

The role of traditional land use systems in the well-being of rural Timor-Leste

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Introduction

Natural ecosystems and traditional land use systems have an important role in the life and well being of the rural population of Timor-Leste, in economic as much as in social and cultural terms. The main objectives of this paper are: 1) to identify the different land use patterns of Timor-Leste; 2) to identify the goods and services produced by them and 3) to examine the relationship between the services produced by land use patterns and the well-being of Timor-Leste rural population. This paper is based on a multidisciplinary approach incorporating contributions from several fields of knowledge, and makes use of documentary sources, direct observations made during several periods spent in the field and interviews conducted in 2003, 2009 and 2010. In order to achieve our purpose we combine the Millenium Ecosystem Assessment (MEA 2003) taxonomy, used to examine the issues related with the goods and services produced by land, with the Human Rights Based Approach (HRBA).

The multidimensions of the services supplied by different land uses are essential resources for the majority of the population of the developing countries. Besides the economic value associated with those services, land services have also historical, cultural and sacred values that should not be ignored since they have shaped over time the social organization of communities. In this perspective, land as the most important natural resource should not be viewed or examined separately but embedded in its natural, social, economic and cultural context. Recognizing the multidimensional character of the services provided by nature in general, and land in particular, is precisely the essence of a human rights approach to development. According to the United Nations Organization (UN), a human-rights based approach to development is a conceptual framework for the process of human development that is normatively based on international human rights standards and operationally directed to promoting and protecting them. In its essence, a human rights-based approach integrates the norms, standards and principles of the international human rights system into the plans, policies and processes of development. In other words, human rights are simultaneously the means and the goals of development.

One of the crucial features of human rights is that, being indivisible, in other words each rights value being intrinsically equal, it is not possible, nor indeed acceptable, that rights should be taken on a hierarchical basis. This means that if the services provided by nature are taken as rights each one of them is as important as the other to the well being and the fulfilment of the development goal. Development becomes, consequently, the result of a conjugation of material, political, cultural and spiritual values, none being dismissible in favour of the others. Development demands therefore the production of a growing quantity of goods as much as nurturing identity and freedom.

In practical terms, a human rights approach to development implies that as far as possible, one part of the overall development goal cannot be achieved in detriment of the other. Let us consider that there is a conflict between two different purposes in the use of a resource, economic and spiritual for example. If the former prevents the latter, then one should not consider the benefits of its use only as adding positively to people's well being. Indeed, in this case one must take into account both the utility of the use of the resource for economic purposes and the disutility of the loss of the resource for other uses. The concept of opportunity cost is extended, here, to other domains beyond economic cost-benefit analysis. That is why it is of the utmost importance not only to identify all the possible uses for natural resources but also all the conflicting uses.

In our work, specific emphasis will be placed on the relationship between well-being and land use, through physical, economic, social and cultural connections. The involvement of people with land includes also aspects of land tenure and natural resource management.

The main land use patterns in Timor-Leste are: natural and semi-natural ecosystems, subsistence agriculture, the sacred, housing, basic infrastructures and industries and services. For

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Timor-Leste rural communities these land use patterns produce a set of goods and services essential for their survival and well-being. Poor people in Timor-Leste are the most vulnerable and consequently the most severely affected when the environment is degraded or when their access to natural resources, namely land, is limited or denied. Poor people have limited assets and are dependent for their livelihoods on common pool property resources since their income originates largely or fully from them, most especially in rural areas.

Ecosystem Services, Well-being and Development

Ecosystem services are the benefits provided by ecosystems that contribute to making human life both possible and worth living. This includes human use of products from forests, wetland and so on, and the services ecosystems perform that are used and valued by human societies such as cultural services, nutrients and water cycling, soil formation and retention, resistance against invasive species, pollination of plants and regulation of climate. These overall goods and services supplied can be aggregated in different classifications schemes. For example the Millennium Ecosystems Assessment aggregates them in four categories: provisioning, regulating, cultural and supporting (MEA 2003).

Humans influence and are influenced by ecosystems through complex and multiple interacting pathways. The MEA makes clear the inextricable linkage between natural systems and human well-being. Well-being is an inclusive concept, in its broadest sense human well-being refers to everything important to peoples' lives, ranging from basic elements required for human survival (food, water, shelter) to the highest level achievement of personal goals and spiritual fulfilment. According to the MEA, the components of human well-being are: security, basic material for a good life, health and good and social relations. These four elements contribute to an ultimate well-being benefit of freedom of choice and action, or "development as freedom" in Sen's words (MEA 2003; Sen 2000).

Human well-being is dependent upon multiple and often interrelated ecosystems goods and services contributing each of them to more than one component of well-being. Furthermore, the interconnectedness of the well-being components and ecosystem services are dynamic and context-dependent. This same human well-being and poverty reduction are dependent upon improving the management of earth's ecosystems to ensure their conservation and sustainable use. Dealing with the threat to the planet's natural capital should be seen as part of the struggle against poverty and is key to achieving all eight Millennium Development Goals (MDG). Economic "development" that does not consider its impact on ecosystem goods and services, may decrease the well-being of vulnerable populations, even if other segments of society benefit from it, and so, it cannot be considered a path to true development.

