C18 Main perennial crops

Introduction

Although most arable land in the Lao PDR is devoted to annual crops, there has been a notable increase in the area under perennial crop cultivation in recent years. Perennial (or permanent) crops are defined as crops with a production cycle of longer than one year such as fruit and nut trees, banana, coffee, tea, cardamom and rubber. The area under perennial crops in the Lao PDR is around 151,000 ha, covering 10 percent of total agricultural land. However, the area under perennial crops has more than doubled over the decade from 1999 to 2011.

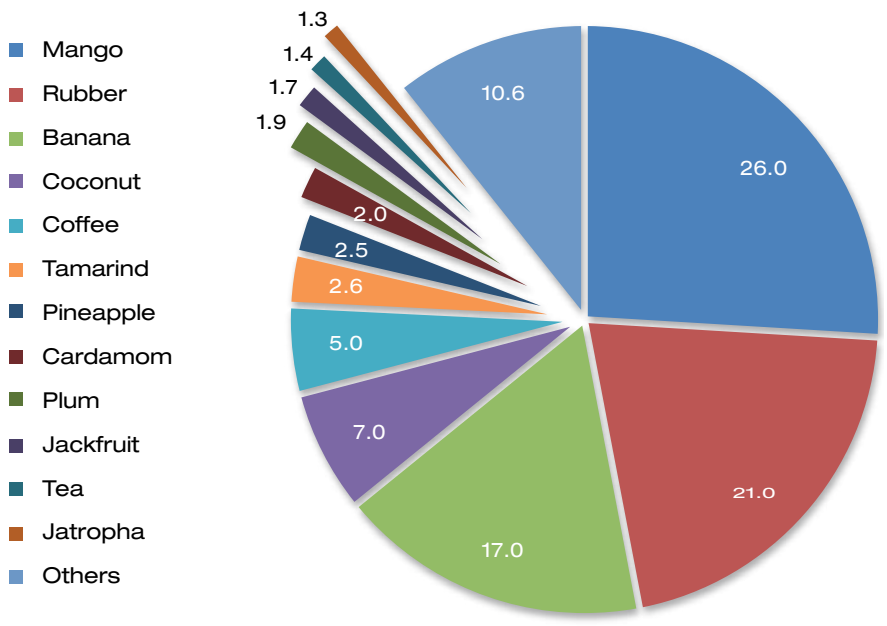
A significant increase occurred in all regions of the Lao PDR, but most prominently in the northern provinces. This was the result of various programs supported by the GoL and international donors which promoted perennial crops as alternatives to shifting cultivation. Farmers often intercrop industrial trees with pineapples and other crops during the first years of tree plantation establishment, with the main aim of securing intermediate livelihoods while waiting for trees to reach production age. Since 1999, permanent crops cultivation has increased only marginally in the south. Noticeably, larger households are much more likely to plant market-oriented perennial crops than smaller households. Farmers with small land holdings and cash constraints tend to allocate their lands to growing crops to meet household consumption needs rather than to invest in the cultivation of perennial crops.

Description of patterns in 2011

The 2010/11 Agricultural Census indicated over 80 different kinds of perennial crops grown in the Lao PDR, which broadly fall into the categories of (a) beverages and stimulants, (b) fiber crops, (c) flowers, (d) fodder crops, (e) fruits, (f) herbs, (g) industrial crops, (h) nuts, (i) oilseed crops, (j) spices, (k) trees and palms, and (l) other permanent crops. It should be noted that the types of perennial crops in the Lao PDR may be greater than what the census reports.

The map shows the dominant perennial crops planted in villages throughout the Lao PDR in terms of cultivated area. In total, 7,821 villages or 90 percent of all villages throughout the Lao PDR grow perennial crops. Mango, rubber and banana were the perennial crops planted by the largest number of villages, with 26 percent, 21 percent and 17 percent of all villages planting each crop respectively (see Figure 6). Other widely grown perennial crops include coconut (7 percent), coffee (5 percent), tamarind (2.6 percent), pineapple (2.5 percent), cardamom (2 percent), plum (1.9 percent), mandarin and orange (1.8 percent), jackfruit (1.7 percent), tea (1.4 percent), jatropha (1.3 percent) and others (10.6 percent). Oftentimes, fruit trees are planted in scattered patterns for household consumption, rather than in contiguous plantation areas, which may affect how fruit trees are represented on this map.

Figure 6: Proportion of villages by dominant perennial crop in the village



Mango is grown as a main perennial crop in almost one quarter of all villages, but less in the regions where industrial perennial crops are planted.

In the past decade, rubber plantations have been established at a huge scale in the Lao PDR. Rubber trees were most widely planted in northwestern Lao PDR, particularly in Luang Namtha, Bokeo, Oudomxai and Phongsaly, but also in central Lao PDR in Vientiane, Bolikhamxai and Khammouan. The map shows that in the northwestern provinces, but also in some central provinces, rubber has become the main perennial crop for many villages. There is also a notable amount of rubber planted in southern Lao PDR, but this is primarily done by foreign companies under a plantation model and is thus not included in this data.

Banana is a traditional perennial crop grown across the country for household consumption and sale. Bananas are grown throughout the country, but predominantly in central and southern Lao PDR. Fresh banana, fried banana chips, and grilled banana are all popular and are widely consumed in the Lao PDR. In addition, a large quantity of bananas are exported to neighbouring countries, particularly to China, Thailand and Vietnam.

Coconut trees were traditionally grown in the Lao PDR for both household consumption and sale, and trees produce for multiple human generations. Coconuts are the main perennial crop grown in 540 villages, primarily villages located in Savannakhet and in southern Champasak and located at lower altitudes with warm climates.

Coffee is cultivated by over 400 villages mostly in the four southern provinces, on and around the Bolaven Plateau. Almost 95 percent of total coffee production in the Lao PDR is produced for international markets, while only a small proportion (5 percent) is domestically consumed. Coffee is one of the five largest export commodities for the Lao PDR, which ranks third in coffee production among ASEAN countries, just after Vietnam and Indonesia, but still produces less than one percent of all coffee produced globally.

The map also depicts where cardamom is cultivated, primarily in Phongsaly and in the north of the Bolaven Plateau; tea is cultivated in Phongsaly, Oudomxai and west of Xayabouly town; mandarins, tangerines and oranges are cultivated around Vangvieng; cashews northwest of Pakxe, and tamarind is cultivated south of Xayabouly and in Attapeu, among other less widely grown perennial crops.

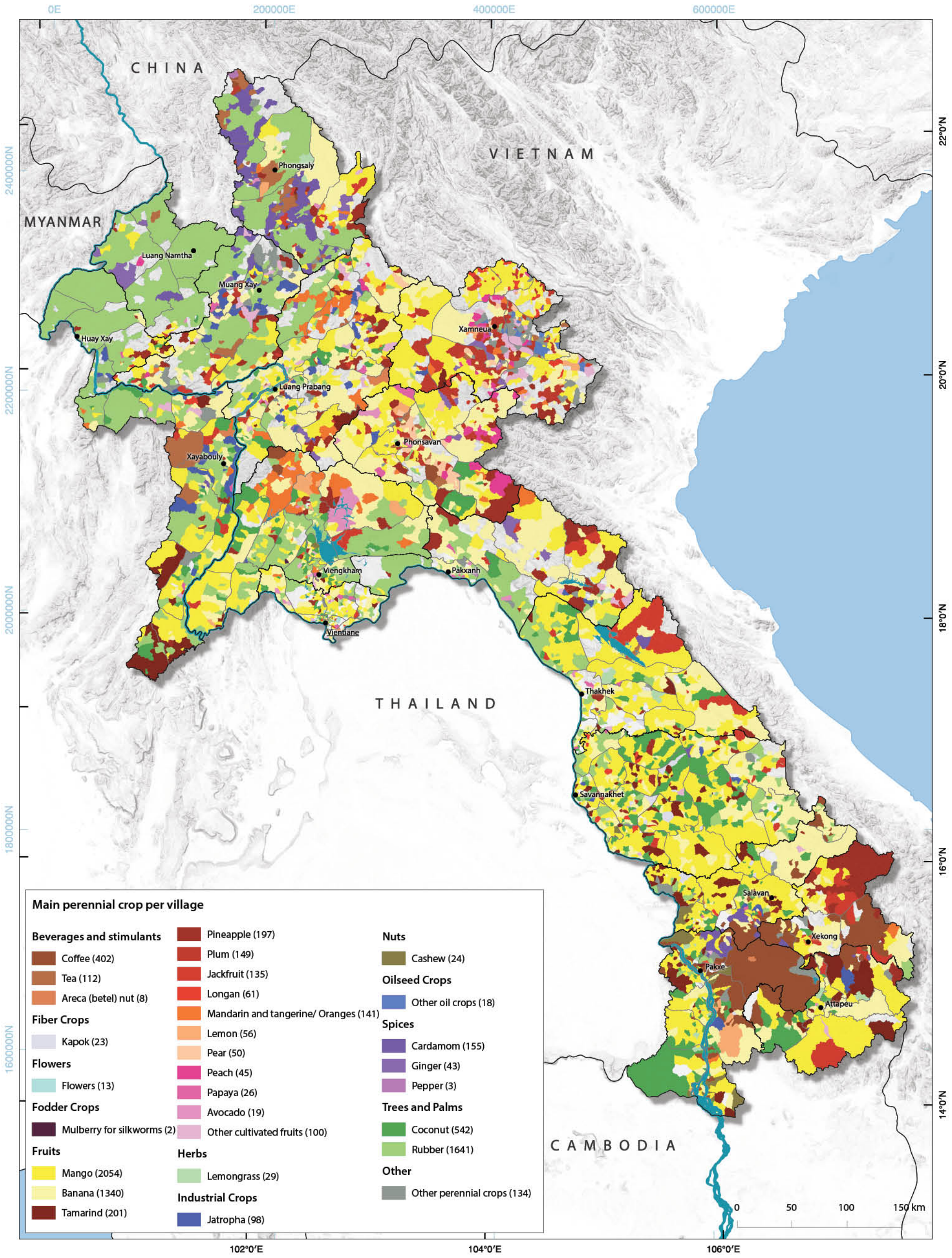
Interpretations

The Lao PDR has entered a phase of significant economic and agrarian transition in the last decade. Perennial crops such as rubber and coffee are not grown as food sources but as industrial inputs. Consequently, producers of these perennial crops are more dependent on global market prices. This offers on the one hand great potential to increase incomes and reduce poverty when markets are strong, but on the other hand great risk of loss for producers when market prices drop. Negative environmental impacts may also occur.

