

Land Fragmentation and Environmental Degradation in Sri Lanka

(with reference to Gampaha District)

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Many Environmental problems including elimination of tropical forests, desertification, and reduction in biodiversity, is most clearly evident in the Third World. While rapid population growth is often considered an important factor in this environmental degradation, solid empirical evidence on its role is almost nonexistent. Understanding the effects of population on the environment requires careful consideration of the full range of factors responsible for environmental deterioration and of how they interact with demographic factors. The nature of this relationship is heavily determined by land use patterns and agricultural policies adopted by governments. This paper is described some of the relationships between population growth, land fragmentation for building houses and environmental degradation. Most studies linking population factors and the environment focus on the impact of population growth on resource use. While population size and growth rates are important determinants of resource use, population movements also affect, and are affected by, the natural environment.

This study has been based on both primary and secondary data. Primary data was collected from a case study of Pahala Imbulgoda village in Gampaha district. 100 families were selected from two housing schemes. The interview method and observations were conducted to collect primary data in March 2007. The problem of this study is whether they're any impact of land fragmentation on environmental degradation in Sri Lanka. The objectives were to Identify the reasons for land fragmentation identify the impact of land fragmentation on environmental degradation and find out the solutions.

The land is fragmented to very small plot like 12 perch each. Then there are at least fifteen houses within one acre of land. They have dug well for getting water. In February and August every year there is only one or two foot of water in the wells. So there are 10 to 15 dug wells and reducing underground water level rapidly. They use un-sealed toilets pits and polluted the underground water very quickly. There is no rainwater

removing system and lot of social disputes among the residence. No solid waste management system and they put their waste on the roadside and polluted the environment. Due to removing the upper layer of the soil by land sellers' so house owners cannot grow any plants and increase the air pollution. So the government and policy-making bodies should take necessary action to control the environmental degradation due to land fragmentation for housing in Sri Lanka.

Key words: Land fragmentation and environmental degradation

Introduction

Due to differences in land types, farming methods, the history of land acquisition, general social and economic conditions and political ideology, the definition of land reform is not easy. Yet definition is important because some supposed land reform policies are not in fact intended to change the distribution of land ownership and rural power. After 50 years of collectivization, countries in Central and Eastern Europe and the Commonwealth of Independent States have made significant progress in the devolution of state-owned real estate to private urban and rural ownership. Despite the remarkable success of the land-reform process, land fragmentation has emerged as a side-effect, with detrimental implications for private and public investments, sustainable economic growth and social development. Less-favored and least-developed regions with economies still dependent on agriculture have experienced negative growth rates, soaring unemployment and mounting rural poverty, resulting in serious social and economic disintegration and widespread disappointment among local actors and stakeholders.

Land reform is generally accepted to mean: **the redistribution of property or rights in land for the benefit of the landless, tenants and farm laborers**. This is a narrow definition, reducing land reform to its simplest element (Warriner, 1969).

'Land reform' and 'agrarian reform' are often used interchangeably. Agrarian reform, a construct of the Cold War to counter 'communist' land reform, embraces improvements in both land tenure and agricultural organization. Its policy prescriptions urged governments to go beyond redistribution: they should also support other rural development measures, such as the improvement of farm credit, cooperatives for farm-input supply and marketing, and extension services to facilitate the productive

use of the land reallocated. Whilst conceptually sound, the danger with these wider prescriptions is that they may discourage governments from doing anything until they can do everything.

Thus, land reform pertains to the remodeling of tenure rights and the redistribution of land, in directions consistent with the political imperatives underlying the reform. Those favoring **revolutionary** change advocate a drastic, planned, public intervention to redistribute land. Yet attempts at drastic redistribution of private land, in the face of strong opposition from landed interests (and in some cases related budgetary impediments), may distract from more feasible **evolutionary** policies aimed at improving access and security of tenure for small farmers under alternative forms of individual and communal tenure, which do not involve expropriation and compensation.

There is wide variation in the objectives, circumstances and conduct of land reform. Just how extensively the state should intervene has long been the subject of debate by welfare economists. Economic arguments favoring land redistribution focus on the diseconomies of large-scale enterprises and on the need to increase returns to land. However, decisions on whether to proceed with land reform are essentially political. When growing landlessness, chronic indebtedness, and eviction of tenants threaten stability, the state has often intervened to regulate ownership rights, sometimes with the tacit agreement of landowners seeking to prevent land invasions.

