



Agricultural Systems and Management



**CONTRIBUTION OF TRADITIONAL STRATEGIES TO ENHANCE
THE FOOD AND NUTRITION SECURITY IN *PALUGASWEWA*
CASCADE SYSTEM, SRI LANKA**

**G.P.W.S. Anuradha¹, N.M.K.C. Premarathne¹, G.A.S. Ginigaddara¹, and
A. Wewaldeniya²**

*¹Department of Agricultural Systems, Faculty of Agriculture, Rajarata
University of Sri Lanka, Anuradhapura, Sri Lanka.*

*²Janathakshan (GTE) Ltd, No.05, Lionel Edirisinghe Mawatha, Colombo 05,
Sri Lanka.*

Use of traditional knowledge in food production has started to die off in Sri Lanka at present. In the meantime, adverse impacts of climate change have resulted significant losses in the food production. However, the ancient dry zone cascade system produced enough food utilizing traditional knowledge. This research was carried out with four objectives to support the food security in the dry zone, accordingly, to determine the adoption levels of traditional knowledge in food production, to identify the constraints related to the use of local farming practices, to identify the women's role in ensuring the food security at present and to evaluate factors affecting household food security. A sample of 120 farmers was randomly selected from *Palugaswewa* cascade system in *Anuradhapura* district. A pre-tested questionnaire and four key personal interviews were administered for data collection. Results revealed that 52% of the respondents use traditional practices for food production, processing, storing and preservation. Meantime, 48% of respondents do not use traditional practices due to less popularity (33%), limited access to the traditional seeds and equipment (29%) and limited knowledge (21%). Further, 58% of female respondents engaged in agricultural activities on average (1.5 ± 1.34 hours per day). In this regard all most all female respondents spend at least one hour for activities such as food processing (65%), keeping food stocks (40%) and searching foods (59%). Generalized linear model results revealed that, food security score of households is impacted by age, marital status, household size, household income, land area, home gardening and traditional knowledge use at ($p \leq 0.05$). Based on the results, the strategies based on traditional knowledge play a vital role in food security enhancement in *Palugaswewa* cascade system, Sri Lanka insisting that traditional knowledge still should be promoted.

Keywords: Food production, Food security, Traditional knowledge

AGROTOURISM AS AN ADAPTATION STRATEGY FOR CLIMATE CHANGE IMPACTS IN TEA PLANTATIONS OF SRI LANKA

H.D.N.R. Godamanna¹, K. Wickramasinghe², and S.N. Dissanayake¹

¹*Department of Agriculture Systems, Faculty of Agriculture, Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka.*

²*Institute of Policy Studies of Sri Lanka, Colombo 7, Sri Lanka.*

The production of the Ceylon tea has been experiencing frequent negative fluctuations in the recent past. The phenomenon of climate change is one of the major reasons for the declined productivity and hence the income. Therefore, the tea plantation sector of Sri Lanka should concern more on income diversification methods as supplementary income sources. A blend between the tea and tourism industries has been identified as a possible solution in this regard. The study assesses the feasibility of tea tourism as an adaptation strategy for climate-induced income losses in the tea plantations in Sri Lanka. The study used a sample of 56 estates, selected through snowball sampling method. The required data were collected through a questionnaire survey together with key informant discussions and site observations. Primary data on general information, production details and the information on tea tours of the tea estates were collected during the survey. The collected data were analyzed using descriptive methods and Probit regression. The results of the regression analysis revealed that the estates with low land productivity, high labor productivity and small in scale of operation are more likely to adopt tea tourism as an income diversification method ($r^2 = 87\%$, $p < 0.05$). Almost every respondent believed that they experience loss of productivity even with a slight change of climate. As much as 83% of estates perceive the climate-induced fluctuations in tea revenue as a motivating factor for practicing of tea tourism. The study identifies the lack of government support as a major barrier in disseminating the tea tourism concept in the tea plantation sector of Sri Lanka. Further, the study finds that even at a very basic level, the concept of tea tourism contributes approximately two percent to the total income of the estate suggesting the potential to offset the climate-induced income losses in the plantation sector of Sri Lanka.