There are an increasing number of fruit processing factories in the Lao PDR that allow Lao producers to capture added value and enhanced the quality of their products. These factories allow domestic production to serve domestic markets, thus reducing imports. Moreover, these factories create jobs for local workers and contribute to reducing labour outmigration.

Laos has the potential to gain more access to export markets for the products derived from perennial crops, for example through certification schemes (e.g., organic, Forest Stewardship Council, fair trade) or Geographical Indicators (GI). Since 2009, some coffee produced on the Bolaven Plateau has been both fair trade and organic certified, and coffee chain stakeholders are working together to develop what could become the Lao PDR's very first GI. Some smallholder tea plantations on the Bolaven Plateau are also organic certified.

C18 Main perennial crops



C19 Crop clusters - perennial crops

Introduction

A wide range of perennial crops are grown in various regions of the Lao PDR, covering 151,000 ha, equivalent to 10 percent of total agricultural land. Some perennial crops are grown in clusters in certain areas such as rubber, cardamom, tea, pear, peach, cashew and coffee. These crops are mainly grown at commercial scales for both domestic and international markets.

Description of patterns in 2011

The main map presents the share of the total perennial crop area which is devoted to selected perennial crops, indicating a high degree of regional concentration. The regions close to China and around the Bolaven Plateau have a particularly high percentage of perennial crops. The smaller inset maps show in greater detail the particular areas where certain perennial crops are cultivated in concentrated clusters.

Rubber, for example, expanded rapidly in the Lao PDR through investment by foreign companies, local elites, and individual farmers. The top right inset map shows that 68 percent of the national area under rubber is planted in north and northwestern Lao PDR, especially in Luang Namtha Province. A second cluster ranges from Vientiane to Khammouan, though this cluster only constitutes 12 percent of the area under rubber. Overall, almost 44 percent of the agricultural land used for perennial crops in the Lao PDR is under rubber.

Around 8 percent of all agricultural villages in the Lao PDR are engaged in cardamom cultivation. It is cultivated in two main geographical areas: in western Phongsaly Province close to the Chinese border, which constitutes 58 percent of the total cardamom area nationally, and in the region surrounding the Bolaven Plateau, which accounts for 22 percent. Overall, 4 percent of the agricultural land used for perennial crops is under cardamom.

The Lao tea sector is relatively underdeveloped but has great potential. Tea produced in the Lao PDR is mainly exported to China as Lao tea leaves are highly valued on the Chinese market. Some is processed into Pu-Er tea, which is a special product made in China's Yunnan province bordering the Lao PDR. Over 80 percent of all land under tea cultivation is concentrated in Phongsaly, Oudomxai and Xayabouly. Phongsaly alone accounts for 62 percent of the total agricultural land under tea, while Oudomxai and Xayabouly represent 19 percent of the total tea area in the Lao PDR.

Coffee is mostly concentrated on and around the Bolaven Plateau where over 80 percent of the total coffee production area of the country is located. Almost 95 percent of the total coffee production in the Lao PDR supplies international markets while the remaining small proportion is consumed locally. Overall, 30 percent of the agricultural land used for cultivating perennial crops is under coffee.

Cashew is predominantly produced in Champasak Province and Salavan Province. The two provinces combined are home to over 90 percent of the total cashew planting area in the Lao PDR. Villages use very low percentages of their total agricultural land for cashew production. Overall, less than 1 percent of the country's total agricultural land used for cultivating perennial crops is under cashew.

Peaches and pears are predominantly grown in cooler areas in northern Lao PDR. Xiengkhouang Province, with 66 percent of the total pear cropping area, is the predominant production location in the country. Farmers used relatively small percentages (less than 5 percent) of their agricultural land for pear cultivation. Peach cultivation is also clustered mainly in Xiengkhouang and to a smaller extent in Vientiane and Houaphan Provinces. Overall, not even 1 percent of the agricultural land used for cultivating perennial crops is under peaches and pears.

Interpretations

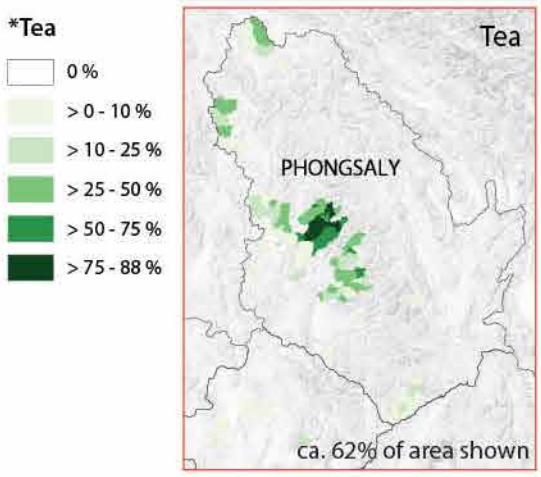
The high concentration of some perennial crops in certain areas in the Lao PDR predominantly occurs in areas with high market proximity, suitable soils and climate conditions, and farming communities with extensive experience growing such crops, e.g. coffee on the Bolaven Plateau. Many types of perennial crops are therefore grown in areas close to borders with neighbouring countries. Areas where certain perennial crops are grown in concentrated clusters, like in the northern provinces, may be partly a result of declining fallow periods and the increasing need to engage in multiple cropping systems in these regions.

The GoL's promotion of perennial crop plantations for domestic markets and international export focuses on areas with high potential and competitiveness in terms of agro-ecological suitability, growing experience and expertise, and market demand. It has been suggested that developing production and processing standards to meet the certification requirements for Good Agriculture Practices (GAP), Organic Agriculture (OA), and Geographical Indicator (GI) labels might not only improve the general hygiene and quality of agricultural products but also increase prices and allow Lao producers to access related specialty markets.

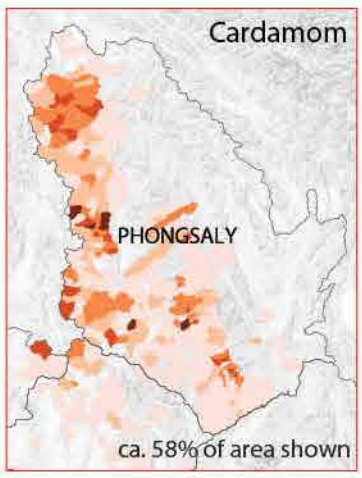
The uncertainty of the markets for many perennial crops may lead to food insecurity or food shortage in areas where farmers have devoted most of their land to perennial cash crop cultivation and thus rely on those crops' respective global markets for income to meet their basic needs.

Perennial crop clusters

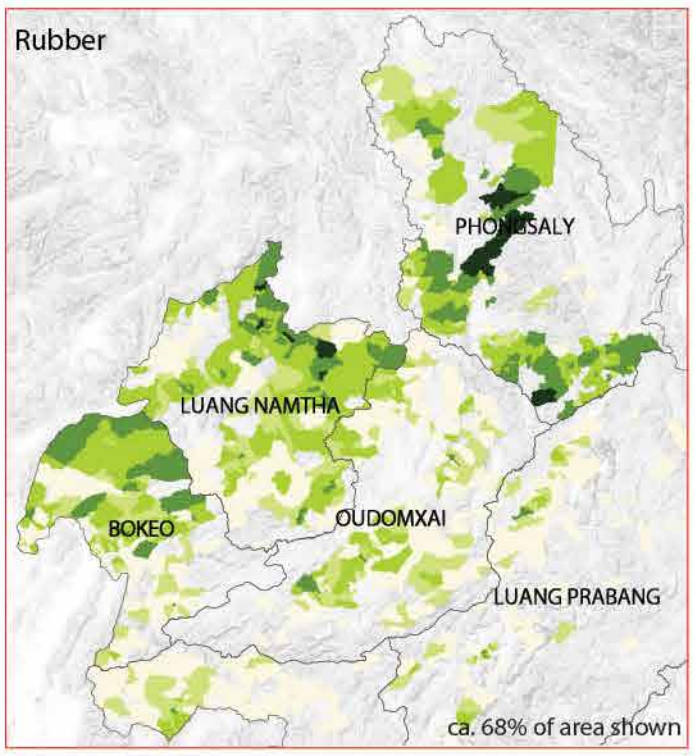
*Legend: Percentage of agricultural land under crop at village level



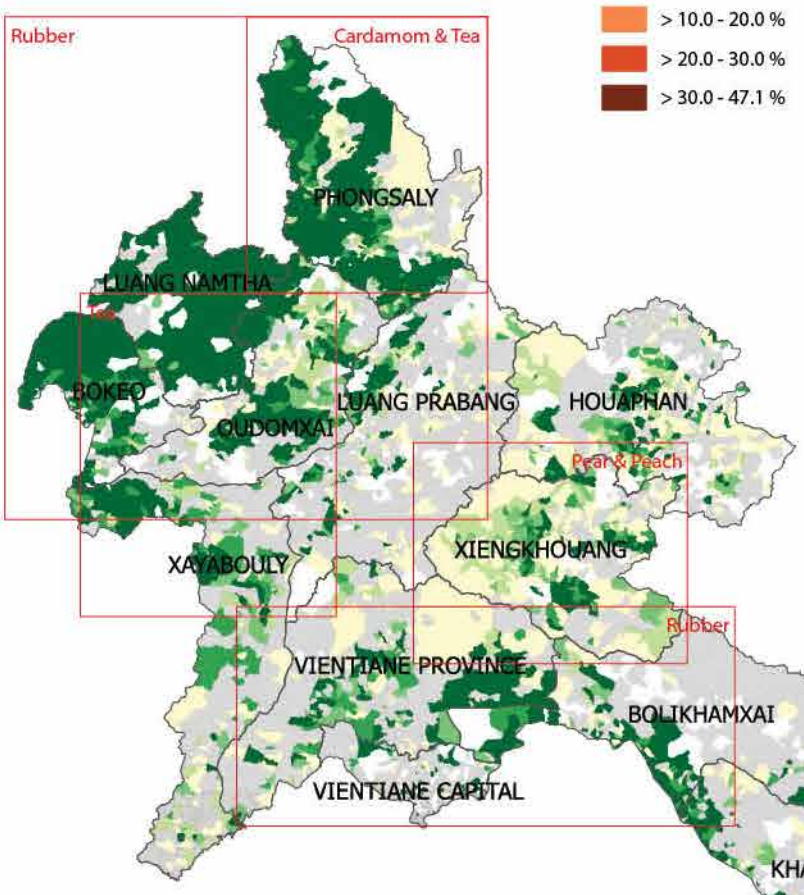
*Tea
0 %
> 0 - 10 %
> 10 - 25 %
> 25 - 50 %
> 50 - 75 %
> 75 - 88 %



