F-01	**F-06**	**F-11**	**F-16**	**F-21**	**F-26**
F-02	**F-07**	**F-12**	**F-17**	**F-22**	**F-27**
F-03	**F-08**	**F-13**	**F-18**	**F-23**	**F-28**
F-04	**F-09**	**F-14**	**F-19**	**F-24**	
F-05	**F-10**	**F-15**	**F-20**	**F-25**	

F – 01

Rain forests are sources of direct consumptive use values for many people. Although non timber forest products. (NTFPs) have marketable use values, they only rarely enterinto the calculations of forest enterprises. However, these products contribute substantially to the rural economy. Yet with the establishment of products areas, NTFP collections often face restrictions. However, these ecological and socio-economic issues related to NTFPs have not been addressed scientifically. This is mainly due to the lack of information to justify the role of non-timber forest resources in forestry sector development. Therefore determination of the value of NTFPa collected from the Sinharaja Rain Forest Reserve was the main objective of this study.

Four methods of primary data collection were applied for the study namely, household survey, informal interviews, direct observations and market survey. Twelve villages with varying degrees of relationships with the forest were selected for the survey.

A total of 216 households were surveyed. It was observed that resource use patterns of the villagers have changed due to the restrictions imposed by the reserve authorities. Villages differ considerably in their resource use patterns. Economic values of five forest products namely fuel wood, food building materials, kitul products and medicinal plants were estimated using shadow prices. A total of Rs. 330 worth NTFps are being collected annually from a hectare of the Sinharaja forest. This value was comparable to what has been reported in the literature.

There is a considerable dependency of villagers on the forest for NTFps. Therefore, any decision on the forest or the reserve state of the forest has to be associated with due consideration on the contribution of NTFP to the local economy.

F – 02

Rapid degradation of forests due to direct exploitation conversion into other land users is a major problem faced by the world. Conservation values of forests have not been identified, quantified or valued resulting in under-investment in conservation. Total economic value (TEV) provides a comprehensive framework for valuing complex environmental asses such as tropical rain forests. TEV comprises of several component parts, mainly use values and non-use values. Both use and non-use values can reside in the host nation or globally (all nations other than the host nation).

The concept of TEV is important when a decision has to be taken regarding land use options of a tropical rain forest. The development option could go ahead only if the development benefits are higher than the benefits of conservation (that is TEV) and costs

of development. The objective of this paper is to discuss some practical problems of using TEV approach in determining conservation benefits of tropical rain forests.
TEV of the Sinharaja Forest Reserve was estimated using several environmental economic methods, mainly the contingent valuation method. The TEV (net present value) Was Rs 3.8 billion. However, local values only accounted for 0.5% of the total value which demonstrates the importance of often unrecognized global values.

The under solved issues of TEV could be discussed from t=ethical, biological and economic stand points. First, although the TEV concept includes several types of values, they are not completely distinct. They are interrelated from a biological point of view and adding them up will result in double counting. From an economic point of view, there are obvious trade-offs among different values and only the compatible values should be added together. The estimation of TEV needs the use of various techniques and the final value will retain the inherent problems of those techniques. From an ethical point of view, TEV is only able to capture anthropocentric values and it does not stand for intrinsic values.

There are several other values of forests that cannot be given monetary value due to lack of appropriate methods. In addition, the values of future generations are not taken explicitly into account in estimating TEV. Due to above shortcomings, the use of total economic value in decisions regarding rain forests needs further consideration.

F – 03

The immiserising growth refers the driving down of the welfare of the growing economy to a lower than its pre-growth level as a result of continued deterioration of terms of trade (TOT). Sri Lanka, being a typical developing economy has been experiencing many conditions and problems, which are common to most of the other developing countries.

Sri Lanka has adopted the export-led growth strategy since 1977. This process was further strengthened in 1989 under the Structural Adjustment Policies. However, Sri Lanka has failed to achieve its expected goals of economic stabilization even at the end of the present century. Therefore this experience of Sri Lanka provides a major impetus to the immiserising growth hypothesis.

Main objective of this study was to test the validity of immiserising growth hypothesis to Sri Lanka in the period 1970-1997. Data extracted from annual reports of Central Bank of Sri Lanka were used in an econometric model to compute the change in TOT effect to estimate the change in welfare during the study period.

Empirical results confirmed the validity of the hypothesis in the case of Sri Lanka. TOT effect on changing the welfare has declined from 330 in 1970-77 to 858 in 1978-97 in constant US dollar terms. The policies directed at supply management of exports through export diversification and regional negotiations are vital for increase the price of exports and in turn to achieve a meaningful economic growth in the country.