Keywords: Income, Productivity, Tea plantation, Tea tourism

**WILLINGNESS TO ADOPT GOOD AGRICULTURAL PRACTICES
(GAPs) BY VEGETABLE FARMERS IN ANURADHAPURA DISTRICT,
SRI LANKA**

A.A.M. Jayarathne and A.M.K.R. Bandara

*Department of Agricultural Systems, Faculty of Agriculture, Rajarata
University of Sri Lanka, Anuradhapura, Sri Lanka.*

Vegetables are an essential component in food production and consumption. Farmers tend to obtain a higher yield by adopting improper agricultural practices which are not recommended by the Department of Agriculture, Sri Lanka, leading to high cost of production and many health issues. Good Agricultural Practices (GAPs) have been introduced to vegetable farmers to mitigate the adverse effect of improper agricultural practices and increase profit. This study aimed to identify the level of adoption and the factors affecting the use of GAPs by the vegetable farmers in *Anuradhapura* district. A sample of 120 vegetable farmers from four DS divisions: *Thambuththegama, Galenbindunuwea, Rambewa, Medawachchiya* were selected using two stage purposive sampling technique. Semi-structured pre-tested questionnaire was used to collect information on demographic, production and cultivation factors. Level of adoption (LADOPT) of GAPs was calculated based on the numbers of GAPs adapted by farmers. Farmers were categorized as good, moderate and poor level of GAPs practitioners based on the LADOPT scores. Data were summarized using descriptive methods and multiple linear regression model was used to identify the relationship between LADOPT scores and other variables. Results showed that 28%, 40% and 32% of respondents practice good, moderate and poor LADOPT respectively. Good adopters have a higher income compared to the moderate and poor level of adopters. Sixty percent of vegetable farmers were willing to practice GAPs if they receive required the knowledge and information. Results further revealed that adoption of GAPs was significantly related with education level ($p=0.0489$), farming experience ($p=0.0340$), awareness on GAPs ($p<0.0001$), unit cost ($p=0.0096$) and unit income ($p=0.0086$). Awareness is a crucial factor for adopting GAPs by vegetable farmers. Appropriate training, extension and awareness programs are needed for popularizing the GAPs among vegetable farmers in *Anuradhapura* district, Sri Lanka.

Keywords: Adoption level, Good agricultural practices, LADOPT scores, Vegetable farmers

IMPACT OF DROUGHT ON FOOD SECURITY IN ANURADHAPURA DISTRICT, SRI LANKA

S.H.M.T.N. Senevirathna¹, L.P. Rupasena¹, and J.M.S.B. Jayasundara²

¹Department of Agricultural Systems, Faculty of Agriculture,

²Department of Environment Management, Faculty of Social Sciences and Humanities,

Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka.

Sri Lanka, a country in the tropical region has experienced cyclical droughts of high intensity, occurring in the intervals of three to four years. These droughts have had a series of adverse impacts on the household food security especially in areas with rain-fed cultivation. This study assessed the impacts of drought on food security by comparing normal and drought situations in minor irrigation areas and ascertained mitigation strategies adapted by households of the *Anuradhapura* district. The survey conducted by the Department of Environmental Management of the Faculty of Social Sciences and Humanities of Rajarata University of Sri Lanka in 2017 was used for the study. Data collected from 533 randomly selected households from eight divisional areas in minor irrigation schemes in *Anuradhapura* district were analyzed employing descriptive statistics and paired T-test using SPSS software. The results reveal that paddy productivity has reduced during the period of droughts by 49% compared to the normal season. The mean comparison between two periods found that drought has a significant negative impact on paddy productivity ($p < 0.05$) creating food insecurity of the households in the study area. Further, during the drought period majority households received insufficient incomes to meet the daily necessities and hence savings were utilized for essential household needs such as food (64%), children's education (28%), and health (21%). The major drought coping strategies used by households include consuming less amount of favorite foods (49%), borrowing foods (56%), reducing quantity of meals (27%), skipping meals (2%), reducing buffer stock of seeds (28%), use of food reserves (40%), collecting rainwater (76%), and food preservation (20%). Introduction of drought resistant paddy varieties, provision of credit facilities, renovation and reconstruction of village tanks, and popularizing of drought coping strategies among paddy farmers are needed to mitigate the impacts of droughts on household food security.