*Cardamom
0.0 %
> 0.0 - 5.0 %
> 5.0 - 10.0 %
> 10.0 - 20.0 %
> 20.0 - 30.0 %
> 30.0 - 47.1 %

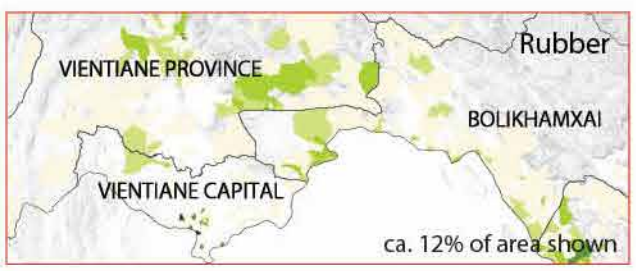


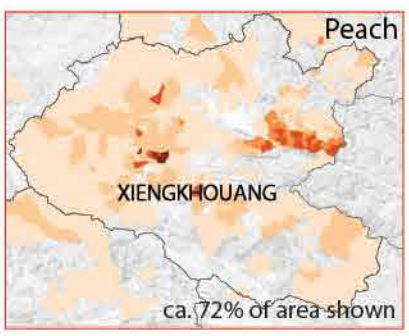
*Rubber
0 %
> 0 - 10 %
> 10 - 25 %
> 25 - 50 %
> 50 - 75 %
> 75 - 100 %



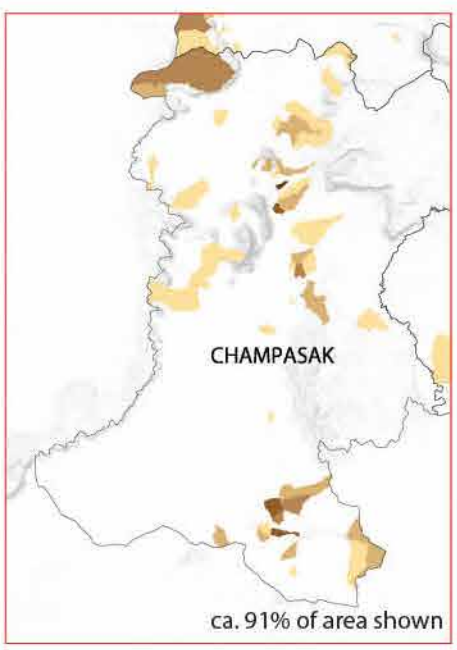
Percentgage of selected perennials of total perennial crop area
< 0.01 %
> 0.01 - 20 %
> 20 - 40 %
> 40 - 60 %
> 60 - 80 %
> 80 - 100 %

*Pear
0.0 %
> 0.0 - 0.1 %
> 0.1 - 0.5 %
> 0.5 - 1.0 %
> 1.0 - 5.0 %
> 5.0 - 10.9 %

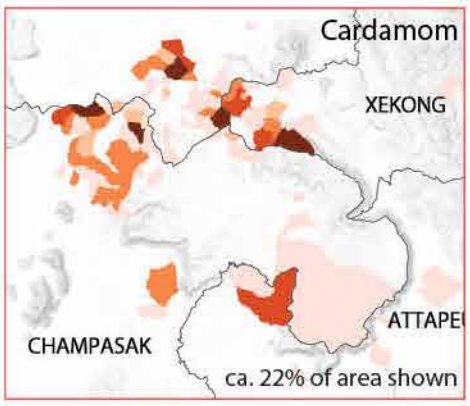




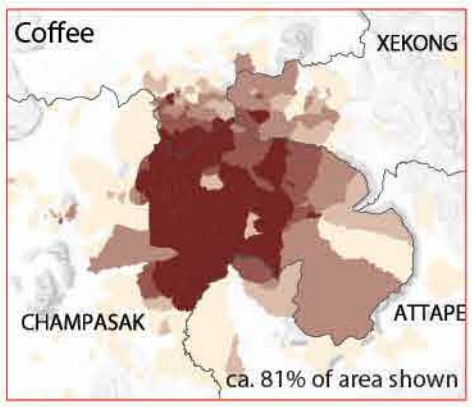
*Peach
0.0 %
> 0.0 - 0.1 %
> 0.1 - 0.5 %
> 0.5 - 1.0 %
> 1.0 - 5.0 %



*Cashew
0.0 %
> 0.0 - 1.0 %
> 1.0 - 5.0 %
> 5.0 - 10.0 %
> 10.0 - 25.0 %
> 25.0 - 44.3 %



*Coffee
0 %
> 0 - 20 %
> 20 - 40 %
> 40 - 60 %
> 60 - 80 %
> 80 - 100 %



C20 Rubber

Introduction

Rubber (*Havea brasiliensis*) was first introduced in the Lao PDR in 1930 when trial plots close to Pakxe town were established under a French colonial project. Sixty years later in 1990, the Phatthana Khet Phoudoi Company planted rubber first in Thakhek and in 1992 expanded into Hinboun District. Between 1994 and 1996, the Hmong village of Hadnyao in Luang Namtha Province established over 342 ha of rubber in the form of smallholdings, and these smallholders started tapping their rubber trees in 2002 (Manivong *et al.*, 2003). Rubber production in northern Lao PDR was largely driven by the influence of Chinese investors and in southern and central Lao PDR by Vietnamese and Thai investors. Since the 2000s, the area under rubber cultivation in the Lao PDR has increased at a rapid pace through planting by both individuals and private sector actors, encouraged by support from the GoL. The sudden, rapid and largely uncontrolled expansion of rubber cultivation has resulted in a total of 66,358 ha planted under smallholdings, not including rubber under concessions.

There are three models under which rubber cultivation has taken place in the Lao PDR. These include smallholdings, contract farming, and large concessions. The latter is the dominant form and covers about half of the rubber area in the country. Of the total area under rubber, 30 percent was planted by smallholders and 20 percent under contract farming (NAFRI, 2011).

Patterns of rubber cultivation in 2011

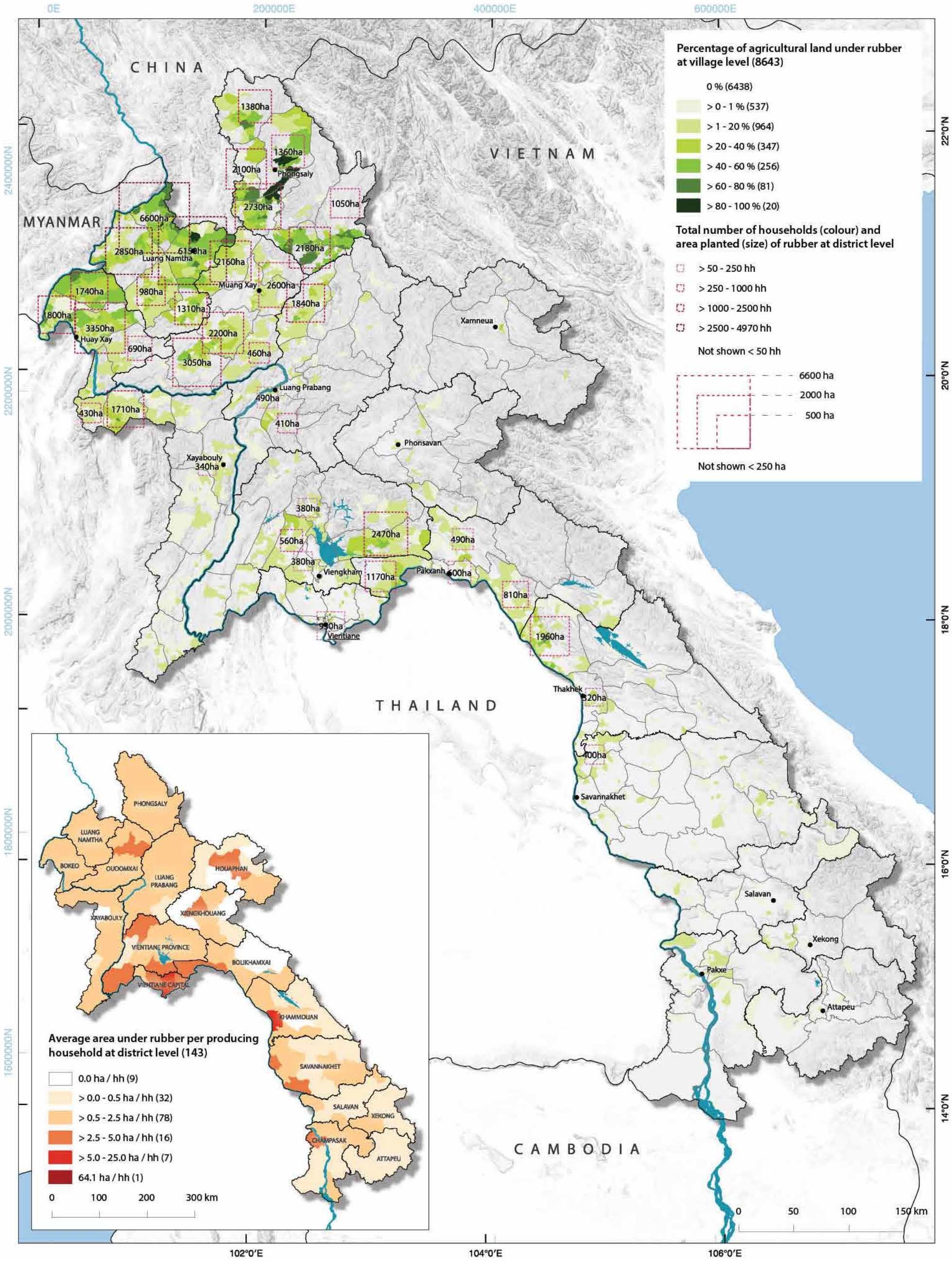
The main map illustrates the spatial patterns of household-level rubber cultivation. 26 percent of all villages in the Lao PDR grow rubber with an average area of 30 hectares per rubber growing village. 4 percent of these villages use more than 40 percent of their agricultural land for rubber (average size: 115 ha). The map demonstrates that, in large parts of Luang Namtha, Phongsaly and Bokeo, individually owned rubber takes up a significant share of the agricultural land of the respective villages.

