

**Proceedings of the State Level Workshop on
'Opportunities and Challenges of Women in Agriculture of Kerala'
(March 21st & 22nd, 2014)**



Organised by

**Centre for Gender Studies in Agriculture and Farm Entrepreneurship
Development (CGSAFED), Kerala Agricultural University, Vellanikkara
(In Technical Collaboration with Kerala Veterinary & Animal Sciences
University and Kerala University of Fisheries and Ocean Studies)**

Proceedings of State Level Workshop on 'Opportunities and Challenges of Women in Agriculture of Kerala'
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Preface

The pivotal role played by women in Indian Agriculture cannot be overemphasized. Indian women are major producers of food in terms of value, volume and number of hours worked. They perform about 70 percent of farm work and play a significant and crucial role in agricultural development and allied fields including crop production, livestock production, horticulture, post-harvesting operations, agro/social forestry, fishing etc.; a fact which has been ignored quite often. Even when the participation of women in agricultural and allied sectors is acknowledged, the quality of the work, the tediousness and back breaking long hours of labour they engage in are often glossed over. In this context, it is very important to orient and sensitize the R&D personnel and other stakeholder agencies about the various efforts that are under way at National and State levels to address women specific problems in agriculture, drudgery reduction, solving health problems and empowering women to take their rightful place in the society. The state level workshop on 'Opportunities and Challenges of Women in Agriculture of Kerala' conducted on the 21st and 22nd of March, 2014 is one such endeavour organized by the Centre for Gender Studies in Agriculture and Farm Entrepreneurship Development, Kerala Agricultural University, in technical collaboration with the Kerala Veterinary and Animal Science University and the Kerala University of Fisheries and Ocean Studies. Academic deliberations on all sectors of agriculture including agribusiness and value chain development, by scientists, development functionaries, elected representatives, policy makers, bank officials, women farmers, women workers and women entrepreneurs were the focus of the workshop. Such a gathering can go a long way to addressing the technological and institutional issues of women and I am sure that many worthwhile suggestions and recommendations have come out of the discussions.

I congratulate the organizers of the workshop, particularly Dr. P.S. Geethakutty and her team for their timely intervention and for the efforts taken to bring together such a diverse group. I am convinced that the results of the two day long deliberations which form the core of this publication will be of enormous help to researchers, development agencies, planners and policy makers to bring in pro active interventions for the cause of women in agriculture. KAU looks forward to receiving co-operation and extensive partnership from the stakeholders.



Dr. P. Rajendran
Vice-Chancellor
Kerala Agricultural University

Executive Summary

The Centre for Gender Studies in Agriculture and Farm Entrepreneurship Development (CGSAFED) of the Kerala Agricultural University organized the State level workshop on **'Opportunities and Challenges of Women in Agriculture of Kerala- Field Experiences to Policies and Governance'** during 21st and 22nd March, 2014 at the College of Forestry, KAU, Vellanikkara .Thrissur in technical collaboration with the Kerala Veterinary and Animal Science University (KVASU) and Kerala University for Fisheries and Oceanic Studies (KUFOS). The objectives of the workshop were (i) to deliberate on the field level challenges and opportunities of women in agriculture and best practices, (ii) to reset agenda for women inclusive research and technologies for women in agriculture and (iii) to prioritize the critical areas wherein women inclusive policies and programmes for Women in Agriculture be needed in the governance of agriculture and allied sectors. The Vice- Chancellors of the KAU, KVASU, and KUFOS and Executive Director of Kudumbashree were present in the two day workshop. Invited Deans, Directors and Heads of Stations of the three Universities were present to lead the panel discussions where in Women Farmers, CBOs, Scientists, Extension Personnel, Research Scholars and Media Persons have contributed papers and shared views about innovative interventions and field challenges faced by women in agriculture. The two day workshop had four technical sessions -(i) Overview on the opportunities and challenges of women in agriculture and allied sectors (ii) Women`s Access to Farm Resources & Farmer Support Services (iii) Technology and Skill Development of Farm women in the Production Sector in Agriculture and Allied Sectors (iv) Farm Women in Post Harvest Management and Value Chain Development in Agriculture and Allied Sectors. 23 invited papers with focus on the status and concerns of women in agriculture with respect to the issues of resource access, availability of women friendly technologies and successful and innovative technological and institutional interventions to solve challenges of women in the production and post harvest sectors of agriculture and allied sectors were presented and deliberated in these sessions and recommendations drawn. In the second day afternoon a plenary cum valedictory session finalized the workshop recommendations and deliberated on the Way Forward. The major recommendations of the workshop were-(i) to set up a gender consortium of the farming sector of Kerala to promote the efforts of women in agriculture in an integrated way; the KAU, KVASU, KUFOS and Kudumbashree will join hands to initiate this platform (ii) to set up a technology multiplication centre by KAU with intensive skill imparting mechanism (iii) to set up a Centre for Studies on Women in Fisheries by KUFOS to take up research based interventions (iv) to launch web portal, information bulletin, and to provide sufficient human resource and minimum quota of research fund to the CGSAFED to take up contextually relevant studies. The workshop was concluded with decision to bring out the proceedings of the workshop and initiate follow up on the workshop recommendations without delay.

I. CONTEXT OF THE WORKSHOP

At present, women are emerging as equal partners with men in the farming sector and contribute even more than their male counterparts in agriculture and allied sectors of Kerala, as farmers, co-farmers, workers, group farmers and agribusiness operators. Agrarian changes due to male outmigration, farmer suicides, urbanization, abandoning of farming by traditional farmers, etc in the rural sector are found to accelerate the rate of feminization of farming in our state. About 21% of the rural families in Kerala is reported to be women headed (Census Report, 2010). Besides, the forced entry into farming by the women heads of families due to unavoidable circumstances of crisis and poverty in the family and large number of housewives of middle income and also high income families taking up commercial farming on individual or group basis are also witnessed. Hence it is very important to recognize that women are no more confined to kitchen gardening or such subsidiary farming activities, which is the conventional thinking. Large number of women farmers of the state are now hiring and cultivating uncultivated land patches of the 'non-cultivating farmers', as seen in many parts of Kerala. Thus in every respect, it is apt to state that women are now the major category farmers in the state. This is a welcome change that is to be recognized, accepted and planned for, by all the stakeholders of agricultural development. In this context, it is also high time to recognize that effective and efficient performance of women as 'professional farmers' is not much possible in the existing socio-economic and institutional environment of gender bias, marginalization and exploitation. It is widely accepted that due to gender divide, women in agriculture, especially, the women farmers are denied of due entitlements, opportunities, gain, recognition and status they deserve. In this context, a cursory glance through the FAO Report assumes significance, which reads: *'Closing the gender gap in agriculture would generate significant gains for the agriculture and society. If women had the same access to productive resources as men, they could increase yields on their farms by 20-30 percent and raise total agricultural output in developing countries by 2.5- 4 per cent (SOFA, FAO, 2011)*. It is a fact that many often the women farmers in our country are not even formally considered and included in the planning efforts as "farmers". Reduced access to land and credit, lack of farm resources, infrastructural facilities, institutional inclusion, managerial and technological skills, financial assistance, marketing avenues, information on agriculture and welfare measures etc are some of the constraints faced by the women farmers of Kerala. Lack of competitiveness among women farmers is ultimately leading to the underutilization of the potential human resource of women farmers as partners of food security mission and economy of the state which warrants action.

Against the background, it is to be highlighted that the challenges faced by the women farmers in the agricultural and allied sectors cannot be ignored anymore. It is high time that the policy makers, planners, researchers, and development agencies of agriculture and allied sectors join hands and formulate

appropriate policies, strategies and programmes to address the practical needs and problems of women in agriculture. The KAU with its involvement and expertise gained over the years through the Centre for Gender Studies in Agriculture and Farm Entrepreneurship Development (CGSAFED) in the context had set up such a needed platform by organizing a State level workshop on **‘Opportunities and Challenges of Women in Agriculture of Kerala- Field Experiences to Policies and Governance’** during 21st and 22nd March, 2014 at the College of Forestry, KAU, Vellanikkara, Thrissur in technical collaboration with the Kerala Veterinary and Animal Science University (KVASU) and Kerala University for Fisheries and Ocean Studies (KUFOS).

The objectives of the workshop were: i) to deliberate on the field level challenges and opportunities of women in agriculture and best practices
(ii) to reset agenda for women inclusive research and technologies for women in agriculture and
(iii) to prioritize the critical areas wherein women inclusive policies and programmes for Women in Agriculture be included in the governance of agriculture and allied sectors of Kerala .

The Scientists of KAU, KVASU, KUFOS development functionaries of agricultural and allied sectors, bank officials, women development agencies like Kudumbasree, SUBISCHA, women farmer clusters, women workers, women entrepreneurs and CBOs were participants of the two day workshop.

II. Deliberations of the Workshop

DAY ONE (21st March, 2014)

The Workshop started at 9.30 am and in her welcome address to the dignitaries and participants, Dr.Geethakutty.P.S, Professor & Project Co-ordinator, CGSAFED, outlined the objectives of the two day workshop and highlighted the relevance of the joint effort initiated by the three farm universities of Kerala for the cause of women in agriculture and allied sectors.

Excerpts of the Inaugural Session (9.30-11.00 am)

Dr.P.Rajendran, Vice-Chancellor, KAU presided over the function. In his opening remarks, Dr. Rajendran congratulated Dr. P.S.Geethakutty and her team for organizing the workshop on a timely topic. He mentioned that though women play multiple roles and their representation in all walks of life has dramatically increased, they face numerous challenges and problems which need to be tackled. Dr. Rajendran touched upon the innumerable tasks traditionally undertaken by women and the changes which have occurred over the decades. Agriculture has witnessed an ocean of conceptual change with the advent of mechanization. The involvement of women has increased with product diversification and value addition. On farm processing and production of new products with farm produce are now common occupations of women. Women have played an important role in cashew processing, coir industry, fish processing industry especially inland aquaculture. The use of machinery in agriculture, particularly in paddy cultivation is gaining popularity but the number of machines which women can use comfortably is minimal. Another difficulty faced by women is that in availing loans from banks, mainly because majority of women lack title deeds of their landed property. This is also the reason for failure of women cultivators to avail government subsidies and other such incentives. There is approximately 5-10 % opportunities reserved for women in small farming agribusiness consortia, VFPCCK, etc. Nevertheless, there is an ever increasing need for promoting women farmers and entrepreneurs taking due consideration the role of women within households. The need for gender friendly machinery in agriculture, policies for credit support even without title deed, simplified official procedures like single window systems, easily accessible infrastructure and subsidies were stressed in the inaugural address. The Hon'ble Vice Chancellor reiterated that the workshop was an apt platform for discussing these and similar such issues. He expressed the wish that the participants would, after in depth discussions, arrive at concrete recommendations which could be utilized by policy makers and planners for future interventions.

Dr.B.Ashok, IAS, Vice-Chancellor, KVASU in his keynote address pinpointed that Women stand as invisible workforce in agriculture processing and marketing. He said for many rural farmers, livestock activities are a daily occupation and animal products such as eggs and milk are produced,

triangle with relevant examples in livestock and animal husbandry sector and pointed out that 76% of total workers engaged in livestock in India are women. The Asset-Empowerment-Profit relationship should be one area that needs strengthening while making policy decisions pertaining to farming community. How the farmers in Tamilnadu and Pondicherry took livestock production as a family operation as well as status symbol was pointed out. Though most of livestock management is carried out by women, development, extension and training programmes are not geared to their involvement and hence they derive no benefits. He talked on the shift of farm patterns in 1950s to 2010 through peasant farms, small farms and commercial farm patterns and the approaches from socio-emotional approach to socio-economic approach. In India the transformations happening in the dairy sector, from household small cattle unit to hi-tech live stock farms was pinpointed and explained the challenges in this context; as finding new and improved ways to capacitate institutions and small-scale farmers especially women to respond to this growing demand so that they take part in, and benefit from, this growth is a future challenge that we must all address collectively. He pointed out that although the position of women livestock keepers can be improved through income-generating activities like selling milk to milk co-operatives etc., the role of women and their empowerment in the local and regional livestock production system should receive special attention. This can result in information being channeled to men only, inadequate consideration of the demands that new technologies or breeds might make on women's time and labour, and other similar mistakes that can threaten the initiative's success.

Dr.K.S.Purushan, Former Dean(Fisheries) and Professor of Eminence (KUFOS) presented the “Status of Women in Fishery Sector of Kerala” and highlighted that it is very essential to identify talents and knacks of fisherwomen and chalk out appropriate empowerment programmes. Kindling their inborn skills and resource development is essential. Capacity building for adoption of appropriate technologies in multi dimensional aspects of aquaculture and fish farming is a priority. Setting up of small scale production units and markets in places accessible to the most deserving people is another essential intervention. Projects in the sector should train the fisherwomen in identifying the market demand and produce end products according to the consumer preference. Projects organising fisher folk into self help groups so as to escape the clutches of middle men should be taken up. Policy decision should be taken to remove the wage rate disparity prevalent in agriculture and allied sector especially in the fish processing sector.

Dr.Bindu Podikunju, KAU and **Dr. Daisy C. Kappen**, KUFOS were the Rapporteurs of the Session.

Technical Session: Two (1.30 - 5.00 pm)

The session on **Farm Women's Access to Farm Resources & Farmer Support Services** was chaired by Dr.P.Rajendran, ADR, Ambalavayal .The session's focus was on exploring the challenges of farm women in accessing farm resources like land, water, credit, farm inputs, market, insurance, information and successful/innovative interventions of women friendly farmer support institutions and services introduced in agriculture and allied sectors. The papers presented were on- Hired Land farming and Enhanced Credit Accessibility (**Shri. S. Selvakumar**, Punjab National Bank) MKSP and Farm Women Groups (**Ms. Bindu P Varghese**, ADMC, Kudumbasree), Information Access of Women in Livestock Sector (**Dr.Rajeev.T.S** Assistant Professor, KVASU) SAF and Fisher Women Empowerment (**Dr. C.R.Sathyavathi**, Joint Director of Fisheries), Mechanisation in Food Industries (**Dr.K.P.Sudheer**, Associate Professor, KCAET), Women Groups Led Seed Villages in Anakkayam (**Dr.P.Rajendran**, KAU) Women run Cage Farming and Fish Feed Production, (**Dr. Padmakumar. K.G**, Former ADR, KAU).

Sri Selvakumar explained the scope of JLG scheme and pointed out modifications needed at various levels to increase the access of credit by the women farmers, especially those engaged in hired land farming. In the context he highlighted that the Union Budget 2006-07 had announced that the banks may open a separate window for JLGs of tenant farmers and ensure that a certain proportion of the total credit is extended to them. The two field functionaries viz, DDMs and LDMs must be geared to play their role in grounding of the scheme at their level. The review of implementation of the scheme may be ensured at all forums, viz. banks own meetings, BLBC, DLCC, SLBC, etc. He pinpointed the need of publicity of the schemes and its achievements, proactive role of State Govt. Agriculture Department and Kudumbasree and the need of strengthening the monitoring mechanism for JLG.

Ms.Bindu P Varghese presented the coverage and functioning of the JLG farming and Mahila Kissan Shashaktheekaran Programme (MKSP) under the Kudumbasree. She pointed out the challenges of women in agriculture and the need of formal procedures of land hiring to encourage the women engaged in hired land farming.

Dr. Rajeev. T.S highlighted the need of effective information dissemination among the women in livestock sector. He also presented various ICT based techniques and models developed and promoted for the purpose.

Dr. C.R.Sathyavathi of the SAF detailed the functioning and programmes implemented from SAF for empowering the women in fisheries sector. The capacity development programmes in fisheries and non fisheries sector for the empowerment of women, modern facility markets, mobile fish vending facilities etc were discussed in the session.

Dr.K.P.Sudheer highlighted the primary role of food industry as the production of safe and quality processed products through recent technologies and pinpointed with examples like modernized and mechanised milling, sorting, grading, fruit processing and packaging. The use of suitable machinery/ technology will reduce the labour and improve the quality and safety of processed product. Through success cases of women entrepreneurs, he illustrated that food processing sector is an attractive sector for investment and offers significant growth potential to entrepreneurs.

Dr.P.Rajendran gave a detailed description of the women group based initiatives taken up to boost vegetable seed production and plant nursery in Anakkayam and Wayand. He also illustrated the potential of intensive skill development to build service provider teams for setting gardens, and polyhouses for other farmers.