Keywords: Drought, Household food security, Paddy productivity

**FACTORS AFFECTING LOW ADAPTATION OF ORGANIC
VEGETABLE FARMING: A CASE STUDY OF KURUNEGALA
DISTRICT**

W.P. Madushankha and L.P. Rupasena

*Department of Agricultural Systems, Faculty of Agriculture, Rajarata
University of Sri Lanka, Anuradhapura, Sri Lanka.*

Although organic farming is associated with ecologically and economically sustainable form of agriculture, its adaptation is extremely low in Sri Lanka. Therefore, this study was conducted to examine factors affecting organic vegetable farming in *Kurunegala* district. A total of 100 farmers representing 50 each in organic and nonorganic were interviewed using a pretested questionnaire. Demographic analysis, binary logistic regression, and Likert scales were used to analyze the data. Demographic analysis showed that the family labor has a strong relationship with the adaptation of organic farming and women are more involved in organic farming (46%) than nonorganic farming (24%). Further, organic farmers are more educated having O/L or above (56%) than conventional farmers (46%). The likelihood ratio statistic of 40.61 is statistically significant ($p < 0.01$) showing that identified ten variables in logic model are major determinants of adaptation of organic farming. Number of family labor ($p = 0.001$), high demand for organic product ($p = 0.012$) and age of the farmers ($p = 0.002$) have positive impact while low yield of organic farming ($p = 0.019$) and farmer experiences in agriculture ($p = 0.001$) have negative impact on adaptation of organic farming. Income and cost of production have no significant impact on adaptation of organic versus inorganic vegetable farming. Nevertheless, a higher productivity of nonorganic farming was reported compared to the organic farming. Likert scale analysis showed that the majority of organic farmers have limited constraints compared to the nonorganic farmers. The problems of supplying of fertilizers, controlling pest and diseases and producing large quantities of organic products were faced by organic farmers at present. In conclusion, low adaptation of organic farming is mainly due to farmers' perception of low yield of organic farming, and lack of financial support to produce organic vegetables. Major recommendations for prompting organic farming are organizing farmer training and provision of credits.

Keywords: Nonorganic, Organic, Sustainable, Vegetable

DETERMINANTS FOR CONVERTING CONVENTIONAL TEA TO ORGANIC TEA FARMING IN *NELUWA SINHARAJA* BUFFER ZONE, SRI LANKA

C.S. Rubasingha, S.P. Dissanayake, and G.A.S. Ginigaddara

Department of Agricultural Systems, Faculty of Agriculture, Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka.

Promoting organic tea farming is getting popularized as conventional intensive tea farming which is also leading to emerging environmental and social problems. This study aimed to explore the determinants of farmers' conversion decision from conventional tea to organic tea in *Neluwa Sinharaja* buffer zone in Sri Lanka. A questionnaire survey of 200 organic and inorganic tea farmers was done in data collection. Descriptive analysis, Mann-Whitney test and logistic regression were employed in data analysis. Majority of farmers in both farming systems were male and within 41-50 age group. Moreover, farm gate prices of organic tea varied between Rs. 90-117 kg⁻¹, while conventional tea prices varied between Rs. 70-93 kg⁻¹. Organic tea farming reported better economic performances: high product price, maximum utilization of on-farm/community resources and low cost of production as well as better environmental performances like discharging non-polluted water, enhancing soil fertility and soil erosion compared to conventional tea farming. Logistic regression revealed that, farming experiences (OR=0.218), training participation (OR=4.348), access to extension services (OR=7.509), size of households (1.963), farm gate price (OR=1.829), yield (OR= -0.003) and total cost (OR=1.000) as determinants significantly ($p<0.05$) affecting on conversion decision from conventional tea to organic tea farming while land extent (OR=0.096) was significantly affecting determinant at 10% significance level in *Neluwa Sinharaja* buffer zone. The study recommends to focus on aforesaid significant determinants when motivating farmers to convert from conventional tea farming to organic tea farming in other potential areas in the country.

Keywords: Conventional, Determinants, Organic, Performance, Tea farming

PRESENT STATUS OF AGRICULTURE EXTENSION AND ADVISORY SERVICES PROVISION FOR FOOD CROPS IN ANURADHAPURA DISTRICT, SRI LANKA

S.H.D. Sellawaduge, A.M.K.R. Bandara, and A.I.Y. Lankapura

*Department of Agricultural Systems, Faculty of Agriculture,
Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka.*