There are almost 66,500 ha of rubber planted by 49,000 households countrywide, of which 60 percent of the cultivation area is concentrated in the above mentioned three provinces. Over 65 percent of all households in these three provinces are engaged in rubber cultivation. Other important rubber cultivation areas are the regions around the Nam Ngum reservoir and southeast Vientiane Province alongside the Mekong River running down to Khammouan.

As shown in the district-level inset map, in almost all districts there are at least some households who have planted rubber. Most of the households have, on average, less than 2.5 ha of land dedicated to rubber. In 23 districts, the average size per household is between 2.5 and 25 ha. The highest average area under rubber was recorded in Chanthabouly District of Vientiane Capital with an average of 64.1 ha per household under rubber cultivation.

Table 5: Total area, percentage and change of land under rubber in 1999 and 2011

Province	Total ha rubber 1999	% of rubber in 1999	Total ha rubber 2011	% of rubber in 2011	Change 1999 to 2011
Vientiane Capital	360.5	87.5	1,333.8	0.3	973.2
Phongsaly	7.9	1.9	10,817.3	18.0	10,809.4
Luang Namtha	29.2	7.0	17,893.3	30.5	17,864.1
Oudomxai	0.0	0.0	10,598.9	16.7	10,598.9
Bokeo	0.0	0.0	7,738.4	12.0	7,738.4
Luang Prabang	0.0	0.0	3,115.8	4.6	3,115.8
Houaphan	0.1	0.0	61.8	0.1	61.7
Xayabouly	0.0	0.0	3,191.8	6.3	3,191.8
Xiengkhouang	0.2	0.0	141.4	0.2	141.2
Vientiane	0.1	0.0	4,665.7	4.3	4,665.7
Bolikhamxai	2.0	0.4	3,108.5	2.4	3,106.5
Khammouan	2.2	0.5	2,418.5	2.2	2,416.3
Savannakhet	0.3	0.0	761.4	1.1	761.1
Salavan	2.5	0.6	85.2	0.4	82.7
Xekong	0.1	0.0	71.7	0.1	71.6
Champasak	7.0	1.7	347.3	0.4	340.3
Attapeu	0.0	0.0	7.0	0.3	7.0
Total	**412.1**	**100.0**	**66,357.8**	**100.0**	**65,945.8**


Percentage of agricultural land under rubber at village level (8643)
0 % (6438)
> 0 - 1 % (537)
> 1 - 20 % (964)
> 20 - 40 % (347)
> 40 - 60 % (256)
> 60 - 80 % (81)
> 80 - 100 % (20)
Total number of households (colour) and area planted (size) of rubber at district level
> 50 - 250 hh
> 250 - 1000 hh
> 1000 - 2500 hh
> 2500 - 4970 hh
Not shown < 50 hh
6600 ha
2000 ha
500 ha
Not shown < 250 ha
Average area under rubber per producing household at district level (143)
0.0 ha / hh (9)
> 0.0 - 0.5 ha / hh (32)
> 0.5 - 2.5 ha / hh (78)
> 2.5 - 5.0 ha / hh (16)
> 5.0 - 25.0 ha / hh (7)
64.1 ha / hh (1)
0 100 200 300 km
0 50 100 150 km
CHINA
VIETNAM
MYANMAR
THAILAND
CAMBODIA
Phongsaly
Luang Namtha
Muang Xay
Huay Xay
Luang Prabang
Xayabouly
Xamneua
Phonsavan
Viengkham
Vientiane
Pakxanh
Thakhek
Savannakhet
Salavan
Xekong
Pakxe
Attapeu
PHONGSALY
LUANG NAMTHA
BOKEO
OUDOMXAI
LUANG PRABANG
HOUAPHAN
XAYABOULY
XIENGKHOUANG
VIENTIANE PROVINCE
VIENTIANE CAPITAL
BOLIKHAMXAI
KHAMMOUAN
SAVANNAKHET
SALAVAN
XEKONG
CHAMPASAK
ATTAPEU
102°0′E
104°0′E
106°0′E
22°0′N
20°0′N
18°0′N
16°0′N
14°0′N

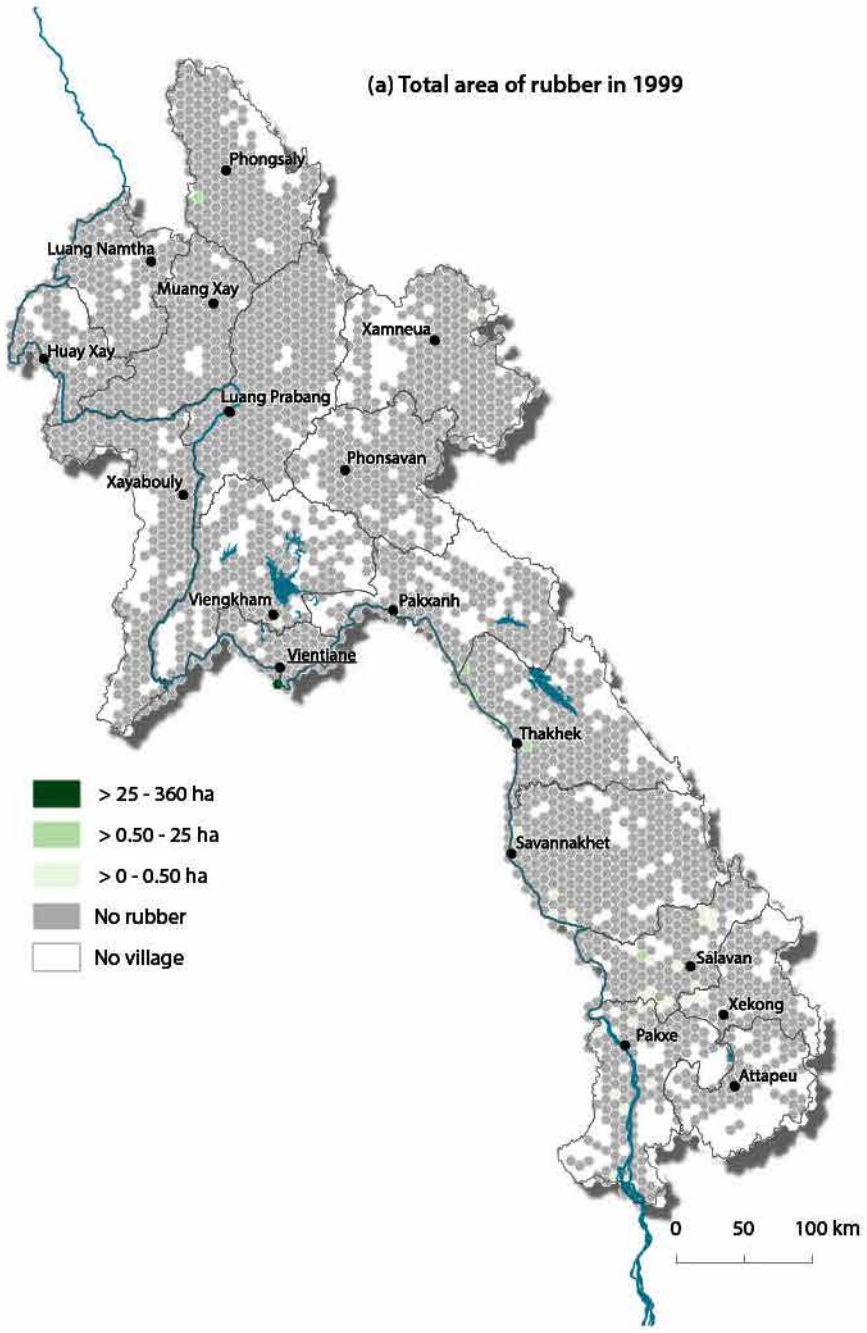
Changes in rubber cultivation patterns between 1999 and 2011