F – 04

Until very recently population aging was thought to be concern only to a limited number of developed countries. But today an increasing number of developing countries all over the world are experiencing not only a high percentage of the elderly population but also increasing rate aging. This study proposes a projection model to replicate past and future demographic and socioeconomic changes as recorded in time series data and produce projections and generate indices describing the population aging and its consequences. This paper also discusses the future national policies in the sphere of population and related fields.

The population aged 60 years and over Sri Lanka will rise 1.8 million in 2000 to 7.0 million in 2051. IN consequence of this phenomenon the proportion of elderly population rises from nine percent in year 2000 to twenty eight percent in 2051, the child dependency ratio reveals a decreasing trend, while the old age dependency ratio shows an increasing trend. Also, rural based elderly is considerably high, female widowhood is prominent.

It is evident that demographic factors compounded by Modernization, Industrialization and Urbanization have brought about serious changes in the social values of the people, leading to the gradual breakdown of the extended family. All these factors clearly show that eldery population in Sri Lanka is a vulnerable segment. The aging population has become a social problem as much as a social process, which needs serious attention of the state.

F – 05

Social malaise is often manifested in behavioral reactions of individuals against people or on the built environment. Theft and robbery and vandalism and graffiti are some of such reactions. Defensibility, surveillability and territoriality of space are vital in deterring offenses against people and the built environment. Examining this notion with reference to the public housing in Colombo. A general study in 38 public housing schemes and two case studies were conducted. The incidence of vandalism and graffiti in relation to their location and extent of damage were recorded. Causes of offences were studies by conducting unstructured interviews with randomly met residents.

Findings show that housing blocks having more than four floors, under-utilised public spaces and unconcealed service networks are more vulnerable to vandalism and graffiti undefined spaces, pocket spaces formed by unauthorized additions, and under-utilised green areas in the immediate vicinity of the housing blocks are also vulnerable. The interviews revealed that the offenders are mostly residents or accomplices of residents. These findings indicate that surveillability and territoriality of space are vital in deterring offenses against the built environment. However the nation of defensible space may not be applicable in the same manner since the offenders are from the same community.

F – 06

Bomb explosions have increased in number as a result of the ongoing-armed conflict in Sri Lanka. Understanding physical and psychological sequelae of such victims is important for planning rehabilitation services effectively. A study was conducted to understand the nature of the experiences of surviving victims of selected bomb blasts during 1995-96 period. Respondents to a notice offering medical, psychological and legal assistance for bomb blast victims, inserted in local newspapers were requested to answer a questionnaire. Twenty-two males and seven females were in the group. Their age range was between 17 years to 62 years.

Body ache, head ache and constant tiredness were the most common physical sequelae as reported by respondents. Difficulty in breathing, loss of appetite, pain in chest area and discomfort in palpitations were reported with lesser magnitudes. Twelve and ten victims experienced partial blindness and partial deafness, respectively. Two victims were totally blind while two were totally deaf. One victim had lost a limb.

Feeling of constant fear or sadness and depression were most dominant among psychological sequelae. Nightmares, constant feelings of anger and aggressiveness, loss of memory, and inability to concentrate were less reported. Feeling of shame and insomnia were identified by only one person.

Finding indicate that experiences of bomb blast victims from in Sri Lanka is similar to those from other countries. Constant fear, feeling of sadness and depression are dominant among their experiences. Ramifications of these psychological injuries alter persons' social relationships and productivity and thereby likely to cause adverse effects on the society. Focus of the present study is limited as it describes experiences of only those were responded the newspaper advertisement. Victims of bomb blasts are in number and a broader study is important to understand the complex effects of these traumatic experiences.

F – 07

Among other reasoning techniques, the so-called scientific method has gained a big popularity. Science is fundamentally based on observations and uses the reasoning technique conclusions are always liable to be falsified and it is taken as the strategy for invention of new theories in science. Sine, science is popular many people try to show that their own disciplines are also science.

In this vin, some conventional Buddhists tend to describe that Buddhism is scientific. Unfortunately, they have forgotten the essential characteristics of science. We are confident that no Buddhists want to say that Buddhism is incomplete and liable to be falsified. Those Buddhists put forward this argument yet because some inventions in modern science coincide with what the Buddha had said. That is a misunderstanding of what the scientific method is. Just because two disciplines talk of the same theme in the same manner, it does not imply that two disciplines are the same.

So, such attempts to interpret Buddhism as a science really destroy the core of Buddhism. Of course, reasoning techniques used in Buddhism are much broader than those used in science. In fact, the reasoning techniques used in Buddhism even go beyond the twofold deductive reasoning in mathematics, which is truth preserving, and postulates the idea of multi-valued logic as well. Buddhism should be considered as a discipline, which uses different reasoning techniques as appropriate rather than as a science. So comparison between science and Buddhism is misleading.

