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Paudel, Bikash and Pandit, Januka and Reed, Brinton

Ph D Student, Natural Resource and Environment Management,
University of Hawaii, Planning Officer, Ministry of agriculture
Development, Nepal, Natural Resource and Environment
Management, University of Hawaii

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Fragmentation and conversion of agriculture land in Nepal and Land Use Policy 2012

B Paudel¹, Januka Pandit² and Brinton F Reed³

¹Ph D Student, Natural Resource and Environment Management, University of Hawaii, ²Januka Pandit, MS Agriculture Economics, Planning Officer, Ministry of agriculture Development, Nepal, ³Natural Resource and Environment Management, University of Hawaii

Abstract

High land fragmentation and accelerated rate of conversion of agriculture land are major challenges for food security of Nepal. Realizing ineffectiveness of previous efforts to manage these problems, government of Nepal has adopted land use policy 2012. The paper reviews the effects of previous land management policies on land fragmentation and conversion of agriculture land, and analyzes land use policy 2012 with respect to these problems. Analysis suggested that land fragmentation and high rate of agriculture land conversion could partly be attributed to failures of previous land management policies that were adopted for land re-distribution. Land use policy 2012 has proposed classical regulation tools for controlling land fragmentation and conversion of agriculture land such as land pooling, land classification, zoning and tax/incentive based discrimination. Considering long history of non-regulated land use system in Nepal, the acceptability of the strong regulatory provisions could be the main constrain for successful implementation of the policy, thereby recoiling the effort to control land fragmentation and agriculture land conversion in Nepal.

1. INTRODUCTION

Nepal is a landlocked and mountainous country located in the southern belt of the Himalayas. It has an area of 147,181 square kilometers and a population of 26.6 million [CBS \(2011a\)](#). From the mid-18th century to the early 19th century, King Prithvi N. Shah and his successors united the modern state of Nepal. The Shah dynasty ruled Nepal as monarchs until 2007 although they were reduced to figure-heads from 1846 to 1953 by Rana, another autocratic dynasty who made appointments for prime minister and other government positions hereditary. Nepal's modern democracy, which resembles the British parliamentary system, started in 1950 after a peoples' movement lead to the fall of the Rana dynasty.

After 1960, a "party-less" *Panchayat* system governed Nepal for 30 years, until another peoples' movement restored Nepal's multiparty democracy in 1990.

Nepal's hilly and mountain regions comprise about 86% of its total area ([NPC, 2012](#)). Due to the arrival of disparate immigrant groups throughout the ages, Nepal is a multi-ethnic, multi-cultural and multilingual country, having 103 castes and ethnic groups speaking 92 languages. It is also classified as one of the poorest countries in the world, having a per capita Gross Domestic Product (GDP) of USD \$367 ([UNDP-Nepal, 2009](#)). Nepal's economy largely depends on agriculture, which employs 73.9% of its economically active population ([CBS, 2008](#)) and contributes approximately 31.1% to GDP ([NRB, 2010](#)).

About 16.7% of land in Nepal is arable ([Worldbank, 2013](#)). Nepal's arable land availability is 0.8 square kilometers for 1000 people, which is very low compared to per capita rates of 1.3 in India, 1.1 in China and the world average of around 2.0 ([WORLDSTAT, 2012a](#)). In addition, there are many challenges related to land management. The problem of limited land availability is exacerbated by highly skewed distribution of land, with the top 5% of landowners owning a total of 37% of available land and 47% of landowners owning only 15% of available land ([Adhikari, 2006](#)). Increasing fragmentation ([Khanal, 2008](#)), desertification ([MoEST, 2006](#)), de-intensification and abandonment of agriculture fields ([Gurung, 2004](#); [Khanal & Watanabe, 2006](#)), conversion of agriculture land to settlements ([Basnet, 2012](#); [Rimal, 2012b](#); [Rimal, 2012a](#)), double ownership structure and unclear land tenure rights ([USAID, 2010](#); [Adhikari, 2008](#); [Bhandari & Linghorn, 2012](#)), and a large landless population ([Adhikari, 2006](#)) are other major problems having to

do with land management in Nepal. [LRMP \(1986\)](#) estimated that only about 20% of Nepal's land was under cultivation while, in terms of percentage of total area, forests (37.8%), shrub land (4.6%), non-cultivated parcels within cultivated areas (6.5%), pastures (11.8%), snow and ice packs (3.4%), lakes and ponds (0.1%), urban areas (0.1%) and rocky, sandy or stony surfaces (15.7%) were other land uses. Recently, [WORLDSTAT\(2012b\)](#) has indicated an increase of agriculture land use to about 29% and pasture land to 12.1%, and a decrease of forested areas to 24%.