Four principal types of intervention by the state in the operation of the land market can be distinguished: **Land tenure reform** designed to adjust or correct the reciprocal property rights between proprietors, in response to changing economic needs (e.g. the establishment of statutory committees or land boards to organize and supervise the use of common rights and other interests; the conversion of more informal tenancy into formal property rights; tenancy reform to adjust the terms of contract between landlord and tenant).

External inducements or 'market-based' incentives offered by government for social and economic reasons and leading to the restructuring of existing property rights or the creation of new ones, e.g. the distribution of public lands; state expenditure on land reclamation

and subsequent allotment as private property; state sponsored credits channeled by a land bank through cooperatives; support to institutions to administer the necessary land acquisition and distribution mechanisms. **External controls** or prohibitions imposed by law on property rights (i.e. non-market measures), for instance: nationalization and collectivization; restitution; redistribution policies involving expropriation of land (with or without compensation) on grounds of excessive size, under-utilization, ownership by absentee landlords and/or foreigners. By contrast, gradual redistribution policies operate e.g. through death duties. Other external controls can act against redistribution, e.g. laws preventing land fragmentation below certain minima.

Finally, **confirmation of title** to verify and secure land titles to those who have already a demonstrable claim reduces doubt and contention and so sets the foundations for development.

Economic reform programs have generated increasing interest in so-called 'market-based' land reforms. However, in countries where tenants have had to compensate landowners' at near-market prices, productivity gains have been modest. This is because the price of land includes a premium, over and above the capitalized value of agricultural profits, on account of the preferential access that land ownership provides to credit markets, via its collateral value (Binswanger and Deininger, 1993). Once a poor farmer is provided with credit to buy land at the market price, s/he cannot repay out of farm profits alone. Thus a free land market alone will not transfer land to smaller and poorer farmers, without grant financing in addition to, or instead of, credit. Given the budgetary constraints facing governments, settlement subsidies are often insufficient to place the rural poor on the first rung of the property-owning ladder. In these situations, laws designed to protect tenants (i.e. improved leasehold contract) can fall under the rubric of market-based land reform. In this century, redistributive land reform has taken different forms and met with varying success in terms of coverage and impact on productivity and income. Even within the following typology some of these differences may be masked.

In the restructuring which followed World War II, a major objective of land reform was to break up feudal estates and prevent the advance of communist revolution. Reforms in East Asia have been comprehensive,

creating a class of independent property-owning peasants and alleviating poverty and landlessness. However, the contexts have been highly specific, thereby limiting replicability (Hayami et al., 1990). Thus, in Japan, US occupation forces enforced land reform as a means of breaking the power of large landowners, pillars of the militaristic class. Resident landlords were entitled to retain only about one hectare. The reform in Korea was carried out under the threat of communist aggression from the north of the country. In Taiwan, the Nationalist Government exiled from mainland of China and therefore alienated from indigenous landowners imposed land reform. Also important for success in Taiwan were accurate land tenure data and the non-indigenous bureaucracy that had accompanied Chiang Kai-shek.

In East Asia, land reform usually entailed the transfer of rights to tenants without breaking-up operational holdings. Reforms covering landlord tenancies in the Middle East (e.g. Iran, Egypt and Iraq) and India (e.g. Kerala State) followed a similar pattern. However, with the possible exception of Egypt under Nasser, they were less effective due to stiff opposition from influential landowners. Attempts to implement land-for-the-tiller reforms in the Philippines met with mixed results for the same reasons.