The role of extension and advisory services is imperative for agricultural development. Recently, the performance of the extension sector in Sri Lanka, especially the state sector at key agricultural locations has been questionable. Thus, this study aimed to explore the status of agricultural extension service for the food crop sector at the *Anuradhapura* District. Multistage sampling technique was employed to draw a sample of 120 farmers representing major food crop categories. Descriptive analytical techniques, factor analysis, constraint analysis and Poisson regression were used for data analysis. Accordingly, compared to state sector (92%) private institutes offer extension services for selected farmers (47%), whilst the participatory approach is exercised by NGOs (16%). Though, majority of the teaching methods and information types offered by the state sector perceived to be ineffective, method demonstrations (77%), farm and office visits (68%) as teaching methods and varietal selection (59%), pest and disease management (62%) as information types were perceived to be comparatively effective. Farmer expectations on extension improvements were extracted from Factor analysis in to supplementary services (66% variation), qualities of extension agent (17%) and value of extension information (8%). According to constraint analysis, insufficient market-driven extension (19%) and lesser extension contacts at the field level (17%) and shortage of field staff (20%) and inadequate support services (17%) were the major constraints faced by farmers and extension agents respectively. The Poisson regression analysis revealed that the farmer's age, being an executive committee member of farmer organization and distance to extension office significantly affect the number of effective extension contacts. Compared to old - aged farmers (>55 years), younger farmers had more extension contacts ($Exp \beta = 2.5$), whilst extension contacts of executive committee members were increased by 40% ($Exp \beta = 1.4$). Altogether, the study recommends strengthening supportive services to minimize the ineffectiveness in the extension system.

Keywords: Effectiveness, Extension, Factor analysis, Poisson regression

IMPACTS OF PRESENT AGRICULTURE ON TANK ECOSYSTEMS IN SIWALAKULAMA CASCADE, SRI LANKA

**P.H.G.R.K. Wimalasiri¹, N.M.K.C. Premarathne¹, G.A.S. Ginigaddara¹, and
A. Wewaldeniya²**

*¹Department of Agricultural Systems, Faculty of Agriculture, Rajarata
University of Sri Lanka, Anuradhapura, Sri Lanka.*

*²Janathakshan (GTE) Ltd, No.05, Lionel Edirisinghe Mawatha, Colombo 05,
Sri Lanka.*

Land encroaching for cultivation and living purposes are leading reasons for deterioration of tank cascade systems threatening to their ecological integrity. This study evaluates the effect of present agriculture on the tank ecosystem in *Siwalakulama* cascade, *Galenbindunuwewa*, *Anuradhapura*. A sample of 120 households was randomly selected from four Grama Niladhari divisions in *Galenbindunuwewa* divisional secretariat division. Data were collected using a pre-structured questionnaire to ascertain the willingness to conserve of tank ecosystem and to compare past and present situations of vegetation in *Kattakaduwa* and *Gasgommana* areas. Data were analysed using a skewed logistic regression and descriptive methods. Further, water samples were collected three times from *Siwalakulama* tank after rainy season to assess physicochemical parameters. pH, EC, TDS, (NO₃⁻-N), (PO₄³⁻-P) and As, Cd, Hg were measured using standard procedures and, compared with the FAO irrigation water quality standards and WHO drinking water quality guidelines. Results revealed, tertiary education level ($p=0.031$), farming as an occupation ($p=0.027$), farming experience ($p=0.017$) have positive significant ($p<0.05$), impacts on willingness to conserve of tank ecosystem. The tested water quality parameters were within the permissible limits of FAO irrigation water quality standards. The mean value of lead (Pb) (0.01mg/L) in water samples was found as similar to the WHO standards(0.01mg/L). Also, there is a difference in vegetation between present and 20 years ago. For tank rehabilitation, 99% of respondents recommend to remove sediments of the tank and 53% recommend to restoration of *Kattakaduwa* and *Gasgommana* areas with commercial perennials. The results revealed that, there is an impact on present agriculture on the tank ecosystem of *Siwalakulama* cascade. The water can be utilized for agricultural purposes during the study period, but not for the drinking purpose. The study recommends to minimize the pollutant loading from farmlands and restoration of tank ecosystem for the sustainable utilization and conservation of the cascade.

Keywords: Tank cascade system, Tank ecosystem, Water quality

**FACTORS INFLUENCING SMALLHOLDER VEGETABLE FARMERS'
ADAPTATION TO CLIMATE CHANGE: A CASE STUDY IN NORTH
CENTRAL PROVINCE, SRI LANKA**

W.G.S. Ariyadasa and K.P.P. Kopyawattage

*Department of Agricultural Systems, Faculty of Agriculture, Rajarata University
of Sri Lanka, Anuradhapura, Sri Lanka.*