F – 08

Essay type questions are used in most of the test papers in the GCE AL Examination. A fairly common practice in the use of essay questions is to give options to students to select questions. Despite the pervasiveness of this technique, however, most testing experts agree that such a procedure is not good testing practice. These warnings concerning the use of options on essay examinations usually center on the issues of content validity, reliability, and undesirable study habits. If, however it is necessary to allow a choice of questions, it is important to try to ensure that the questions are of equal difficulty and marked with equal severity.

The purpose of this study is to investigate the extent of the use of optional questions in essay type papers in the AL Examination and check whether the questions are constructed in accordance to the testing principles mentioned above. These objectives were investigated through a study of test papers set for Economics in the GCE-AL Examination. It was revealed that the use of optional questions has caused inter-item variability in Economics papers. Questions with different cognitive abilities are included in sub-parts but most of the questions are constructed on the comprehension ability. If the difficulty of a question considers only on the facility index, considerable paper. Consequently giving options in such a case cannot have a serious effect on the fairness and the validity of the examination.

F 09

The Entrance Examination of the Sri Lanka Law College has been changed with effect from the year 1999. The revised examination will consist of a two hour paper titled 'Background to the Law' in place of the earlier two papers on General Knowledge & Intelligence and Language. The Model question paper given in the Course Book consists of two parts; 1, 45 multiple choice questions, part 11, 20 structured essay type questions. For purposes of this research and in keeping with its objectives the 45 MCQs in Part 1 of the Model Paper were analyzed as the examiners were keen to get feedback on the effectiveness of the MCQ items.

The main purpose of this study was to appraise the effectiveness of the MCQ test items in order to provide a basis for increased skill in test construction. The model question paper was administered to a sample of 224 first year students. Facility indices and discriminative indices of items were used to assess the effectiveness. Of the 45 MCQ items of the used with slight revision. A percentage of the items (about 10) should be reconstructed, as they are too easy for a competitive examination.

F 10

Integration of livestock in crop based agriculture is preferred due to several reasons. Goats are reared as the livestock component of farming systems, especially in dry areas. However, for many poor rural families goat farming is unable to provide a sufficient means of survival. A study was carried out to identify potentials and constraints in goat farming in rural areas of Hambantota District of Sri Lanka. Hundred farmers selected at random from five divisional secretary's divisions were interviewed using a pre-tested structured questionnaire. Livestock development instructors, market middlemen, farmer-leaders and potential farmers were also interviewed. Free grazing is the most common management system in the area. Inadequate management practices has led to high kid mortality rate. Management of herds is comparatively better in remote rural areas than in urban areas.. Although, a potential demand exists for milk and milk products, milking is not practiced. Farmers confront legal and social barriers in operations such as transporting and processing of animals, and inadequate veterinary services are identified as the most dominant constraints for development of the industry. Goat farming in small scale is not economical due to presence of economies of scale.

Producer's co-operatives or similar organizations would help to obtain the benefits of economies of scale through production of milk and milk products, and finding solutions for marketing problems and socio-legal barriers. Selecting remote areas as target areas in introducing goats would lead to higher success than such programs in urbanized or irrigated areas, where well integrated diverse economic activities already exist.

F 11

The unsettled situation due to the insurgency in Sri Lanka has continued for over a decade leading to severe effects on the economy of the country. Thirty five percent of asweddumised paddy land in the country lies the within northern and eastern provinces where the insurgent situation is intense. This study attempts to value possible losses to the paddy production of the country as a consequence of reduced production in the region.

Data on paddy production published by the Department of Census and Statistics for the period 1975-1995 were analyzed to quantify and value possible losses due to the prevailing situation. All dry-zone districts in the country were used to from two groups as "the standard "and "the affected". Periods 1975-84, and 1895-95 were considered as "normal years" and "affected years", respectively. Each affected correlation shown during the normal period. Trends of behavior of all determinants of output were analyzed using OLS regressions. Dummy variables were employed to represent the differences between two groups and the two periods.

The analysis proved the decline of cropping intensity in the maha season and yield in the yala season after 1984. Potential production in affected years was estimated using potential cropping intensity and potential yield for each district, assuming that affected districts behaved similarly as their counterparts. The difference between estimated production in actual situation and standard situation was calculated for each district. This physical loss was valued at the current market price.

The cumulative value of production loss for the period 1985-95 due to unsettled situation is estimated at Rs 5993 million. In constant 1982 rupees in the Maha and Yala seasons respectively.