2. THE PROBLEM OF AGRICULTURAL LAND FRAGMENTATION AND ARABLE LAND CONVERSION IN NEPAL

Nepal's land holdings are highly fragmented with an average of more than three parcels per holding. The households with larger holdings, between five and ten hectares, had the highest average number of parcels (about 7.5 per household) ([CSRC, 2009](#)). Moreover, the majority of farmers are smallholders, with an average holding of 0.79 hectares in 2001. About 8% of households had more than two hectares of land, fragmented into an average of six parcels ([CBS, 2011a](#)). [Niroula and Thapa \(2007\)](#) also verified an increasing trend in number of parcels and a decreasing trend in parcel size in the hilly region of Nepal. The structure of the land inheritance system, haphazard housing and urbanization planning, and loosely-enforced policies are all offered as major causes of land fragmentation ([CRSC, 2012](#)). Land fragmentation in general has a negative impact on agriculture productivity ([Kakwagh et al.; Rembold, 2003; Austin et al., 2012](#)). Although, after [Sen \(1962\)](#), many studies reported that smallholdings were more productive than large holdings ([Lipton, 1993; Singh et al., 2002](#)), but researchers still report negative relationship between farm size and agriculture productivity in South-Asia ([Deolalikar, 1981; Chattopadhyay & Sengupta, 1997; Niroula & Thapa, 2007](#)). Moreover, [Niroula and Thapa \(2005\)](#) reported that fragmentation of already small holdings into even smaller parcels was detrimental to land conservation and economic progress in Nepal.

The conversion of fertile agriculture land to non-agriculture land use is another problem in Nepal. Historically, conversion of forests to agriculture land had been the center of debate, but conversion

of fertile agriculture land to non-agriculture uses, mainly urban and suburban settlements is becoming more and more of a problem ([Mathema, 1999; Sivakoti et al., 1999; UN-HABITAT Nepal, 2010; Basnet, 2012](#)). Cultivated land area in Kathmandu Valley decreased from 66.23% to 23.5% between 1976 and 2009 ([Rimal, 2012a](#)). Similarly, cultivated area in Pokhara Valley decreased from 60.7 % to 20.2% during 1977-2010 ([Rimal, 2012b](#)). Both of these places were once fertile mid-hill valleys with significant agricultural production. The rate of agriculture land conversion is very high in Biratnagar ([Rimal, 2011](#)), which is in the especially fertile *Terai* region of Nepal. In other cities of Nepal, land conversion is also occurring at high rates. There are regional differences in rates of land conversion, as agricultural land use in hilly regions appears to be stabilizing ([Jackson et al., 1998](#)), compared to the *Terai* and valley regions in hills. Thus the highest conversion rates are in Nepal's food production belt and fertile "hot spots," making such conversions a serious threat for national food security.

Nepal's government introduced several environmental and sectorial policies in past 30 years, some of which were supposed to reduce arable land conversion. The government's realization of the need to consolidate Nepal's private lands was reflected in *Land Acquisition Act 1977* ([HMG/N, 1977](#)), though the main objective of the act was land acquisition. Some other policies and laws include: *National Parks and Wildlife Conservation Act 1973* ([HMG/N, 1973](#)); *Soil and Water Conservation Act 1982* ([HMG/N, 1982](#)); *Water Resources Act 1992* ([HMG/N, 1992](#)); *Forest Act 1993* ([MoFSC, 1995](#)); *Nepal Environmental Policy 1993*; *Action Plan 1993* ([HMG/N, 1993](#)); *Agriculture Perspective Plan 1995* ([NPC, 1995](#)); *Environmental Protection Act 1997* ([HMG/N, 1997](#)); *Environmental Protection Rules 1997* ([MoEST, 1997](#)); *Water Resource Strategy, 2002* ([HMG/N, 2002](#)); *National Biodiversity Strategy, 2002* ([MoFSC, 2002](#)); *National Wetland Policy 2003* ([MoFSC, 2003](#)); *National Agriculture Policy, 2004* ([MoAC, 2004](#)); *National Urban Policy 2007* ([MoPPW, 2007](#)); *National Adaptation Programme of Action (NAPA) 2010* ([MoE, 2010](#)), and the new *National Wetland Policy 2012* ([MoFSC, 2012](#)). Similarly, the need to control the rapid conversion of agriculture land has also been stressed in Nepal's new millennium development plans ([NPC, 2002; NPC, 2003; NPC, 2007; NPC, 2010](#)). The

Local Self-Governance Act, 1999 ([HMG/N, 1999](#)) was also expected to reduce land conversion rates. But, because of a lack of an efficient and meaningful land use management framework, most of the government efforts to regulate land use through environmental policies have been largely ineffective. Realizing these needs, the government has recently adopted the ‘*Nepal Land use Policy 2012*’ ([MLRM, 2012a](#)).