The smallholder vegetable farmers are highly dependent on rainfall and temperature for their agricultural needs hence are vulnerable to climate change. Vegetable production of the country dropped by 9.1% in 2017 due to adverse weather conditions. Adaptation is the key strategy to mitigate adverse effects of climate change on agriculture. Therefore, this study was designed to explore the factors affecting smallholder vegetable farmers' adaptation to climate change in Anuradhapura district. A pre-tested structured questionnaire was used to collect data from 150 respondents selected using multi-stage random sampling technique from three divisional secretariats. An index for climate change adoption was developed using Weighted Principle Component (WPC) method by categorizing similar adaptation strategies. Multiple Linear Regression model was used to identify the factors affecting different adaptation strategies. According WPC, six climate adaptation strategies were identified namely crop diversification, soil and water conservation, changing crop calendar, flood prevention, irrigation practices and off farm activities. Results of the regression analysis revealed age ($p < 0.05$), land ownership ($p < 0.1$) and use of extension service ($p < 0.1$) significantly increase the use of crop diversification strategies while only age ($p < 0.1$) significantly increase the use of flood prevention strategies. Use of soil and water conservation strategies are significantly increased by gender and age ($p < 0.05$) while engaging in off farm activities is positively influenced by household size and type of employment ($p < 0.1$). Gender ($p < 0.1$) and household income ($p < 0.05$) significantly affect the increased use of irrigation strategies. This study recommends that programs on climate adaptation strategies should consider the heterogeneity of the population and develop tailored programs meeting the diverse needs of different population segments. Moreover, future government policies need to focus on strengthening smallholder farmers' adaptive capacity through providing access to climate related information.

Keywords: Adaptation strategies, Climate change, Limitations, Smallholder vegetable farmers

PRODUCTION OF A VIDEO-DOCUMENTARY TO MOTIVATE FARMERS TOWARDS CLIMATE-SMART AGRICULTURAL PRACTICES IN THE DRY ZONE CASCADE, SRI LANKA

M.A.H.T. Madurasinghe and K.P.P. Kopyiawattage

Department of Agricultural Systems, Faculty of Agriculture, Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka.

Agriculture being highly dependent on climate, farmers who are engaged in agriculture-related livelihood activities have become vulnerable for the changes in the climate. Adopting climate-smart agricultural (CSA) practices is identified as one of the strategies to minimize the adverse effects of climate change. CSA being a new concept, awareness programs related to CSA need to be planned to motivate farmers towards adapting CSA. This study aimed at promoting the CSA concept through the production of an audio-visual material. In the pre-production phase, a survey was conducted in *Sivalakulama* and *Bandarakubukwewa* cascades to identify the level of awareness about CSA. According to the findings of the survey dramatic, personal, motivational and educational message treatment dimension combination was selected to develop the concept for the video. Field video recordings were conducted in the production phase. In the post-production phase, the video was evaluated with 35 graduates. Majority of them strongly agreed that the video was attractive (71%), understandable (77%), of good visual quality (63%), appropriately disseminate knowledge (89%), motivate farmers towards CSA (74%) and of good overall quality (86%). To evaluate the effectiveness of the video among farming communities, another survey was conducted with 35 rural farmers. The attitude and knowledge change before and after watching the video was tested using paired t-test. After watching the video about 91% of farmers were willing to practice CSA in the future ($p < 0.05$). To ensure understandability of the video a pooled t-test was conducted between farmer's and graduate's responses. Understandability and attractiveness of visuals and dialogues were not significantly different ($p > 0.05$), suggesting suitability of this video to disseminate and motivate farmers towards adopting CSA. Translations of this video in Tamil and English and making them available in public and social media is recommended.

Keywords: Audio-visual, Climate change, Climate-smart agriculture, Dry zone, Video production

COMMUNITY PERCEPTION ON SUSTAINABLE UTILIZATION OF KADUWELA WETLAND FOR AGRICULTURE, SRI LANKA

**W.R.M.D.P. Navarathne¹, S.P. Dissanayake¹, G.A.S. Ginigaddara¹ and K.K.
Kakulandara²**

*¹Department of Agricultural Systems, Faculty of Agriculture, Rajarata
University of Sri Lanka, Anuradhapura, Sri Lanka.*

*²Janathakshan (GTE) Ltd, No. 5, Lionel Edirisinghe Mawatha, Colombo 05,
Sri Lanka.*