F 12

The East Coast Veddas are one of the three major groups of indigenous people in Sri Lanka. A chena cultivating and hunter gathering type of lifestyle has changed due to various factors. Most of the present Veddas are agricultural laborours and seasonal fisherfolk. The objective of the study was to evaluate empirically the general belief that the Veddas are inferior in economic position. Data were collected from four villages: Kuluvenkerny, Parakaimadu, Nasiventivu and Mankerny, which still retain a Vedda identity. All families in the villages were interviewed and a questionnaire survey was also conducted.

Percentages of permanent houses in Kuluvenkeny and Parankaimadu were fifty and seventy six, respectively. These figures are high when compared with the district average of thirty six percent. In contrast, Nasiventivu and Manketrny reported lesser values as twenty-five and thirteen, respectively. Twenty five percent of households in Kuluvenkerny had pit latrines. Other villages had no reports on any type of latrines. Kuluvenkerny also reported a higher literacy rate than the district average while that in other villages was less. People in Kulvenkerny had higher in comes than other three villages.

Kulvekerny is situated close to the sea and the close proximity of the village to the main road facilitates fish marketing. Lifestyle in this relatively less disturbed when compared to that of villages that dominated chena cultivation this leads to higher and stable household incomes, which is followed by higher socio-economic status. A non-governmental organization is the causal agent for high percentage of permanent houses in Parankaimadu.

Results show that some vedda communities have higher socioeconomic status thus the general belief of low socioeconomic status of East Coast Vedddas cannot be generalized all communities.

F 13

The Veddas are considered as indigenous people in Sri Lanka. Three major groups of veddas are identified as, east-coast, south-east and north-central. The most recent census on vedda community has been conducted in 1924, which reported 51 villages as inhabited by veddas. Various forces have had their impact on lifestyle and identity of veddas. A study was planned to review the present situation and relate that to situation reported by the previous census. All villages reported by the 1924 study was visited.
The study showed that number of village where vedda communities are living as reduces to forty-five. Factors contributed to this reduction are diverse. Migration and subsequent assimilation due to irrigation schemes were recorded in villages within Poratiuv and Manmunai North divisions. Veddas were not reported in villages within

division due to assimilation with surrounding Tamil villages. In Eravurpattu division veddas are concentrated in Kaluwenkerny which is a near the sea.

Koralaipatt east division reported the highest concentration of veddas. Their main occupations were agricultural laborer or seasonal fishing. This division is isolated from the rest of the area due to poor infrastructure and lack of politics. This physical and social isolation has been major cause for retaining the identity of veddas.

F 14

Landslides have become common natural disasters in Sri Lanka in terms of loss of lives and properties. The study of socio-cultural aspects of landslide-prone areas is important for assessment of risk at regional level. A study was conducted in Yatiyantota landslide area in Kegalle district with the objective to study the existing socioeconomic conditions of the communities, to ascertain their aims and aspirations, and to estimate the value of land and property in a landslide-prone area. Three categories of households (i) affected and yet to be rehabilitated/relocated (ii) not affected but living in high-risk areas, and (iii) relocated areas were interviewed using a structured questionnaire following a base map of the area. Dialogues with selected households and discussions with real estate traders and other relevant organizations were other research methods employed in the study.

Main reason for people to live in the area is its close proximity to main roads. Total value of land and properties are estimated at Rs 14 million. Labour force participation is about sixty six per cent. Male to female ratio is higher than the national average. Limitations in relocating the affected people to safe locations include inadequate employment opportunities and other essential services. People prefer to be within 5 km of the present location if they are relocated.

It observed that the continued concentration of people into this area and their activities have had a direct relationship in inducing landslide in the area. The cumulative effects of these losses broadly threatened the economic and social life of the people who reside in Yatiyantota landslide area and will continue to be severe if total numbers of households are not relocated.

F 15

Fertillzer subsidy scheme in Sri Lanka in 1952 and continued until it was abolished in 198. The scheme was restored in 1994. All major fertilizers were subsidized until 1997. At present the subsidy is give only for urea. Almost all the fertilizer requirement in Sri Lanka is imported. Urea accounts for more than a half of all imported fertilizer.

Private sector dominates in the industry. Importers operate their own networks for distribution of fertilizer. Rate of subsidy is decided by the National Fertilizer Secretariat, the state agency responsible for implanting the subsidy program, after negotiations with importers. The purpose of this study was to examine the implications of fertilizer subsidy scheme on its three major stakeholders, traders, the government and farmers.