Dr. K.G.Padmakumar highlighted the roles and challenges of women in freshwater fishery. The increased scope and opportunity for women's involvement on cluster basis in cage fish farming, fish feed production units, was illustrated with the example of units established from the ARS Kumarakom. He pinpointed that steps should be taken to improve the work environment and to reduce drudgery of the women involved in the shrimp peeling and fresh water mussel processing. He also mentioned that the concept of Kitchen waste to fish tank should be popularized in urban and semi urban areas for waste disposal.

Dr.A. Prema, KAU was the Rapporteur of the session.

DAY TWO (22nd March, 2014)

Technical Session: Three (9.15 -11.30 am)

The session "**Technology and Skill Development of Farm women in the Production Sector in Agriculture and Allied Sectors**" was chaired by Dr. U.Jaikumaran, Professor & Head, ARS, Mannuthy. The focus of the session was on the issues of access, availability of women friendly technologies and successful/ innovative technological interventions to solve challenges of women in the production sector of agriculture and allied sectors. Papers presented in the sessions were Farm Machines for Women in Agriculture (**Dr. Jayan. P.R**, Associate Professor, KCAET, KAU), Women friendly farm designs for livestock (**Dr. Gigin.T**, Assistant Professor, KAU), Small Machine Requirements of Women Rice farmers (**Ms. Suma Nair**, Assistant Professor, KCAET, KAU), Women Led Milk Production & Marketing (**Dr.G.S Madhu**, Deputy Project Director, ATMA, Idukki), Fodder Bank and Drudgery Reduction (**Dr.C.GeorgeThomas**, Professor, KAU), Farm Women Inclusive Mechanization and Custom Hiring Units (**Dr. U. Jaikumaran**, Prof & Head, ARS).

Dr. Jayan described various small women friendly machines developed by the Kerala Agricultural University. He informed that efforts were on to hand over the technology to private agencies, so that the machines could be brought to the market in the shortest possible time.

Dr. Giggin T. described with illustrations, the concept of integrated vertical farming. The design is compact, utilizing very little space to maintain an integrated farming system. Moreover, as most of the activities like providing feed and water to animals, cleaning the cages, and irrigating the crops were automated, the system is highly women friendly and time saving. Dr. Giggin also demonstrated innovative women friendly goat sheds, which had facilities for collecting dung and urine, and thus reduced drudgery considerably.

Ms. Suma shared her experiences in Velookkara panchayath, from where, firstly, small manual transplanters, and later, more advanced machines, were requested for by the women farmers. The need for location and work specific affordable machinery was stressed. Machines were to be developed based on the need, and in some situations, models considered old or basic may be of more use than newer, more advanced models. The popularization of small prototypes is essential to promote their use by women and hence facilities for mass multiplication of such machines should be made available with institutional support.

Dr.G.S. Madhu shared his experiences on the success story of the production of 'Nature Fresh' milk by a Kudumbasree unit in Idukki. The importance of local economic development was stressed. The project benefitted several families, ensuring the supply of fresh hygienic milk. Dr. Madhu brought out the greater impact produced by a few farm families working together as opposed to a single large farm operated with a few labourers.

Dr. C. George Thomas shared his experience in conducting a DBT project for women and pointed out the difficulty faced by women groups in leasing land for fodder production. Support from the dairy development Department could help in establishing individual women run farms. In this context, local governments could help in identifying common uncultivated areas which could be utilized for cultivation. The need for technology developed in the University to reach the women and to be adopted was stressed.

Dr. Jaikumaran initiated his presentation with documentary on women's empowerment through mechanised farming and custom hiring units. He further questioned the technologies released by the University, and their applicability to small farmers. The already existing several women friendly technologies had to be refined and popularized. In addition to training, confidence building and hand holding were essential for technology adoption. He highlighted that there should be government facilities for support and facilitation; only then could any programme succeed.

Dr. Meera V. Menon, Associate Professor, COH, KAU was the Rapporteur of the Session.

Technical Session: Four (12.00 noon-3.00 pm)

Dr. Sudha Nair was the chair of the fourth session on “**Farm Women in Post Harvest Management and Value Chain Development in Agriculture and Allied sectors**”. The objective of the session was on exploring the extent of access and availability of technologies for women and successful/innovative interventions to solve the challenges of women in post harvest management and value chain development of agriculture and allied sectors. Papers presented in the session were -Women Run Coconut Based Agribusiness Clusters (**Ms .Mumtaz Rasheed**, SUBICSHA), Kadali Cultivation and Guruvayoor Naivedyam (**Dr. K.Aravindakshan**, Professor, KAU), Smart Fish Products and Marketing (**Dr. S.Ashaletha**, Sr Scientist, CIFT, Cochin), Women’s Food Security and Health Issues (**Dr. V. Indira**, Professor &Head, Home Science, KAU), Village Home Shop Network –A Market Possibility (**Dr. A. Prema**, Associate Professor, COH, KAU), Financial Literacy Programme and Rural Women (**Dr.Sangeetha.K.Prathapan**, Assistant Professor, CCB&M).

Ms. Mumtaz Rasheed of SUBICSHA, Kozhikode explained the genesis and functioning of the Women’s cluster on Coconut based value chain. About 16 coconut based products are being sold by the cluster with to and fro linkages. The initiative taken up by the LSG in empowering the women groups and technology up gradation needed were highlighted.

The presentation on the genesis of the Kadali Naivedyam done by **Dr. K. Aravindakshan** highlighted how the CGSAFED , KAU had connected LSG, local women’s livelihood, natural resources, traditional wisdom and pilgrim needs of the region through a DBT funded project of capacity development. The sustainable model evolved by the KAU was then up-scaled by Kudumbasree.

Dr. Ashalatha shared her observations and experiences in empowering the fisher women to bring out smart fish products to the market and the related women friendly technologies evolved by her.

Dr. V. Indira explained the women specific health disorders and their association to the food habits. The cause- consequences of anemia and osteoporosis among women and food based prevention strategies were explained. She also highlighted in her presentation the importance of traditional food practices and consumption of green leafy vegetables.

Dr. A. Prema analysed the scope of the village home shop net work in the context of a case study from the Kodakara, Thrissur. The factors behind the discontinuity of the home shop project and sustainability factors were discussed.

Dr. Sangeetha Prathapan highlighted the importance of promoting financial literacy among rural women and narrated the field experience of a grassroots level intervention taken up in the Pullu Village of Thrissur District. **Dr. Suman KT**, Asst. Professor (Home Science, COH) and **Dr. Shaheena** (Associate Professor, CCB&M) were Rapporteurs of the session.

Plenary & Valedictory Session of the Workshop (3.30-5.30 pm)

Dr.V. Indira, Prof & Head, Home Science of COH proposed welcome to the guests of the Plenary & Valedictory Session and presented a brief report of the workshop events. **Dr. P. Rajendran**, Vice-Chancellor, KAU in his remarks highlighted the importance of strengthening the technological linkages with enabling agencies of women in agriculture in the field like Kudumbasree. The potential of KAU's research stations and KVKs in different districts of the state to serve as the technology providers for the women farmers groups and women agribusiness operators was pinpointed. **Dr.B.Madhusoodana Kurup**, Vice-Chancellor, KUFOS in his Special Address congratulated the organizers for organizing an insightful dialogue on a very important topic of social importance. He pinpointed the special concerns of the women in fisheries and described their status as most vulnerable next in order of the tribal women. Dr. Kurup praised the empowerment programmes initiated by the Society for Advancement of Fisher Women (SAF) towards sustaining income of fisher women. During his address he announced that the deliberations of the Mini workshop on women in Fisheries organized by the CGSAFED KAU, on 11th March at College of Fisheries has motivated the KUFOS to launch a Centre for Women in Fisheries and that the Centre will be initiated in the upcoming financial year itself. He further hoped that there will be more joint efforts of this kind on research and capacity building taken up by KAU and KUFOS for the cause of women in agriculture and fisheries in the coming days. **Dr. K.B. Valsalakumari**, Executive Director, Kudumbasree, initiated the Valedictory Address by highlighting the role Kudumbasree could play in promoting women of BPL families to enter farming sector and said that now women have gained a strong presence in the agricultural sector. She also reminded that the women groups entered into hired land farming only had firstly indicated the possibility of fallow land rice cultivation in the state and there is much to be done to meet the credit requirements of women engaged in rice farming. The supply of small machines, quality inputs and continuous technical support are major needs of women in agriculture for which Kudumbasree needs collaborative support from KAU and KVASU. **Dr.S.Ramkumar**, Director of Entrepreneurship, KVASU appreciated the deliberations of the workshop and mooted the idea of setting up a Consortium of Gender Resource of KAU, KVASU and KUFOS for generating data set on women in farming sector through collaborative studies and for supporting Women in Agriculture and Allied sectors. He concluded by assuring all support of KVASU for such a joint platform for the cause of women agriculture and allied sectors. **Dr. Sudha Nair**, DST Task Force Member and Former Sr. Director, MSSRF opined that the Gender studies Centre of KAU is an unique initiative and should play a pro active role as think-tank and facilitate a discussion platform on major challenges and opportunities faced by the women in agriculture of the state and provide timely policy papers/briefs which should reach politicians, key technocrats and different departments and implementing agencies. The outreach should

cover the print and electronic media to reach to the larger crowd. It should follow the lines of CGIAR-IFPRI and FAO as a model. This Department should document best practices where women have been empowered to address these challenges and take on opportunities. A web portal should be created to show case this for others to see how the 'know how' has been converted to 'do how'. KAU is considered by far one of the best Agriculture Universities in the Nation and therefore should set an example in the dissemination of the technologies developed by the group to increase the social impact of the work done by them. Towards this, mature technologies classified under different sectors should be part of the web portal inclusive of machines developed. She pinpointed the need of a dedicated mechanism in the CGSAFED for the transfer of technology to women farmers and to work with women collectives like *Kudumbasree*, other NGO supported women groups, NGOs and other organisations, In this context the, need for strengthening the Gender Studies Centre of KAU was highlighted in Dr. Sudha's felicitation address .She added "this could also be done by giving them good consultancies to do position and strategy papers to help the KAU and the State to develop good policies and programmes to address the challenges of the women in agriculture and increase the opportunities to strengthen their livelihoods". **Ms. Annamma Simon**, Lead Bank Manager, Thrissur while felicitating the programme spoke about the JLG scheme arrangements in place for enabling credit support among the JLG farmers of Thrissur District. She also assured that consultations to address the issues of women engaged in hired land farming can be taken up together with NABARD and CGSAFED, KAU.**Ms. Anitha Sivaraman**, Dpty. Director of Agriculture described various ongoing programmes from the Agricultural Department in Thrissur District as women inclusive and highlighted the achievements of award winning farmers promoted by the Department of Agriculture and CGSAFED, KAU. Recommendations drawn from the four technical sessions of the workshop were then presented by **Dr.A. Prema**, Associate Professor, COH, **Dr.Meera V Menon**, Associate Professor, COH, **Ms. Suma Nair**, Assistant Professor, KCAET and **Dr. K.T. Suman**, Assistant Professor, COH following which vote of thanks was proposed by **Dr.P.S. Geethakutty**, Professor and Project Co-ordinator. **The Workshop Session ended at 5.45pm**

III. Selected Papers Presented in the Workshop

Closing the gender gap in access to technology- National Overview of Women in Agriculture

Dr. Sudha Nair, Former Senior Director, M S Swaminathan Research Foundation

Women make crucial contributions in agriculture and rural enterprises as farmers, workers and entrepreneurs. Their roles vary depending on the regions, the crops, season etc., and they face gender-specific constraints that reduce their productivity and limit their contributions to agricultural production, economic growth and the well being of their families.

Thus the central challenges include bridging the gender divide, achieving gender equity gains for women in rural community's parallel to urban gender gains; creating opportunities for rural women to be the principal agents in poverty eradication and achieving household food security with gender equity.

In this regard it could be stated that evidences strongly confirm that MDG on gender equality (MDG3) and poverty and food security (MDG1) are mutually reinforcing. The latest report by the Indian Govt. 2014 clearly indicates that MDG1 the proportions of people who suffer from hunger – the progress is slow or almost off track, while MDG3 in terms of education the nation seems to be on track. On a closer look the Social Institutions and Gender Value, which, measures the access and power of control over resources among other sub-indices needs a vast improvement. The level of entry and retention at the tertiary education also needs to improve greatly. Given that the levels of education is directly correlated with decision making power of women these MDG's are important.

While women account for 43% of the agriculture labour force in developing countries the recent Indian Human Development Survey shows that women in agriculture sector in India has reduced from 91-85% and for men from 73-65% and that they receive only 5% training and advisory services. It has been demonstrated that same access to men and women could increase yield by 20-30% and over all agriculture output by 2 ½ -4% which can in turn reduce the undernourished by 12-17%.

While the Nation has looked at the issues and challenges of women in Agriculture by the National Commission for Farmers, The Women Farmer Entitlement Act (draft) or more lately by the Global Conference on Women in Agriculture, there is much to be done in the Policy area. A gender responsive agriculture policy which looks at the rights issues in terms of access to land, credit and resources, the policy should also recognise that the roles and responsibilities vary with gender and the knowledge they hold too. It should also address areas of need for training, technology and better trade prospects.

Extension services play a significant role in farming and women are still not perceived as 'real farmers'. Persistent inequalities in land rights reinforce this exclusion because women still hold less land/less security of tenure. Financial services such as savings, credit and insurance provide opportunities for improving agriculture output and economic vitality at the household thereby improving food security.

Access to new technologies is also crucial in maintaining and improving agriculture productivity. S&T could be used as a transformative tool provided access to land, credit and resources are available.

Modern science can validate women's knowledge and skills arising from their role in food production, traditional healing practices and management of natural resources while new technologies can enhance their networking opportunities and skills. The Science Policy of 1983 has been strengthened and was presented at the 100th Science Congress by the Hon'ble Prime Minister of India in terms of inclusive growth of women and a number of measures have been put in place to enhance the participation of 'women in science' and 'science for women'.

A triad approach which addresses the technological solutions and skill empowerment with functional literacy and financial inclusion and a good institution building will work towards a good transformation process through innovative policies, programmes and partnerships to enhance the participation of women in the knowledge economy.

Over the years the Nation, in terms of bridging the gender gap in access to technology have put in place very good delivery models. The clear cut 7 year guideline for the implementation of the water shed has helped in better implementation inclusive of women participation. The concept of the Bio-industrial watershed has helped in integration small scale entrepreneurial opportunities to enhance livelihood options for women. Programmes like MGNRES/MRLM/*Rashtriya Krishi Vikas Yojana* have seen the employment of women but more as labour force. It is refreshing to see that the MKSP has been conceptualised well and the first phase of implementation will bring in good insights of an end – to end approach done with stakeholder participation.

The other delivery models which have been tested as platforms for technology delivery are the Bio-resource Complexes designed by Department of Biotechnology in partnership with State Agriculture Universities, the bioparks and industrial parks. These organized parks apart from giving physical infrastructure like the industrial food parks also provide common facilities, services such as management, and networks of contacts between producers, markets and processors. These delivery systems will suit well for collectives, cooperatives, Federated Farmers Farms. A specific initiative of the MOFPI in setting up incubators for food processing will help women as many micro enterprises are run by them. But for the participation of women in such parks there is a need for a lot of hand holding and linkages both backward and forward.

Some of the income generating activities where women are increasingly involved include dairying, beekeeping, mushroom cultivation, vermi-composting, poultry, piggery, goatery. In agro-processing – coconut/lac/spices/fruits/vegetables value chains to name a few; food processing and testing units, post harvest management units, agri-based handicrafts etc., social forestry, agri-horticulture cultivation, management of medicinal and aromatic plants, bioenergy crops etc are other examples. They

are also seen in the areas of household appliances – Chula, biogas, solar cookers, solar heaters etc. Women are also increasingly seen in rural entrepreneurship – quality seeds production, advisory and consultancy, community service centres/village knowledge centres, hiring of implements, micro-propagation, hatcheries of fisheries, feed units, production of biocontrols and bio fertilisers, artificial insemination, village level marketing, agri-clinics, multipurpose ware house and cold storage etc.