Unlike Europe and Asia, where there has been a broad tradition of small-farm ownership, in Latin America the monopoly of land ownership stemmed from colonial rule, either from the subjection of the indigenous population, or the use of imported slaves on plantations. From 1910-1990, Latin American countries attempted an enormous variety of land reforms. Redistributive reforms in Mexico, Bolivia and Chile focused on the transformation of semi-feudal estates (haciendas), based on bonded labor (corvée labor and labor tenants), into capitalist estates employing wage labor, land-owning family farms and free-peasant farms. Cuba collectivized all large plantations, a process which is now being relaxed in favor of cooperatives. Towards the end of this period agrarian reforms, often complemented by labor laws, were introduced. Some abolished sharecropping and share tenancies, pursuing a 'land-for-the-tiller' approach. As is often the case, landowners anticipated the new laws by evicting tenants and dismissing labor. To skeptics, these 'reforms' therefore merely served to modernize labor contracts, rather than redistribute land. On the other hand, detailed production data collected

in Chile in the period 1965-70, on land reform settlements formed from expropriated land as well as on portions retained by landowners, showed significant increases in output per hectare.

An essential, but not sufficient, ingredient for land reform is genuine political commitment of the country's leadership and the administrative capacity to see the process through. Many supposed land reforms have faltered because they were opportunistically conceived in order to mobilize support at a critical time in the life of a government (or an aspiring government). Because of the difficulty of sustaining support for redistributive reform, a 'short-sharp-shock' treatment may be necessary for success. This assumes that the treatment has been carefully prescribed, is simple to administer, adequately communicated, reasonably free of loopholes, that the bureaucracy is adequately prepared, that the per-household costs of land acquisition and settlement are financially feasible and replicable, and that progress with land transfer can be monitored.

To be sure, reform means a structural change and in any agrarian society, land is always, the most important factor of production. Moreover, land and its characteristics inevitably determine the agrarian structure and directly bear far-reaching implications upon the economy as a whole. Land characteristics are physical, social, economic and even political. They include the distributive pattern of landholdings and landownership, the size of farms, the man-land ratio, the production structure etc. In developing countries, where rural poverty is the rule of the game, structural change in land and its associated characteristics is basic and fundamental to successful rural development. Reform involves some kind of transfers, in our case, of land and other resources with or without compensation. But transfers themselves do not ensure a long-lasting solution of poverty eradication.

Over the past two decades, environmental degradation, including land degradation has continued to worsen exacerbating further poverty and food insecurity. Conversely, awareness of the importance of the environment and its conservation has increased.

The immediate challenge is to consider how ratification of the CCD can be expedited, how it can be implemented and how to secure adequate financing for local area development. The CCD also stipulates a major

role for civil society organizations, foremost among them the community-based organizations - namely that they should galvanize energies and mobilize resources. The private sector, as well as civil society at large, should also be encouraged to think beyond individual or corporate interests towards recognition of a shared responsibility for the environment. Vigorous resource mobilization to combat desertification would stand a better chance of succeeding if launched on the basis of empirically verifiable improvements.

Farming is a way of life for nearly half of the world's people.

In many developing countries and some formerly communist societies, rural families comprise a substantial majority of the population. For these families, land represents a fundamental asset: it is a primary source of income, security, and status. But almost half of these rural families—some 230 million households—either lack any access to land or a secure stake in the land they till. As a result, acute poverty, and related problems of hunger, social unrest, and environmental degradation persist.

For more than 40 years, Rural Development Institute (RDI) attorneys have helped tackle the land problem with great effect, using law and policy to confer land rights, and bringing hope and ladders out of poverty to millions of the world's rural poor. In fact, as a result of this work, more than 100 million rural families worldwide have received land ownership or ownership-like rights to land.

This work began with a "land to the tiller" program in South Vietnam—carried out between 1970 and 1973—that provided land ownership to one million tenant farmers. Since then, RDI attorneys have gone on to develop and apply democratic approaches to land reform in both traditional developing countries and post-communist, transitional economies in Asia, Latin America, Eastern Europe, the former Soviet Union, and the Middle East.

The majority of Asian countries remain essentially agrarian. However, significant differences in agrarian structure exist among and within Asian countries. Agrarian reforms have been widely adopted in the past. Government interventions have had the objectives of accelerating social change, achieving greater equity in the agrarian structure, and improving agricultural productivity. A new international understanding

of agrarian reforms is evolving, which includes the evolution of a free market for agricultural land, linking agrarian reforms with environmental protection, addressing emerging issues, enabling farmers to make informed choices on agricultural technology, etc. Land redistribution and growth with equity remain unmet goals, however. The overall achievements of agrarian reforms have been far from satisfactory in many member countries.