The study indicates that as subsidy rates are determined according to the importers' cost structure, a substantial amount of subsidy passes to traders through the process of price determination. Furthermore, margins of traders have in creased recently. Actual government expenditure for the fertilizer subsidy in recent years is more than Rs. 2.5 billion. This exceeded the budgetary allocation of Rs 1.5 billion. Thus, despite the removal of subsidy in fertilizers other than urea, the government's burden on fertilizer subsidy has not been eased substantially.

The world market price and as a consequence the import prices of urea has reduced to a half of its previous value. The farm-gate price of urea has remained constant. The protection provided to farmers through the scheme is decreasing. Although national level figures show high levels of urea consumption, district level figures prove that its use is inadequate in some districts, this study concludes that as a lager share of benefits is passed on to the importers, urea subsidy has given little consolation to the farmer under the present situation.

F 16

Desiccated coconut (DC) is the main coconut based product in Sri Lanka. Desiccated coconut industry has thrived profitable for more than 100 years. Sri Lanka ranks as the second largest DC exporter in the world, providing approximately thirty per cent of the world demand. This study was designed to determine the constraints faced by the Desiccated Coconut industry at present. A survey was carried out in 30 DC mills in Gampaha and Puttalam, the main DC producing districts in Sri Lanka.

Results indicate that the industry still maintains its profitability. However, production is substantially affected due to inadequate supply of fresh nuts. Shortages of fresh nuts lead almost all the factories to stop operations during slack months and to work below potential during the rest of the year.

Fragmentation of coconut lands poor quality of existing lands and high domestic use of fresh nuts are main causes of scarcity of nuts. Shortage of skilled labour is also a constraint faced by the industry. Employees seek alternative employment opportunities, as the fluctuating demand of Labour by the industry is a disincentive for them to adhere to work in DC mills. Marketing of products in the world market is becoming increasingly difficult as competitive countries maintain their cost of production at a lower level.

It is evident that all major constraints in the industry are related directly or indirectly with limited supply of fresh nuts. As increasing nut requirement for domestic consumption and lesser nut supply due to decreasing production, the present situation is likely to continue predicting that the future of DC industry in the country does not seem to be bright.

National policies should be formulated to address the issue of limited nut supply to the DC industry in order to prevent this adverse situation to maintain the viability of the industry.

F 17

A considerable share of cost of production in rice is attributable to expenses on chemical inputs. Integrated Pest Management (IPM) reduces adverse environmental effects caused by pesticides. Lower quantities of chemicals reduce cost of production by reducing cost of chemicals as well as that of applications. The objective of this stud was to understand the economics of rice production using IPM at the farm level.

This study was carried out in a rice growing area in the dry zone of southern Sri Lanka. One hundred farmers selected at random participated in the study. Field investigations were conducted during 96/97 Maha season. Farm level gross income and cost of production in rice cultivation for IPM and non-IPM farmers were recorded separately.

Rice yield reported by two groups of farmers did not show a significant difference. However, cost of production of IPM farmers was significantly lower than that of non-IPM farmers. As a consequence the difference of average gross margin per hectare of rice, realized by an IPM farmer was Rs. 8000 higher than a non-IPM farmers was.

A detailed analysis of costs revealed that IPM farmers incurred as per hectare chemical costs for insect-pest control only an average fifteen percent of that of non-IPM farmers. Average spraying frequency per season has reduced from three to one. This indicates that farmers who use IPM techniques are prudent to reduce insecticide use and still to maintain yields.

The results indicate that IPM techniques lead to increase gross margins of rice production at the farm level. It is revealed that economic benefits of IPM at the farm level are derived from low expenditure on chemicals and labor. Thus dissemination of information on IPM techniques and its potential profitability will make more farmers to use it. Reduction of chemicals will have positive benefits on the environment and it will lead to saving of foreign exchange used on pesticide imports.

F 18

Sri Lanka people use traditional medicine for the promotion of health, prevention and treatment of illnesses even though the modern health system has rapidly influenced in Sri Lanka. Sri Lankans practice different methods of treatment for illnesses i.e. supplicating with ritual and supernatural powers, resorting to home remedies (traditional/modern), obtaining treatment from private practitioners (Ayurvedic/modern) and from institutions (Ayurvedic/modern).

The objectives of this research were to find reasons for people choosing between Ayurvedic and modern medicine and to identify the usage of home remedies in these districts. In order to achieve the research objectives, three of 286 patients were interviewed in both traditional medical institutions (TMIs) and modern medical institutions (MMIs) in the districts. The data collection were carried out susing individual survey forms which comprised of open-ended questions and in –depth interviews which translated from Sinhala to English.