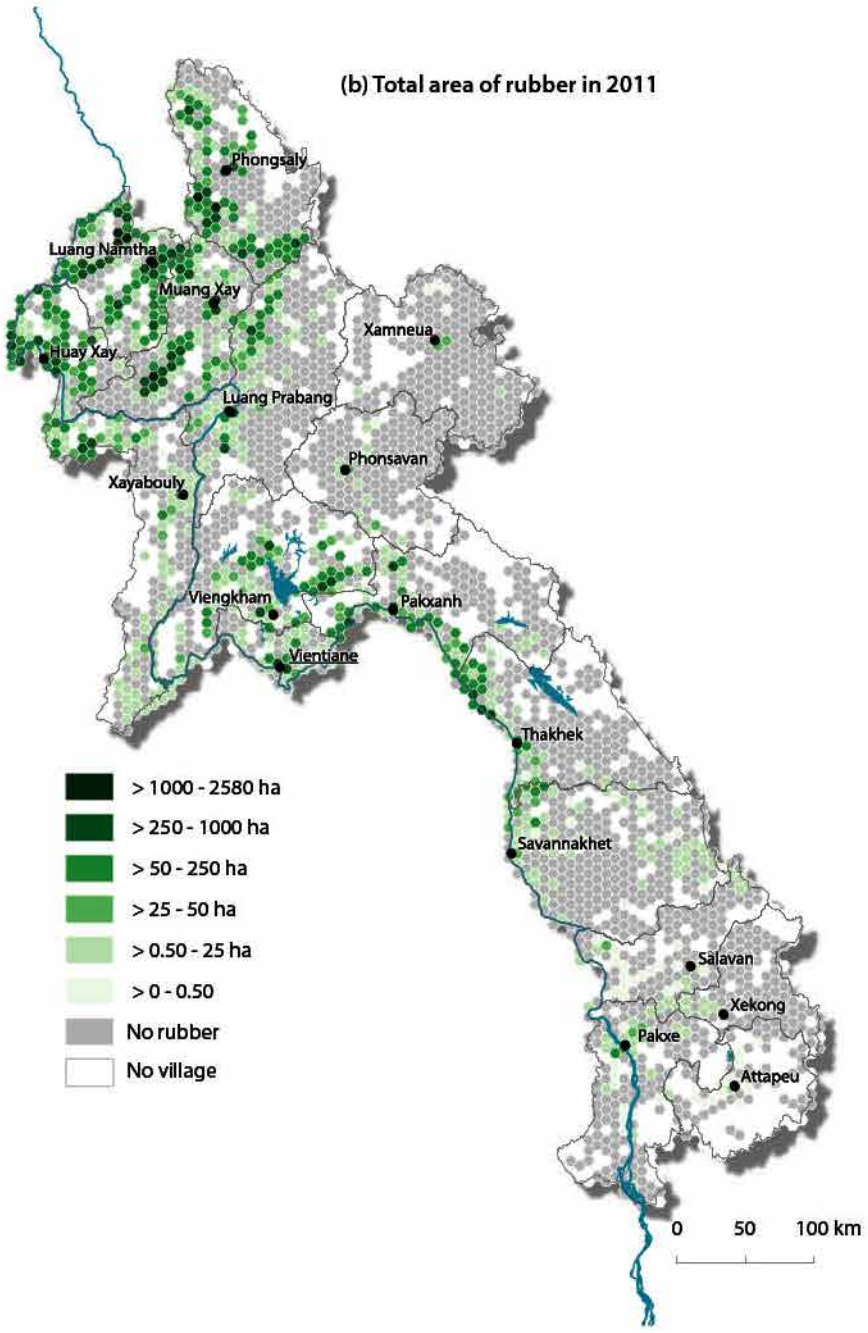
There has been an enormous increase in the area under rubber cultivation between 1999 and 2011, when the total area increased from 412 ha to 66,358 ha. The total area under rubber per province and the change in area between 1999 and 2011 are presented in Table 5.

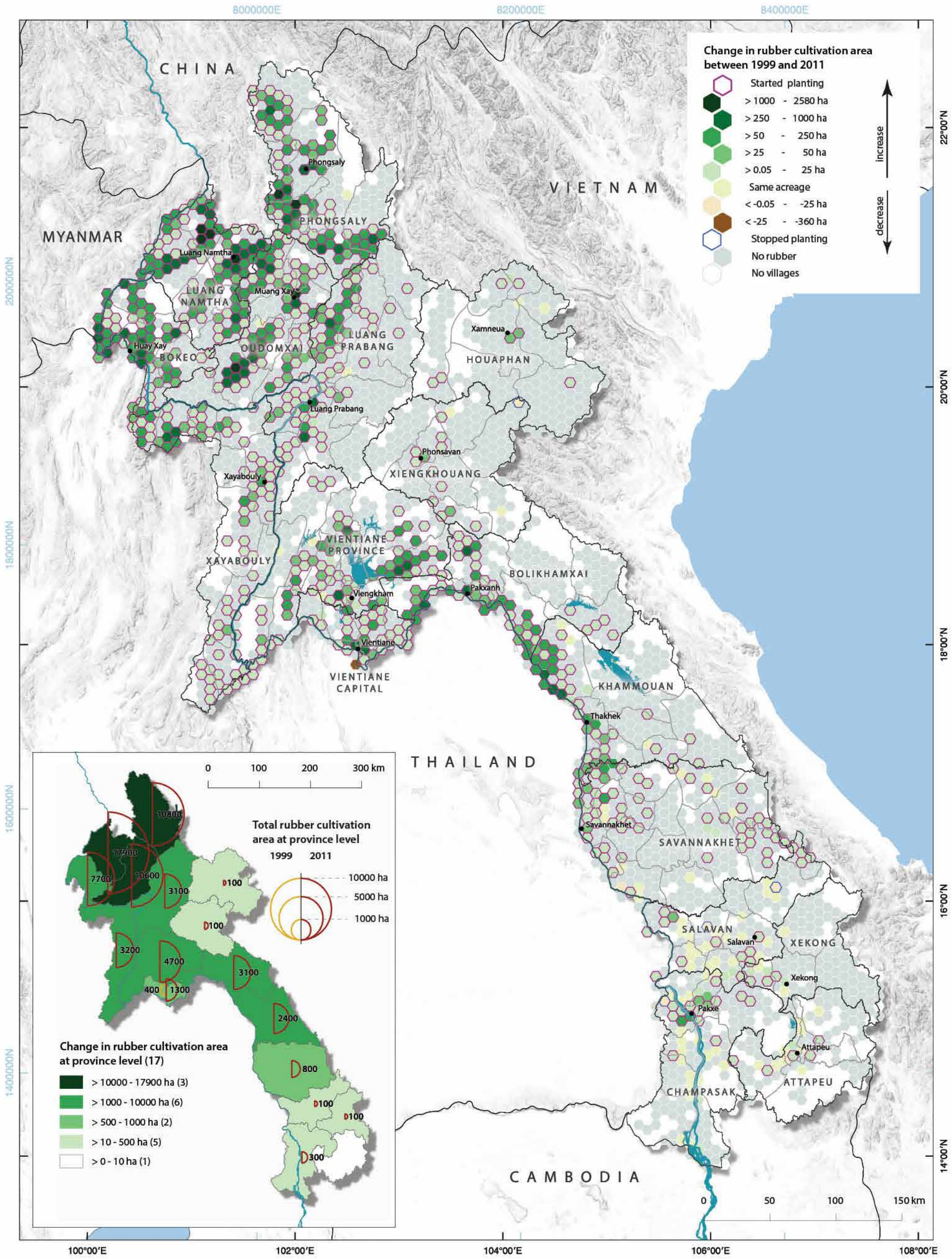
Interpretations

Rubber has rapidly become one of the most important perennial crops in the Lao PDR over the past decade, and now plays an important role in the Lao economy. However, when rubber was first introduced, supportive policy, legislation, and institutional arrangements were not in place to effectively ensure sustainable development at the national level. Rubber planting has therefore often encroached on natural forest areas (NAFRI, 2011). While there are potential economic benefits for households involved in rubber cultivation, there are also important environmental and social impacts that merit consideration.

The fast expansion of rubber was strongly linked to national, regional and international policies supporting rubber, as well as interest among investors, in response to high market demand driven by the global tire industry, particularly in China. Rubber promotion policies in China and Vietnam which enabled and encouraged companies to invest in rubber abroad, coupled with GoL policies supporting the establishment of tree plantations, created conditions which greatly encouraged the expansion of rubber in the Lao PDR over the last decade.






Change in rubber cultivation area between 1999 and 2011
Started planting
> 1000 - 2580 ha
> 250 - 1000 ha
> 50 - 250 ha
> 25 - 50 ha
> 0.05 - 25 ha
Same acreage
< -0.05 - -25 ha
< -25 - -360 ha
Stopped planting
No rubber
No villages
increase
decrease
CHINA
MYANMAR
VIETNAM
THAILAND
CAMBODIA
Phongsaly
PHONGSALY
Luang Namtha
LUANG NAMTHA
Muang Xay
OUDOMXAI
Huay Xay
BOKEO
LUANG PRABANG
Luang Prabang
Xamneua
HOUAPHAN
Phonsavan
XIENGKHOUANG
Xayabouly
XAYABOULY
VIENTIANE PROVINCE
Viengkham
Vientiane
VIENTIANE CAPITAL
BOLIKHAMXAI
Pakxanh
KHAMMOUAN
Thakhek
Savannakhet
SAVANNAKHET
SALAVAN
Salavan
XEKONG
Xekong
Pakxe
CHAMPASAK
Attapeu
ATTAPEU
8000000E
8200000E
8400000E
22°00'N
20°00'N
18°00'N
16°00'N
14°00'N
100°00'E
102°00'E
104°00'E
106°00'E
108°00'E
0 100 200 300 km
0 50 100 150 km
Total rubber cultivation area at province level
1999 2011
10000 ha
5000 ha
1000 ha
10800
17900
7700
10600
3100
100
100
3200
4700
400
1300
3100
2400
800
100
100
300
Change in rubber cultivation area at province level (17)
> 10000 - 17900 ha (3)
> 1000 - 10000 ha (6)
> 500 - 1000 ha (2)
> 10 - 500 ha (5)
> 0 - 10 ha (1)

C21 Coffee

Introduction

Coffee (genus: *Coffea*) was first introduced to the Lao PDR by French colonists around 1915 and was almost exclusively cultivated on the Bolaven Plateau, an area whose soils are rich in minerals, ideal not only for coffee but also for many other crops. Coffee is now the fifth largest export commodity of the Lao PDR. The volume of coffee exported increased from 14,000 tons in 2000 to 23,656 tons in 2004. Roughly 95 percent of Lao coffee production is produced for export, although the Lao PDR constitutes a minor producer (less than 1 percent) on the global coffee market.

The Bolaven Plateau covers an area of about 500 km² stretching across four provinces. It is located between the Annamite Mountain Range and the Mekong River, and ranges in elevation from 1,000 to 1,300 masl (about 500 m higher than the areas surrounding it). According to the Köppen climate classification, it is *Cwa* or a "Monsoon-influenced humid subtropical climate", whereas most other areas of the Lao PDR are classified as *Am* and *Aw* – "Tropical monsoon climate" and "Tropical wet savannah climate", respectively.