Meaningful developments in these areas could help these women to do better in terms of scale, quality control and branding. They would need training in managerial and organizational skills. The Agribusiness and Innovation Platform- a technology transfer platform and the NIABI has more than 250 technologies to offer and a possibility of women being part of this process, currently they are nearly non-existent. The role of women is largely excluded in modern contract farming and agri-value chains. With secondary agriculture which, can value add 2-3 fold there is a large scope of women being absorbed here. The Women Technology Parks conceptualised by Department of Science and Technology Department functions as a rural technology centres and as a platform to harness S&T for rural industrialization development and employment with a special focus on women. With 18 of them in place and 8 more in the pipe line this is an exciting delivery model which will help women access technologies to strengthen their livelihoods. Some good examples include SRI, Ranchi; TIDE, Bangalore and HESCO, Uttarakhand. With 20 years of SHG formations and savings of over 22,000Cr the need for this critical mass of women is skill empowerment and access to improved technologies to strengthen their livelihood options in on/off farm and non- farm areas.

To enhance the participation of women in the knowledge economy especially women in agriculture more specifically, we need to build on constitutional guarantees, to recognise that women hold differential knowledge and create multiple opportunities for women to strengthen their livelihoods. It will be worthwhile to apply the WEAI as part of the gender audits especially in the area of women in agriculture. Curricula reforms are an absolute must especially the vocational courses and community colleges to help rural women to get the necessary knowledge to improve their performances in different sectors of agriculture and allied sectors. While implementing programs for women there is a need to develop multi-disciplinary and multi-institutional programs which help in leverage and convergence to bring in power of the modern technologies and other strengths on a triad approach and better delivery models. There is a need to enhance networks/participation in women's associations of Ag-cooperatives. While here is a trend in increasing feminization in Ag sector better decision making by the women in agriculture could help enhanced family farming concepts.

Challenges of Women in Agricultural Sector of Kerala

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Women are equal partners, and contribute even more than their male partners in agriculture as farmers, co-farmers, workers, group farmers and entrepreneurs but yet they are denied the due gain, recognition and status they deserve. Often women are denied or cannot be beneficiaries of the resources, agricultural facilities, production implements, technical knowhow, wage, financial assistance, marketing avenues, information on agriculture and welfare measures in the agriculture sector because of the conditions prevailing and bias against women in the social economic developmental arena and institutions. If these lacunae relating to women in the agriculture sector are done away with, it would be possible to commendably increase their employment potential in the agriculture sector and sustain the participation. Women can gainfully participate and thereby increase possibility of regional food security through policies that ensure equal role for women in agriculture. Women will be able to surmount the discrimination in development initiatives if there are special projects of agriculture envisaged exclusively for women and are given priority in the mainstream development projects in the agricultural sector.

Women constitute major category of farmers in Kerala: About 23 per cent of rural households in the State are found to be Female Headed Families and these household heads are supposedly leading their family farming. Studies of the Centre for Gender Studies of KAU have shown that even in households that are headed by men, around 40 per cent of the family income is earned by women through agriculture work done by them, which otherwise indicate that women in such households can be recognized as co-farmers. Women are the majority of the labour force in the organized and unorganized sectors in the State. Besides, they comprise 90 per cent of the labour in the land related work under the Mahatma Gandhi National Employment Guarantee Act (MGNREGA) programmes. Women are also the primary workforce in agriculture related sectors such as coir, cashew, and fishing sectors besides as plantation workers. Of late, women have also registered active participation in various small scale agriculture related enterprises of self-help group (SHG) activities. The 'Women in Agriculture Programme', implemented by the Central Government during 1996-2005 and the group farming project under the Kudumbasree Mission have encouraged women to be partners in agriculture in large numbers on a collective basis. As per the Kudumbasree website, more than 2.6 lakh women of BPL families are engaged in the agriculture sector as farmers in Kerala. What emerges is that it has become imperative to recognize with due seriousness the fact that women are not only major partners in the agricultural sector, but also that majority of these women earn their livelihood through the different agriculture related activities mentioned above. Hence the active participation of women is inevitable for sustained development of Agriculture; Priority ought to be given to ensure gender equality and address the peculiar problems

encountered by women in a practical way while framing the policy for agriculture and related sectors where women play a major role. The development approaches for women in agriculture and related sectors ought to strengthen and bond the relationship between women and their means of livelihood and visualize women as major partners in the field.

Problems/ Challenges of Women in Agricultural Sector:

a) **No special projects exist for women in the agriculture sector:** On examining agriculture development programmes, it is found that there are no special comprehensive schemes now aimed to benefit women in agriculture and allied sectors. As mentioned earlier, the need for special programmes for women arises to overcome the social and gender biases that women engaged in the sector encounter. The studies conducted by the KAU have shown that the development structures and personnel in the sector have low awareness about this special requirement. Also, the major development projects of the Agriculture and related departments do not have any criteria to consider women as a segment entitled to special benefits. There are no directives to ensure that the reports and review studies of the Agriculture and allied departments give special information on the participation of women in agriculture besides problems faced by them. The Central Sector 'Women in Agriculture Project' implemented in the State from 1995-2000 had encouraged women agriculturists, provided them technical knowledge and income, created awareness among the development workers in the Agriculture Department on the participation of women in agriculture and the problems faced by them in the sector. But this project was not continued in the Eleventh Plan. Moreover, the 7,750-odd women agriculturists who got training under the project did not get any follow up assistance or special consideration from the State Agricultural Department. Later, it is found some of these women agriculturists' joined the group farming programme of the Kudumbasree and also helped in strengthening the agriculture component in the Kudumbasree's initiatives. The only project specially envisaged for women farmers in the State is the Mahila Kisan Swashakthikarana Pariyojana (MKSP) under the NRLM Scheme of the Ministry of Rural Development and implemented by the Kudumbasree as Group Farming. The scheme does not have benefits for women agriculturists who are not engaged in group farming activities. Related studies and discussions show that except for a few local Self-Government institutions that have launched schemes to benefit women farmers, the facility of the Women Component Fund, in general is not being utilised effectively to benefit women farmers.

b) **Land access problems of women group farmers:** The majority of the women farmer groups are carrying out the cultivation on land taken on informal lease or hired land farming. Women engaged in group farming are faced with many problems. The main problem is that land is not available to these women farmer groups. Even if the land is available on lease, the land owners are not willing to provide the women with the agreements and copy of tax remittance receipt which also pose serious problems. More over, there are many instances of the lesser taking back the land, without prior notice. Women

engaged in group farming need the documents to apply for agriculture loan, subsidy, pesticide, produce procurement, insurance etc. Under the circumstances, a good number of women engaged in group farming prefer to take loans from private individuals on a higher interest rate and gold loans to cultivate the land. Many often the women group farmers are also denied the opportunity of paddy procurement programme and they are forced to sell the crop to traders at a lower rate soon after harvest. There is no permanent system under the departments of agriculture and allied sectors for selling the other agricultural products.

c) Agriculture Loan and Women farmers: Though there are a number of schemes in the banking sector to provide loan facilities for agriculture, no schemes, priority or assistance to benefit women agriculturists exist. Though the banking sector appreciates women's credibility in repayment, no provisions have been introduced in the banking sector to encourage women in the rural areas such as availability of loans at a lower interest rate, other concessions or longer repayment period. There are no criteria to monitor and highlight the extent to which loans are disbursed by banks to women. It is also pointed out that women in the agricultural sector do not avail of loans from banks for fear of being caught in a debt trap but would prefer to take loans from private individuals at a higher rate of interest. Women opine that when loans are got easily and without much trouble from private individuals as they do not have to submit documents and are not made to run from pillar to post. However, neither the banking sector nor other agencies associated with women self-help groups have intervened effectively to create awareness among women farmers on the inflated interest rate on loans being charged by the private individuals. Women farmers in some areas also point to the reluctance and lack of interest of the banking personnel to sanction loans to them.

d) Lack of knowledge of farming practices among women: Majority of women who have launched into women group farming have no previous experience in agriculture and hence these women have to be provided appropriate technical knowledge and training on a regular basis. Since women have less contact with institutions engaged in agricultural development activities compared to their male counterparts, information on farm practices percolate down to them slowly and in a limited manner as the studies indicate. Majority of women are not aware of the technicalities of the different schemes that are in existence, production technologies, besides information on financial assistance. Of late, the demand to include women in the training programmes is being followed to a certain extent. Yet there is an urgency to bring within the reach of women framers, the necessary technical knowledge so as to enable them to increase productivity, to earn more profit and reduce their physical burden. For this, besides the joint training programmes for men and women, special training focused on relevant aspects ought to be conducted for different segments of women in the sector. Women entrepreneurs in the agriculture sector ought to be given the necessary training in technical knowhow besides business practices.

e) Women not included in decision making: The presence of women in agricultural development committees and agricultural cooperative institutions is negligible. It is found that there is no proportionate representation of women from different segments in a particular area in agriculture related and allied committees. The result has been that majority of women in the different regions have not got the opportunity to participate, or be a part of the decision-making process in committees attached to agriculture, fisheries, and animal husbandry departments or voice their needs or avail the benefits of the various ongoing schemes. Women from different segments in agriculture do not have proportionate membership or participation in agricultural cooperative societies. The reason for this anomaly is traced to the fact that most of the women are not recorded as farmers as they do not possess land in their name. It is also seen that women are rarely in the leadership positions in the agricultural cooperatives.

f) Women in farm enterprises: Women engaged in farming on a commercial basis and managing business enterprises on an individual level encounter a number of problems. Due to the lack of strict enforcement of labour laws, the women in the segment are denied the benefits of the social security system and welfare schemes. As they do not get the necessary technical training, they are not able to produce quality product. They are also in need of loans at a low rate of interest. They do not get other infrastructural facilities such as power at concessional rate. The market network is tenuous. No attempt has been made to make use of the forward and backward linkages of production while planning for the activities of women's enterprises. As security measures are not in place, there are instances of women facing danger of accidents. Fatigue due to constant labour and the incidence of occupational diseases plague these women.

g) Women Farm Workers: The injustice that has been prevailing for centuries with regard to the bias in the rate of payment of wages to women workers in the unorganized farm sector continues even now. Though there has been a rise in the rate of wages, there has been no corresponding difference in the gap between the wages paid to men and women. A study conducted by the Agriculture University in 2004 shows that while earlier the wages paid to men labour was Rs. 175 to Rs. 200, now it is Rs.450 to Rs. 600. The wage rate for women workers in 2004 was Rs. 75 to Rs. 90, whereas now a sum of Rs. 150 to Rs. 300 is being paid to them. It is, therefore, evident that the wages paid to women workers had risen only to half of the rate of what is being paid to men workers. One positive aspect of the MGNREGA is that it enabled a rise in the rate of wages paid to women workers in the agriculture sector, but the notion of equal wages encapsulated in the MGNREGA is yet to become a reality due to various impediments. A special wage rate ought to be defined for women undertaking public works. It is here that the relevance of a criterion that ensured social justice through payment of equal wages arises. Studies show that women farm labourers face difficulties and health problems because of the absence of toilets at the work spot. Women suffer from diseases because of the effect of the excessive use of pesticides in the fields. Anemia

and orthopedic complaints are some of the main difficulties women labourers suffer because of malnutrition. The studies conducted by the Agriculture University show that as 100 per cent of the wage earned by women farm workers is spent on the family and children, a rise in their wage level will go a long way in bringing about a comprehensive improvement in the welfare of the family.

h) Technology suited for women: The machines and equipments used to reduce physical labour in agriculture have been generally designed for use of men workers. Small changes are being noticed with the acceptance of the notion of natural justice that women should be provided equipment suitable to their physique, and thereby decrease their burden of labour. This perspective ought to be popularized among agriculture scientists, research must be conducted in this area and funding assured for the initiative. Only a few of the agriculture equipments in use now can be utilized by women. It is highly necessary to popularize appropriate farm equipments that can be operated by women workers and women farmers. New equipments that are suitable for women must be designed and the respective developmental departments must ensure that there are manufactured on a mass scale through companies and make them available to women farmers and workers. Local Self-Government institutions have conducted training for women workers in handling different agriculture equipments used in paddy cultivation and are taking up mechanised farming on a contractual basis. Similarly, some women groups have learned to use coconut climbing machines and coconut basin making machines. The research stations of the KAU, the KVKs and some Local Self-Government Institutions are encouraging such activities. But it is only through widespread sustained operations that positive changes can be brought about in this regard.

i) Agricultural Education and Research: The issue of gender equality is rarely an issue for academic discussions in the institutions such as Farm Universities (Agricultural University, Animal Science University and Fisheries University) that provide basic training to personnel in agriculture and allied development. Hence in the policy formulation efforts of research and education in agriculture, there is a need to incorporate gender perspectives. The Centre for Gender Studies in Agriculture & Farm Entrepreneurship Development (CGSAFED), which has been functioning since 1999 at the Kerala Agricultural University (KAU) had designed study materials and resource modules in this regard and have been conducting research on gender concerns and offering capacity building programmes for researchers, teachers and development workers.

j) Consequences of socio-economic changes in agriculture: The loss of agriculture land for non agricultural purposes has resulted in loss of job, means of livelihood and food security, causing much hardship to women. The shift from cultivation of paddy, tuber crops, and pulses to cash crops has resulted in not only job loss but also the nutrition of family diet and has affected the health of women adversely. In addition, widespread reclamation of land, sand mining, destruction of forests, and biodiversity were not only adversely affecting on the environment but were also affecting the availability of food and water.

The livelihood of women was most affected by these hazards. The women are the lot who has to suffer the most due to starvation and scarcity of water both in the family and community.

In nutshell, one may note that the women are now a major category in the farming sector of Kerala and it has become an urgency of the present to ensure that the participation of women in the agriculture field is ensured on a war footing. It would be possible for women in the agriculture field to sustain themselves only if comprehensive and adequate solution is chalked out.

Status of women in fisheries sector of Kerala

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It is a well-known fact that in the agrarian set up of our country, gender mainstreaming plays an important role in the primary food production sector. However, the tiresome duties performed by women equally or more than that of men are not considered properly or recognized at any desired level, but, quite often ignored whether it is in agriculture, animal husbandry or fisheries. Likewise, disparity in treatment and status continues to prevail in the sector while discharging their destined duties and responsibilities at work place. The principle of equal pay for equal work is seldom practised. In general, 20-25% lower wage is paid to women when compared with that of men. Such kind of discrimination experienced while unflinching performing highly monotonous and drudgery work along with men generates a complex within them. Besides, the unhealthy environment and occupational diseases also prevalent among women aggravate the situation. In such a context it is worth examining, how far it is true in the case of womenfolk largely employed in fisheries sector.

Being hazardous by nature, fisheries continue to persist as a men dominant activity from time immemorial. However, as subsistence level of livelihood means, women and children of coastal dwelling population, especially of fisher folk also take part in its myriad activities along with men. With the advent of civilization and scientific innovations, this sector has witnessed for tremendous changes, which very much reflected in the living condition of the dependants. Nevertheless, desired progress could not be attained in their living conditions owing to proverbial poverty and socio-economic backwardness.

However, with inborn skills, talents and enthusiasm, fisherwomen actively participate in the sustenance fisheries to eke out a living. Even with odds, it is customary that they contribute many a service to the progress of fisheries viz, capture, culture, harvesting, processing, curing and marketing with the sole objective to earn their daily bread. It is significant that having contributed significantly to multifarious and labour intensive fishery activities, the womenfolk are kept marginalized without recognizing their services to any extent. They are also subjected to exploitation by all means.

Even in this era of astounding advancement, the talents and efficiencies of fisherwomen are badly taken advantage of, without being beneficial to them, much. For the tiresome efforts and hard labour which are bestowed amicably and unflinching, they are not even paid adequately, but mostly remain deprived of any other benefits or perks. Besides, many of them are strained to work under very poor and insanitary conditions. Now-a day there are frequent reports that they are also being sexually harassed at work places. These situations are not at all conducive to their welfare.

The revolutionary transformations in harvesting and post harvest technologies evolved have not yet been properly penetrated amongst traditional fisherwomen group to any desired level. Being totally neglected even, there are no radical programmes for their human resource development. Therefore, in the existing scenario, their inherent skills, knacks, talents and competence remain dormant without any improvements and applications.

Furthermore, there is a growing tendency to eliminate them from the cherished sector due to the effect of consumerism. The job opportunities rightful to them in myriad aspects of fisheries development viz fish net making, fish capture, processing, preparation of value added products, marketing, aquarium setting, ornamental fish culture, fish breeding, backyard hatchery management, aqua farming, feed preparation, fishery software development etc. have been taken over by new entrepreneurs/consumer groups replacing the traditional group from the sector. Being alienated from the main source of livelihood, they are at dismay with no way out, to pull on normal life. In such miserable circumstances, they are awaiting for opportunities for upliftment and progress.

