneurship development in Zanzibar.

Business Incubation is the process of nurturing and nourishing start-ups and small initiatives into relatively mature, independent, healthy and wealth-creating businesses. ZTBI accomplishes this through a myriad of methods including providing office space at subsidized rental rates, high-speed Internet, consultancy services such as business, legal, marketing and sales to mention a few. ZTBI nurture business in ICT, Tourism, and Agribusiness Sectors. ZTBI promotes youth development activities under a Business Incubation Program to create self employment, entrepreneurship. ZTBI technology-incubating program designed to assist entrepreneurs in the development of new technology-based firms, both start-ups and fledglings. It seeks to effectively link talent, technology, capital and know-how to leverage entrepreneurial talent in order to accelerate development of new companies, and thus speed the commercialization of technology.

VISION: ZTBI aspires to become the most outstanding technological Business Incubator in East Africa.

MISSION: To stimulate new business developments and growth of enterprises into successful, well structured and fully productive enterprises for the benefit of all in Zanzibar.

ROLE OF ZTBI: The ZTBI provides a micro environment for accelerating start-up business and maximizing their growth potential by:

a) Conserving entrepreneurs most scarce resources, time and money, through cost sharing, work space, Business Development support services and equipment in a flexible and timely manner

b) Assisting entrepreneurs overcome constraints to growth that arise from the macro-economic environment, such as administration barriers, lack of information and access to capital

c) Accelerating the rate at which entrepreneurs learn core elements of business planning and business management by providing informational interchange, mentoring, technical and management assistance and access to learning resources.

BUSINESS INCUBATION SERVICES:

BUSINESS INCUBATION STAGES:

Zanzibar Technology and Business Incubation program are as under:

- Innovation Space for students who want to make their career in Entrepreneurship
- Hot Desk for those who are in the preparatory stage to join Business Incubation
- Incubation Consist of;
- Pre-Incubation period (1-3 months)
- Orientation, selection and business plan development
- Incubation period (1 year)

- Continues monitoring by Incubator specialists. Support with financial and non financial services (BDS)
- Graduation: Graduation benchmarks
- One year residency within the incubator as business needs larger and more facilities than the Incubator can provide
- Business can now survive without business Incubation Support

Delegates from ZANZIBAR

TARGET GROUP: Youth including women from Institutions of Higher Learning,Startups and existing MSMEs who needs Business Incubation Support in ICT, Tourism and Agribusiness Projects. Female entrepreneurs are given preference

ZANZIBAR TECHNOLOGY AND BUSINESS INCUBATOR CENTRE PARTNERED WITH 'SEED', HYDERABAD ON SOLAR DRYERS TECHNOLOGY TO CREATE SELF EMPLOYMENT

Agribusiness is one of the priority sectors of the Government of Zanzibar. ZTBI has therefore integrated Solar Dryer Technology developed by SEED to help the youth and the community towards self employment. This approach finds a solution for preservation with long shelf life and for self employment. Solar Drier technology will process the food products with Zero energy cost. In this regards Ministry of Empowerment, Social Welfare, Youth, Women and Children has partnered with Society for Energy and Environment Development (SEED), Hyderabad to supply, install Solar Driers at Agribusiness Incubator. Through this solar drier, it is expected that youth can start business in following areas;

FRUITS BARS: Mango, Pineapple, Papaya, Guava

DRYING OF VEGETABLES: Potatoes, Carrot, Tomato, Mushrooms, Onion, and coconut.

DRYING OF LEAFY VEGETABLES : Spinach, Fenugreek, Tamarind, Gogu, Mint, Drumstick, Coriander and Curry leaves.

DRYING OF SPICES: Ginger, Mango Ginger, Garlic, Red Chillies, Green chillies and Pepper.

We are confident that by using above technology, youth/women will think to take up self employment as career option and develop Zanzibar Economically.