This study analyzes existing literature to assess the historical roots of Nepal’s modern day land fragmentation and land conversion problems, focusing on agriculture land use, and will also examine Nepal’s current land use policy and discuss the suitability of these measures to mitigate such problems.

3. RESULTS AND DISCUSSION

3.1. Factors contributing to agricultural land fragmentation in Nepal

Land fragmentation is rooted in traditional inheritance practices whereby the parental estate is divided equally among sons ([Sapkota, 2004](#)). Due to lack of off-farm employment opportunities, parental land inheritance is often indispensable for highly agriculture-dependent families in Nepal. It is because of these two basic characteristics that redistribution and fragmentation of agricultural land occurs every generation. Contributing to fragmentation is the fact that most farmers are not incentivized to seek larger parcels due to their reliance on subsistence agriculture and limited available resources with which to cultivate crops. Land prices also play a part ([Miller, 2006](#)); after 2000, Nepal’s land prices soared, resulting in an overall decrease in average parcel size. In this way, the land-price hike at the turn of the millennium also contributed to increasing land fragmentation. Furthermore, governmental and political parties have in recent years offered more support to landless people, which has resulted in even more privatization and the subsequent parceling of public land. However, failures of past policies and programs, especially during the ‘land reform’ era of the 1960s, had an arguably stronger negative impact on land consolidation. Changes in the land tenure system, the provision of tenancy rights and the enforcement of land ceilings all contributed to agriculture land fragmentation.

3.1.1. Land tenure changes

Before the ‘land reform’ era, there were mainly two land tenure systems in Nepal: state landlordism, known as *Raikar*, in which all land was state-owned; and *Kipat*, a form of communal land ownership whereby a form of territorial land ownership rights were given to various ethnic or indigenous communities. *Raikar* tenure had different modalities such as *Birta* (grants to upper classes which helped consolidate wealth and power), *Guthi* (grants to religious or charitable institutions) and *Jagir* (grants in consideration of services for state employees), among others. The ‘*Kipat*’ system of land tenure enabled indigenous peoples to own land communally and practice traditional forms of land use. *Kipat* parcel sizes were relatively large, as they were established to reflect the territorial rights of entire communities or groups of communities. The *Kipat* system was at the time considered a ‘land-grant’ policy but was later abolished by the 2nd land act amendment of 1966 which required registration of lands ([Ghimire, 2010](#)). Following the amendment, some of the communal lands were never officially registered and continued to be cultivated by farmers although the land was technically owned by government. Much of the land that was registered was subsequently divided among individual owners, significantly contributing to modern land fragmentation in Nepal.

3.1.2. Provision of tenancy rights

After the establishment of democracy in 1950, Nepal’s government tried to abolish previous land tenure systems, such as *Kipat*, *Birta*, and *Jagir*, with the intent of securing tenancy rights for private owners. The *Land Act 1964* and *Land Revenue Act 1977* were major policies developed to replace the older systems. One major objective of these policies was to eliminate the unfair distribution of land. However, these policies were practical failures in this regard; less than 2% of the land was re-distributed as a result of their implementation. Assurance of tenancy rights essentially increased land ownership fragmentation between owner and tenant. Moreover, because of the fear of tenancy right enforcement, many landowners sold their lands before the law came into existence. Thus the provision increased the rate of land fragmentation in two ways. The demand for strong tenancy rights have only strengthened over the years, and it is still a priority program in current development plan.

3.1.3. Land ceiling

The implementation of a ‘land ceiling,’ or cap on individual land holdings, was used as a tool for land reform in 1960s. *The Land Act 1964* introduced the concept and *The Land Acquisition Act 1977* reinforced it. In accordance with these acts, Nepal’s government acquired land from private landowners whose holdings exceeded the land ceiling, and re-distributed it to landless households. In anticipation of the acts, many landowners either registered the land using names of their families and friends, or sold the excess land. When the law came to action, there were very few landowners with land holdings surpassing the land ceiling. Overall, the provision failed to re-distribute land as planned and significantly contributed to land fragmentation. Data showed that average number of parcels per household declined from 6.8 in 1961-62 to 4.4 in 1981-82, to 4.0 in 1991-92 and finally to 3.3 in 2001-02 (CBS, 2006).

3.2. Factors for rapid conversion of agriculture land in Nepal

Like land fragmentation trends, the conversion of agriculture land to non-agriculture use (mainly residential settlements) is also deeply rooted in the subsistence-oriented behavior of Nepalese farmers. Like in other cultures, house ownership lends status and financial stability to households. Typically, every generation of sons build new houses for themselves and their families on land bequeathed from their parents. This trend is especially common in rural areas. In Nepal’s cities, the demand for new houses has risen tremendously in recent years due to high increases in household income, mostly from remittances. This rise in demand has only contributed to the conversion of agriculture land to residential land uses. Not only is land needed for new housing developments, appreciated land values make agriculture land use untenable for many households. Although these are all important factors contributing to the conversion of agriculture land, the major cause for concern going forward is ongoing policy failure at the national level. The most important of these failures are discussed next.