Wetland agriculture is one of the significant farming systems in many developing countries with lack of cultivable lands and increasing population. *Kaduwela* wetland is such an important wetland situated in Western Province of Sri Lanka. Production of paddy and other crops of nearby farming community are affected due to water scarcity during *Maha* season and flooding during *Yala* season in *Kaduwela* wetland area. A questionnaire survey to collect primary data was done using 120 farmers to identify the community perception towards sustainable utilization of *Kaduwela* wetland for agriculture. Qualitative and quantitative analysis were used in data analysis. Results revealed that, 57% of the farmers are willing while 43% of the farmers are not willing to cultivate crops in the wetland. Majority of the farmers (87%) who like to cultivate upland crops were males. Majority of the farmers (78%) utilized their home gardens (< 1 ac) for upland crops. Factor analysis proved that, constraints in supportive services, irrigation issues, marketing problems and lack of technology as the major constraints in adaptation of wetland cultivation. Land extent {Odds Ratio (OR)=0.387}, knowledge on environment friendly farming practices (OR=0.070), knowledge on traditional farming practices (OR=14.696), farming experience (OR=1.126), and access to extension services (OR=0.202) were recognized as significant factors ($p<0.05$) influencing the adaptation for wetland cultivation whereas the occupation (OR=0.358) was significantly influencing at 10% significant level. The study also revealed that coping strategies like mixed cropping, intercropping, crop rotation, ridge and furrows, raised beds, incorporation of soil amendments, agroforestry practices with water logging condition, tolerant species and water conservation strategies are needed for sustainable utilization of *Kaduwela* wetland for agriculture. The study concludes that the majority in the community is willing to cultivate using suitable coping agricultural strategies in order to sustainably use the *Kaduwela* wetland for agriculture.

Keywords: Agriculture, Community perception, Wetland cultivation

**INFORMATION NEEDS AND SEEKING BEHAVIOR OF MINOR
IRRIGATION PADDY FARMERS TO MANAGE CLIMATE RISKS IN
ANURADHAPURA DISTRICT, SRI LANKA**

P.M.S.S Premasiri, S.P Dissanayake, and G.A.S Ginigaddara

*Department of Agricultural Systems, Faculty of Agriculture, Rajarata
University of Sri Lanka, Anuradhapura.*

A significant gap existing between available information of advanced technology in agriculture and what farmers actually practice to mitigate climate risks increases the vulnerability of minor irrigation paddy farming systems. This study aimed to investigate farmers' information needs, the determinants of information utilization and the constraints contributing to information seeking behavior in *Anuradhapura* district. Stratified random sampling method was used to select 200 paddy farmers in minor irrigation systems to conduct the questionnaire survey. Descriptive and quantitative analysis were occupied in data analysis. Descriptive statistics revealed that, majority of the respondents are males (67%), literate (94%) and representing the age group of 51-66 years (46%). The majority (65%) has paddy lands less than 2 acres. The most needed information by the respondents were information on extension services (75%), rain water harvesting methods (74%), climate and weather forecasting (65%), newly improved varieties (59%), weed control techniques (57%) and paddy storage and paddy marketing plans (57%). The Garret's ranking method identified the significant challenges for climate change adaptation as wild animal attacks, lack of access to finance, high cost of adaptation measures, poor access to farm inputs and lack of awareness on information communication technology respectively. According to logistic regression results, respondents' age {Odds Ratio (OR)=0.941}, gender (OR=0.434), education level (OR=23.020), land extent (OR= 1.773) and participation for training (OR= 2.692) are significantly ($P<0.05$) influencing the information seeking behavior of them. Moreover, most severe constraints contributing to information seeking behavior were lack of awareness of information sources (69%), lack of finance (60%), lack of infrastructure (50%), and language barrier (42%) since many information comes in English language. Therefore, the study suggests the need of improvements in private and public extension services to make farmers aware on updated information sources and motivate farmers to seek more information in order to mitigate climate change risks of minor irrigation paddy farming systems in *Anuradhapura* district.

Keywords: Climate change, Information needs, Paddy farming system,

**SUSTAINABILITY ASSESSMENT OF WETLAND PADDY
ECOSYSTEM IN URBAN *KADUWELA* AREA, SRI LANKA**

**R.D.A.K. Ranasinghe¹, G.A.S. Ginigaddara¹, U.A.D.P. Gunawardena² and
K.K. Kakulandara³**

¹*Department of Agricultural Systems, Faculty of Agriculture, Rajarata
University of Sri Lanka, Anuradhapura, Sri Lanka.*

²*Department of Forestry and Environmental Science, Faculty of Applied
Sciences, University of Sri Jayewardenepura, Sri Lanka..*

³*Janathakshan (GTE) Ltd, No.05, Lionel Edirisinghe Mawatha, Colombo 05,
Sri Lanka..*