Facing the poor performance and the difficulties in implementing traditional land-redistribution programs, many governments have changed their methods for agrarian reforms. Currently, moderate approaches to implement gradual corrective measures are preferred. More effective, participatory, and socially acceptable institutional changes are demanded. These measures include improving title-holding systems to encourage investment, discouraging excessive land fragmentation. They often accompany other supportive measures such as improved extension services, institutional financing and infrastructure.

Environmental degradation takes many forms, but the elements of most immediate consequence to the world's population relate to land, air and water. The two most serious infrastructure deficiencies in both rural areas and cities are contaminated water supplies and polluted air. In the rural environment, land fragmentation, eroded slopes and degraded soils are contributing to poverty, hunger and migration. The unplanned rapid growth of cities, fed partly by migrants from rural areas, is creating intense pressure on local ecosystems and has in some cases, overwhelmed environmental resources. Millions have settled in slums and shantytowns without adequate shelter and basic services, including clean water and sanitation.

The majority of the rural poor have increasingly become clustered on low-potential land. This has resulted from a combination of factors that vary in importance from one country to another – land expropriation, demographic pressures, intergenerational land fragmentation, privatization of common lands, and consolidation and expansion of commercial agriculture with reduced need for labor. Demographic pressures, among others, continue to play an underlying role in the geographical, economic and social marginalization of the poor in most countries where there is a high incidence of poverty. Because they have

been pushed or squeezed out of high-potential land, the rural poor often have no choice but to overexploit the marginal resources available to them through low-input, low-productivity agricultural practices, such as overgrazing, soil-mining and deforestation, with consequent land degradation.

Land Degradation has emerged as a serious problem in Sri Lanka. The population has been expanding rapidly and this has led to an increased demand for land for economic purposes and social services. The demands from various users such as agriculture, industry, transport and settlements have set up pressures on the land, and these in turn have inevitably resulted in the misuse and degradation of land in many areas. Evidence of this degradation can be seen in heavy soil losses; high sediment yields; decline in soil fertility, salinization and the marginalization of agricultural land.

The Convention to combat Desertification is being implemented through national action programs. As a party to the convention Sri Lanka is expected to prepare and implement a National Action 2 Program (NAP) to identify the factors contributing to land degradation and practical measures necessary to combat land degradation. This document has been prepared to fulfill this need. It is divided into two parts. Part I presents the country background; significant environmental issues, the state of land degradation and its causes and consequences; and measures adopted up to date to combat land degradation and to mitigate the effects of drought. Part II presents the National Action Program for implementation. It is hoped that the implementation of the National Action Program will lead to the prevention and reversal of land degradation.

The government has been keen to address this problem and several measures have been adopted over the past few decades to control land degradation. However these have only had a limited impact and this is reflected in the spread of settlements into environmentally fragile areas; eroded up lands; low and unreliable crop yields, and other off site effects of soil erosion such as sedimentation of reservoirs and floods. These trends need to be reversed early; if not there could be serious economic and social consequences.

In 1972 a land reform program based on the objectives of maximizing agricultural production and employment and reducing in-

equalities in wealth and income was initiated in Sri Lanka. It commenced with the enactment of the Land Reform Law, No.1 of 1972, which imposed ceilings on private ownership of land and provided for the setting up of a Land Reform Commission (hereafter, LRC) vested with powers to acquire privately held land in excess of the ceilings. Three years later, the scope of the reform was extended through the Land Reform (Amendment) Law, No. 39 of 1975 under the provisions of which land held by public companies was nationalized. Both these laws provided for the payment of compensation to dispossessed owners.

Several other legislative enactments may be included in the current package of land reform. The Estates (Control and Transfer) Act, No. 2 of 1972 which imposed governmental controls over land transfers of or from properties of over 100 acres in extent and the State Agricultural Corporations Act, No. 11 of 1972 which empowered the Minister of Agriculture and Land to establish state corporations for the purpose of planning, coordinating and developing public sector agricultural undertakings were both promulgated in anticipation of the Land Reform Law (Peiris, 1978).