3.2.1. Eradication of Malaria and settlement in Terai

The *Terai* region is an extremely fertile, low elevation band of land running from east to west along the southern board of Nepal (Timsina, 2003; Fofana et al., 2005; Pokhrel et al., 2009). This region, which is part of the indo-gangetic plain’s northern boundary has been referred to as the ‘bread basket’ of Nepal (Bishop, 1978; Sah et al., 2001). Before the 1950s, only a small number of indigenous people lived in the *Terai*, depending on hunting, gathering and shifting cultivation for sustenance (Forest Monitor, 2006). The threat of malaria kept many of Nepal’s citizens in other regions from migrating there (Goait, 2007). Eradication of malaria coupled with a government settlement plan accelerated the migration from the other regions of Nepal to *Terai*, which resulted in a dramatic rise in population (Ertur, 1994; Regmi, 1994; Forest Monitor, 2006). The initial government goal was to settle a population of around 30,000 by reclaiming 20,240 hectares of grass and forestland. But, during the period between 1970 and 1983, the number of households resettled was 50,859 on 33,733 ha of land (Gurung, 1998). Before the 1950s, around 35% of population lived in the *Terai* (MHP, 2011). In 2011, 50.15% of Nepal’s population lived there (CBS, 2011b). Although this initial migration resulted in the conversion of forests or rangelands to agriculture, later migrations ultimately resulted in the conversion of agricultural land into settlements.

3.2.2. Unbalanced development

The eradication of malaria was an important factor motivating the migration into the *Terai*, but it was not the only one. People migrated from the hills to the *Terai* for economic reasons (Regmi, 1994). The *Terai* is more developed than hills or mountain regions (Ransom et al., 2003). In 1971 the annual migrant population to the *Terai* was 399,925. By 1981, it had increased to 686,178 and grew to 915,578 and 1,085,862 in 1991 and 2001, respectively (MHP, 2011). The current population growth rate in the *Terai* is about 1.75%, which is quite high compared to the mountain and hill regions of Nepal (0.63% and 1.13%, respectively) (CBS, 2012). Urban-focused development efforts also contributed to widespread development (Sharma, 2006). The population growth rate in rural areas is about 1.03% but is around 3.38% in urban areas. The percentage of people living in urban areas increased from about 13% to 17% during the

period from 2001-2011. Among these trends is a decrease in size of households from 5.44 to 4.70 members in 2012 ([CBS, 2012](#)). These enormous population surges into the Terai, regional urbanization and reduction in household sizes have all contributed to increased demand for new houses. This has led to the development of many small city centers with expansive urban sprawls, all of which are a result of historical and continuing conversion of agricultural land into settlements.

3.2.3. Unplanned urbanization

Nepal has struggled to establish a strong urban planning regulatory and institutional framework for its cities. Urban development planning has gone through a series of institutional restructuring efforts starting as early as 1987, but has been unable to achieve efficient urban development. The number of designated urban areas has increased from 10 to 58 and the percent of urban population in Nepal has grown from 2.9% to 13.9% in the time period from 1952 to 2001 ([Sharma, 2003](#)). The growth of urban areas to river basins, valleys and plains with alluvial soils in the *Terai*, have tragically degraded the once highly productive capacity of those areas ([Basnet, 2011](#); [Rimal, 2011, 2012b](#); [Rimal, 2012a](#)). A study from Pokhara valley indicated that the cultivated area there decreased from 60.7% in 1977 to 20.2% in 2010, which is a loss of 22.38 square km (about 75% of total) of fertile agriculture land ([Rimal, 2012b](#)). Most cities do not have physical development plans (PDP), and in places where they do exist (Kathmandu has had a PDP in place since 1969), enforcement has been poor ([Rimal, 2012a](#)). According to literature, urban development in Kathmandu will reach a critical stage where urban and suburban areas will place unprecedented stress on land, river and forest ecosystems in the next decade ([Thapa & Murayama, 2010](#); [Thapa & Murayama, 2012](#)).