The endeavor should be on providing need based education and relevant training in the multidimensional aspects of fisheries development. The experience acquired through skill development and its application in desired manner will instill confidence in them to efficiently utilize the vast resources overcoming the dogmas. Opening up new vistas for gainful avocation and substantial improvement in the income will enable them to lead a peaceful and quality living. In short, empowerment of women in myriad aspects of fisheries will play an effective role towards redeeming them from the present day concept of marginalization.

The foregoing clearly reveals the current status of women employed in fisheries sector. The SWOT analysis clearly brings out problems and prospects seeking remedial measures. A pragmatic solution is the need of the hour, especially in the context that environmental deterioration and scarcity of fish is being experienced at present. The planners and administrators should cast their eyes on the staring realities discernible at grass root level. Appropriate state and national level policies are to be chalked out with a view to satisfying their bare minimum needs and aspirations. Opportunities should be provided enabling them to come to the mainstream of life at par with other section of society. Let us await the dawn of such a paradigm shift in which women fisher folk are also got empowered to play their dynamic and predominant role in the nation-building process and sprout their enhanced capacities with a smile occupying pivotal positions in society.

Kudumbasree -MKSP Enabled Women Groups in Farming

Bindu P Varghese, ADMC, Kudumbashree

The cultivable land in Kerala is very limited and the men in Kerala have been increasingly moving away from cultivation for recent years. The state is heavily dependent for its daily needs including all items of food. This even includes paddy and vegetables which were otherwise cultivated intensely in its region. Land in Kerala is no longer valued for its capacity to produce; on the contrary the growing real estate trends in the late 20th–early 21st century period have transformed land, in the state, entirely as saleable object. The latter trend has serious and even dangerous consequences as not only is there a massive withdrawal from farming sector as a primary source of livelihood but also land – especially cultivable ones – is sold in bulk. This primarily goes for the purposes of trade where such pieces of land are often used for erecting shopping malls and residential complexes. These changing equations over land and in its utility have considerably contributed to the changing ecological balances within the region. One area where this is explicitly felt is in the continuously receding level of underground water in a state which is popularly known for its long monsoon seasons that sometimes spans for as long as eight months in a year. Thus there is a huge requirement to reinvent the productive capacity of land in the state by both involving more people in this area as well as by restarting farming activities in pieces of land that otherwise remain fallow waiting to be sold through real estate agents.

It is against this backdrop that the intervention of Kudumbasree in the form of Collective Farming becomes very crucial. The main objectives of Collective Farming through Kudumbashree are to bring back fallow land to cultivation and women to agriculture, creating livelihood for poor and landless women in the community, and to ensure food and nutritional security of the state. With these broad objectives, Kudumbasree intervened in the agriculture sector in 2002. During the period from 2002-2006, both individual women as well as women groups were given incentives and, thus encouraged to take land on lease and to start cultivation. Since 2008, continuous efforts have been made to strengthen and organize collective farming groups; elaborate campaign programmes are being conducted for the expansion and awareness of collective farming among the community members. Since then Kudumbashree assistance has been limited to women groups (which were known as “lease land farming groups” and/or “collective farming groups”) who are basically members of the Neighbor Hood Groups (NHGs). As a result of the joint venture with NABARD in 2010, the collective farming groups of Kudumbasree were conceptualized as Joint Liability Groups (JLGs). With the inception of Mahila Kisan Sasaktheekaran Pariyojana (MKSP) which is a subcomponent of the National Rural Livelihood Mission (NRLM) in 2012, the JLGs have got a new direction with technical orientation.

Salient Features of Joint Liability Groups (JLGs) of Kudumbashree: Kudumbashree has a three tier system at the local body level: 1) Neighborhood groups (NHGs) at the grass root level with 10-20 women from different families belonging to the particular neighborhood 2) Area Development Society (ADS), which is a ward level federation consisting of members elected from the NHGs of the ward and 3) Community Development Society (CDS) which is the apex body at the local level having direct interface with the local administration. In this organisational structure JLG members belong to the NHGs, the grass root level group of Kudumbashree. Since 2010, Collective Farming groups have been renamed as JLGs with 4 to 10 women members from a single or different NHGs. In order to be a Kudumbashree JLG, the group has to be registered with the CDS who will then be given an Unique Identification number (UID) so that they can be identified and monitored through the online management information system (MIS) at CDS as well as at District level properly. Monthly meetings, maintenance of records and minutes, keeping accounts and attending trainings/meetings conducted by ADS or CDS are mandatory; the whole system developed to make the functioning of JLGs more transparent and smooth. Minimum area for cultivation of the JLG is 50 cents (25 cents in the case of vegetables and medicinal plants) and maximum is limited to 5 hectares. The number of plots under cultivation is limited to 3 so as to discourage fragmented cultivation on tiny plots. The area and number of plants are criteria for deciding financial assistance from Kudumbashree. Immediately after forming a JLG, a savings bank account is opened through which financial assistance from Kudumbashree is channeled. JLGs are supposed to take the crop insurances through the Krishi Bhavan and banks. They are also eligible for Kissan Credit Cards (KCC) and agricultural credit from banks and interest subsidy from Kudumbashree. The primary responsibility of monitoring the JLGs lies with Area Development Society (ADS).

Area of and crop under cultivation by JLGs: Over the years since inception, the number of JLGs as well as the area under cultivation has reached considerable figures (see Table 1). Nearly an area of half lakh hectare is being cultivated by the various JLG groups across the state. It is interesting to see that a major chunk of the area under cultivation is that which is taken for lease. Those falling under the categories of owned and *purambokku* (untitled land) together constitute only less than 7 percent of the total area.

Table:1. Number of JLGs and Area under Cultivation

Total Number of JLGs	46563
Area Under Cultivation	48347 ha
Lease Land	45282 (93.66%)
Own	2936 (6.07%)
Purambokku	129 (0.27%)

Source: MIS, Kudumbashree, 2014

While, the number of JLGs has reached near to 50000, the families depending on cultivation for livelihood through this scheme have surpassed the figure of 2.61 lakhs (Table 2). The category of beneficiaries and the category of land for cultivation are very much inter-related which can help in satisfactorily answering the question why more lease land is used by the JLGs. Majority of the beneficiaries (77 percent) are from poor families among whom land ownership is very negligible. On the whole 45282 hectares of land are taken for lease by the members of various JLGs most of who are poor and land less. Members from APL (Above Poverty Line) families constitute only 23 percent of the total strength of JLG members. JLG members who belong to the category of SC and ST are also in proportion to the general demographic profile of the state.

Table:2. Socio-economic categories of JLG women farmer participants

Category	No. of JLG members	Percentage
APL	59230	23
BPL	202605	77
Total	261835	100
SC	21194	8
ST	4651	2

Source: MIS, Kudumbasree, 2014

The major crops cultivated by the JLGs are paddy and banana. The area under Paddy (34%) is slightly more than that of banana (30%) although the number of groups in paddy cultivation is significantly lesser (see table 3).

Table:3 Crops grown by different JLG women farmer participants

Crops	No of JLGs	Area (ha)	Percentage of cropping area
Paddy	12472	16406	33.93
Banana	21381	14538	30.07
Vegetables	13605	5851	12.10
Tuber	17294	9728	20.12
Others	3396	1825	3.77
Total	46563	48348	100

Source: MIS, Kudumbasree, 2014

Achievements, Support Systems and opportunities by the JLGs of Kudumbashree: Kudumbasree has formed and institutionalized 46563 JLGs as against its initial target which was 30000. It has provided with livelihood opportunities to nearly 3 lakh families and has brought 48348 ha., of area under cultivation against a target of 20000ha. Mass campaigns with the support of NABARD are being conducted for the awareness and propaganda of JLGs among the community members. Hand books and guidelines, meant specifically for this purpose, have been published and distributed at the grass root levels. Nearly 25 percent of JLGs are linked through bank loans and interest subsidy worth rupees 6 crores have already been distributed among the JLGs.

Financial incentives are given to the JLGs on the basis of the area and production of cultivation. JLGs are able to avail the benefits of convergence with Panchayats, NREGS, Agricultural Department, Agricultural University and allied institutions, VFPCCK and even with private agencies as they are affiliated to Kudumbashree CDS. They are also eligible to receive the seed and fertilizer subsidies given by local bodies and agricultural departments. Likewise, convergence with NREGS lessens the burden of labour charge to a considerable extent as many of the JLGs are not able to do all the manual works themselves and have to hire labour from outside. Convergence with academic institutions provides opportunities in the form of training programmes and exposure to modern techniques of agricultural practices; further assistance in marketing is also provided by government agencies like VFPCCK and SupplyCo. Kudumbashree facilitates agricultural credit to JLGs through CDS. District and State missions have taken initiatives for dialogues and discussions with Banks and special tie-ups are also being made with banks for the expansion of bank linkages of JLGs. Apart from this, an interest subsidy of 5 percent is given to the linked JLGs so that the burden of interest is lessened considerably (In many cases, JLGs are able to avail loan almost interest free when the interest subsidy and subvention from the Government of India and Reserve Bank are also added to the interest subsidy of Kudumbashree).

Kudumbashree JLGs are considerably benefitted by the monitoring mechanism implemented through the three tier system established at the local level as well as through the District and State missions of its organisation. All types of government assistance and supports are availed to the JLGs after intense scrutinisation. Further, an Evaluation Committee – a joint body of the representatives of local body, CDS and the implementing officers chaired by the president/chairperson of the local body – is constituted to track the functioning of individual JLGs. This committee ensures the smooth functioning of JLGs, raises criticisms, gives suggestions, takes necessary steps to make the integration with other funds and schemes and intervenes as and when the elected representatives require their support. The demands of JLGs are integrated into the CDS action plan. This is pertinent in order to avail the local body support and in channeling departmental plan funds to the JLGs. An action plan is a demand driven plan prepared annually by incorporating the demands and proposed activities from the local NHGs. The action plan is further incorporated into the annual plans prepared by the local bodies thus making the three tier system literally inclusive where even the requirements and suggestions at the most grass root level are given due consideration.

Future activities and strategies through MKSP: The introduction of MKSP in 2012 through Kudumbashree has already proved to be critical in leading JLGs to a new era of mechanization and technical trainings. As against the initial plans to select and provide technical and mechanization trainings to 10000 master farmers Kudumbashree has, in these two years, already completed training programmes where 10141 women master farmers were involved. They were selected from different JLGs through

elaborate processes of experience sharing workshops conducted at local and district levels. Another important component of MKSP is the formation of Farmers Facilitation Centre (FFC) which is supposed to act as a resource as well as a monitoring and technical centre at the level of the local CDS. The members of FFCs are invariably representatives of the JLGs and the CDS whereas the local agriculture officer will remain the technical officer. Kudumbashree has already formed 758 FFCs all over Kerala all of which are currently functional. Certain innovative programmes have been introduced through MKSP helping JLGs to expand their current zone of activities. These include trainings on Integrated Pesticide Management (IPM) and Integrated Nutrient Management (INM). JLGs are also encouraged to experiment innovative farming techniques like precision farming, System of Rice Intensification (SRI) and Zero budget farming. It is also planned that the integrated farming system be expanded among the JLGs and to encourage adoption of indigenous agricultural practices. Special incentives are provided for encouraging the innovative, integrated and indigenous agricultural practices. Exposure visits are organized to enable JLG members to have exposure to the special and innovative farming techniques. Value addition and market supports are also expected to be given to JLGs in the near future under MKSP.

Challenges and Issues- how solved and yet to be solved? The issues and challenges faced by the JLGs are mainly related to land and credit needs. As discussed in introduction, land availability for cultivation in Kerala is becoming limited due to several reasons. Even when land is available, land owners are generally not willing to give their lands for cultivation to the JLG members. Many times the assurance and compulsion on the part of CDS members, members of elected representatives and agricultural officers are required to make the land owners agreed to give land to JLG members. Another problem is related to the lease amount which is usually very high which is also not uniform across the state. Another major issue is related to period of agreement for cultivation, though Kudumbashree insists to make an agreement between JLGs and land owners for three years, the land owners often agree only for one year tenure or one crop season. Hence there is always the danger of land owners taking their land back which the JLG members have made fertile through their hard work and which had remained non-productive for long periods preceding their intervention. In such situations all the hard work and efforts made by JLG members become futile.

Kudumbashree has made several provisions in order to face the issue of credit needs for JLGs. As a primary source of credit all JLGs depend on the internal loan (loan taken from the NHG members out of the thrift amount) and the linkage loan (loan given by the banks to the NHGs based on the thrift amount) from the NHGs. As the internal loan and linkage loan amounts for JLGs are limited, Kudumbashree has adopted several measurements in order to smoothen credit availability to the JLGs. Despite the efforts made by Kudumbashree around the issues of bank linkage, nearly 75 percent of the JLGs are yet to be linked with banks. Even though the state government and NABARD have issued clear guidelines in the

context of JLG linkage, it has often come to the notice of authorities that banks create various kinds of problems in this regard. Sometimes banks openly express their unwillingness to give loan to the JLG members who have already taken linkage loan via their mother NHGs. There have even been incidences where the bank managers have rejected the loan application of JLGs on the ground of double loan although the live loans they indicated were in the name of the family member of any of the JLG member! Further banks quite often demand title deeds of cultivated lands as collateral security although NABARD and government agencies have agreed to exempt the same in the case of loans to JLGs. The issue is most pertinent as it is literally impossible for JLG members to submit the land documents before banks as most of the JLGs are doing cultivation on leased lands or on untitled lands. Further problem arises in the case of untitled lands as production of the photocopies of tax receipts is mandatory while applying for loans. JLGs also face the difficulty of availing credit at needy times of land preparation or sowing as banks sometimes take a lot of time for the processing of loan application and field visits due to staff shortages.

In order to resolve unnecessary delays in the process of loan application and to ensure the genuineness of the credit requirements of JLGs, grading mechanism with the help of CDS has been introduced. Further a tie-up with the Canara bank has been arrived at according to which the grading done by CDS will be accepted by the banks and 10000 JLGs will be linked through Canara Bank alone during the period of 2013-14. Loan applications of all graded JLGs in the district are scrutinized and approved by a district committee which consists of Lead Bank Manager, Assistant General Manager, NABARD and District Mission Coordinator, Kudumbashree. After the approval of district committee, loans will be sanctioned by the respective bank managers within a short span of time.

In many cases rejection and delays of loans to JLGs happen due to the confusion on the part of bank managers as they have to differentiate JLG loans and other individual agricultural loans. In order to avoid such situations, elaborate training programmes are being conducted by Kudumbashree with the intension of giving awareness to the bank managers about the structure and schemes of Kudumbashree especially about the linkages of JLGs and NHGs. In these training programmes, Lead Bank and NABARD also take active role so that the bank managers can clearly connect the JLG issues from bankers' point of view. Apart from the trainings to bank managers, special trainings regarding bank linkages and financial literacy campaigns are being conducted among JLG members as well as among NHG members.

In order to settle the issues with banks (whether they are related to JLGs or NHGs), special banking committees have been formed in each CDS in which bank manager, CDS chairperson, vice chairperson, member secretary and accountant are members. With all these initiatives, Block and district level banking committees (BLBCs and DLRCs) spend more time to listen to Kudumbashree members and to discuss issues related to JLGs and NHGs. Banking resource persons (retired bank officers) have been

appointed by Kudumbashree as connecting links between banks and CDS for resolving the problems at the grass root level itself. In order to help the CDS on the paper works related to banks (apart from the paper works, they are expected to all the works related to banks and CDS including helping the CDS for monitoring of repayment of JLG and NHG loans) Banking Mitras are going to be appointed at each CDS.

Concluding remarks with Policy Recommendations: The land and credit issues of JLGs have already been brought into notice of the government so that policy decisions can be taken up soon. The proposal like Land Bank if implemented, the land owners can deposit their fallow lands for a minimum period with CDS or local government with some remunerations. The assurance from the part of local government /development agency can wipe away the land owners' fear of losing their land. Further, some official initiation has to come for fixation the lease amount so that high and non-uniform rates can be minimized. Clear government guidelines are needed regarding the documents to be produced for availing loan. Such policy initiatives certainly can help to expand the activities of JLGs more and, to fulfill the objectives of sustainable livelihood for the poor women and food security of the state.