The results show that 50% of patients used home remedies before seeking institutional treatment. Method of treatment selected by patients depended on several resons. The main reason why they selected TMIs was that they considered traditional treatment as the most suitable for those symptoms (20.0%). The other reasons why patients chose the present treatment was that the institutions were close to their home (14.4%) and they believe the doctor to be able to treat the symptoms (11.0%)

Patients in the TMIs were more motivated to select it compare to those who were in MMIs. It was concluded those patients' socio-demographic background, transportation, type of symptoms, and formal medical treatment influenced the selection and use of either traditional medicine or modern medicine.

F 19

Although, the government has tried to promote hazard-free use of pesticides through various measures, an increasing trend of indiscriminate use of pesticides in crop production is also evident.

A study was carried out to understand marketing and application related activities of pesticides in rice farming in southern Sri Lanka. Sixty farmers selected at random and all traders engaged in pesticide trade in two villages of Hambantota District were interviewed using structured questionnaires.

The study revealed that majority of farmers in the study area does not adopt optimum procedures in using pesticides. Proper transportation, recommended dosages and timing, and proper disposal methods. Were used only by about a one half of the farmers. Proper storage practices, using masks or gloves were adopted by less than a one fifth of farmers. However, the majority of the farmers used a special measuring cup and used wind direction as a precautionary measure.

Traders did not oblige the compulsory licensing requirement. Some traders had followed the training course conducted by the Department of Agriculture. None of the traders followed proper storage procedures. Though animal feed was available with some traders, the majority sold pesticides with non-food items.

Farmers depend mainly on their own experience when decisions on using pesticides are made. Extension agents' role was meager in the system. Traders are also a source of advice to farmers. Traders' recommendations were based on information from their client farmers. It is also noted that traders' recommendations were biased.

F 20

Any agricultural activity depends mainly on the availability of land and water. As annual rainfall is decreasing, water is becoming a very limited resource in Monaragala District. This situation is likely to have adverse effects on future agricultural activities in the district. This study was designed to investigate the impact of water on future agricultural development activities in the district.

Information on water resources and agricultural activities were collected using anthropological research methods such as field observations, interview, causal conversation, updating base maps and questionnaire surveys. Stratified random sampling was employed to select farmers from each divisional secretary's division. Average a= sample size was thirty farmers per division. A questionnaire survey was conducted among selected farmers.

Threw are eight basins in the district. Total basins surplus of water in the district is estimated as 638.9 million cubic meters per year. But seventy five per cent of this surplus comes during October, November and December. During the rest of the period except March and April, all the basins suffer from water deficit.

More than forty per cent of total agricultural area of 0.1 million hectares has become uncultivable due to scarcity of water. Eighty per cent of cultivated land is occupied by paddy, annual crops and semi-permanent crops, which are the most water demanding towards brands with higher trader margins. Advising farmers to contact an extension agent was not a familiar strategy.

As water is becoming a limited natural resource not only the land use efficiency of agricultural crops, but water use efficiency should also be considered in planning future agricultural activities in the district. Therefore, future agricultural activities should be planned to change the present pattern of water inefficient crops by introducing more water efficient crops such as banana and maize into the district.

F -21

The objective of Second Agriculture Extension Project (SAEP) was to increase farm production and income through closer integration among the extension services provided by different line agencies. Department of Agriculture, Department of Cultivation Board were expected to participate in extension programmes, implemented at grass root level by Field Extension Teams (FETs).

According to the Integrated Agricultural Extension Strategy (IAES) of the SAEP, it was expected from FETs to deliver general extension programs to farmers through Farmer Reference Groups (FRGs) and Problem Census/ problem Solving (PC/PS) techniques. The objective of this study is to estimate the impact of SAEP at grass root level.

This study was carried out in Matara district. Akuressa, Yahamulla, Walikatiya, Borala and Athuraliya villges were selected on random basis for the investigation. Pre-tesed questionnaires, different PRA techniques and informal interviews were used to collect information from farmers and extension officers. Secondary data were also obtained from relevant sources. Data were analyzed using standard analytical techniques for impact assessment studies.
Results reveal that extension workers from respective agencies have prioritized work from their own agencies rather than those of extension programmes designed by the SAEP. Budget allocations, promotion of croup and livestock specific programmes and promotional prospects for extension have made a tendency to grant priority for the programmes of line agencies.

It is also evident that the formation of FRGs has shown a marginal success. On average, each member of FET has formed 5-7 FRGs instead of 20-30 expected from SAEP. Although, PC/PS is considered an effective technique for problem identified problems remain unsolved.