Some people are more vulnerable to the deterioration of natural ecosystems than others. People who do not enjoy minimum standards of well-being are generally the most vulnerable to the deterioration of natural systems. The rural poor in developing countries are often disproportionately affected because they are more directly dependent on the resources and services that ecosystems provide. However, their voices have been largely absent from policy discussions and negotiations over environmental issues. The deterioration of natural ecosystems is, therefore, likely to accentuate inequalities and marginalization of the most vulnerable groups.

Land use patterns in Timor-Leste

Topography, soil fertility and weather conditions are the natural determinants of the vegetation of Timor-Leste. From an ecological point of view land occupation in Timor can be divided in the following categories: mountainous areas; highland plains; moist lowland areas (along the southern coast); arid lowland areas (along the northern coasts); marine and coastal areas; and, urban areas (RDTL 2005a). The most important categories of land use are forest, 57.2%, and agriculture, 27.5% (Table 1).

Table 1 – Land use areas by category

Land uses	Area Hectares	%
Forest land		
Lowland	761,486	51.0
Highland, coastal & other	92,768	6.2
Agricultural land		
Estate crops	74,578	5.0
Food & other	336,400	22.5
Non-productive land	203,152	13.6
Cities, towns villages	19,934	1.3
Lakes	5,080	0.3
Total	1,493,398	100.0

Source: RDTL 2005a

The vast majority of agricultural land is used for traditional agriculture, which forms the basis of the livelihood of most rural households in Timor-Leste. The area of estate crops is mainly dominated by the coffee plantations of arabica in the highlands and robusta in lowlands and coconut trees.

The manipulation by man of the natural ecosystem of Timor-Leste started some 40,000 years ago, continued with the Portuguese arrival at Lifau at the beginning of the sixteen century and was dramatic accelerated during the 24 years of Indonesian occupation of the territory. The principal change in Timor-Leste land use patterns due to the Portuguese presence or colonization was the intensive exploitation of sandalwood until its almost extinction, in terms of natural regeneration, in the nineteenth century. Sandal almost extinction coincided with the introduction of coffee production, meaning that the sandal economic cycle was succeeded by the coffee economic cycle (Cinatti 1950a; Cinatti 1950b).

The Indonesian occupation of the territory in 1975 was characterized, in its turn, by a dramatic deforestation, principally of the remaining sandalwood, the few trees that were still preserved until 1975, and of other commercial timber species. Gusmão (2003) reports that during the Indonesian occupation, because Timorese guerrillas were based in forests, reforestation programs were suspended due to security issues and crop production was encouraged through opening new fields in forest land without using any practices of soil conservation.

Combining all the aspects mentioned and the peculiarities of Timor-Leste, Table 2 indicates the main land use patterns and the most common uses that were considered relevant to examine the relation between the set of goods and services that each land use pattern supplies and the well-being of the people of Timor-Leste.

The first two types of land use pattern, already mentioned above, occupy the majority of the land of Timor-Leste. The natural and semi-natural ecosystems land pattern is used for primary and secondary forests, streams and lakes and coastal areas, while the land pattern of subsistence agriculture includes land for staple food crops, cash crops, livestock and fish ponds. Commercial agriculture in Timor-Leste, identified with large estate coffee and coconut plantations, is not as relevant as it once was.

Table 2 – Land use patterns in Timor-Leste

Land use patterns	Use types
Natural and semi-natural ecosystems	Primary and secondary forests, streams and lakes and coastal areas, natural pastures
Agriculture	Staple food crops, cash crops, natural pastures, livestock and fish ponds
Sacred	Sacred houses, altars, forests and water sources
Housing	Urban and rural housing
Basic infrastructures	Churches, schools, hospitals, roads and public services
Industries and services	Industrial and commercial activities

The third type, sacred land, used for sacred houses, altars, forests and water sources, is very important in Timor-Leste not in terms of producing materials or area occupied but in terms of the intangible good that produces.

Land for housing, beyond the cultural issues, is essential to consider because it provides shelter for the households and housing conditions sharply influence the level of well-being. On the same line of thought, is the land use for basic infrastructure, such as churches, schools, hospitals, roads and public services. Considering Timor-Leste recent history, principally the destruction of houses and basic infrastructures occurred after the 1999 referendum, present and future well-being will be dependent upon the reconstruction, and in the case of basic infrastructures of the quantity and quality of the public goods supplied to the population.

The impact of some drivers of change of land use, such as population growth, market pressure over land and the effect of economic growth, that are already in place, will result in an increase of land use for commercial agriculture, industries and services. The majority of these land uses will demand a significant manipulation of natural and semi-natural ecosystems, and often involve a permanent conversion of the original ecosystem.

Land use patterns, ecosystems goods and services and components of human well-being

The land use patterns of Timor-Leste studied are natural and semi-natural ecosystems, subsistence agriculture, sacred and housing. The links between land use patterns, goods and services produced and components of human well-being in Timor-Leste are summarised in Table 3.