Seed Village Programme of ARS, Anakkayam

Dr.P.Rajendran, Associate Director of Research, KAU

The lack of job creation in the organized sector, the slow rate of shift of employment from agriculture and shortage of skilled labour all account for the poor quality of employment and disparities in income especially in the rural sector. India's human resource utilization especially that of women in rural sector is characterized by part-time nature, seasonality of work, under employment and social factors which restrict many women from joining the mainstream. Compared to 56% of our male population, only 23% of women are part of India's total work force: people who are usually employed. It is a fact that more than 50% rural women are unemployed just because they have no opportunities to involve in any organized production programmes. This results in a huge loss in person-days. In rural India, nearly one-third of women workers' person days are lost annually, while in the cities 15% of working days of women go unutilized. Commercial vegetable cultivation and vegetable seed production as a group activity has a lot to offer in empowering our rural women both with sustainable income and self-employment opportunities. In this context, the Kerala Agricultural University is way ahead through the implementation of the model vegetable seed village programme at ARS, Anakkayam, the best research station of KAU at present.

Kerala has lessons to learn from the small state Sikkim, in how they flourish in terms of employment and income generation just by adopting commercial orchid cultivation as a lucrative livelihood to rural women. This has been possible due to its easy farming method in the favorable agro-climatic conditions and promising high return from the crop. Orchid growers in Sikkim have been producing around 10 million cut flowers annually through group cultivation and other programmes of the state government and women contribute to more than 70% of the activities in the flower trade. Having recently recognized the potential of its orchid industry, the Sikkim state government has identified orchid industry as the priority area in their agricultural policy planning and maximum funds are allocated for promoting commercial cultivation of orchids.

Demonstration of hi-tech, low-cost crop production technologies is the need of the hour to maximize production from every square inch of available land. We have developed technologies sound enough to make tangible positive changes in the field of agriculture but many of them have not so far reached the farmers fields, especially in the rural sector. In reality, this is one among the major reasons for agriculture crisis, especially in a literate state like Kerala.

India has one of the world's largest agricultural research networks, churning out a good deal of new technology. However the majority of farmers still practice traditional farming, for want of adequate transfer of the new technology to the fields. A recent National Sample Survey report on farmers revealed

that over 60 per cent of them lack access to new technology. In reality, a sizable chunk of others too, do not get to know all that is new and useful for them. The most embarrassing situation is that the extension workers, who are directly responsible for the technology flow and dissemination, themselves are not aware of the recent technologies for boosting productivity. The second major problem in technology adoption is the mindset of the farmers themselves. For instance, though the state of Kerala is bestowed with the ideal soil, climate and geographical situations suitable for commercializing vegetable production, we have never taken care to develop this area as a major enterprise for achieving self-sufficiency and generating income for the state. Therefore the practical way out to address this issue is the direct linkage of research stations with farmers/farmers groups to work on a participatory production system. The idea was thus put into practice at ARS, Anakkayam during 2009-2010 by utilizing the revolving funds of the research station to start the vegetable seed production in farmers fields by signing a MoU between the Kerala Agricultural University and the registered farmers and women groups like Kudumbasree Units of the district. The research station is currently undertaking participatory seed production programmes for women groups and selected progressive farmers so as to provide them additional income from their farming activities.

An integrated approach for combining training and demonstration of technologies with entrepreneurship development is essential for attracting rural youth and women towards agriculture and allied activities, especially to promote agriculture as a means of sustenance. The technology should be acceptable in terms of economy and social situations. With this view, the vegetable seed production under Farmers Networking and SHG mode was started at ARS, Anakkayam during 2009-10 with 22 participating farmers. The project opened up additional income generation opportunities to farmers and helped to scale up seed production of the research station. The strength of the farmer's net work is 89 farmers at present. The requirements of vegetable seeds for various schemes of the Department of Agriculture, local bodies and other institutions in the district are now fully met by implementing the project at ARS, Anakkayam. About 65 award winning farmers of the district are now among the members of this network. During 2012-13 three tonnes of vegetable seeds and 3.5lakh seedlings of vegetables in pro-trays were produced under the project.

The seed village programme of ARS, Anakkayam has proved that the collective venture will ensure employment-oriented group activities under the leadership of the research station and attract the younger generation to commercial crop production. Now we are focusing on value addition to avoid any crisis that may arise due to production glut due to further expansion of the seed village network.

KAU Evolved Farm Machines for Women in Agriculture

Dr. Jayan P. R, Associate Professor, KCAET, KAU

Women play a vital role in agricultural development and related activities. Even though, they have always been the obelisks of agriculture, their hard work has always got neglected and hence unpaid. Women empowerment can enlighten the Indian economy. Keeping this bright thought as motto, Kerala Agricultural University has developed many hand tools for women. The details of some of these technologies are given below.

KAU coconut husking tool (Keramithra): Keramithra is an easy to operate simple coconut husking tool, which is particularly useful for domestic purpose. It consists of mainly a stationery wedge, a movable wedge, a hand-lever and a pedestal having base. It takes only about 8 to 20 seconds for husking a nut depending upon the variety, maturity of the nut and skill of operator. It is light in weight (2.5 kg), simple to use and handle, and can be used both indoors and outdoors. This novel tool bagged the NRDC award in 1999 and got Indian patent ((Patent No. 192670 dt.25.08.1995). This technology has been transferred to the Regional Agro Industrial Development Co-operative of Kerala Limited, Kannur for marketing in Kerala from 1996-2001.

Coleus peeler: In order to make use of the existing table top grinder of available capacities, a peeling mesh with a directing rod is developed and tested to peel the coleus for household purposes. The peeling unit is made of stainless steel mesh of 5mm x 5mm size considering minimum breakage and maximum peeling of the coleus. The raw coleus is fed in to the rotating drum and sufficient quantity of water is added to it. When the motor is switched on the directing rod passes the coleus and get in contact with the peeling mesh. The maximum capacity of the peeler is 15 kg. h⁻¹. The cost of the peeling unit is Rs 700/- (excluding the cost of wet grinder). The unit is ready for transfer of technology. Another model was also developed with an independent electric motor of 0.5 hp for commercial purpose.

Simple machine for multi functions for coconut: A simple multi function unit for husking, splitting, punching (tender coconut), scraping, and copra separating, i.e. five operations in one unit for coconut was developed and tested. These operations are normally carried out separately and are essential for house hold purpose. This machine is specially designed and fabricated as homestead tool. It is portable equipment made up of mild steel square pipes which can be dismantled as each unit and assembled whenever required. This unit is ready for transfer of technology to any reputed firms. It is made of mild steel square pipes and was steel plated as it is the first prototype.

Thorny bush uprooter: Thorny bush uprooter is a simple hand tool developed for removing thorny plants/ bushes found in vegetable gardens and orchards. It consists of claw type knife attached to mild

steel handle its length is about 1 meter. A “V” cut is provided on both ends of the claw knife to remove thorny plants. Thorny bush up rooter is slowly inserted the root and plucked quickly.

Arecanut husker: The arecanut husker developed consists of a pair of counter rotating fluted rollers rotated by hand cranking. The arecanut is fed between the two counter rotating fluted rollers and pressed against these rollers by one hand. The fluted rollers grip the husk and pull it to the other side of the rollers. In this process, the husk is ripped open and the kernel ejected from its shell. It takes about 5 seconds to husk a nut. Its cost was about Rs. 500. This technology has been transferred to the Regional Agro Industrial Development Co-operative of Kerala Limited, Kannur.

Tender coconut punch and splitter: The tender coconut punch is a simple tool for extracting liquid and solid endosperm. The punching mechanism consists of a stainless steel punch connected to a hand lever as in a slider crank mechanism. It aids in punching open a hole through the husk and shell to draw out its water, preferably with a straw. The tool is found effective in punching tender coconut in the age range of 6 to 8 months. The tender coconut splitter consists of a stainless steel knife attached to a hand lever. It provides the necessary mechanical advantage need for splitting open the nut.

Tender coconut punch: The conventional method of tender coconut cutting is tedious and time consuming. A T-shaped simple hand tool was developed to punch tender coconut. It consists of handle and a sharp piercing hollow pipe of diameter 15 mm and a length of 170 mm. It is very easy to handle and use. The tool is a hollow punch on which force is applied. It easily penetrates into the tender coconut shell. This is a women- friendly hand tool which can easily pierce the tender coconut.

Copra separator: Traditionally copra separation is done by using knife which is an unsafe process. The copra separator developed was intended for separating copra from coconut shell without risk. Copra separator consists of 9 cm long, 3 cm wide blade connected to a handle which can be rotated about a fulcrum. Main frame and short blade is made up of mild steel and rotating handle is made by wood. The whole unit can be fixed on a table or a slab. The copra can be separated by slightly pressing the coconut shell with copra against the blade and rotate the handle. Thus the copra will be separated out from the shell. It can separate 12 copras/min.

KAU Coconut palm climber: KAU coconut palm climber consists of upper and lower frames fitted with adjustable ‘U’ frame members. The upper frame is intended for comfort seating of the operator and the lower frame is attached with an actuating mechanism for climbing up and down the palm. Hence the upper frame has to bear an average weight of the worker of about 60 – 75 kg, without any bending due to cantilever action. Galvanized iron was selected as the material for its fabrication. The lower frame is for placing the legs of the operator and for actuating the upward and downward motion. While climbing, both frames (lower and upper) are moved alternatively by means of combined actions of hand and leg (knee and toe action) together. These actions will be just reversed when climbing down. As the lower frame is

only for facilitating these supportive actions, aluminum is selected as the material of fabrication, which in turn helps to reduce the weight of the unit to 9.45 kg. Both the frames are made with square pipe of 20 x 2.5 mm cross section. Safety lock pins are provided for attaching the 'U' frames with main units which reduced the time for fitting or removing of the climber. Rubber bushes are provided in both frames as gripping material. The lifting of lower frame with toes is a tough task for the users and frame. The palm gripping section of the upper frame was made of 'U' shape with an inclination to the horizontal. Hence, while climbing, the upper frame will remain parallel to the horizontal thus providing more stability to the climber. 'U' frame is also provided to the lower frame with an inclination to the horizontal for giving more safety to the operator. Sagging type rexin seat is provided on the upper frame which increased the comfort and safety of the operator. Its technology has been transferred to the M/s. Metal Industries, Shornur.

Goat fecal pellet pulverizer: For easy application as farmyard manure and for making potting mixture the dried goat fecal pellet needs to be pulverized. The goat fecal pellet pulverizer consists if a prime mover, hopper, pulverizer (rasp bar type drum) and power transmission unit. Prime mover is a 0.5hp, 1440 rpm single phase electric motor. Its drive is transferred to the pulverizer through belt and pulley. The speed of the beater is 300 rpm at no load condition. The clearance between the threshing drum and casing is 8 mm. The dried fecal pellets get crushed between the threshing drum and casing and expelled as powdered form through the sieve. The fecal matter will remain inside the drum until it attains a size smaller than the perforations. The powdered matter is ejected through the outlet chute. The capacity of the machine is around 45 kg/h.

Conclusion: Women have become the centroid of all economic activities of our country. The Kerala Agricultural University paves magnificent way to the Indian women to give their best in the country's agricultural development. The user friendly equipments developed by KAU can contribute to women empowerment in many ways.

GIGGINS Farm Villa-Hightech, Intensive, and Integrated Live Stock Based Vertical Farming

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Kerala is a place where majority of people are non-vegetarian in lifestyle. Livestock provides the major share of protein requirement of our people. Most of the meat and other animal products like egg are coming from neighborhood states. Space is the main constraint in livestock production in a state like Kerala where population density is more and land cost is high. Because of these problems, lion share of our hard-earned money is flowing to the neighborhood states. Egg is considered to be one of the best sources of protein, used as such and as part of many dishes and value added products, well accepted even by the vegetarian people and provides the cheapest source of protein. Goat is known as “Poor man’s Cow” as it provides livelihood for the poor marginal farmers who cannot afford heavy initial investment. Goatery is good livestock production practice where adaptation of high-tech broiler goat production practices yield high income compared to existing practices. More over that, live animals and products from scientifically managed farms (even if it is a small unit) can claim and yield more value compared to individual household products. Among meat products, Goat meat (Chevon, which is called “mutton” as a misnomer) is well accepted among people as a delicacy as it is not attached with religious taboos as in the case of other meats like beef and pork. Rabbit is used as a pet and for meat. Rabbit meat is gaining popularity among health conscious keralites as it is a recommended protein source for heart patients. Sale of kids is a good income as rabbit reproduces in good number in short time and management is comparatively easy and needs less space. Fodder production is the major constraint in livestock rearing as the land availability is meager and cost is high. The fodder grass needs good sunlight for growth and water logging retards its growth. These factors affect the choice of land for grass cultivation. The utility of vertical space for fodder cultivation helps fodder to get enough sunlight and cultivating in pots reduce water logging. The biggest advantage in this cultivation is that, it prevents overheating of the shed and provides a cool atmosphere for animals which helps to reduce heat stress, a major stress on animals in Kerala.

This project aims at the usage of space vertically with high-tech integrated farming system so that maximum revenue can generate from a unit space. All these systems of production are individually evaluated and adapted by the farmers. One of the major advantages is that this promotes urban agriculture and all farming activities are women-friendly. Less time is invested for farming activities and most of the major activities like water for animals, birds and plants are given automatically which reduces drudgery. The system is compact which generates income for a small family and can be adapted for those who wish to do farming for own organic produces for family and as an additional income and this is highly pocket-

friendly when considering the land cost of Kerala. Adaptation of advanced technology in the infrastructure gives durability and adaptation in management gives increased production performance. A major share of our people's income is spending on procuring quality non-vegetarian protein sources like egg, milk and meat. Almost all such amounts are flowing to other states as we are very poor in production of these indigenously. This project will help to retain that money which goes out of our own financial circle. The more people spend money in products of local origin; more amount of money will be available for our state's economy which in turn helps our states financial growth.

This project's main objective is to integrate various systems in livestock, poultry and fodder production technologies which are individually proven otherwise. The idea of integration in this project is to rear Goat, Layer Hen and Rabbit in the space provided and an additional structure and roof space can be used to cultivate fast growing short crop fodder grass. Tree fodder can be cultivated in the boundary of land for long term usage which will serve an added source of green tree fodder. Open space can be used as paddock space for goat and also space for other breeds like duck, turkey or backyard layer poultry. These species can be partly fed with the food waste and balance food from goats and hence utilization of waste in a proper manner can be obtained.

Roof top cultivation is a concept originally developed for the urban Kerala where lack of space is a problem. In this project, the roof top agriculture system will be adapted for fodder production which saves space and promotes self sufficiency. The fodder cultivation meets most of the requirement of fodder by the goats and waste food from goat can be used for backyard poultry. This will help the unit to be self sufficient to a greater extent and hence will be a benefit for the farmers with small piece of land. In livestock production, an added advantage for this practice is that it helps to reduce the room temperature in sheds, which helps to reduce the heat stress in animals. Heat stress is a major factor affecting production in animals in Kerala. The model can be adaptable to almost any terrain as the unit space is very small. Only One cent of level land is needed and can be easily available with most of the farmers. The model provides the freedom of changing different species in this system of integration and to evolve a best combination for maximum production. With minor changes, other species like other poultry, ornamental birds, ornamental fish etc can be adapted to this unit.

Structure of the Farm

This is an innovative Intensified Integrated Vertical Farming System where two galleries supporting each other forms the roof for the two-storey animal house in which ground floor is for poultry and first floor is for goat. Rabbit is accommodated in hanging cages and Azolla is grown in tanks over rabbit cage. Galleries can accommodate grow bags with micro irrigation for cultivating fodder for animals, or as kitchen garden for a small family, or for cultivating high value vegetables or flowers or fruits etc. Separate provisions are there for collecting manure and urine of goats and rabbits which can be

used as manure for the items in gallery which helps in organic farming. Animal components are planned in such a way that returns are there at different time intervals like daily returns, monthly returns, half yearly returns etc.

The structure is 16 ft in height, 32 ft in length and 10 ft in width with a floor area of 400 sq.ft but gives effective utility area of 1000 sq.ft as 2 floors and 2 galleries. Ground floor have two cages of 60 sq.ft each on both ends preferably for adult layers and a central 200 sq.ft space for broiler or layer grower chicks. First floor area is 200 sq.ft which is for goats and with two partitions, one for male and another for animals with advanced pregnancy or with kids. Rabbit cages are hanging outside at the level of first floor. 16 cages of 4 sq.ft each is provided as two rows in front and back side. Azolla tanks of 20sq.ft size have been set up above the rabbit cages. Galleries provide steps of 10 ft length and 1 ft width which can accommodate pots or grow bags with micro-irrigation. A tank with capacity of 500 Ltrs is needed for the storage of water.