Riverine wetlands are known as one of the most productive ecosystems in the world and have been used for paddy cultivation for eras. *Kaduwela* wetland ecosystem is one of such wetlands in Colombo district of Sri Lanka and situated in western part of the *Kelani* River basin. Long term intensive paddy farming practices have led to loss of original characteristics of this natural wetland ecosystem. This study attempted to assess the sustainability of *Kaduwela* wetland paddy ecosystem and farmers' perception on ecosystem services. A questionnaire survey was conducted for 100 paddy farmers of '*Mahasen* farmer organization'. Data were analysed using multiple linear regression. Total sustainability index (TSI) for the paddy farmers with social, economic and environmental components was calculated. Results revealed that only 3% of the farmers are sustainable ($TSI \geq 0.5$) while 97% ($TSI < 0.5$) are vulnerable. Regression results revealed that, profitability, farmer education level, frequency of extension services, women participation in agricultural activities, hired labour/acre and farming experience are significantly ($p < 0.05$) influencing on adoption of sustainable agricultural practices by the paddy farmers in the area. Farmers identified flood controllability and provision of habitats for flora and fauna as the most important services from this ecosystem. Overall results emphasized that, though there are significant drives for sustainability in the system, there are less adoption of sustainable agricultural practices among the farmers due to less government intervention, less availability of organic manure and lack of extension services for the farmers. The study concludes that the *Kaduwela* wetland paddy ecosystem is vulnerable for degradation due to lesser adoption of sustainable agricultural practices by paddy farmers. Hence, the study suggests the need of government support and intervention in promoting sustainable agricultural practices for maintaining ecosystems services in *Kaduwela* wetland paddy ecosystems in Sri Lanka.

Keywords: Ecosystem services, Paddy farming system, Sustainability, Wetland

A MODEL TO CALCULATE WOMEN'S CARE ECONOMIC VALUE IN HOUSEHOLDS: A CASE STUDY IN KANDYAN HOME GARDENS, SRI LANKA

S.C. Ranasinghe¹, K.W.H.A.N. Somaratne², G.A.S. Ginigaddara¹, and N.M.K.C. Premarathne¹

¹*Department of Agricultural Systems, Faculty of Agriculture, Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka.*

²*Consultant (Freelance) in Gender, Social Capital and Rural Community Development, Sri Lanka.*

Women's primary role as care givers in the domestic sphere is not valued yet economically. Women's involvement in home gardening for household consumption is one of the care role dimensions that attempted to value in this study. The sample consists of 120 female *Kandyan* home gardeners, were selected from *Medadumbara* Divisional Secretariat Division in *Kandy* district using multistage sampling. A pre-tested questionnaire was administered for data collection and MS-Excel Software (2010) was used for data analysis. The concept of opportunity cost was applied to calculate the forgone income for the respondents from home gardening due to her involvement in other care economic activities at home. The real labour market values were used to calculate it. The study considered six most common activities pertaining to home gardening and its relationship to consumption along with six other domestic activities performed by a typical woman in the area. The labour-days spent for all activities by a woman and prevailing daily labour wages in the study area were accounted in calculations. The selected most common domestic activities included caring for child/elderly/sick, meal preparation, washing/laundry, housekeeping, fuel-wood collection, and home-decoration. A weightage factor was adjusted to each considered home gardening activity considering the relatedness (as a percentage) of personal labour contribution to consumption. The total of the mean cost of labor of selected home gardening activities for consumption (LKR 4,488) and mean cost of labour of selected domestic activities (LKR 42,057) per month were interpreted as the care economic value in the sample and it is LKR 46,545. The total monthly income level of approximately 74% of the respondents in the sample is in the range of LKR 25,000 –50,000. Based on the results, the study concludes that the women's care role has a significant economic value. Therefore, valuation of women's care role and developing reliable methods and tools for such valuation are very important. These measures will eliminate the belief of women's domestic work has no value.

Keywords: Economic value, *Kandyan* Home gardening, Women's care role

**HOME GARDENING FOR FOOD SECURITY AND INCOME
GENERATION OF WAR AFFECTED WOMEN-HEADED FAMILIES IN
CHEDDIKULAM, SRI LANKA**

**S.A.S.R. Senarathna¹, G.A.S. Ginigaddara¹, A.N. Kodithuwakku¹, and
V. Vimaladhas²**

*¹Department of Agricultural Systems, Faculty of Agriculture, Rajarata
University of Sri Lanka, Anuradhapura, Sri Lanka.*

²Community Seed Bank, 2nd farm, Muhanthankulam, Cheddikulam, Sri Lanka.