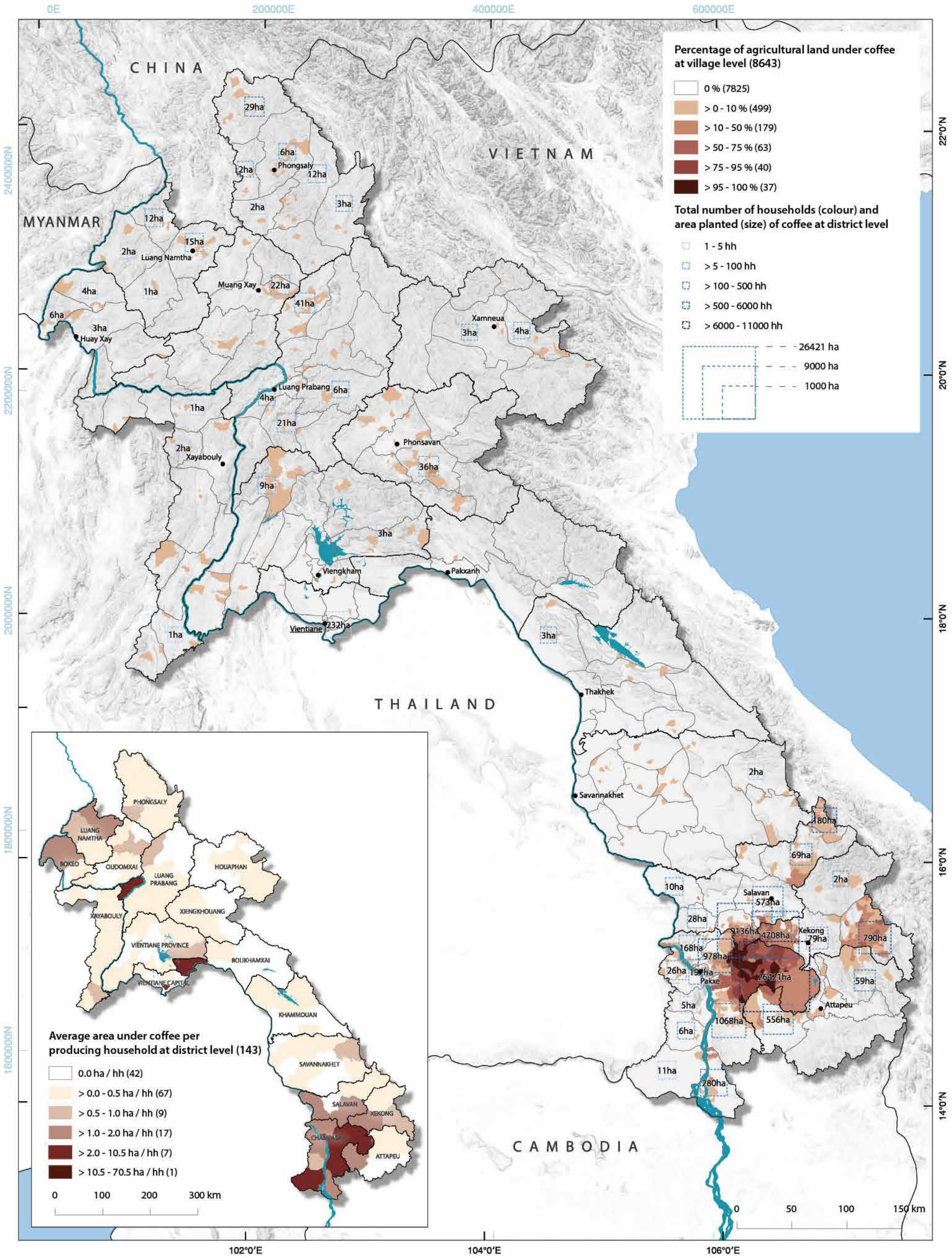
The three main coffee varieties planted in the Lao PDR are Robusta, Arabica and Liberica. Due to the spread of coffee leaf rust disease and the low price of Liberica, Robusta is the preferred variety for farmers in the Lao PDR. Robusta is resistant to disease and requires less care than other coffee varieties. However, a new dwarf hybrid Arabica Catimor is expanding in the country, and is increasingly grown in almost all coffee plantations. Arabica Catimor has several advantages, such as the low height of the trees, which makes them easier to harvest, the high possible tree planting density (2,500 trees per ha), the short harvest cycle (four years), the high yield, and the decent market price (twice the price of Robusta) (Cooper, 2014).

Patterns of coffee cultivation in 2011

In 2011, the total production area of coffee in the Lao PDR was 45,847 ha, of which, approximately 99 percent was planted in Champasak, Salavan and Xekong. Pakxong District, (located on the Bolaven Plateau) in Champasak Province, alone contributed 58 percent (26,421 ha) of the total coffee production and has 11,000 households engaged in coffee cultivation. In total, 25,220 households are involved in coffee cultivation, with 96 percent of them in southern Lao PDR. The districts surrounding Pakxong also have a high amount of land under coffee, e.g. Laongam District in Salavan Province has 9,136 ha. In Xekong Province, two conspicuous regions have coffee: Thateng District (with 4,708 ha of coffee) bordering Champasak's Pakxong District and Dakchung District in the east bordering Vietnam (790 ha).

The main map shows the share of the agricultural land used for coffee cultivation. 37 villages on the Bolaven Plateau devote more than 95 percent of their agricultural land to coffee. 103 villages in this region use more than 50 percent of their agricultural land for coffee, which speaks to the importance of the crop for this region. Only 497 ha (1 percent) of the total coffee area in the Lao PDR occurs in central and northern Lao PDR. In these two regions, intercropping and planting coffee beneath forest canopies is common. The only notable district with more than 30 ha of coffee cultivation is Khoun District in Xiengkhouang Province.

The inset map shows the average area under coffee per household at district level. In Champasak Province, four districts have an average area between 2.0 and 10.5 ha per household. Chomphet District in Luang Prabang Province (4.0 ha/hh), Thaphabat District in Bolikhamxai Province (2.4 ha/hh), and Chanthabouly (10.5 ha/hh) and Xaisettha (70.5 ha/hh) Districts in Vientiane Capital also have high average areas of coffee per household.


CHINA
VIETNAM
MYANMAR
THAILAND
CAMBODIA
Percentage of agricultural land under coffee at village level (8643)
0 % (7825)
> 0 - 10 % (499)
> 10 - 50 % (179)
> 50 - 75 % (63)
> 75 - 95 % (40)
> 95 - 100 % (37)
Total number of households (colour) and area planted (size) of coffee at district level
1 - 5 hh
> 5 - 100 hh
> 100 - 500 hh
> 500 - 6000 hh
> 6000 - 11000 hh
26421 ha
9000 ha
1000 ha
Average area under coffee per producing household at district level (143)
0.0 ha / hh (42)
> 0.0 - 0.5 ha / hh (67)
> 0.5 - 1.0 ha / hh (9)
> 1.0 - 2.0 ha / hh (17)
> 2.0 - 10.5 ha / hh (7)
> 10.5 - 70.5 ha / hh (1)
0 100 200 300 km
0 50 100 150 km
Phongsaly
Luang Namtha
Muang Xay
Huay Xay
Luang Prabang
Xayabouly
Phonsavan
Xamneua
Viengkham
Pakxanh
Vientiane
232ha
Thakhek
Savannakhet
Salavan
573ha
Xekong
79ha
Pakxe
26421ha
Attapeu
PHONGSALY
LUANG NAMTHA
BOKEO
OUDOMXAI
LUANG PRABANG
HOUAPHAN
XIENGKHOUANG
XAYABOULY
VIENTIANE PROVINCE
VIENTIANE CAPITAL
BOLIKHAMXAI
KHAMMOUAN
SAVANNAKHET
SALAVAN
XEKONG
CHAMPASAK
ATTAPEU
102°0′E
104°0′E
106°0′E
22°0′N
20°0′N
18°0′N
16°0′N
14°0′N

Changes in coffee cultivation patterns between 1999 and 2011

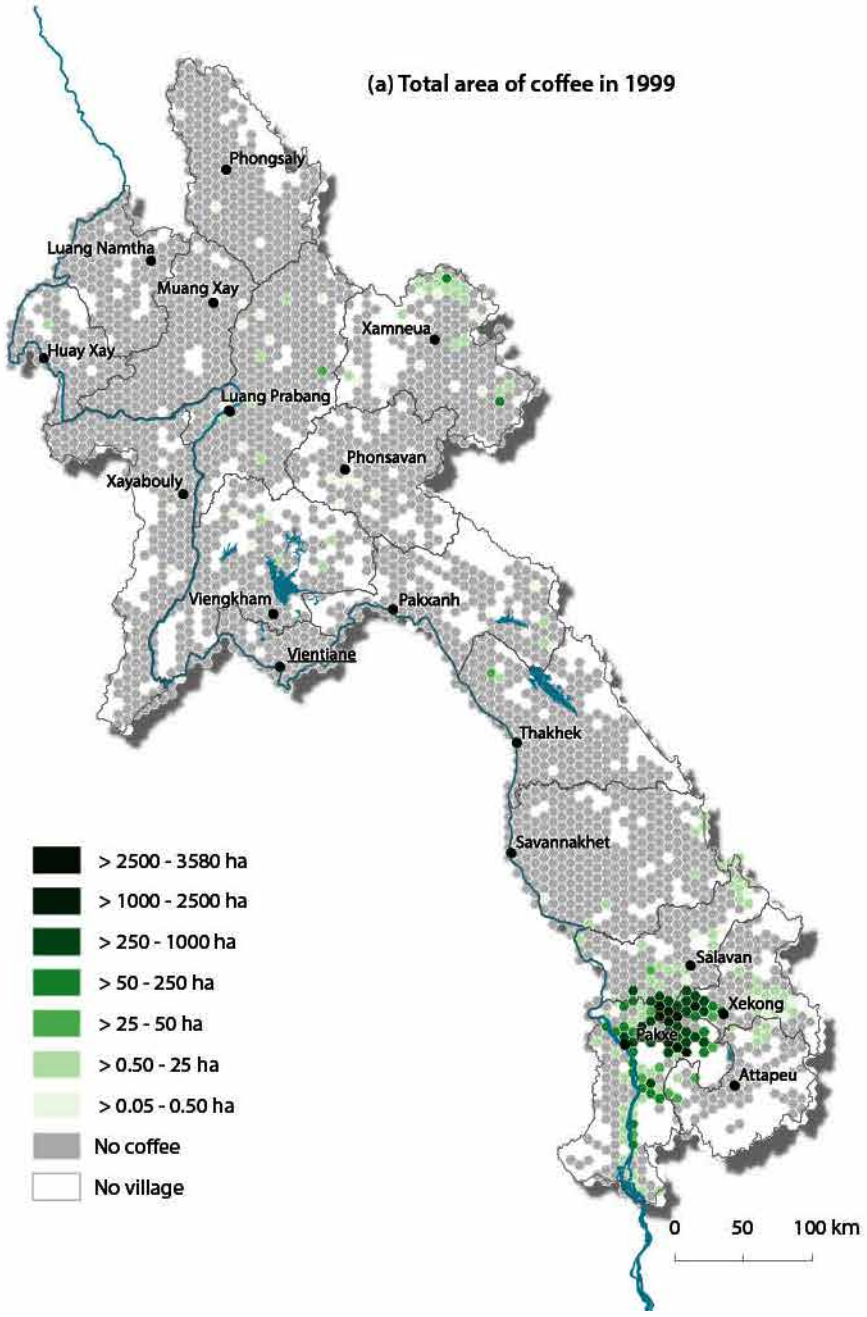
The total area under coffee cultivation remained fairly stable from 46,226 ha in 1999 to 45,847 ha in 2011. However, some regional spatial changes took place. In the south, Champasak lost 4,000 ha, whereas the cultivation area in the surrounding three provinces increased. Both Salavan and Xekong Provinces experienced increases in the area under coffee of around 1,500 ha compared to 1999 levels. In Attapeu only 89 ha of coffee was planted in 1999, but the area expanded to over 600 ha by 2011.