F 22

Water is literally the source of life on earth. Therefore, people tend to cluster in areas where water is available. Though, Monaragala is conventionally considered as a dry zone district, its northwestern part shows a wet zone climate. This study was conducted to investigate the impact of population distribution pattern on water resources of the district. Thanamalwila, Buttala, Wellawaya and Kataragama divisional secretary's divisions were considered as dry areas. Bible, Madulla Madagama, Monaragala, Badalkumbura and Siyanbalanduwa divisions were considered as wet. Secondary data were collected on population, Samurdhi recipients, unemployment rate and infrastructure facilities.

The Wet region has a higher population density than the dry region. Infrastructure facilities are less in the wet region. Though, unemployment rate is slightly higher in the wet region, percentage of Samurdhi recipients in the region is significantly lower compared to the dry region, indicating availability of water ensures better living standards even with less infrastructure facilities and high unemployment rate.

The wet region is located in the upper watershed area of six important river basins. Increasing the population in this area could adversely affect the water resources in the district. Population density in the wet region might further increase in the near future, as the percentage of the people below 14 years of age in Monaragala district in high when compared to the national average. Increasing population has fewer options other than encroaching the virgin lands in watershed areas causing more damages to the watersheds.

F 23

Monaragala is generally considered as a dry zone district. A three fourth of the total labour force is employed in agriculture related activities. Main income sources are paddy and annual crop cultivation. These crops are severely affected due to the decrease of annual rainfall. The objective of the present work was to study the long term rainfall trends of the district.

As there was no single functional meteorological station in the district only rainfall datqa were collected from three rain gauging stations namely, Bibile, Okkampitiya and Hambegamuwa for the period from 1965 to 1995. These stations represent wet, locations were averaged to obtain the district rainfall data. Long-term rainfall trends for annual rainfall and North-East Monsoon rainfall were computed using the simple liner regression technique.

The district receives 44% of its annual rainfall from North-East Monsoon, while inter-monsoon periods bring 42%. About 50% of the total annual rainfall is received during the months of October, November and December. Both monsoon and inter monsoon rains have significantly decreased during the study period.

Mean annual and North-East Monsoon rainfalls have decreased by 12.8 and 6.9 mm per annum respectively. Equations for estimation of average annual rainfall and North-East Monsoon rainfall for Monaragala district are $y = 2608.7 - 12.8x$ and $y = 1245.3 - 6.9x$ (where, y = expected rainfall and x = year) respectively.

These changes in rainfall pattern have a significant influence on agricultural activities and surface water bodies in the district. Therefore, in planning of future agriculture and water resources development activities in the district, due consideration should be given to these rainfall changes.

F 24

Environmental and social considerations are often not given a proper account in water allocation decisions. An economic valuation of goods and services provided from various uses of water would be a useful exercise to set priorities by decision-makers. This study presents a practice to value fresh water for its services to the multiple users. The Bundala National Park and its surrounding area in the Krindi Oya irrigation scheme was selected as the study site. The concept of total economic value is used as a framework of the study.

Agriculture, fisheries, livestock, wildlife, and household uses were identified as the five major uses of fresh water. The wildlife has a high value since it is essential for the tourism of the park. Agriculture and wildlife are the two main fresh water uses in terms of economic value. A conflict exists between these two uses since major areas of the two activities are hydrologically connected but have different beneficiaries. Irrigated agriculture virtually controls the water availability for the other uses because of its dominance in quantity of allocation and its location upstream in the river basin.

An accurate valuation is not easily accomplished because many types of information are required to quantify all uses of water and to estimate their values in the complex ecological system and hydrological regime of the study area. However, the total economic valuation exercise creates a better view of the level at which the benefits of the use and non-use values are obtained.

F -25

The scarcity of fresh water in localized areas has been ranked as the world's second most pressing concern in the next century. To face this challenge, it is necessary to study the current situation of water related activist in Sri Lanka. A case study was conducted in the Walawe Ganga Basin to compile a water resource balance and to estimate the water use efficiency in different sectors.

A literature survey and a questionnaire survey using stratified random samples covering the entire basin were conducted. At present the total water demand and the gross basin yield are estimated at 738.4 and 941.8 million cubic meters (MCM) per year respectively. Therefore, there is a 203.4 MCM of net basin surplus of water.

Agriculture sector accounts for ninety five percent of all water uses in the basin and is the most inefficient in water use. Its water use efficiency is only 20-35% of the potential. Domestic and industrial sectors use one and four percent of the total demand respectively. Unaccounted for water (UFW) in the domestic sector is about fity percent in urban areas. Leakage in service pipes, illegal tapping of pipe born water sources, leakage in domestic taps, water in stand pipes are the main reasons for UFW. Spilling away of water while filling the pitchers are tube wells in the Walawe Ganga Basin ranges from 325-490 m3 per day. This also creates lot of environmental problems such as mosquito breeding and groundwater contamination.