Table 3 – Links between land use patterns, goods and services produced and components of human well-being in Timor-Leste

Land use Patterns and types	Goods and services	MEA services	MEA components of human well-being
Forests	Timber from various species, non-timber products, grazing, medicinal plants, vegetal and animal food products, opportunities to recreation and tourism Protection of watersheds and flood regulation, water purification and supply for domestic consumption and agricultural irrigation, control of waste degradation and treatment, soil formation, stabilization and erosion control, nutrient cycling, primary production, shelter and nursery for wild fauna and flora	Provisioning Regulating and supporting	Basic material for good life; health Basic material for good life; security
Coastal areas	Fish and aquatic plants, recreational activities connected to fishing and diving	Provisioning	Basic material for good life
Forests and coastal areas	Freedom, inspirational, aesthetic, spiritual, educational opportunities	Cultural	Security; good social relations
Agriculture	Staple food crops, cash crops, livestock and fish ponds	Provisioning	Basic material for good life; security; health; good social relations
Sacred	Sacred spaces, totemic species, inspiration, identity, belonging, settlement patterns, family alliances, community rules and institutions of use and management, cultural and spiritual traditions	Cultural, regulating and provision	Security; good social relations; health; basic material for good life
Traditional housing	Shelter, place to enjoy privacy, to eat, to sleep, to keep possessions, opportunities to express culture and identity	Cultural and Provisioning	Basic material for good life; health; security

The goods produced with higher short-term value to the people of Timor-Leste are classified as provisioning, including food, raw materials, genetic resources and medicinal and ornamental features. The vast majorities of these goods is produced by subsistence agriculture, the forest and the coastal areas and contribute essentially to those components of well-being called basic material for good life and health.

Among food products we include those obtained through hunting, fishing, gathering of wild species and subsistence agriculture; among raw materials, building materials, firewood for domestic consumption, fodder for animals and natural fertilizers crops; among medicinal and genetic resources, the many wild species used in prevention and cure of many diseases, through traditional East Timorese medicine and among ornamental features, materials used for crafts produced in different regions.

The goods and services classified as regulating and support, include, among others, protection of watersheds and flood regulation, water purification and water supply for domestic and agricultural irrigation, control of degradation and waste management, training and soil stabilization and control erosion, nutrient cycling, primary production, shelter and nursery areas for wild flora and fauna. These goods and services, mainly provided by forests, play an essential role in the well-being component of security, also contributing to the component basic materials for a good life.

For most East Timorese, the earth is the center of spirituality. The areas deemed sacred can vary from a few trees to a mountain and its limits cannot be fixed. There is no estimate of the area occupied by sacred lands, but it is spread all over the country. Sacred land provides goods and services classified as **regulating and provision**, for example, through the conservation of water sources and forests that are ecologically useful to keep water flows and biodiversity and to prevent erosion. But more importantly, sacred land provides cultural services, such as totemic species, sense of identity and belonging, settlement and alliance patterns, inspiration for art expressions, and the transmission of knowledge between generations.

Cultural services may be considered the greatest contribution of sacred land for well-being, among other reasons, because they are unique, in other words there are no substitutes, and are complementary to other goods. Cultural services are inputs for all components of well-being, with notable contributions to the components of good relations and security.

Final Remarks

Land performs a crucial role in the development of rural areas in Timor-Leste and in the path to achieve a higher level of well-being. The diversity and complexity of the cultural matrix has been determinant for the patterns of land use observed in the country. This cultural matrix is also a fundamental element in nation-building and therefore in achieving one of the consensual conditions for development.

This paper highlighted some of the relationships between land use patterns and well-being of Timor-Leste population, through the identification of services supplied by land uses and their contributions for the constituents of well-being. The objective was to shed light on the role of land in simultaneously improving human well-being and sustaining vital ecosystems in Timor-Leste.

Due to cosmology and heavy dependence on natural resources, the people of Timor-Leste have established a very close and holistic relationship with nature, which provides them with essential goods and services such as water, land, food, firewood, building materials and spiritual enrichment. Thus, land provides the population not only with economics benefits but also important cultural services and plays a central role in ensuring families' and communities' well-being. An illustration is the role of cultural goods produced by sacred and forest and coastal areas land types, which were important cohesion elements and tools to support the struggle for freedom against the Indonesian occupation. This liberation paved the way for development.

We should stress that cultural freedom becomes itself a development goal within a human rights approach to development and a prerequisite for economic, social and cultural development, all crucial in achieving freedom of choice and action.

The land means much more than money for Timor-Leste people. This research recognizes the essential role that land performs in the development of rural areas of Timor-Leste and the importance

of focusing and keeping in mind that many of the goods and services supporting peoples' well-being have a public or a common pool good nature, and thus do not have market value and are not subject to commodification. This fact should be considered when elaborating, adopting and implementing policies and laws. In sum, as shown above all the networking between land uses, land services and constituents of well-being are interconnected and contribute to the ultimate well-being benefit of "Freedom of choice and action".

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