Advantages: High-tech intensive Integration of goat, poultry, rabbit and fodder production; Maximum production from minimum space; Vertical height utilization for farming and promotes roof-top cultivation; Women-friendly design and automated farming activities which reduce drudgery; Reduction in room temperature for livestock where roof is used for cultivation; Self-sufficiency for the individual unit; Revenue generation and Year round income through various products; Single time investment for infrastructure which helps to use daily income for recurring expenditure and profit generation; Promotion of local cash flow which promotes increase of income and More acceptable products due to local production are the advantages of the model

little space, skill and time and enterprises that do not require high end technologies, such as integrated farming of fish, animals and crops have often been suggested as potential enterprises for women. Undoubtedly such enterprises that can be developed as family farming ventures offer opportunities to improve the economic condition of the household. Women can utilize their full potential in more profitable activities like aquaculture if necessary institutional support is provided for capacity building and entrepreneurship. The experiences from a participatory entrepreneurship development programme initiated at KAU Regional Research centre, Kumarakom involving rural women in open water cage fish farming, indicate that women can excel men even in the most challenging and physically tough projects if timely technology support and motivation is rendered. Frequently, projects to assist women focus only on small and minor enterprises falling within the general sector category where competition is intense.

Aquaculture Clusters for Livelihood: Aquaculture industry is a rural product and community integration and clustering can be a good option. Kerala is endowed with abundant open water resources for aquaculture development. It has a freshwater spread of 3,32,000 ha consisting reservoirs, rivers, and wetland paddy fields suitable for aquaculture. The estimated brackish water area of 1.25 lakh ha inclusive of around 65,000 ha of open brackish water bodies suitable for farming. Women can play a crucial role in the development of this sector as aquaculture management of this kind does not call for full time engagement.

In a model project viz. Participatory Vembenad livelihood enhancement project under the Rashtriya Krushi Vikas Yojana, Regional Agricultural Research Station, women cluster group members were found capable to take up all such types of highly skilled work from fish breeding to cage construction and cage management. When necessity arose they even took up the more sophisticated works viz., hatchery production of fish seed and compounded feed production etc employing small machinery. With the level of self confidence in every step from cage fabrication to maintenance of cage installation in open lake situations the Vembenad Vanitha Swasray Samithi is presently, a highly sought after field level counseling group for cage fish farming. By linking the women with credit, technology, infrastructure, training and trade, the enterprise was also developed as a powerful tool for improving livelihoods and economic security of these rural women. Open water fish culture projects in public waters will be of immense help to boost income and employment opportunities to rural women who lack ownership to land and water resources. However, there is dire need to organize interface training and hand-holding of the participants in the effort to make the exercise most fruitful and rewarding.

Cage-Fish farming involving Cluster Groups: With the mounting pressure on land for agricultural, industrial and housing purposes and restricted scope for bringing arable land under aquaculture in Kerala. The state of Kerala has immense potential for the development of open water aquaculture. In such a context a practical approach to increase aquaculture production is to take up fish husbandry in large water

bodies such as lakes, reservoirs and canals, in cage and pens enclosures. With almost 20% of the state occupied by wetlands, Kerala is blessed with abundant water resources, mostly public water bodies. The 44 river systems, extensive backwater and kayal system that run parallel to the coastline and the large number of reservoirs and Impoundments in the high lands, there is immense scope for open water fish farming. Owing to short gestation period, this unconventional system can yield quick results with minimum conflict of interest. Recent studies on enclosure fish culture taken. The advantage of this captive aquaculture are high production- owing to dense stocking and intensive feeding and continuous exchange of water, low investment, faster growth of fish, better utilization of feed and easy management. Cage fish farming developed as a participatory farming taken up in lake Vembanad by the Regional Agricultural Research Station, Kumarakom has shown that enclosure fish culture can also play a significant complementary role in augmenting yield from capture fisheries as the spilled feed from the cages become food for fish in the vicinity of the cage.

Technology Transfer - Cage Fish Farming: Cage fish culture system developed has great potential for adoption in our lakes, reservoirs and small revering systems. Small volume high density cage culture have been shown to be more suitable, as fish yield up to 35kg/m² is realized in such small cages. In small cages of 1-2 sq.m, a stocking density of 200 / sq m is recommended. Cages can be made up of square mesh cages, floated on PVC rafts with sinkers and moore lines. Although omnivorous species such as Tilapia and common carp are widely used for cage culture in China and Philippines, the brackish water fish *Etroplus suratensis*, was the chosen species. The cages are erected in open waters with mild flow and around 200-250 cages are moored as a single unit maintaining a spacing 1-2 m between cages and 2-4 m between rows so to facilitate easy movement of boats for feeding. Feeding is done *ad lib* or at least thrice a day manually by training the fish to the feeding table. This high value fish is of great commercial demand which grow up to 230g in 6-7 months, when reared under an intensive feeding regime using commercial pellets.

A major problem for cage fish farming has been non availability of commercial feed pellets. Success in cage culture depends on species specific feed. For pearlspots, there is no such feed in our country. In such a context artificial feed of desired protein and composition was formulated using locally available feed ingredients and hence feed production also became part of the cluster cage farming at Kumarakom which in due course was developed as a more profitable enterprise.

Grow out farming of *Lates calcarifer*, in small volume high density cage culture have also been shown to be suitable, as fish yield up to 35-50 kg/m² is realized in such small cages. In the case of sea bass a two stage culture where in fish is raised up to 150 g for 2-3 months and then separately up to 600-800 g in 5 months. Fishes can be fed with extruded floating pellets or low value fishes direct as feed.

Organization of women Self Help Groups: Organizing open water culture in public waters is generally believed difficult due to the cumbersome process involved in getting clearance at different levels. The dissemination the technology met with difficulties initially owing to lack of water lease/use policies by the Government and organizational difficulties in establishing viable clusters. However, Government has lately evolved guidelines for this. The local women groups were mobilized by forming a cluster under community ownership, under the aegis of the Regional Agricultural research Station, Kumarakom. The technology became promptly acceptable and could be developed in part in to a livelihood enterprise through women Self Help Group, viz., Vembenad Swasraya Samithy, who now operate all the activities viz., seed production, cage farming and fish seed production, all under one roof. They are not only managing the program as a viable enterprise but also conversant in every techniques in fish breeding to production. All the women engaged in this enterprise earn income not less than Rs 5000 per month based on the quantum of production. This unit has become a model for replication and the State fisheries department has initiated several such small scale open water farming projects though the level of integration of activities has been missing in such operations.

Fish Feed Units as rural women enterprises For culture of fish in captivity the most important factors nutrition and feeding. The requirement of nutrition varies with through out the lifecycle. Trash fish is the main food for carnivores fish species like sea bass and snappers. Supplementary feeds incorporating basic necessary dietary requirements viz., protein, fat and carbohydrates and minerals have to be developed. Formulated dry fish feed pellets or crumbles will be durable and water stable. Since feed is the major operational expenditure in cage culture there is immense potential for establishing fish feed units as rural enterprises. The major ingredients s for fish feed is fish meal which is easily available in coastal locations as by catch of the fishing trawlers. Jayaraman (2004) estimated trash fish to constitute 10-20% of total catches (271,000 tonnes in India) landed by trawlers operating along Indian coastline. The quantity of discards varies from season to season with substantially higher discards during pre-monsoon and post-monsoon periods (Pramod, 2009). Trash fish from marine fishing industry is utilized most effectively as feed ingredient in the fish feed units.

The primary objective is to produce nutritionally balanced feed which is economical, palatable, water stable that produce the desired final product. Steam pelleted feed, partially extruded feed or slow sinking pellets expanded floating pellets etc is produced by the Vembenad Swasraya samithi, Kumarakom by setting up appropriate machinery and other facilities. Diet formulation and preparation by combining feed ingredients is also done locally with the support of the scientists. This venture utilized trawl by catch from nearby coastal location for aquaculture feed. The principal expenditure on cage farming is cost on feed (30-50%) and seeds(30-35%).

A significant concentration of innovative entrepreneurs around a nucleus of R & D facility such as University or a Research institute can become a hot bed of investment and technology transfer. Opportunities for young women entrepreneurs in aquaculture technologies in rural areas can become a movement so that fish farming in rural setting can support income enough to support the family with honor in own villages. In the context that most women in fisheries lack access to physical and capital resources and in decision-making and leadership positions, access to these critical resources and services through training and formal education is vital. It is also essential that women be given the opportunity to acquire appropriate technologies so that they can fruitfully and confidently involve in decision making. Such an approach that recognizes the crucial role of women will render women as equal partners and productive participants in fisheries. This will undoubtedly enable them to contribute effectively to sustained development and growth of fisheries.

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Nature Fresh Milk –Women Led Dairy Enterprise of Kerala

Aby Abraham GK and Dr G.S. Madhu, Joint Director, ATMA, Thodupuzha

Once upon a time, the Malayali depended on the neighbourhood milkman for his daily supply of milk. Then came MILMA with its packet milk, and pushed the milkman into oblivion. Now they are making a comeback, at least in some villages, under the 'Nature Fresh' brand, under the tutelage of Kudumbasree. And consumers don't mind paying a premium, too! Some ideas are such. They refuse to die down even when suppressed for long. Their inherent advantages make them a natural in their environment. Neighbourhood milk distribution is one such idea in Kerala. Amply demonstrated by the likes of the Ponpulari Nature Fresh milk society in the remote hilly area of Uppukunnu, 30 km off Thodupuzha. The society sells milk branded as 'Nature Fresh' at Rs.38 a litre. That too in Thodupuzha, where milk pouches from MILMA is available for Rs.30 a litre. So why do consumers prefer 'Nature Fresh' milk? "We get fresh milk within one or two hours of milking," says Dr K Prabhakaran, a veterinary doctor, and one of the first customers of the society's Nature Fresh milk. "The milk is free from additives and preservative that is added to prolong its shelf life, adding to its quality." Mr K.V Mathai, an Assistant Sub Inspector of Police, too, is vocal in his support for the initiative. "The milk we used to get earlier produced a foul smell when boiled. The Nature Fresh milk has no such problem. It tastes good too," says he. Mr Mathai even introduced the product to his neighbours, who too fell for its charms. The good word has spread fast, and so has the demand. The society today supplies Nature Fresh milk to around 600 customers, up from the 28 customers that it had at the start two years back. "We are unable to meet the demand at present," beams Ms Jalaja Ramakrishnan, president of the society. The society has six members today who together raise 35 cows. Says Ms Tiji Ananthan, secretary of the society, who rears seven cows. "I sold milk worth Rs.79,000 last month. The expenses come to around Rs.35000, and the rest is profit." A hard earned one, though. The members themselves do all the work from fetching fodder to milking, packing and processing and even marketing and distributing the milk. Their day starts at 4 in the morning and extends to late evening. The milk is distributed in 650 ml glass bottles; a full bottle is priced at Rs.25 while half a bottle is sold for Rs.15. The society members take turns to distribute the milk in a jeep hired for the purpose. But isn't the price a bit high? The price is only for the milk that is sold under the Nature Fresh label (see box). "We charge a premium for the high quality Nature Fresh milk that we supply to households," says Ms Tiji Ananthan. "We ourselves decide the price of the milk, based on our costs and the effort we put in. The producer should have the right to fix the price of the product. "The society also refrigerates and sells the milk that is produced in the afternoon to hotels for Rs.27 a litre. Value-added products such as ghee and curd are also produced and marketed among the customers for milk. The customers though seem willing to pay the price. Says Ms. Ananthan, "We were apprehensive

when we increased the price from Rs.20 to Rs.25 last September, but only three customers left us." Adds Ms.Ramakrishna, "Some people switched to other sources when the price was increased, but then soon came back, For sure, the consumer is ready to pay extra for quality products. It was out of desperation that the members of the society took to rearing cow. The pepper vines that sustained the remote hilly region had succumbed to diseases. And people had to look for alternatives. The availability of fodder in the lush green region opened up the possibility of dairying. The grass was green and the milk pure and white, but the enterprise bordered on the red. When we turned to rearing cows 6 years back, milk fetched us just Rs.8 a litre," recalls Ms Ananthan. Then they formed the 'Pulari' neighbourhood activity group under the auspices of Kudumbasree. The group would collect the milk and sell it to a local milk society in the foothills for Rs.13 a litre. That was all that the society could afford to pay them. Not surprising, when one considers the price fixed for milk by the government then and the inefficient distribution system that cost the farmers dear. Kerala had tried to replicate the highly successful ANAND model of milk distribution, perfected in Gujarat- a state that has isolated villages, far away from the cities. A centralised system that collects milk from the interior villages transports it in cans to cold storages and then in tankers to dairy plants, where they are processed and packed for distribution in cities, was ideal for Gujarat. But Kerala, with its contiguous towns and villages, doesn't need such a system that needs 3-4 days for reaching the milk to the end consumer. "In Kerala, it is possible to supply fresh milk produced in the suburbs to the cities within 1-2 hours, eliminating the need for processing, storing, packaging, and transporting milk that just adds to the cost, "says Dr GS Madhu, then District Mission Coordinator, Kudumbasree and currently Asst Director, Animal Husbandry Department and Honorary Consultant to Kudumbasree. In addition, big dairy farms are not practical in Kerala which has problems of land and labour availability and waste disposal. At the same time, Kerala which consumes 80 lakh litres of milk a day is importing a quarter of that from neighbouring States. It was this situation which spawned the idea of a regional milk producing – distributing system suited for the State. With this aim in mind the Kudumbasree Mission proposed setting up Nature Fresh milk societies in different parts of the State. Each society would be a joint liability group of 5-10 individuals in the neighbourhood, interested in cattle rearing and willing to adhere to the specified norms. The groups, Would have to bring in part of the investment on their own, while the Kudumbasree CDS would provide them subsidies and help them avail bank loans. The group members would also be provided entrepreneurship training and technical training in cattle rearing at the recognised centres of the Kerala Livestock Development Board. Nature Fresh unit, were first started in Edavetty Grama Panchayath in Idukki district in 2007. Units were also set up in Kannadi, Alagappa Nagar, Thidanad, Shasthamkotta, Poonkulam and Sreekaryam Panchayaths. Inspired by the Success, of the Ponpulari society, other units such as the 'Deepam' at Udumpanoor and Anugraha at Cheruthoni have also sprung up. But after initial successes, many of these units fail to live lip up to

their promise. The units need Continued Support till they establish themselves and learn the tricks of the trade. A challenge that these units face initially is identifying customers, that too in a contiguous area so that milk can be delivered within the prescribed time efficiently. At least 60 litres of milk have to be sold a day to breakeven. The units tie up with residence associations, circulate pamphlets, and conduct door-to-door campaigns to find customer. "We have been able to increase our customer base from 15 to 52 in the two months of operations," says Ms Shajitha Hameed of the Deepam society. She is confident of making profits soon. But for the members of the Ponpulari society, which sells around 400, litres of milk a day, to 600 customers, availability is the issue now, not marketing. "Once people start using the milk, more customers come in through word of mouth publicity says Ms Ramakrishnan. According to Ms Bindu Surendran, a member, who has three cows, "We are not able to expand the number of cows as fetching enough grass to feed them is a problem. We will have to employ labourers if we are to increase the number of cows". "But that is not the idea," says Dr. Madhu. "The aim is to provide an income source to a large number of people through homestead farming, rather than concentrating the production among a few. Increasing the number of cows will also lead to diseconomies of scale, and also affect the quality of milk. It is ideal if each member rears 2-3 cows". "One reason for our success is that we ourselves undertake all the activities, from production to distribution," says Ms Ananthan. The society had earlier outsourced distribution, but the distributors wouldn't turn up on special occasions such as, Onam, when milk is a must for customers. The producers also suffered as they cannot avoid milking the cow. "Now we take turns to distribute the milk and we haven't avoided distributing milk even for one day," Says she "The challenge though is to institutionalise the movement," says Dr Madhu. He suggests formation of a producer company to support the small holder units. It could involve in activities such as fodder cultivation, cattle feed production, cattle-shed/biogas plant construction, production of value-added products, branding and market expansion. Big dreams at that. But for now, you and I can at least hope to get milk in its pure form - fresh, naturally.