While the amount of water available is constant or decreasing demand for water increases steadily. Therefore demand management tools such as improvement of water use efficiency in agricultural and domestic sectors, promotion of non-consumptive water use activities and recycling in industrial sector should be introduced to mitigate above mentioned environmental economic problems.

F 26

Studies on perception and attitudes are used by planners and policy makers in the developed countries in solving resource management problems. However, perception studies on flood hazard management have not been a concern to planners and policy markers in Sri Lanka. Ratnapura is the second largest town in the Kaluganga floodplain. It experienced severe damages due to recurrent flooding. Although, relocation of the town was considered as a solution for this problem, the success of the program is not commendable.

The main objective of this study to determine hazard perceptions of residents, especially flood risk and future expectancy of flooding. Main sources of information are field questionnaire survey, discussions with officials and key stakeholders and field observations.

More than 50 percent of respondents agreed that flooding is a problem to the area. About 81 percent of them considered the magnitude of the problem as severe. 11 percent considered floods damage as moderate while for the rest, floods cause less damage. Perceptions on the flood risk in the area followed a somewhat similar pattern. 72 percent respondents considered as flood risk are high. 23 percent considered the risk as medium, 69 percent of the respondents believed that flood risk will increase in the future. 17 percent expected that the pattern will remain same while 14 percent anticipated a decrease in floods.

About 80 percent of respondents believed that there will be a major flood soon. According to respondents, deforestation, river-bank erosion, and inappropriate land use planning contribute to increase flood risk in the future.

The study reveals that the level of awareness of flood hazards among urban occupants in the area is high. Therefore, policy makers should consider perception and attitudes of urban occupants when future flood mitigation programs are planned.

F 27

Watershed degradation leads to accelerated ecological degeneration, reduced economic opportunities and increased social problem. In Sri Lanka, about 0.6 million hectares of land in Sri Lanka have been estimated as degraded land. This study focuses on the Siyambalagoda Oya catchment, which is a sub basin of the Nilwala river basin. The basin coves 118 km^2 of land. The main objective of this stud is to identify causes and consequences of watershed degradation. Data collection methods involves, field questionnaire surveys, field observation, air photo interpretation, and discussion with officials and community base organizations.

Natural causes such as high intensity and duration of rain, high stream density and steep stream gradients have contributed to degradation. Man-made causes such as deforestation, encroachment of stream reservations, inappropriate land management and institutional and socio-economic issues have substantially contributed to degradation. Forestland decreased by 50 percent during the last three decades. Many increased demand for building materials, inadequate forest management and protection are major causes of deforestation.

Uncontrolled land use changes have triggered watershed degradation in many occasions. The growing need for new agricultural land has also led to illegal encroachment on forestland. Especially tea growing area increased by about 50 percent during the last three decades.
Socio-economic reasons such as lack of incentives for people's participation and limited awareness of importance of watershed management at all levels of society and government, land tenure problems are identified as causes of watershed degradation. Adverse consequences such as drying of 38 natural streams, accelerated soil erosion and rapid disintegration of the self-sustained agro-ecosystem in the study catchment were identified as causes of degradation. Therefore, recommendation are made to adopt watershed management action for protection of the environment.

F 28

Madola a perennial rivulet of the Holuwagoda canal, which is a tributary of Gin Ganga. Madola is 12 km in length. It's catchment spreads over 32 Km2. The sub basin is located on southern part of the basin. Hiyare reservoir is located on upper part of the cathment. The reservoir covers 22 ha and 10m in depth. It is a main water source of domestic water for Galle town. This study was conducted to identify water-related problems in the Madala cathment area. The basic field research consisted of gathering information from local people, field level officers, field observation, air photo interpretation and mapping.

About 74 percent of respondents reported that they have noted the gradual drying of several streams in the area. Deforestation, low rainfall and unsustainable farming

practices were identified as causes of the process. Sedimentation of the Hiyare of soil conservation measures in using encroached stream reservation is the major cause for sedimentation.

Majority of the people use ground water for drinking. However over 50 percent of the wells were not utilized due to deterioration of water quality. Respondents believe that water has become acidic so it is unusable. Also 25 percent of people use tube wells for drinking water. However, the source is underutilized due to lowering the water table.

According to above mention factors, it can be concluded that natural environment in the Madola catchment has degraded substantially. This process is likely to continue in the future leading to irreparable damages. Therefore it is recommended that suitable environmental conservation measures should be taken to arrest the situation.