The most important change in agriculture after independence of Sri Lanka has been an increase in the production of rice due to increase in the productivity and the diversion of forest land for cultivation. The diversion of additional land to agriculture has adversely affected the forest cover. Similarly, the population of livestock, which is an integral part of Sri Lankan farming system, is increasing. If this trend continues for quite some time then it may endanger the sustainability of forest resources.

The auctioning of coconut lands in blocks as commercial projects has become a lucrative business affecting the coconut industry severely, government says. The tax is intended to prevent the fragmentation of coconut lands. The Cabinet has granted its approval to amend the Coconut Development Act to formulate a structure to charge tax for fragmentation of any coconut land authorized from the Tea, Rubber and Coconut Estates (Control of Fragmentation) Board.

The Government of Sri Lanka is preparing to introduce a new land policy bill. This bill is based on the agreement in the "Regaining Sri Lanka" proposals, as well as an agreement with the World Bank.

Government intends to approve this legislation very soon, however, this new law would be very destructive. The following is a brief analysis.

1. Bill is described as a move to "grant land to 1.2 million people who do not have an inch of land of their own". This is not true. All these people have received land grants either under the LDO (Land Development Ordinance in 1935) or later as grants given to settler farmers under irrigated settlement schemes. Some others received land under the "village expansion schemes" or under the land regularization schemes, where unauthorized settlers' land has been regularized, when they have properly established settlements, this was done by holding land kachcheries.
2. All these grants were made with restrictions against their selling this land. This was to prevent them losing land due to poverty, indebtedness and other emergencies. This was a measure adopted in the recent history of Sri Lanka, to prevent the creation of a very large population of landless destitute or paupers. This has contributed to a lower rate of migration from rural to urban areas and it has also provided them some for of land-based livelihoods.
3. All governments up to 1977 had policies of protecting their small-scale agriculture and provided them with various support schemes to kept them in their livelihoods. Such measures have had a positive impact in keeping rural poverty and income disparities low. The ability of Sri Lanka to maintain a considerable level of food security and quality of life in the post Independence decades was a result of such policies, protecting the poor. The WB pushed.
4. Market oriented policies since 1977, which reversed these positive achievements, considerably. In March 1996, the WB made its policy recommendations in the "Non Plantation Sector Policy Alternatives Report" which said that there was no "growth" in this sector since much of the rural agriculture is producing "low value crops" such as rice, vegetables etc. There for they recommended a shift from low value domestic food crop production to "high value (export) crop production. It also said that the small farmers were unwilling to shift away from rice and other domestic food crops. So, they recommended creation of a "free land market" as an essential

immediate measure to achieve "fast growth on the non plantation sector"

The obstacles to a "free land market" identified by the WB in this report were, firstly, the existence of a large land area granted by the Government where "free marketing of land" was legally prevented and there was much rural land that was jointly owned by the families. In such cases the individual members were not free to sell their land plots away. They needed clear, regularized "freehold titles"

Problem

Severe land degradation affects a significant portion of the earth's arable lands, decreasing the wealth and economic development of nations. Land degradation cancels out gains advanced by improved crop yields and reduced population growth. As the land resource base becomes less productive, food security is compromised and competition for dwindling resources increases, the seeds of potential conflict are sown. Thus a downward eco-social spiral is created when marginal lands are nutrient depleted by unsustainable land management practices resulting in lost soil stability leading to permanent damage.

We often assume that land degradation only affects soil productivity. However, the effects of land degradation often have more significant impacts on receiving water courses (rivers, wetlands and lakes) since soil, along with nutrients and contaminants associated with soil, are delivered in large quantities to environments that respond detrimentally to their input. Land degradation therefore has potentially disastrous impacts on lakes and reservoirs that are designed to alleviate flooding, provide irrigation, and generate Hydro-Power.

Environmental protection and conservation are of utmost importance to many planning systems across the world. Not only are the specific effects of development to be mitigated, but attempts are made to minimize the overall effect of development on the local and global environment. This is commonly done through the assessment of Sustainable urban infrastructure. The problem of this study is there any impact of land fragmentation on Environmental Degradation in Sri Lanka.