Milk nature fresh

Everything, from cattle shed to milk delivery schedule, is pre-planned. Nature Fresh is a brand of the Kudumbasree Mission in the State. Fresh wholesome milk that small holder Kudumbasree dairy entrepreneurs produce as per the specifications set by the mission can be sold under this brand. Cows are to be reared in specially designed cattle sheds to ensure hygienic milk production. Each shed can hold 2-3 milch Cows, The design gives cleanliness a priority; it has a specific area for catching the dung and the urine, without spoiling the whole shed. Ample ventilation and sunlight ensures that the shed remains dry, thereby preventing diseases. Cleanliness is ensured in the milking process also. The shed has to be cleaned before Milking. The utensils and glass bottles are also cleaned with detergents and hot water. The udders are cleaned with potassium permanganate lotion, and the hands with anti-septic lotion, before

Operation	Name of equipment / machine	Approx. cost (Rs.)
Land preparation	Tractor	4.50 lakh onwards
	Power tiller	1.50 – 2.50 lakhs
Sowing / Transplanting	Paddy wet seeder (manually operated)	0.05 lakh
	Manual transplanter (hand operated)	0.06-0.10 lakh
	Power operated Walk behind transplanter	2.00 – 2.50 lakhs
	Power operated Ride on transplanter	2.50 - 10.00 lakhs
Weeding	Hand operated cono weeders	0.02 lakh
	Power operated paddy weeders (2 rows or 3 rows)	0.40 – 0.60 lakh
Plant protection	Hand operated sprayers	0.01 – 0.10 lakhs
	Power sprayers	0.40 lakhs
	Tractor operated power sprayers	1.75 lakhs
Harvesting	Sickles	upto 0.005 lakhs
	Brush cutters with harvesting attachments	0.25 lakhs
	Paddy reapers	0.75 lakhs
	Combine harvesters	15.00– 25.00 lakhs
Threshing	Power operated (0.5 – 1hp) loop type threshers	0.10 – 0.20 lakhs
	Axial flow threshers	2.00 lakhs
Winnowers	Winnowing fans	0.10 lakhs
	Power operated winnowers	0.40 lakhs

There are several successful cases of women operating machinery for rice farming and taking up mechanized rice farming as a vocation. However, none of these machines have been specifically keeping in mind the women labour who uses it. Machines ergonomically suited to women are the need of the hour in order to increase the work efficiency of women. Often, the women taking up rice cultivation on leased land have to begin cultivating on land left fallow for years due to reasons of non availability of water, accessibility to resources or unsuitability to mechanized cultivation. Preparing such land for cultivation requires tough physical labour on the part of these women. Such land is often not in the mainstream paddy land and is fragmented and small sized. Women cultivating paddy in such lands have to face hurdles in terms of access to resources and suitable machinery at the right time. Bigger machinery commonly available is not suited to such locations. Women in these situations require custom made, location specific and need specific machinery which can be afforded by them.

The manual transplanter is a classic example of a machine re-invented for use in the Velookkara panchayath of Thrissur district. The women SHG members who took up rice farming wanted a small mechanical alternative to manual transplanting of their leased paddy cultivation. When the Centre for Gender Studies in Agriculture and Farm Entrepreneurship Development (CGSAFED), KAU conducted a trail-cum-demonstration of the outdated CRRI model four row manual transplanter, they came forward to try it out and were very satisfied with the reduction in drudgery, resultant reduced cost of operation as well as increased yield. The cost of the machine was also affordable and this motivated the women farmers

The CGSAFED in tandem with the *grama panchayath* and the *krishi bhavan* played a proactive role in helping these women groups to take up mechanised rice farming. The grama panchayath took up a development project for women friendly farm mechanization in the year 2012-13. Low cost machinery, suited to the work environment of these women, worth Rs. 2.00 lakhs, was procured. The women were formed into a society and the machinery was handed for their use. They were provided training in operation and maintenance of these machinery in collaboration with the Agricultural Research and Training Centre, College of Horticulture, KAU. They were also provided guidance in maintaining books and records, and measuring and quantifying their activities, income and profit. A Monitoring and Evaluation committee consisting of the grama panchayath officials, Agricultural Officer, President and Secretary of the womens group and the CGSAFED, KAU was constituted for mentoring the women, providing necessary technical support and monitoring the activities of the society.

The *Vanitha Karshaka Maithri Sangham* (women society for mechanized farming) now takes up mechanized rice farming operations on leased land. Due to mechanization, they have been able to reduce their number of working days and hence are also able to render their services to other farmers in the panchayath during their lean time, on contract basis, thus adding to their income. This venture, where the actual need of the women workers in rice cultivation was addressed through a collaborative effort of the various development agencies and institutions indicates a way forward for helping women farm workers of the state.

livestock scientists and specialists in agri-business management who can serve as resource persons, the venture would be highly profitable and rewarding.

A project for imparting training on fodder bank functioned at the College of Horticulture, Vellanikkara during the period 2005-2008. The project, which was a collaborative venture by the Kerala Agricultural University with the Department of Biotechnology, Government of India, was envisaged to provide intensive training on various aspects of fodder production and establishment of field demonstration units of fodder banks by the trainees. It was hoped that fodder banks developed by women groups for raising, harvesting, and selling of green fodder needed for the local cattle growers would contribute greatly to profitability of milk production and prove to be a regular income earner for the participating women, thus “empowering” them. As a first step, intensive trainings of 20 days duration were given to groups of women who came forward to start their own venture of fodder production. The training covered all aspects of fodder production starting from land preparation to harvesting of high yielding fodder crops grown in Kerala. Practical skills were also imparted in areas such as farm composting, vermicomposting, coir pith composting, azolla cultivation, and fodder preservation. Classes were also included on aspects on feeding of dairy cattle, goats and poultry. The women were thus equipped with a fundamental knowledge of agriculture and animal husbandry by the time they completed the training.

Four trainings with 15 trainees per batch were conducted along with motivational programmes. Theoretical as well as practical knowledge were provided to the trainees. Field trip to established and experienced farmer’s field was a major part of the programme. Training manual on fodder cultivation (*Theettappulkrishi*) in Malayalam prepared and distributed. Later two more books, *Forage Crop Production in the Tropics* (English) and *Kalitheettavilakal* (Malayalam) were also published. Support and maintenance of two ventures of women groups, “*Thanal Swasraya Vanitha Sangham*” and “*Mahima Swasraya Vanitha Sangham*” who established field demonstration units were done. They planted hybrid Napier (CO-3 and killikulam-1). Minimum infrastructure and technological support provided. Two more groups established fodder banks using their own resources.

The experiences and results gained by the project on fodder bank are enormous. The changes brought about in these women was quite amazing. When they first arrived for the training, they were quite ignorant and unaware of their own potential. They were gradually transformed into a disciplined, confident group, with a good grasp of what they wanted to achieve and how to go about doing it. They turned out to be good at taking decisions and tackling problems when they arose. These women, who were not used to hard work took on all aspects of cultivation with vigour and enthusiasm. As a part of the project, two groups were supported financially from the project. One group (*Mahima*) has flourished and diversified their activities with more animals and other ventures. On the other hand, the group by the

name "*Thanal*" was wound up because of problems of land tenancy, most of them are raising fodder crops individually now. However, many other groups have sprung up to start fodder banks as a part of programmes of Kudumbasree and local self governments. The groups, in general, adopt direct marketing to the cattle and elephant owners. A part of the produce is being marketed through Milk Marketing Co-Operatives. Now, the price ranges from Rs. 2000/tonne to Rs.2500/tonne depending upon the season. Marketing is not a problem as there is heavy demand for fodder from both cattle owners and elephant owners.

Availability of suitable land, reluctance of landowners to give land on lease for women groups for long duration, and hesitance to initiate group activity are some problems. As this ambitious scheme has caught the attention of a wide spectrum of people, it is hoped this venture will spread to other districts also in the immediate future. This will not only be a solution to the never-ending problem of fodder shortage, but also help to empower rural women in the dairy sector.

Mechanization of Food Industry in India

Dr.K.P.Sudheer Associate Professor, KCAET, & Rana Salva, KCAET, KAU

Introduction

The paper reviews briefly the developments of machineries in food processing sector to reduce the laborious work carried out by the women. It is of particular importance in view of reducing the tedious task and provides safety during their work for women. Today, in most societies women continue to carry the responsibility for mental and manual labor of food provision the most basic labor of care. Women perform the majority of work in various unit operations in food industries. There is an urgent need to identify sustainable strategies and solutions that addresses women's role in achieving food security. Though women participate in all activities related to agriculture and food processing industries, they are the first usually to be marginalized and we need to look at mechanisms for changing that trend. Most of the machineries used will reduce the human intervention in the food industries, which ensure the safety and uniformity and enhanced capacity of the industry. Several well-established traditional processing options are available for the preservation of food. However, these processes utilize manually operated or semi automatic machineries. It tends, however, to degrade the quality of foods to some extent. Aggregate data shows that women comprise about 43 percent of the agricultural labour force globally and in developing countries.

Proportion of labor in all agricultural activities that is supplied by women-

In India, the national rural female work participation rate is 22% according to the National Sample Survey Organization (1996). The level of mechanization in the processing sector also helps to explain the variations in women's participation in the rural labour force. Women make important contributions to the agricultural and rural economies of all regions of the world. A striking degree of within-country variation is shown by time-use data for India. While the nationally representative data indicates that the national average for women's share of total time-use in agriculture is 32%, data for West Bengal and Rajasthan reports women's share as from less than 10 percent to more than 40 percent, respectively. In Rajasthan, for example, girls between 14 and 19 years of age contribute up to 60 percent of the total time spent on agriculture by their age group.

Mechanization of food industries can be defined as the economic application of engineering technology to enhance the effectiveness and productivity of human labour. FAO (2008) concluded that food industry mechanization aims at reducing human drudgery, increasing yields through better timeliness of operations because of the availability of more power, increasing the production rate and ultimately improving the standard of living of women. The technology can be applied to aspects of food processing unit operations such as: cleaning and grading of grains, fruits and vegetables, threshing,

winnowing, drying, capping in case of bottling and canning processing, mixing of ingredients, packaging, material and other processing operations and storage.

Mechanization of drying operation- Use of upgraded machines, technologies, protocols, can reduce the post harvest losses and boost the capacity of processing plants reduce the labour intensive and time for processing. Vegetables, fruits and fishes dried by traditional open air sun drying is time consuming and less hygienic. Drying operation of fruits and vegetables is a complex one since it involves simultaneous exchange of moisture and heat. Drying time in conventional ovens or dehydrators vary considerably depending on amount of food dried, its moisture content, and room temperature and humidity. Some foods require several hours and others take more than a day. Prolonging drying time (by using lower temperatures) or interrupting drying time may result in spoilage, Drying or dehydration means process of removal of moisture by application of artificial heat under controlled conditions of temperature, humidity and air flow. In industrialized regions and sectors, mechanised dryers, with fans have now largely replaced open air-drying.

The sun drying which is unhygienic and involves longer time and the work force of the women can be replaced by the mechanical and solar drying equipments. Mechanised drying is faster than open-air drying and it uses much less land and labour. In recent years many solar gadgets have been developed for variety of applications. Different solar concentrators and box ovens can provide excellent boiling, steaming, blanching and roasting capabilities while solar air dryers/heaters do the work of moisture removal. Combination of such solar gadgets can take care of major energy needs in food processing industry. These gadgets have capabilities of bringing in revolutionary change in food processing technology. In this process, a single layer of fruits or vegetables, whole or cut into pieces or slices are spread on trays which are placed inside the dehydrator. Initial temperature of dehydrator is usually 43°C which is gradually increased to 60-66°C in vegetables and 66-71°C for fruits.

Unit operations involved in rice milling

Rice milling consists of various unit operations viz; pre-cleaning, parboiling, shelling, husk aspiration, paddy separation, polishing, grading, sorting etc., shelling is the major process which determine the grain output. The manual operations done by involving women not only leads to high rice recovery loss but also consume their energy to greater extend.

The various unit operations and where the manual work done by women on cleaning and grading can be mechanized using the specified equipments in the modern rice mills are given below.

Sl. No	Process	Operation	Mechanical equipments
1.	Cleaning	For removing foreign matter from paddy	Air screen cleaner
2.	Parboiling	Hydrothermal treatment to increase head rice yield	Parboiling tank
3.	Shelling	For separating husk from the paddy grain	Rubber – roll sheller
4.	Husk separation	Separation of husk from the product obtained from	Husk aspirator
5.	Paddy separation	Separation of paddy from brown rice	Paddy separator
6.	Bran removal	Removal of bran layers from brown rice	Polisher/ whitener
7.	Bran aspiration	Removal of bran adhering to the rice kernel	Bran aspirator
8.	Grading	Silky sortex section	Separation of broken rice from head rice

Modernization of rice milling process-The threshers and winnowers are replaced in the modern rice mills. Modernization in rice milling sector has reduced the per cent broken and enhanced the grain recovery. The introduction of rubber roll sheller, instead of huller has made this difference in rice milling industries. Similarly introduction of packing hose concept in fruits and vegetable industry has reduced the post harvest losses to a great extent. The present is a time of rapid change in the field of food technologies and the pace of change is increasing. Major motivations determining trends of development of new technologies are those which signify responses of food industry to demands of consumers due to their changing lifestyles and expectations for high quality and safe foods. Some of the machineries used in food industries, mainly rice milling and fruits and vegetable industries are briefed.

Rubber – roll Sheller consists of two rubber rolls rotating in opposite direction at different speeds. A feeder feeds paddy uniformly to the machine. Paddy is fed in thin layer between the rotating roll by the feeder. One of the roll is fixed while the other is adjustable to obtain desired clearance between them. The rolls are drive mechanically and the adjustable roll normally runs about 25% slower than the fixed one. Difference in surface speeds of the rolls develop a shearing force on grain surface resulting in the opening and breaking of husk. The clearance should be about half the thickness of paddy and may be adjusted subsequently by judging the shelling efficiency.

Sortex Section-This unit operation is the most important and prestigious quality maintaining section of rice milling industry. By using suitable sensors, the sortex machine remove all kinds of black or off colour impurities from the finished rice.

Fruits and vegetable processing Cleaning and grading are the important operations in the processing of fruits and vegetables. Sorting and Grading in India is generally done manually by the women labors, while mechanized grading based on size and weight is available which can be used to reduce the work load.

Sorting and Grading-Sorting & Grading of mango fruit under Indian condition is generally done manually wherein the workers sit close to piled mango heap and sort damaged, diseased and rotten fruits by hand. These operations can also be done mechanically, fruits are conveyed through a conveyor belt and workers standing on both sides of the conveyor pick up the undesirable produce. There are some sophisticated technologies available for sorting and grading. It is possible to mechanically sort and grade fruit on the basis of their colour, size, degree of sweetness and firmness etc.

These non destructive methods in which sensors are used to do so without any biasness.

Fruit grader-The machine would typically have two or three belts, with smaller one coming first to allow smaller sizes to be removed first. Size of mesh increases for successive belts and the largest fraction would be the carry-over crop from the larger mesh belt. A super imposed vibration on belt ensures that any item smaller than the hole size of belt will drop through on to a chute or crosswise conveyor below.

Packaging operations -Food packaging has developed strongly during recent years, mainly due to increased demands on product safety, shelf life extension, cost efficiency, environmental issues, and consumer convenience. The packaging operation is the important and the value for the processed product is solely lies on the type and method of packaging. In spite of involving women in packaging not only adds burden for handling materials during packaging, it also leads to poor quality of packaging. Mechanization in packaging of food industry by using filling and sealing equipments reduces the work load of people and increase the productivity of the food processing industry. In order to improve the performance of packaging in meeting these varied demands like modified and vacuum packaging.

The mechanization of food industry improve and strengthen the food processing industry and reduces greatly the burden of women's drudgery during their work. Sustainable and efficient use of modern technologies could help to alleviate these challenges. Mechanization is one of the important elements of processing modernization. Adoption of new technologies through effective technological development and promotion is needed. This paper intends to provide a initiative for all players in agriculture and food industries to deliberate and address productivity related issue that are besetting food processing industrial sector.

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Food Security and Health Issues of Women

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Food insecurity, malnutrition and poor health are the major problems faced by vulnerable segments especially women in developing countries including India. Though, India has achieved self sufficiency in food production and there is 'food for all', the biggest challenge facing the nation is to ensure 'food to all' to achieve food and nutritional security. In spite of significant achievements in our country, double burden of malnutrition with chronic under nourishment and micronutrient malnutrition still coexist with obesity, overweight and life style related diseases.