Home gardens (HG) are dynamic and sustainable food production systems, which have been reported as an older land use system next to shifting cultivation in Sri Lanka. It plays a vital role in supporting households through providing foods, fuel wood, building materials, fodder for livestock, and generation of income. Home gardening was introduced as a viable strategy to ensure food security and income generation method among unemployed women-headed families in *Cheddikulam*, Northern Province of Sri Lanka to mitigate the effects occurred due to lasted civil war in the area. This study was conducted to assess the role of HG in food security and income generation of war affected women-headed families in *Cheddikulam*. Hundred home-gardening women-headed families in *Cheddikulam* divisional secretariat were randomly selected. Primary data were collected through pre-tested questionnaire, key personal interviews and focus group discussions and analyzed quantitatively and qualitatively. Both Shannon Wiener diversity index (SWDI) and Simpson's diversity index (SDI) were calculated. The SWDI obtained a value of 0.6723, while SDI obtaining a value of 0.4999 eliciting higher agro biodiversity in HG. Further, paddy was reported as the most dominant annual crop species (SDI = 0.1994) and banana was recognized as highest dominant species (SDI = 0.0743) among perennial in HG. Results revealed that contribution of HG for the monthly income of the households is 24.45%, which is a considerably a higher value. Further, average household dietary diversity score (HDDS) of the population was 7.31 and 66% members belonged to highly food secured group (HDDS>6.5). Results conclude that the contribution of home-gardening for food security and income generation is considerable in women-headed war-affected families in *Cheddikulam*. Hence introducing home gardening to potential other rural localities would be a worthy investment for ensuring food and income security of rural livelihoods in Sri Lanka.

Keywords: Food security, Home gardening, Income generation, Women-headed families

**EXPLORING THE PERCEPTION OF LOCAL COMMUNITY AND
POTENTIAL TO INTRODUCE AGRO-TOURISM IN *PALUGASWEWA*
TANK CASCADE SYSTEM**

**G.W.G.V.M. Dayarathna¹, S.P. Dissanayake¹, G.A.S. Ginigaddara¹, and
K.K. Kakulandara²**

¹*Department of Agricultural Systems, Faculty of Agriculture, Rajarata
University of Sri Lanka, Amuradhapura, Sri Lanka.*

²*Janathakshan (GTE) Limited, Lionel Edirisinghe Mawatha, Colombo 05,
Sri Lanka.*

The process of attracting visitors and travellers to agricultural areas is known as Agro-tourism. It also can be recognized as a strategy that can enhance rural agricultural livelihoods. Sri Lanka as an agricultural country has many potentials to promote Agro-tourism aiming sustainable rural agricultural development. The Cascaded Tank Village System (CTVS) is a connected series of tanks organized within a meso-catchment of the dry zone landscape. This is mainly used for storing, conveying, and utilising water from an ephemeral rivulet. There are high biodiversity, agricultural lands and scenic beauty around the CTVS. Hence, there is a huge opportunity to involve in Agro-tourism activities in these areas. However, occupants in CTVS seem having lesser awareness and interest in Agro-tourism in it. Thus, the objective of this research was to explore the potential and perception of local community to develop sustainable Agro-tourism plan in *Palugaswewa* CTVS which was recently nominated as a world heritage. Simple random sampling method was used to select 234 respondents. Collected data through field survey, focus group discussions and key personnel interviews were analysed by SAS and Minitab. Logistic regression results revealed that, gender [Odds Ratio (OR)=2.849], primary occupation (OR=3.284), engaging in tourism activity (OR=6.333), awareness about upcoming Agro-tourism plan in *Palugaswewa* (OR=8.106) are significantly ($p<0.05$) affecting the participation for Agro-tourism by the villagers. The factor analysis revealed that social, social welfare, environmental and land associated factors are significantly ($p<0.1$) affecting for community perception on Agro-tourism. According to the thematic analysis, CTVS itself, wild animal tours, nearby *Habarana* and *Ritigala* tourism hotspots, traditional agricultural practices, available ancient ruins in the area and infrastructure facilities are some potentials and possible ventures for Agro-tourism in the area. Therefore, there is a potential for introducing a sustainable Agro-tourism strategy in *Palugaswewa* cascade in Sri Lanka.

Keywords: Agro-tourism, Cascaded tank village system, Logistic regression, Social welfare