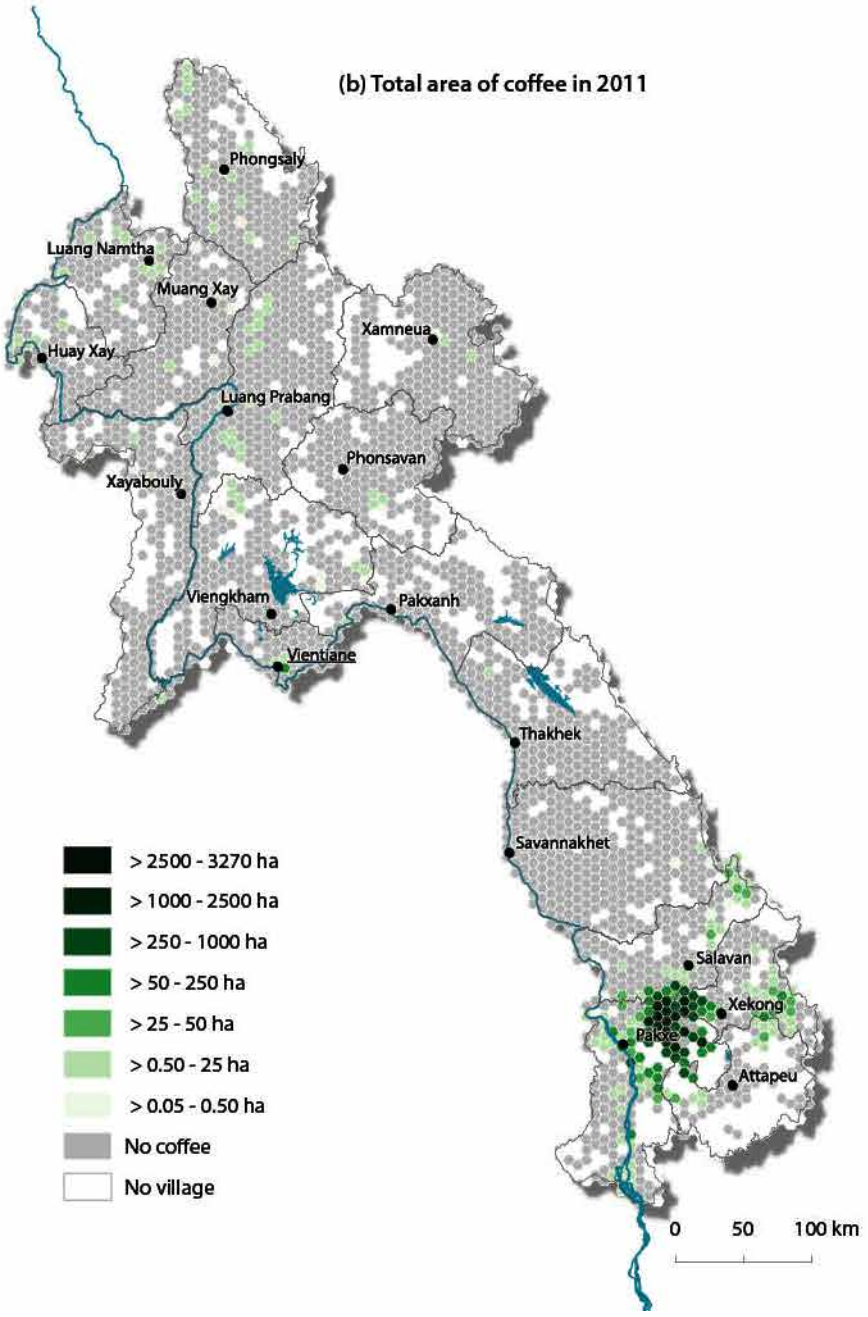
Less significant changes occurred in Houaphan Province and in Vientiane Capital. For example, in northern Houaphan Province in Et and Xiengkho Districts, some coffee planting stopped. In 1999, Houaphan Province still had almost 400 ha of coffee which nearly completely disappeared in 2011. The trend in Vientiane Capital was the other way around, from having only a few ha planted in 1999 to more than 230 ha in 2011. In the other eleven provinces, the area under coffee did not change remarkably, but in several areas some cultivation activities have newly begun.

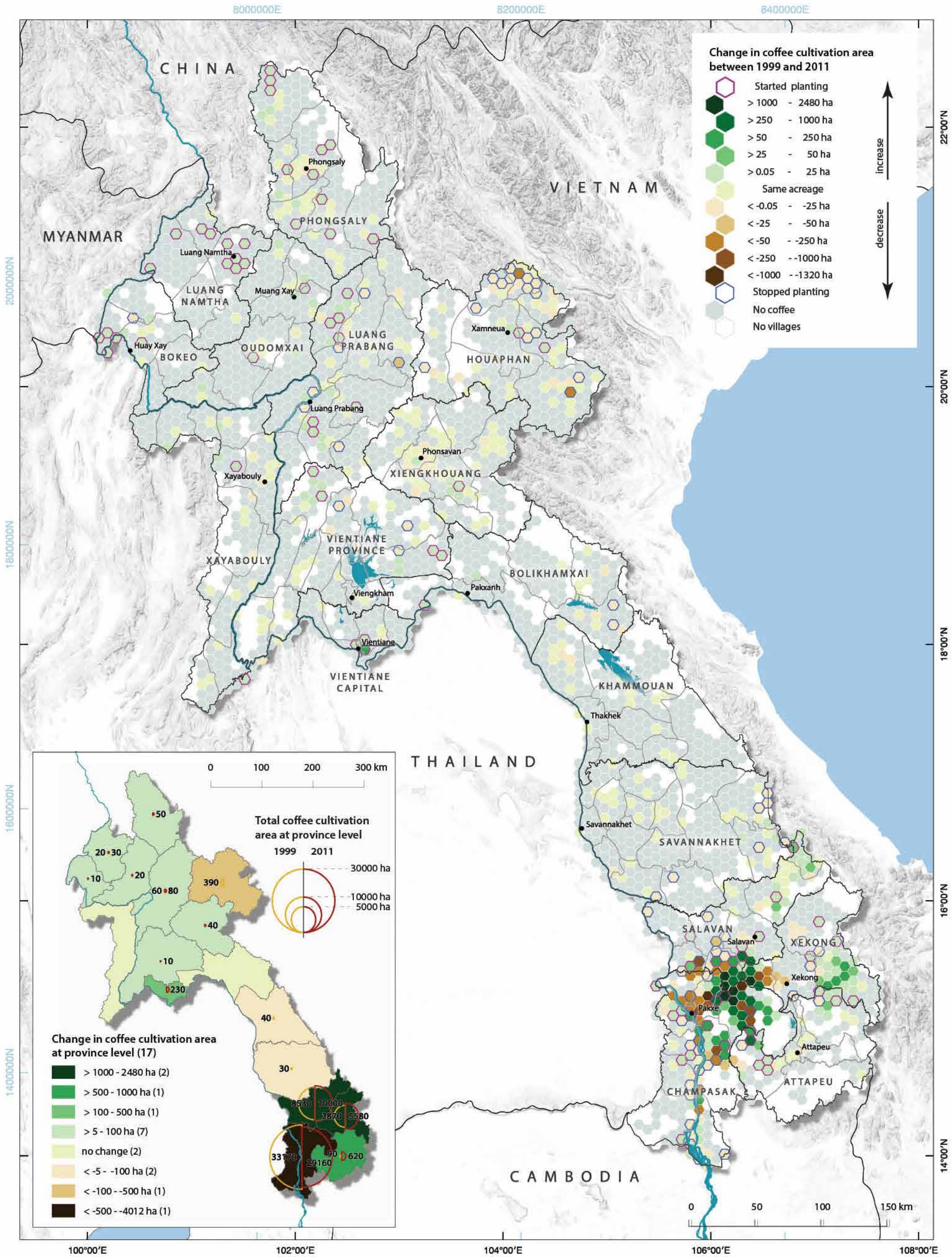
Interpretations

Climate stresses and weaker market demand have affected the coffee sector in the Lao PDR. The country experienced a four-year cycle of low temperatures and frost (*mork keua*) in 2000, 2004, and 2008 (UN-Habitat, 2004). Coffee can tolerate low temperatures, but not frost, and coffee growers in the Lao PDR have suffered during those years when frost occurred. It created severe damage to coffee trees. In Pakxong District, for example, thousands of ha were damaged by incidents of frost.