TECHNOLOGICAL EMPOWERMENT OF FISHER WOMEN IN COASTAL AREAS TO IMPROVE THE SOCIOECONOMIC STATUS

Prof. Vijaya Khader, Ms A Lavanya & Prof. M. Ramakrishna Rao,

Empowerment of women is a highly debated topic all over the world over the last few decades. It is well known that women play a key role in all spheres of development. Although women contribute significantly for the overall development of mankind and economic development of Nations, there is dearth of information on all the facts of them and hard facts and figures. Neither their role is accurately quantified nor correctly recognized. The scenario is all the more worse in the fishery sector with unequal distribution of income and higher disparity in the wage structure.

Every woman is an entrepreneur as she manages, organizes and assures responsibility for running her house. It has been increasingly realized that women possess entrepreneurial talent which can be harnessed to create employment opportunities.

The economy of coastal regions of the country primarily depends upon fisheries. Women play a major role in post harvest fisheries activities mainly in the marketing of fresh fish and processing. The problem of fisher women are many which are due to ignorance, illiteracy , poverty , age old practices in processing , improper technology, additional constraints such as innate conservatism, resistance to change and gender bias approach of technology transfer system. Induction of new post harvest technology and value added products would certainly lead to the improved social and economic status of the fisher women.

Income generating viable technologies for fisher women such as Geriatric foods/ Malted infant food / Amylase Rich foods / Therapeutic foods / Weaning foods, Value addition to fish & prawn products / artificial pearl culture / Processing of salted fish were used. Self Help Group Fisher women of Andhra Pradesh - East Godavari, West Godavari, Prakasham District (9 villages); Karnataka - Dakshina Kannada, Udipi Districts (6 villages); Kerala - Alapuzha, Kollam (5 Villages) ; Tamilnadu - Chennai, Tuticorin Districts (6 Villages) are using the technology regularly for economic enhancement. Product development can be taken as income generating activity in the rural areas by the illiterate women. Products can be included in supplementary feeding programs in order to improve the nutritional status of the vulnerable groups of the population. The horse gram which is commonly used for cattle feed can be diversified for human consumption with less investment.

Seven Fisherwomen have attained the Training and Awareness from National Agricultural Technology Project, conducted and implemented by ANGRAU in their places and enhanced their socio-economic status through various skill oriented training programs and continuous day-to-day discussions with the Scientists.

Technologies Developed & Commercialized:

- Value addition to fish & prawn Products : self help group women of Andhra Pradesh are using the technology.

VIP COMMENTS

The "SEED" centre can move the least development countries to high level. Outstanding achievements.
GOD BLESS YOU ALL.

--Ali KhomisJuma
Ministry of Empowerment, Social Welfare,
Youth, Women and Children

- Alternative Use of millets: The Deccan Development Society (DDS) NGO in Medak District, Andhra Pradesh are using the millet based recipes in feeding program in 8 villages for Anganwadi Children of 3 to 5 years.

✧ Mushroom Powder & Mushroom Masala Powder: Manoj Exports, from Venkatagiri Town, Nellore District are using the technology.

In addition to these technologies, Society for Energy, Environment & Development (SEED) has developed solar dehydration of fish of different varieties for value addition and preservation in 'SEED' solar cabinet dryers. The process description is given below in the following paragraphs.

Prawns & Other varieties

Recently SEED conducted experiments at Kakinada. Four varieties of fish are collected from fisher men at harbor yard for drying. They are 1) Chukka karalu (white and silver looking fish), 2) all variety consisting of 'Kavelalu', Nethallu, Guruvandelu, 3 Chavellu 4) Prawns.

They were loaded in SEED solar cabinet dryer. The time taken for the first three varieties are 8 to 10 hours to reduce the weight to 20%. The dressed Prawns gave the yield by 40% weight in 5.5 sunny hours. The temperatures in the cabinet were between 45 and 52 degrees C and R/H values are between 54-68%.

Prawn Drying

One of the marine products dried in solar dryer is prawn. Generally prawn is used as a source of food either in raw or dry state. The initial moisture content of prawn was 77.0% and the final moisture content was 4% for preservation and for long shelf life (Total yield was 40% of original weight). For processing prawns, they were to be washed and sorted out into suitable sizes manually and dried in trays provided in solar cabinet dryer. The time taken to reach 4% moisture content is 8 hours on good sunny days.