3.2.4. Ineffectiveness of environmental policies managing agriculture land conversion

In the previous section, we discussed Nepal's attempts to regulate land-use changes through environmental policy. But, because those policies were designed for the management of specific natural resources such as forest, water, wetlands and biodiversity, they lacked specific tools for the protection of agriculture land. Some of the policies,

acts and regulations adopted by Nepal contained tools and provisions that could have helped to control agriculture land conversion if they had been effectively implemented. *The Soil and Watershed Conservation Act (SWCA) 1982* empowered the government to declare any area as a "protected watershed area ([HMG/N, 1982](#))." Similarly, the *Irrigation Policy, 2003* ([MoI, 2003](#)) and *Irrigation Development Vision, 2006* ([MoI, 2006](#)) were both targeted at restricting settlements in irrigated areas. These provisions, if strictly implemented, could have helped to protect agriculture land. However, *SWCA 1982* had minimal impacts on agriculture land while irrigation policies were ineffective due to a lack of enforcement. The *Environmental Protection Act 1997* adopted a provision requiring Environmental Impact Assessments (EIAs) for development and other activities, and it has been integrated with several sectorial policies since its inception. However, current EIA practices are poor and typically overlook macro-level cumulative impacts ([Bhatt & Khanal, 2009](#)). [Thapa and Murayama \(2010\)](#) suggested that government plans and programs have had little positive effect on urban planning in Kathmandu. Researchers identify delays in implementation and a lack of effective monitoring and evaluation protocol as major reasons for environmental policy failure in Nepal ([Chaudhary, 2000](#)).

3.2.5. Lack of land use guidance mechanisms

Ultimately, a lack of effective frameworks or systems to manage land use were, and continue to be, the main policy problems contributing to rapid conversion of agriculture land. For example, there is no clear-cut demarcation of agriculture land in Nepal. The 9th five-year plan (1997-2002) emphasized the classification of arable land according to productive capability ([NPC, 2002](#)). Under this plan, the government approved the Land Use Planning Project in 2000 and established the Land Use Coordination Council and the Land Use Programme Committee (LUPC) at the federal level. The District Level Land Use Action Committee was established to implement the project at the district level. In addition to the classification of lands, the project was to update existing land resources maps, prepare land-zoning data, and to prepare land-zoning data ([Oli, 2001](#)). However, at the time this study, the project still has not finished updating existing land

use maps ([MLRM, 2012b](#)). The 10th plan (2002-2007) has again called for the for implementation of this program ([NPC, 2002](#)). The *Water Resource Strategy*, adopted in 2002, emphasized the need of watershed-level land use maps ([HMG/N, 2002](#)) and the *Sustainable Development Agenda (SDA)*, adopted in 2003, emphasized expedited land reform and land use management ([NPC, 2003](#)), although little progress has been made. In 2005, the land use council submitted a draft of the Land Use Strategy to the government and, realizing that small land holding size, fragmented land, and an lack of land use planning are major constraints for growth in Nepal's agriculture sector, the 11th plan (2007) aimed for comprehensive land consolidation ([NPC, 2007](#)). *The National Urban Policy 2007* adopted in 2007 also emphasized the protection of agriculture land ([MoPPW, 2007](#)). The 12th plan (i.e. three year plan 2010/11-2012/13) promoted land consolidation and the use of collective farming systems to reduce the rate of land fragmentation ([NPC, 2010](#)). During this time, political stability and increased income from remittances caused the value of land in urban and suburban areas to skyrocket. According to the Nepal Land and Housing Association, land prices have risen by 300% since 2003 and the Department of Land Reform estimates that land prices almost doubled in 2008 ([UN-HABITAT Nepal, 2010](#)). Ever-increasing land prices continue to accelerate agriculture land conversion. However, in 2012, Nepal's government incorporated the recommendations of recent development plans into the *Nepal Land Use Policy 2012*, exhibiting continued motivation to find solutions for these problems ([MLRM, 2012a](#)).

3.3. Nepal Land Use Policy (LUP) 2012

In the preamble of this document, Nepal's government admits that land use in the past has not benefited Nepal's society as a whole. It stresses that unregulated and uncontrolled land use has converted considerable amounts of arable lands to non-agriculture use, and that any previous efforts for land classification based on land suitability has failed. This document stresses the need for sustainable use of agriculture land based on land capability. Land fragmentation was also identified as another justification for sustainable land use policy. It states that past efforts to consolidate land and establish cooperative farming have failed, and that agricul-

tural productivity has been diminished due to uncontrolled fragmentation. The policy, in turn, stresses the need for establishing large, consolidated cooperative farms as a means to reach economies of scale in commercial agricultural production.

The vision of this policy is for sustainable social, economic and environmental development through the optimal utilization of land by regulating and managing land based on land use classification. To this end, it has set two broad goals (1) classification of land based on land structure, capability, suitability and need, and (2) preparation of a comprehensive land use plan.

The control of land fragmentation and arable land conversion are clearly aims of the policy. Out of seven identified objectives, one of them is directly targeted to gaining control of land fragmentation and three of them are strongly relevant to controlling the conversion of agriculture land. The first is *Objective-3, Management of land fragmentation by planned urbanization*. Although the policy recognizes the need to control land fragmentation in agricultural areas, this objective is focused on managing land fragmentation in urban areas. Objectives relevant for controlling agriculture land conversion are: *Objective-1, Land classification for best use of land and land resources*; *Objective-2, Promotion of land conservation, management and use based on land classification*; and *Objective-6, Preparation of land use plan*. The working policy provisions for each of the objectives are discussed below.