Objectives

Land fragmentation primarily affects the agriculture sector. When cooperative and state farmlands were distributed according to equity principles, without first taking farm management aspects into consideration, the result was that the parcels which farmers received were either too small or were badly shaped, for instance in length-to-width ratio. In some countries, farm size averages 0.5 to 2.5 ha, which has made it difficult to implement new production patterns or to utilize machinery and appropriate technologies. Re-allotment and amalgamation of plots (and parcels) is an important step to increase both productivity and efficiency in the agriculture sector. Most private farmers are restricted to subsistence agriculture and cannot participate in commercial production, which leads to migration and the abandonment of farmland, especially in areas far from markets.

The total land area of Sri Lanka is approximately 6.56 million hectares. Nearly 300,000 ha. are covered by water bodies. Out of this.. Present per capita land availability of the country is 0.3 ha. There is a decreasing trend of this value as the population continues to increase. Moreover 2/3rd of the land area in the country falls within flat to undulating landform. The rest comprised of hilly and mountainous terrain where higher percentage of land area consists of highly dissected, steep slopes and narrow valleys.

Traditional land use in Sri Lanka had been rice lands in lowlands, and chena (slash & burn) and the homesteads in the uplands. Rice lands were irrigated from reservoirs or streams. The paddy lands provided the staple food rice while chena provided coarse grains, pulses, oil seeds, vegetables and condiments. Homestead consists of house and perennial trees such as fruit and coconut.

This traditional land use system in the country gradually changed with the influence of the western world starting from 15th Century. An interest was developed to convert highlands to plantation crops. Cinnamon and Coconut were first established in coastal areas of the wet zone. Rapid change took place following introduction of coffee, tea and rubber plantations. Most of the forest in the wet zone was converted into plantations. This change of land use resulted heavy soil erosion in the country.

The objectives of this study are to identify the Impact of Land Fragmentation on Environmental Degradation, Identify the other reasons for land fragmentation and identify the solutions for mitigate or overcome the problem of Environmental Degradation due to land fragmentation for building residential houses in Sri Lanka.

Methodology

This study has been used both primary and secondary data. Secondary data was collected from secondary sources. Primary data was collected from the Imbulgoda village in Gampaha district. It was selected hundred families. These families were selected using simple random sampling system. It was employed Interview Schedule and Observation method. Data was analyzed using tables and percentages.

Limitation

This study is limited to Gampaha district and the only one village. It has been selected only hundred families for this study. There is great deal of land fragmentation in Sri Lanka. Those are fragmentation land for agriculture, housing, road building, building towns and cities etc.

Data Analysis

Gampaha is the District Capital of Gampaha District in the Western Province and is a principal town around Colombo. It is about 4 km. from Miriswatte on the Colombo Kandy Road Gampaha is connected by road to Miriswatte, Yakkala Ja Ela and Minuwangoda. Henarthgoda Botanical Gardens where the first rubber tree planted in Sri Lanka is still present is located close to Gampaha Town. Gampaha can be reached by Railway along Colombo Polgahawela Railway. Gampaha is the home of the famous Ayurveda Physician Wickremaratchi who produced hundreds of Ayurveda Physicians who came to be known as Ayurveda Physicians of Gampaha. They are still found all over Sri Lanka. The word "Gampaha" is composed from "Gam", which means village and "paha", which means five. So the meaning is Five Villages. The five villages in the Gampaha city is Ihalagama, Pahalagama, Madagama, Aluthgama and Yagoda. Gampaha is an urban city.

A healthy environment enhances the capacity of societies to reduce the impact of natural and human-induced disasters, a fact largely underestimated. As disasters undermine both socio-economic

development and environmental management efforts, there is a compelling need to explore how environmental mismanagement changes hazard and vulnerability patterns. Knowledge about natural resources and the use of environmental management should be promoted as a strategy for reducing risks. Environmental actions that reduce vulnerability need to be identified and applied by disaster reduction practitioners. Quantitative measurement of these actions will determine their acceptance and application in political and economic arenas.

Integrating environmental management within existing disaster reduction policy frameworks and international strategies will build a safer world. National and regional institutions can best increase societies' resilience to disasters as part of a global environmental management effort. Instilling disaster reduction thinking into environmental performance is a positive proposition.