Recently an entrepreneur from **M/s. Lyons Fishermen Co-operative Society Ltd. Mauritius** has come for training in processing and solar dying of fish in solar dryers at SEED Laboratories and purchased Solar Dryer - SDM-50 Model for processing of fish in Mauritius

Trainee from Mauritius

Processing

Pre-Treatments on Solar drying of boche (CatlaCatla)

Boche (Catlacatla) fish weighing approximately 280 g with an average length of 30 cm were purchased from local market . The fish were gutted and washed before cutting them to the required sizes of four pieces for effective drying and grouping before applying the treatments.

Application of Pre-treatments

Salting: Fish samples were dipped into salt in 1:1 ratio for about 15 minutes. And arrange in stainless steel tray and loading in solar dryer. Solar drying carried out until it attained less than 20% moisture content.

Marinating: Fish fillets are marinated with spice mixture which include ginger garlic paste, coriander leaves paste, mint leaves paste and pepper powder in equal proportions on weight basis. Thoroughly spice mixed fish fillets are left for marinating for 20-30 mins. Marinated fish fillets are arranged in stainless trays and loaded in solar dryer until it attain required moisture content.

Effects of pre-treatments on the drying rate and the quality of boche (catlacatla) was examined by treating with two different pre-treatment methods (Salting, marinating, and Control) using an solar cabinet dryer. Solar dehydration of fish by using different pretreatments includes control: fish was washed, cut into fillets and solar dried, salting: cut fish fillets were rubbed with salt with equal weight ratio and solar dried and Marinating: cut fish fillets were rubbed with spice mixture like ginger garlic, mint, coriander paste and pepper powder.

Results and discussion:

In this study Boche (CatlaCatla) variety of fish was selected and two different pretreatments were given. i.e., one pretreatment with salt and other with spice mixture and comparing with control (without pretreatment). And effect of pretreatments on solar dehydrated fish was studied in rate of drying, no. of drying hours and loading capacity in solar cabinet dryer. Control(fish without any pretreatment) and marinated fish fillets dehydrated in 8 hours, where as salted fish dehydrated in 12 hours with ambient temperature 28?C and cabinet temperature 40?C. The %yield of salted fish is 40% with 10% moisture content where as in control and marinated fish are 52% and 47% with 20% and 14% moisture content respectively (table followed

Table 1: Effect of pretreatments on solar dehydration of fish fillets

S.No.	Item	Loading Capacity (Sdm 50)	Yield (%)	Moisture (%)	Drying Hours (Sunny Hours)	Ambient Temperature (^{O}c)	Cabinet Temperature (^{O}c)
1.	Plain Fish	25	52	20	8	25-28	28-40
2.	Salted Fish	25	40	10	12	25-28	28-40
3.	Marinated Fish	25	47	14	8	25-28	28-40

Sensory evaluation: Solar dehydrated fish was processedby different pre treatments and dehydration techniques was evaluated organoleptically by 9 point hedonic scale with semi trained panel members in house and results obtained are as follows(table)

Table 2: Effect of Pretreatments and Dehydration Methods on Sensory Evaluation

S.No	Sensory Attributes	Control	Salted Fish	Marinated Fish
1	Color And Appearance	8	7	8
2	Texture	7	6.	8
3	Taste	7	7	8
4	Flavors	7	6	8
5	Overall Acceptability	7	7	8

Discussion:

Results of sensory evaluation of tomato solar dehydrated fish by different pre-treatment revealed that the marinated fish scored highest acceptability when compared to other two treatments.

Conclusion:

This study can be concluded that the fish treated with spice mix (marinated fish) scored high in sensory evaluation and less drying hours with 14% moisture content then other salted fish. But salted fish achieved longer shelf life. But salted fish stay for longer time compared to control and marinated fish.

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Workshop on "Challenges & Prospects of Food Processing Technology - Based on Solar Energy" December 16, 2014 at SuranaUdyog Auditorium, FAPCCI, Hyderabad

Chief Guest and Management Members of SEED & FAPCCI.

Society for Energy, Environment & Development (SEED) jointly organized one day workshop with FAPCCI.

Sri S. Bhalerao, IAS. (Retd.), Secretary General, FAPCCI welcomed the dignitaries and briefed about the objective of workshop on Food Processing – based on Solar Energy.