3.3.1. Policy provisions for land fragmentation

Table 1 shows the major policy provisions and action plans in *The Land Use Policy 2012* devised for gaining control of land fragmentation. The policy aims to consolidate land through pooling and acquisition although it does not mention exactly how it will be accomplished. It is also silent about compensation for the acquisition of land. Land pooling for development was reported to be successful in South Korea, Taiwan and Western Australia ([Schnidman, 1998](#)), but political instability in developing nations has historically been a major obstacle in the adoption of efficient land use policies ([Fernandez, 2003](#)). Literature ([Niroula & Thapa, 2005](#)) reports the failure of most land consolidation efforts in South Asia.

The policy is also silent on how land consolidation

will be accomplished. Consolidation efforts relying on voluntary consolidation have not worked well in

Table 1: Policy provisions of LUP 2012 regarding land fragmentation

Policy/strategy	Working policy
– Adopt concept of land pooling for consolidation of agriculture land, and acquisition of land for infrastructure (7.3.1)*	<ul style="list-style-type: none"> ▪ Promote land consolidation for land in agriculture use (8.3.1) ▪ Implement land pooling program for new development, planned housing and industrial area development (8.3.2)
– Discourage hazardous fragmentation of land (7.3.2)	<ul style="list-style-type: none"> ▪ Provides for fixing limit of land miniaturization for different land uses (8.3.3)
– Discourage land uses that change land relief and topography (7.3.4)	<ul style="list-style-type: none"> ▪ While developing and expanding urban, semi-urban and residential areas, the lands which are suitable based on physical infrastructure will be given higher priority (8.3.4) ▪ Enforce standard for change in natural relief and topography of land (8.3.5)

* Article numbers are indicated in brackets.

India ([King & Burton, 1983](#)). However, informal land consolidation by way of farmers' spontaneous exchange in land markets worked in Tamilnadu state ([Mearns, 1999](#)). This suggests that the method of land consolidation should be location-specific and timely. A study conducted in Nepal suggests that Nepalese farmers prefer spontaneous or autonomous land consolidation as opposed to forced restructuring of the landholdings in their possession ([Thapa & Niroula, 2008](#)). Land consolidation projects need to be sensitive to stakeholder preference as well as cost-effective, and can benefit from simple and fast procedures ([Vitikainen, 2004](#)). They should be market-led, demand driven and participatory ([Sabates-Wheeler, 2002](#)). Planners suggest that policies with too much focus on formalized and legislative land consolidation measures have high possibilities of failure ([Sabates-Wheeler, 2002](#)). The need for consolidation of agriculture land has

been voiced since as early as 1977 in Nepal, but only a few land consolidation projects have ever been implemented. The government introduced cooperative farming as an informal method of land consolidation, but it was not successful. Thus, a textbook adoption of the land pooling provision needs careful consideration of the factors contributing to past failures to have any chance of success in Nepal.

Another provision proposed by *The Land Use Policy 2012* for discouraging land fragmentation is the establishment of minimum parcel sizes for different land uses. The policy of fixing minimum lot size through zoning is used frequently to reduce the subdivision of farmland in many nations and is frequently reported in planning literature ([Healy & Short, 1979](#); [Freilich & Davis, 1981](#); [Bockstael, 1996](#); [Bengston et al., 2004](#)). Agricultural zoning plans in the United States contain minimum lot sizes requirements in their provisions. Minimum lot sizes creates a barrier to mobility of buyers among market segments ([Nelson & Sanchez, 1999](#)), which makes the subdivision of agriculture land difficult. Minimum lot sizes in agricultural areas can help to ensure that land is retained in parcel sizes that are viable for profitable agriculture ([Daniels & Nelson, 1986](#)). This type of provision is new for Nepal but has potential for success since this provision can easily be implemented through existing land registration and ownership mechanisms. However, the main challenge for implementation of this provision is determining at what size to fix the minimum parcel requirements, given the multifarious needs of landowners and tenants in Nepal. Moreover, consolidating land that is already fragmented could prove difficult. In any case, this provision can only be implemented after the successful establishment of zoning regulations.

Setting a standard for land use change and effective enforcement would be a useful tool for the conservation of the natural landscape in urban and semi-urban areas and although this provision would have little impact on agriculture land fragmentation, the same framework could be applied to commercial agricultural lands. However, in rural agricultural areas where smallholder farming is prevalent, no planning or code regulation procedures currently exist. Therefore, it will be very difficult to enforce this policy outside municipalities.