Due to the multiple roles played by women in and out of the home and the male biased gender discrimination in food distribution, inadequacy in the intake of food among women may occur. This will adversely affect the health and well being of not only women but also the other family members. The effects of malnutrition are felt throughout the life cycle of child right from being in the mother's womb to the old age. This is more pronounced in the case of girl child and leads to a vicious cycle of malnourished girl child becoming a malnourished woman giving birth to a low birth weight child.

Studies conducted in the Department of Home Science of College of Horticulture among women working in various unorganised sectors of Kerala have indicated inadequacy in their food and nutrient intake. The intake of most of the food groups essential in a balanced diet especially green leafy vegetables, fruits and milk and milk products were found to be low among women agricultural labourers, farm women, coir workers, kudumbasree members, fisher women as well as women in the BPL families. The intake of almost all the nutrients was also found to be lower than the recommended amounts. In certain groups, flesh food intake especially fish was found to be high. Under nutrition and anemia were the other nutrition related problems noticed among these women.

In a study conducted among women in the BPL families of Central Kerala during 2011- 13 (Blossom, 2013) in the Department of Home Science, it was seen that though all women included cereals in their daily diet the intake was lower than the requirement. The daily inclusion of pulses, other vegetables and milk and milk products in the diet was noticed only among 31 to 47 per cent of women. More than 90 per cent women did not include fruits and green leafy vegetables in the diet. However, consumption of fish was significantly higher than the requirement. The intake of all nutrients was also found to be significantly lower than the recommended values. Among 93 to 99 per cent of women, the intake of calcium, iron, carotene and riboflavin was below 50 per cent of RDA. Thus, the food and nutrient intake of women in the BPL families of Kerala was found to be inadequate and unbalanced with very high intake of non vegetarian items and low intake of other food groups especially green leafy vegetables, fruits, milk

and milk products. This contributed to a deficit of various macro and micronutrients in the diet. Malnutrition either in the form of under nutrition or over nutrition was noticed among 60 per cent of women. Anemia was detected among 53 per cent of women with a haemoglobin level below 12g/dl. The important factors contributing to anemia were low intake of iron-rich foods as well as foods rich in nutrients which can enhance iron absorption and utilization like green leafy vegetables and fruits.

The studies conducted by NNMB (2006) in the rural areas of nine states of India including Kerala also indicated gross inadequacy in the intake of foods and nutrients among women. The average consumption of leafy vegetables rich in various micronutrients among women in Kerala varied from 4 to 7 g/ day against the required amount of 100g/day. Nearly 21 per cent of women in rural areas of Kerala had Chronic Energy Deficiency. Anemia was reported among 89 per cent of women in rural Kerala.

The increased life expectancy is associated with increased burden of age related morbidities including osteoporosis. It is a progressive bone disease characterized by a decrease in bone mass and density leading to an increased risk of fractures of the spine, hip and forearm. Osteoporosis is most common in women after menopause. About 20 per cent of women and about 10 to 15 per cent of men above the age of 50 years in India are at the risk of osteoporosis. In a study conducted in the rural areas of Northern Kerala by Babu *et al.* (2009), osteopenia and osteoporosis were reported among 41% and 42% of the population respectively. Among the persons with osteoporosis 92% were women. Maximum number was recorded between the age group of 60 to 69 years (33.8%) and 50-59 years (29.5%). Similar trend was observed in osteopenic population also. Osteoporosis is often called the "silent disease" because bone loss occurs without dramatic symptoms. In many cases, the first "symptom" is a broken bone. Patients with osteoporosis may not know that they have the disease until their bones become so weak that a sudden strain, bump, or fall causes a hip fracture or a vertebra to collapse. The risk of osteoporosis fractures can be reduced with lifestyle changes including a balanced diet with adequate calcium and Vitamin D intake, exercise and exposure to sunlight for synthesis of Vitamin D in the body. Stocking up on calcium stores in the younger age can give significant results in preventing osteoporosis later in life.

To overcome all these nutrition related problems, food-based dietary diversification should be implemented. Identification of common and locally available micronutrient rich foods, promotion of traditional foods and traditional food habits, promotion of kitchen/nutrition garden in each and every household and imparting nutrition awareness programmes especially among adolescent girls and women are some of the strategies suggested to ensure food and nutrition security. Comprehensive multi sectoral nutrition and health interventions, focusing on issues critical for each of the important phases of life cycle of women should be implemented to break the vicious cycle of malnutrition and to improve the health of women.

Home Shop Network- A Sustainable Marketing Alternative?

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In Kerala, the Self Help Groups (SHGs) launched as *Kudumbasree* in a mission mode under the leadership and patronage of Local Self Governments are turned out to be the synonyms for women empowerment in the state. The Kudumbasree views micro enterprises as the most important instrument for creating employment and income to the poor women. At the end of December 2006 in the rural areas, there were 1051 individual enterprises and 2789 group enterprises (Oommen,2007). The micro enterprises commonly undertaken by the Kudumbasree units include agriculture including lease land farming, dairying, goat rearing, food processing and vermi composting, small industries like weaving and services like catering, direct marketing etc. An appraisal of Kudumbasree programme done by Oommen (2007) had reported that nearly 35 per cent of the microenterprises registered were either closed down or non-functional. Non availability of assured markets, competition from branded items, non availability of raw material, working capital and infrastructure are the major problems faced by Kudumbasree micro enterprises. The micro enterprise organizers do not have the skill or finance to undertake the publicity and propaganda necessary to market their products. A study conducted by Kudumbasree itself in 2006-07o also identified the lack of planned, organized and stable markets as the main reason for the large scale drop out of Kudumbasree micro enterprises. Marketing concentrated in very small area, lack of experience in marketing, in ability to expand the market due to economic constraints and over and above, the diverse duties and responsibilities to be borne by the micro- entrepreneurs as “women” in a patriarchal society often hindered with the growth of micro enterprises. In order to improve the marketing of Kudumbasree products, the Mission has started its own weekly/monthly markets, participates in trade fairs and markets in connection with important festivals. Even then, it was observed that the rate of withdrawal of the micro enterprises was on the rise. The inexperienced resource poor women entrepreneurs seldom succeeded in finding a space of their own in the highly competitive markets and sustaining their influence in the market.

Home shop – what and how?

The Kudumbasree mission in Thrissur district took the challenge to overcome the constraints in marketing of the kudumbasree products and launched the innovative innovative community marketing network programme christened ‘Home shop’ aimed at developing a sustainable marketing network. It aimed at strengthening and sustaining the production - marketing chain of the Kudumbasree. The main focus of the attempt was to ensure stable income to the Kudumbasree members and achieve local economic development in due course through people participation and efficient integration of production and distribution. Delivering quality products at low cost at the door steps of the local consumer through trusted and loyal Kudumbasree members was the success theme of the programme. The Home shops net

work marketing programme was initiated in Kodakara block of Thrissur district in the year 2008. Even though the Home shops aim to market all the products of the Kudumbasree, to start with daily consumables alone were supplied keeping aside the perishable agricultural products and food items. The main actors in the home shop supply chain are the producer SHGs, the Home Shop Agents (HSA), the Block Level Coordinator (BLC), the District Level Coordinator (DLC) and the customers. The network starts with the producer SHGs which undertakes the production of rice, processed food products and other consumables. The products from different producer units reach the home shop through a co-ordinated system which will be directly sold to the houses in the specified area of the panchayath by the HSA. A HSA is a Kudumbasree member who undertakes the responsibility of selling the products to all the houses in the locality. Each HSA caters to around 100 to 200 houses in a ward with a population of 400 in a grama panchayath. Display racks to stack the products are provided by the Kudumbasree. In addition to direct marketing, the customers can also purchase from the home shops in their vicinity. This arrangement reduced the establishment cost and the setting up of home shop in the vicinity increased the access to good quality products. Only the goods produced and marketed by the Kudumbasree are allowed to be sold through the home shops. The BLCs are the link between production and marketing. There will be 20-40 home shops under each BLC. It is the responsibility of the BLC to supply products to the HSA and to receive the sale proceeds of the home shops. The office of the BLC also serves as a small store house for stocking the products. The BLC visits the HSA once in a week to supply the products and to receive the sale proceeds of the previous week. The co-ordination of the activities of the BLCs and the necessary integration of the producer SHGs is the responsibility of the DLC. He takes the decision regarding the quantity and quality of production, procurement of products, pricing, raw materials supply to producer units and looks after the overall management of the net work. The HSA, BLC and DLC are paid on commission basis. A HSA gets 10-15 per cent of the sales proceeds as commission. The BLCs are provided with commission @4% of the total sales proceeds of the Home shops coming under him and DLC gets 1% of the total sales in the district.

Home shop – a success story of community marketing?

There are large numbers of Kudumbasree micro enterprises in a district producing a variety of products – from rice to vegetables to curry powders to detergents to electronic items. Some Kudumbasree units have selected even marketing as their sole entrepreneurial activity. But with their limited experience and organizational capability, even those marketing Kudumbasrees found it very difficult to integrate between the production and the marketing. The absence of a common brand name for the products, lack of uniform quality, lack of storage and distribution facilities and lack of attractive packing were the main draw backs and reasons for their failure in the market. Through the Home shops, all the products of the Kudumbasree are marketed under common brand names and with attractive packaging, so that they could

compete with the branded products of the big companies in the market. A quality control laboratory with FPO license is also set up at the Block level to ensure the quality of the products. Economies of production are ensured through bulk procurement, decentralized production, centralized quality control and localized distribution.

The brand names under which the products are sold through the Home shops are- Green leaf (Rice powder, tea, masala powders, agro-processed products), Golden Dew (Cosmetics/ herbal soap, shampoo), Splash (Detergent powder/cake, washing soap and dish wash cake), Susthira (Ayurvedic health supplements (eg. Kadali rasayanam).

A midterm appraisal of the Home shop community marketing done by the Kudumbasree mission of Thrissur district (2010) indicated that a HSA working 2-3 hours daily could earn on an average an income of Rs.610 per month. The tea and soap powder units were found to be more profitable. The least income was received by 'rice powder- making' units. (Fig 3). This eventually point towards the need to support and strengthen the food processing units for scaling up their activities through sufficient backward integration with raw material producing SHGs. The average revenue generated from a Home shop was about Rs 6101/- per month. The average monthly income of the BLC was around Rs. 7000 and that of the DLC is Rs.14000 (Table 1). Even though the average income of one HSA was very meager (Rs.610/-), there were agents earning up to Rs.1500 per month. By scaling up the activities and expanding the coverage the monthly income could easily be enhanced.

Table.1 Income from Home shops in Thrissur.

Sl No.	Particulars	Rs/Month
1	Av. Revenue of Home shop	6101
2	Av. Income of HAS	610
3	Av. Income of BLC	7071
4	Av. Income of DLC	14142

(Source: District Kudumbasree Mission, Thrissur)

Some evidences from the field- were collected through a survey conducted among the home shop agents and the consumers in Kodakara block of Thrissur district in 2011, where the programme had been launched initially. Twenty home shop agents and 30 customers from Kodakara block were randomly selected for the response. The study revealed that nearly 75 per cent of the HSA have studied up to the SSLC level and 15 per cent have studied up to +2 level. All of them have been in this field since the last 6 months and were earning an income ranging from Rs. 200-300 per week. Sixty per cent of them catered to 25-50 houses per week and 15 per cent more than 50 houses in a week. The customers in the close vicinity came to the home shops for purchases and for distant consumers the HSA supplied the products

in their houses. On an average nearly 80 per cent of the HSA visited every house at least once in 5 days to sell the products. The range of products sold through the Home shop network included masala mix powders, rice powder, tea, detergent powder, herbal oils and cosmetics etc. The raw material for producing masala powder mix was procured centrally at the DLC level and distributed to the producer SHGs. The processing was done by processing SHG units and the products were procured at the DLC level. For other products like tea, the procurement was done centrally by the DLC and supplied to the SHGs for packing. This helped in lowering the procurement cost, which in turn was reflected in the low price of the product compared to similar products available in the market. The District Panchayat had provided a delivery van to the DLC to aid in the transportation of raw materials and products, thereby strengthening the Home shop system. The products were delivered to the BLC's office through the delivery van attached to the DLC. The BLC distributed the products to the HSA on a weekly basis, depending on the demand. The replenishment of the products at the HSA was done by the BLC. As of now, rice, fresh fruits and vegetables have not figured in the product list.

The consumer survey indicated that both cash purchase (60%) and credit purchase (40%) were done by the customers and the credit purchases would be repaid in a week's time. The HSA had better acceptance than the direct marketers among the customers with regard to acquaintance or familiarity with the agent, facility for credit purchase and trust. The HSA is easily identified by the customer as her neighbour, associated with one of the most credible poverty alleviation and economic empowerment programme; the Kudumbasree. Her identity as a Kudumbasree member gives her better acceptance among the customer households. The customer satisfaction was studied in terms of the quality of the products, safety, local availability and lower price compared to open market (Table. 2). Nearly 70 per cent of the customers responded that the products sold by HSA were better in quality and were safer as they believed that they were not adulterated. Only six per cent responded that products sold through HSA also were adulterated. Half of the customers opined that they were getting local products. Sixty five per cent responded that the prices of the HS products were less than the market price. All the consumers unanimously agreed to the loyalty and trustfulness of the HSA and that it is one of the factors that contributed to the success of home shops. The strategy adopted by the HSA to sell their products to the customers was depicted in table:3. Eighty per cent of the HSA responded that they persuaded the customers to affect the purchase on the basis of quality and 55 per cent believed that the lower price of the products was the deciding factor. It was the social objectives of the Kudumbasree and commitment towards the 'Kudumbasree' programme which persuaded 55 per cent of the customers to purchase the HS products. Another advantage of the programme in the opinion of the HSA was that they need to spend only 2-3 hours daily according to their convenience and that too in their own localities. Their other wise idling time could be effectively used for earning some income of their own. The major short coming of

the Home shop marketing pointed out by the consumers as well as the HSA was the “small size of the basket”. Only limited items had found place in the home shop racks and that too in insufficient quantity. For purchasing other consumables and groceries they have to depend on the local retailer who then hesitates to give them on credit basis which he used to give earlier, forcing them to do away with the home shops. The consumers opined that unless vegetables, fruits and groceries are supplied through the Home shop net work on a regular basis, the sustainability of the system would be in peril.

Table-2: Customers’ perception towards Home shop products

Sl. No	Particulars	Response (%)
1	Availability of better quality products	70
2	Availability of more safe food products	65
3	Availability of local products	50
4	Lower price	65
5	Loyalty and trust worthiness of HAS	100

Table 3 Strategy adopted by HSA to convince the customers about their products

Sl no	Particulars	Response of HSA(%)
1	Product quality	80
2	Lower Price	55
3	Convenient and proximity to home	15
4	Social objectives of KUDUMBASREE	55

(Source: District Kudumbasree Mission, Thrissur, 2011)

Home shop –where are they now? The Home shop community marketing network which had succeeded as a sustainable alternate system of marketing once is struggling to sustain its life today. The changed socio-political environment has really marginalized these small women entrepreneurs. A quick survey revealed that weakening of the managerial supervision at the District level and lack of monitoring has resulted in ‘drop outs’ at different levels in the network. Deterioration of the quality of produce supplied and nonpayment of the sale proceedings by the customers gradually led to the usual death of the system. Only 40 HSA are remaining now managed by a lady, who spelt out a plethora of limitations and lacunae in all stages. Even the distribution van sponsored by the District panchayat is not operational.

The home shops need revival; it has to be transformed from a marketing net work to a supply chain for the common man. Concerted efforts have to be put in from the Kudumbasree and the Govt and necessary hand holding has to be given to develop as a sustainable supply chain. The Home shops should scale up their production especially nature fresh products like milk, vegetables, fruits and grains and integrate them in the supply chain if it is to ensure the nutritional security of the people. The Home shops

The CGSAFED's studies on the needs and challenges of women in agriculture of the state be compiled to provide timely policy papers/briefs which should reach politicians, key technocrats and different departments and implementing agencies.

A large scale multiplication centre of drudgery alleviated small machines and tools will be initiated in KAU to enhance the availability of such devices among women in agriculture and allied sectors.

Intensive skill development and entrepreneurship development among women farmers and groups be imparted on selected and locally relevant areas of enterprises. Corresponding capacity building of the extension personnel and field functionaries in the region also be done for effective field support.

Efforts will be taken up to assess the extent of access and utilisation of the JLG and other bank credit schemes among the women in agriculture and to introduce effective measures of institutional co-ordination in place

The CGSAFED, KAU was entrusted to take up the action required for materializing the collaboration mooted.

List of Workshop Participants

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