Sri Shiv Kumar Rungta, President FAPCCI said that the applications of solar energy in food processing industry are mainly limited to drying operation. Solar food processing is an innovative and multi-faceted technique. The implementation of solar based technologies for food processing using solar energy can indirectly help to reduce poverty, improve health conditions, create sustainable economic opportunities and control environmental damage by promoting the use of clean and renewable energy sources. Solar dryer is a good alternate option in the market. Solar gadgets have been developed for variety of applications in food processing and whole crops can fully capable of feeding its population, provided proper infrastructure in place for the harvest so produced to be transported and conserved from spoilage. As per the present technologies available, small units can concentrate solar energy for immediate and localized use. For promoting solar energy applications on a large scale in food processing industry, it is very important to integrate knowledge of food processing with capabilities of different solar gadgets.

Sri P.V. Surya Prakasa Rao, CFS, IFT Fellow, Technical Advisor & Director, Priya Foods, Hyderabad said that Solar energy on an industrial scale is used not only for heating, drying and sterilizing food products, but also for cooking and refrigerated storage of bulk food materials, Modern solar drying process gains ground and spreads across several countries, producing a wide variety of processed and preserved products, the technology is naturally becoming more advanced and sophisticated, newer technology and equipment and novel applications are being developed day by day. The technology is currently applied for sterilizing, pasteurizing, evaporation, cooking, frying, roasting besides drying/dehydration etc. He said that there is a need for setting up solar energy utilization demonstration plants on high priority in strategic locations across all India. Massive and nationwide propaganda and education campaigns among all sections of population is an urgent need for promoting the harnessing of solar energy for food processing and other industrial applications.

Sri V.V. Kutumbarao, Hon` President, SEED said that the processing of fruits and vegetable industry consists of a large number of units in small scale sector. Out of the total production of fruits and vegetables, 80% is consumed in fresh form while wastage is 20%. During 2013-14, India exported processed fruits and vegetables are 2.87 lakh M.Ts. worth of Rs.2.266 crore. SEED has taken efforts in usage of Solar energy in food processing Technology in rural areas by designing and developing a low-cost high efficiency Solar Dryer because of availability of electrical energy in rural areas is a major constraint. He suggested for conducting series of workshops/seminars in different areas to popularize Solar Drying Technology and to process locally grown fruits and vegetables for value addition and preservation based on the technology. Publicity and marketing of solar processed products and solar dryers should be encouraged by the Government by extending incentives.

Sri V. Rama Rao, Former Governor, Sikkim said that the Government of India is keenly interest to promote the food processing sector, the stakeholders can leverage benefit by using solar energy. Government of India have sanctioned 23 Food Processing Parks, out of them two are for Telangana and Andhra Pradesh each. In horticulture sector Fruit processing and its products are beneficial to the farmers. The farmers have to implement new technologies to enhance production. He suggested that the SEED and FAPCCI can jointly organize the workshop to create awareness among the Stakeholders for utilizing the solar energy.

Sri Anil Reddy Vennam, Senior Vice President, Sri K. Bhasker Reddy, Chairman, Agriculture & Food Processing Committee of FAPCCI, Smt. R. Syamala, General Secretary, SEED and Sri M. Srinivasa Reddy, Senior Manager, SEED were also present and addressed the Workshop.

Dr. M.M.Krishna, Member R&D, SEED Chaired the Technical Session I. The technical sessions were dealt by Sri V.V. Kutumbarao, Hon. President, SEED on Efforts in the application of Solar Energy in Food Processing Technology. Prof P.N. Murthy, Chairman (R&D) SEED on "Skill Development in Food Processing Technology.

Participants of the work shop

Prof. M. Ramakrishna Rao, Director R&D, SEED Chaired the Technical Session – II. The technical sessions were dealt by Prof (Mrs) VijayaKhader: former Dean on Impact of Economic Empowerment of Women on Food Nutrition, Health and Livelihood Security, Dr. Aparna, Asst. Professor on Future prospects in Food Processing – Processing of grains and Dr. K. Vidyasagar, Vice President, SEED on Entrepreneurship Development Programs in Solar Food Processing.

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