The policy has not stressed the need for private sector engagement in land consolidation, although the private sector would likely be a pivotal stakeholder in such efforts. Moreover, land consolidation has been targeted for urbanization and development whereas consolidation of agriculture land is not directly addressed.

Considering the severity of the agriculture land fragmentation problem, the policy provisions proposed in the policy are 'too little, too late.' The major policy measures proposed for land fragmentation are not relevant and applicable enough to effectively address the fragmentation of agriculture land. Some of the measures proposed to curb urban land fragmentation have, at the time of this study, already proven unsuccessful, and evoked no policy response from Nepal's government.

3.3.2. Policy provisions for controlling the conversion of agriculture land

Table 2 shows the provisions proposed in *The Land Use Policy 2012* to control conversion of agriculture land. The policy has a strong focus on controlling the conversion of agriculture land by means of land use zoning. In the United States, zoning (or 'down-zoning') is the most commonly used tool for protection of farmland by local governments (Juergensmeyer, 1980; American Planning Association, 1993; Burby *et al.*, 1993) although it has been challenged by landowners as imminent domain abuse and as conflicting with the right to private property. Many ordinances zone exclusively for agricultural or other non-developmental uses (Becker, 1969). Nepal has no historical record of land use policy but would do well to adopt and enforce policy aimed at zoning on the basis of land capabilities, current use and stakeholder needs. Current criteria are flexible and have loopholes. For example, land under subsistence farming could be zoned as either housing land or agriculture land. Policy encourages the zoning of land with existing or potential irrigation facilities as agriculture land use. However, the government should ensure that the land is being used strictly for agricultural purposes following investment in irrigation facilities.

The Land Use Policy 2012 proposes the development of special zones as another tool with which to establish land use classification. The policy measures aimed at defining special zones are expected to produce better results although enforce-

ment and regulation of zoning could prove difficult. The issue of 'fairness' has prompted many states in the U.S. to temper downzoning efforts by including compensation plans aimed at the transfer or purchase of development rights (Richardson, 2003). Similarly, landowners may ask for compensation should downzoning occur in Nepal. Policy also suggests confiscation of agriculture land if it is left fallow. However, many landowners will likely oppose this method of consolidation. Hence, these issues should be carefully addressed before zoning efforts begin in Nepal.

Proper zoning will require a strong commitment and consistent monitoring on the part of the government. Implementation of these provisions is likely to draw strong opposition from landowners. The policy has also ambitiously targeted the classification of agriculture lands based on the capability to grow specific crops. Such a strong top-down control of land use is bound with high risk and a significant threat of being challenged.

The need of vertical and horizontal coordination and participation of stakeholders in land use regulation is often highlighted in literature (Bengston *et al.*, 2004). The Nepal land use policy has also identified the need for improved coordination of land use laws with industry, housing and agriculture policies, which is a necessary step but alone is not sufficient to ensure success. The policy aims to manage growth and development through land use plans and maps. The success of this measure will depend on how the land use planning will be conducted and how it will be forced. For the reason that it will serve as a strong guiding regulatory mechanism, its implementation will prove difficult under weak governance and institutional capability.

The policy emphasizes the promotion of high-rise and planned housing in urban areas. Considering the socio-economic context of Nepal, it will take some time for many people to be attracted to group housing although planned housing projects in cities can definitely help reduce the rate of agricultural land conversion.