Table 1:

Category	Education level		
	Percentage	Percentage (M)	Percentage (F)
Up to grade five	10%	6%	4%
Grade six to nine	20%	10%	10%
GCE (O/L)	40%	25%	15%
GCE (A/L)	30%	20%	10%
Total	100%	61%	49%

Source: Fieldwork -2007

According to the above table number one it can be seen that 10% percent of people in village has studied only up to grade five. 4% percent of female and 6% percent male out of 10% percent has studied up to grade five. 20% percent has studied up to grade nine and 10% male and 10 percent female has studied up to grade nine. Only 40% has studied up to GCE (O/L) and 25% male and other 15% percent female. Only 30% passed GCE (A/L) and male 20% and female 10%. So this table implied that high percentage of male has been educated than female in this area. The reason for this is that most male person came to do government or private jobs. Due to high education there is high demand for land in this area.

Table 2:

Age structure			
Category	Percentage	Male	Female
Up to 5 years	20%	8%	12%
6 – 14	30%	13%	17%
15 – 55	45%	20%	25%
Above 55	5%	2%	3%
Total	100%	43%	57%

Source: Fieldwork – 2007

The table number 2 shows that the age structure of this families in the study area. 20% percent of the people are age five and 8% percent is male and other 12% is female out of 20% who is up to age five. 30% of the population is age between 6-14 years old and 13% male and 17% of female under this age group. 45% percent is included in the 15-55 age groups and 20% male and 25% is female. There is only 5% people can be seen above 55 age group, but 2% male and 3% female. So, total number of male 43% and 57% female can be seen in various age groups. According to the table number two, labor force is 75% and dependence group is 25%.

60% percent of houses are fully built and 40% of houses are half built. They have used bricks or cement blocks. The condition of these houses is very good, because the walls and roof of these houses are covered with roofing tiles of asbestos sheets. Floor is covered with floor tiles or cement.

Employment

In this area 80% of people do government or private sector jobs. 20% of people do self-employment like making fast food, small business. Some families are there and their wife or husband has gone to abroad for foreign jobs. Their houses and standard of the life is very high, but the education of children is very low level due to low attention of education of children by their parents. All the people are outsiders from this area. Therefore, they have low understanding of each other. There is less relation between these families and the families in old villages. So there is lot of social problems. Those are bordering problem, stealing etc.

Conclusion

Land use changes drive a range of infectious disease outbreaks and emergence events and modify the transmission of endemic infections. These drivers include agricultural encroachment, deforestation, road construction, dam building, irrigation, wetland modification, mining, the concentration or expansion of urban environments, coastal zone degradation, and other activities. These changes in turn cause a cascade of factors that exacerbate infectious disease emergence, such as forest fragmentation, disease introduction, pollution, poverty, and human migration. Population trends and factors have been identified as indicators of sustainability. Existing plans for sustainable development have generally recognized demographic trends and factors as elements that have a critical influence on consumption patterns, production, lifestyles and long-term sustainability.

The natural environment is unequivocally the life support for all human systems. Far from being a luxury available only to those who can afford it, successful environmental management will increasingly become the basis for the success or failure of the economies and social systems of entire countries.

The topic of environmental vulnerability is concerned with the risk of damage to the natural environment of a country. For the natural environment, the entities at risk, termed *responders*, include ecosystems, habitats, populations and communities of organisms, physical and biological processes (e.g. beach building, reproduction), energy flows, diversity, genes, ecological resilience and ecological redundancy. Each of these responders (ecosystem goods, services and relationships) may be affected by natural and anthropogenic hazards, the risk of which may vary with time, place and human behavior. The obvious complex nature of vulnerability has required the development of vulnerability theory to provide a framework for logical development and measurement.

The land is fragmented to very small plot like 12 perch per person. Then there are at least fifteen houses within one acre of land. They have dug well for getting water. So there are 10 to 15 dug wells and reducing underground water level rapidly. They use un-sealed toilets pits and polluted the underground water very quickly. There is no rainwater removing system and lot of social disputes among the residence. No

solid waste management system and they put their waste on the roadside and polluted the environment. Due to removing the upper layer of the soil by land sellers hose owners cannot grow any plants and increase the air pollution. So the government and policy-making bodies should take necessary action to control the environmental degradation due to land fragmentation for housing in Sri Lanka.

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