Table 2: Policy provisions of LUP 2012 regarding ALC

Policy/strategy	Working policy
7.1, Land use zoning – Land will be classified into seven different land use zones: agriculture, residential, commercial, industrial, forest, public use, and other category	<ul style="list-style-type: none"> ▪ Land will be classified according to the following criteria (8.1.1) <ul style="list-style-type: none"> a) Land structure, capability and suitability b) Current use criteria - if zoning is not possible based on land suitability criteria, current land use will be taken as basis c) Need criteria – for community benefit and development works, the state can use land for uses outside zoning policy ▪ Encourage to grow agriculture crops in lands having potential/existing irrigation facility while maintaining soil conservation (8.1.4) ▪ Identify special residential areas for ensuring housing for ‘landless’ and resource poor households and implement suitable programs (8.1.6).
7.2, Using land use zone – Strictly implement land use zoning in land use (7.2.1) – Discourage fallowing and non-agriculture use of fertile agriculture land (7.2.2)	<ul style="list-style-type: none"> ▪ Establish legal and institutional structure for necessary changes in land use; revert and punish for illegal change (8.2.2) ▪ Promote agriculture commercialization by encouraging adoption of commercial agriculture, cooperative farming and contract farming (8.2.3) ▪ The state can confiscate and use agriculture land for public uses, if it is left fallow for more than 3 years without justification (8.2.4) ▪ The state can withdraw subsidies and support; and increase taxes for landowners who do not cultivate land classified as agriculture land (8.2.5) ▪ Classify agriculture land by capability and encourage the cultivation of suitable crops (8.2.6) ▪ The state can establish subsidy, compensation and support mechanisms to discourage conversion of agriculture land (8.2.7)
7.6, Land Use Plan – Prepare and use of Land Use Plan at different levels (7.6.1) – Ensure development works implemented in accordance with land use plan (7.6.2)	<ul style="list-style-type: none"> ▪ Prepare and implement land use plan at different governmental levels i.e. center, district, municipality/VDC levels (8.6.1) ▪ Harmonize lower level plans with higher level plans (8.6.2) ▪ Collect necessary information and prepare land use maps (8.6.3) ▪ Ensure participation of government, public and private sector in land use planning (8.6.4) ▪ Include productivity, environmental conservation, social and economic development, and poverty alleviation considerations in land use plans (8.6.5) ▪ Review and refine the land use plan every five years in accordance with the national periodic plan review (8.6.6) ▪ Take the land use plan as basis for any development plans (8.6.7)
7.7, Land valuation and taxation – Land valuation and taxation based on land use and zone (7.7.1) – Charge additional tax for not using land in accordance with land use plan (7.7.2)	<ul style="list-style-type: none"> ▪ Establish legal mechanism for valuation and taxation of land based on land use (8.7.1) ▪ Discourage keeping excess land for housing by taxation (8.7.2) ▪ Low taxation for agricultural land use, considering its contribution of food security (8.7.3) ▪ High taxation for land not used for specified purpose, unless justified (8.7.4) ▪ Promote high-rise housing and planned housing (8.7.5)

* Article numbers are indicated in brackets.

In short, controlling land conversion is a major focus of *The Land Use Policy 2012*, and this is the first attempt of its kind in Nepal. Overall, the policy has included some of internationally successful and conventional regulatory tools. However, it lacks an innovative model that can replicate the international success in the context of modern Nepal. Nepal’s

government lacks the strong centralized regulatory tools needed for effective monitoring and enforcing of provisions. For the reason that land management in Nepal has historically never been subject to strong regulation, an unwavering government commitment and sustained policy funding is essential for success. With weak enforcement capacity, it will be very difficult for Nepal to adopt strong central

regulatory tools - hence community based environmental policy and decentralized land use controls might be viable options in the future ([Marshall and Shortle, 2005](#)). Moreover, innovative market based tools such as the transfer of development rights (TDR), community benefit agreements and the establishment of special agriculture zones have also been largely neglected by the policy.

4. CONCLUSION

The Land fragmentation and the conversion of agriculture land are major threats for the food security of Nepal. In this report, we discuss how the problems of land fragmentation and agriculture land conversion have been interwoven with various social, economic, cultural and policy problems, and how the LUC 2012 aims to solve them.

The problem of land fragmentation has historically not gotten enough attention from Nepal's government. In addition, government efforts to redistribute land through land reform policies have only contributed to land fragmentation; changes in land ownership structure and provisions of tenancy rights, and the establishment of land ceilings each had their role in increasing fragmentation of agriculture land in Nepal. Due to a historical lack of specific land-use regulation and the limited capacity of other environmental policies to fill the vacuum, there has been little success in the control of agriculture land conversion in Nepal. Realizing the need of a strong land use guidance system, Nepal's government was thus obliged to adopt *The Land Use Policy 2012*. The policy has set two broad goals to tackle these problems - the classification of land based on land structure, capability, suitability and need; and the establishments of the land use plan. Land pooling and land acquisition are the major tools identified by the policy to curb land fragmentation. We conclude, however, that provisions to manage land fragmentation are insufficient, predictable and lack innovative solutions.

The Land Use Policy 2012 has a strong focus on managing agriculture land conversion. It aims to establish strong, centrally-controlled land use regulations regarding land use zoning, special agriculture zoning, land use regulation, new taxation and fees, and classification mapping based on the productive capacity of lands. We believe that a strong centralized land use regulatory framework will be difficult to establish in Nepal, where the govern-

ment currently lacks the strength to effectively enforce existing laws and policies, and there exists no historical context for the establishment of strict land use laws. Therefore, we conclude that *The Land Use Policy 2012* has not properly integrated the relevant social, economic and institutional context of Nepal, and is thus bound to face strong opposition. Considering the failures of past land management regulation, this policy should have identified land use policy tools that reduce the burden to the central government, promote decentralized governance and work through market mechanisms. Tools such as the transfer of development rights and community development agreements would have been more suitable for Nepal.

Considering this early stage of adoption, there is ample opportunity and flexibility in the policy to improve and rectify the provisions, to specify the modalities with which to accomplish its objectives, and to generate broad stakeholder agreement in the process. With properly focused on timely action, this policy could be the first step in the long-term commitment of Nepal to the sustainable use of agriculture land in Nepal.

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