In 2009 to 2011, global coffee prices rose due to poor harvests in South America, and this became a driver of expansion in the Lao coffee sector (Cooper, 2014). Dao Heuang, Sinouk, Mountain Coffee, and Jhai Foundation are key coffee producers in the Lao PDR. The establishment of the Lao Coffee Association, a Lao National Coffee Board, and a Coffee Producers Organization on the Bolaven Plateau have all resulted in better provision of market information, technical training, and financial access to coffee stakeholders, and all have contributed positively to the Lao coffee sector. As a result, farmers have become more organized and manage their production systems better than before. The growing interest of the EU and Japan in organic coffee has become another driver of the expansion of coffee production in the Lao PDR.






8000000E
8200000E
8400000E
2000000N
1800000N
1600000N
1400000N
22°00'N
20°00'N
18°00'N
16°00'N
14°00'N
100°00'E
102°00'E
104°00'E
106°00'E
108°00'E
CHINA
MYANMAR
VIETNAM
THAILAND
CAMBODIA
Change in coffee cultivation area between 1999 and 2011
Started planting
> 1000 - 2480 ha
> 250 - 1000 ha
> 50 - 250 ha
> 25 - 50 ha
> 0.05 - 25 ha
Same acreage
< -0.05 - -25 ha
< -25 - -50 ha
< -50 - -250 ha
< -250 - -1000 ha
< -1000 - -1320 ha
Stopped planting
No coffee
No villages
increase
decrease
Phongsaly
PHONGSALY
Luang Namtha
LUANG NAMTHA
Muang Xay
Huay Xay
BOKEO
OUDOMXAI
LUANG PRABANG
Luang Prabang
Xamneua
HOUAPHAN
Phonsavan
XIENGKHOUANG
Xayabouly
XAYABOULY
VIENTIANE PROVINCE
Viengkham
Vientiane
VIENTIANE CAPITAL
BOLIKHAMXAI
Paksanh
KHAMMOUAN
Thakhek
Savannakhet
SAVANNAKHET
SALAVAN
Salavan
XEKONG
Xekong
Pakse
Attapeu
ATTAPEU
CHAMPASAK
0 100 200 300 km
Total coffee cultivation area at province level
1999 2011
30000 ha
10000 ha
5000 ha
50
20 30
10
20
60 80
390
40
10
230
40
30
8530
10000
3870
5580
33170
90
620
29160
Change in coffee cultivation area at province level (17)
> 1000 - 2480 ha (2)
> 500 - 1000 ha (1)
> 100 - 500 ha (1)
> 5 - 100 ha (7)
no change (2)
< -5 - -100 ha (2)
< -100 - -500 ha (1)
< -500 - -4012 ha (1)
0 50 100 150 km

C22 Banana

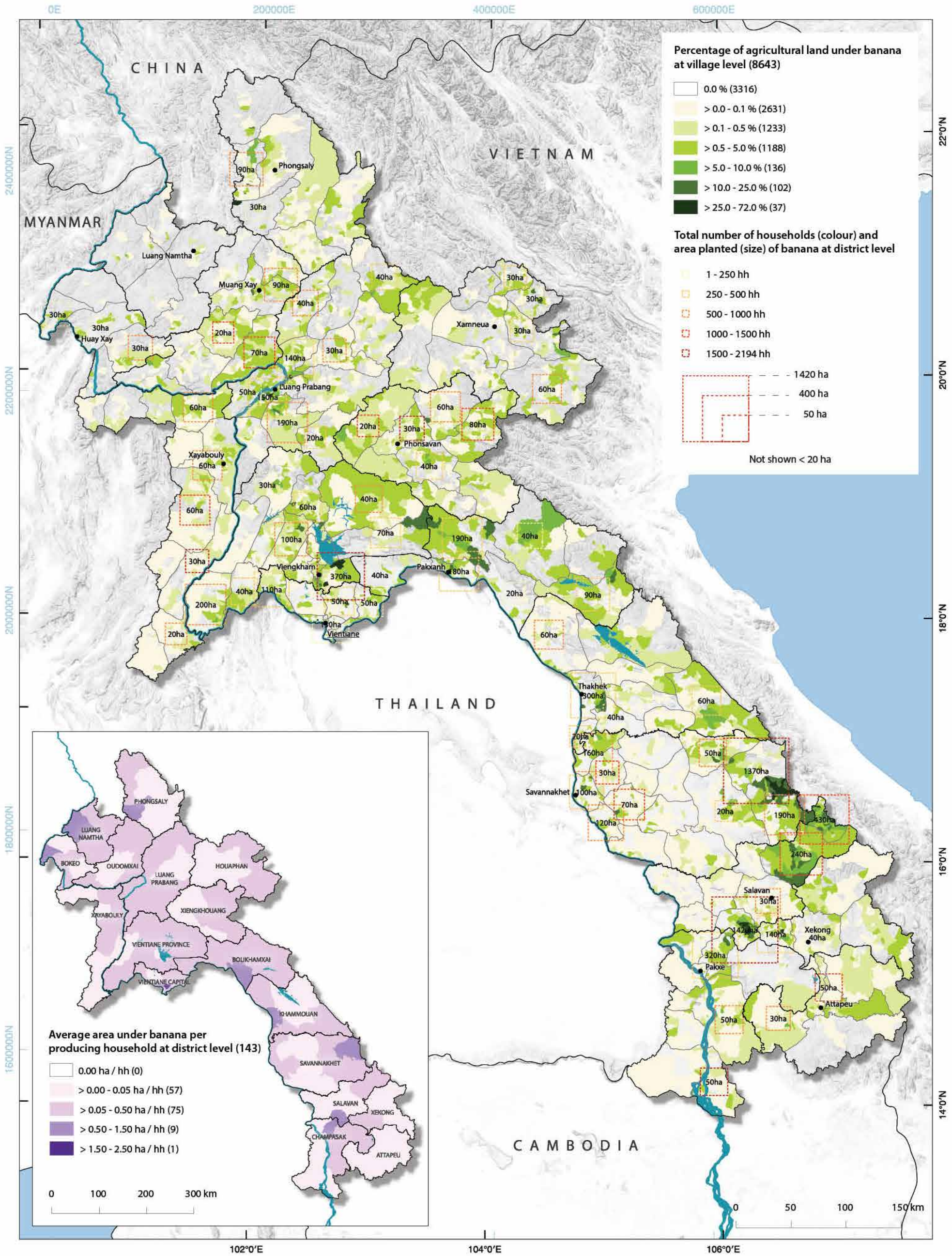
Introduction

Banana (genus: *Musa*) is a traditional perennial crop grown across the Lao PDR for household consumption as well as for sale. Many local varieties of banana are planted such as *Kouay Namva, Kouay Ngao, Kouay Hom* (good smell), *Kouay Thany, Kouay Nok* (bird), *Kouay Khai* (egg), *Kouay Lep Mue nang* (lady finger), *Kouay Mousy, Kouay Typ, Kouay Typ Chanh, Kouay Kenh, Kouay Chia* (bat), *Kouay Som Piang* or *Kouay Khang*. Recently, an improved variety called the "Cavendish banana" has been planted in northern Lao PDR, mainly for export to the Chinese market. Commercial banana plantations have expanded significantly in recent years, but the data presented here only includes household level production, thus these commercial plantations are not reflected.

Patterns of banana cultivation in 2011

In the Lao PDR, nearly 70,000 households in 61 percent of all agricultural villages grow bananas on a total area of 9,500 ha. Salavan and Savannakhet Provinces account for nearly half of the total area under banana cultivation. As the main map illustrates, these areas are primarily located in Laongam District (1,420 ha) and in the mountainous regions of eastern Lao PDR near Vietnam, from Xepon District in Savannakhet (1,370 ha) to Ta-oy District in Salavan (240 ha) . There are 37 villages, primarily located in these districts that use more than 25 percent of their agricultural land for banana cultivation.

The district-level inset map highlights how banana cultivation is distributed across the entire country. Most of the 143 districts have an average of under 0.5 ha per producing household, which indicates that banana is planted typically on a very small scale.


0E
200000E
400000E
600000E
2400000N
2200000N
2000000N
1800000N
1600000N
22°0'N
20°0'N
18°0'N
16°0'N
14°0'N
102°0'E
104°0'E
106°0'E
CHINA
VIETNAM
MYANMAR
THAILAND
CAMBODIA
Percentage of agricultural land under banana at village level (8643)
0.0 % (3316)
> 0.0 - 0.1 % (2631)
> 0.1 - 0.5 % (1233)
> 0.5 - 5.0 % (1188)
> 5.0 - 10.0 % (136)
> 10.0 - 25.0 % (102)
> 25.0 - 72.0 % (37)
Total number of households (colour) and area planted (size) of banana at district level
1 - 250 hh
250 - 500 hh
500 - 1000 hh
1000 - 1500 hh
1500 - 2194 hh
1420 ha
400 ha
50 ha
Not shown < 20 ha
0 50 100 150 km
Phongsaly
Luang Namtha
Muang Xay
Huay Xay
Xamneua
Luang Prabang
Xayabouly
Phonsavan
Viengkham
Vientiane
Paksane
Thakhek
Savannakhet
Salavan
Xekong
Pakxe
Attapeu
Average area under banana per producing household at district level (143)
0.00 ha / hh (0)
> 0.00 - 0.05 ha / hh (57)
> 0.05 - 0.50 ha / hh (75)
> 0.50 - 1.50 ha / hh (9)
> 1.50 - 2.50 ha / hh (1)
0 100 200 300 km
PHONGSALY
LUANG NAMTHA
BOKEO
OUDOMXAI
LUANG PRABANG
HOUAPHAN
XAYABOULY
XIENGKHOUANG
VIENTIANE PROVINCE
VIENTIANE CAPITAL
BOLIKHAMXAI
KHAMMOUAN
SAVANNAKHET
SALAVAN
XEKONG
CHAMPASAK
ATTAPEU

Changes in banana cultivation patterns between 1999 and 2011

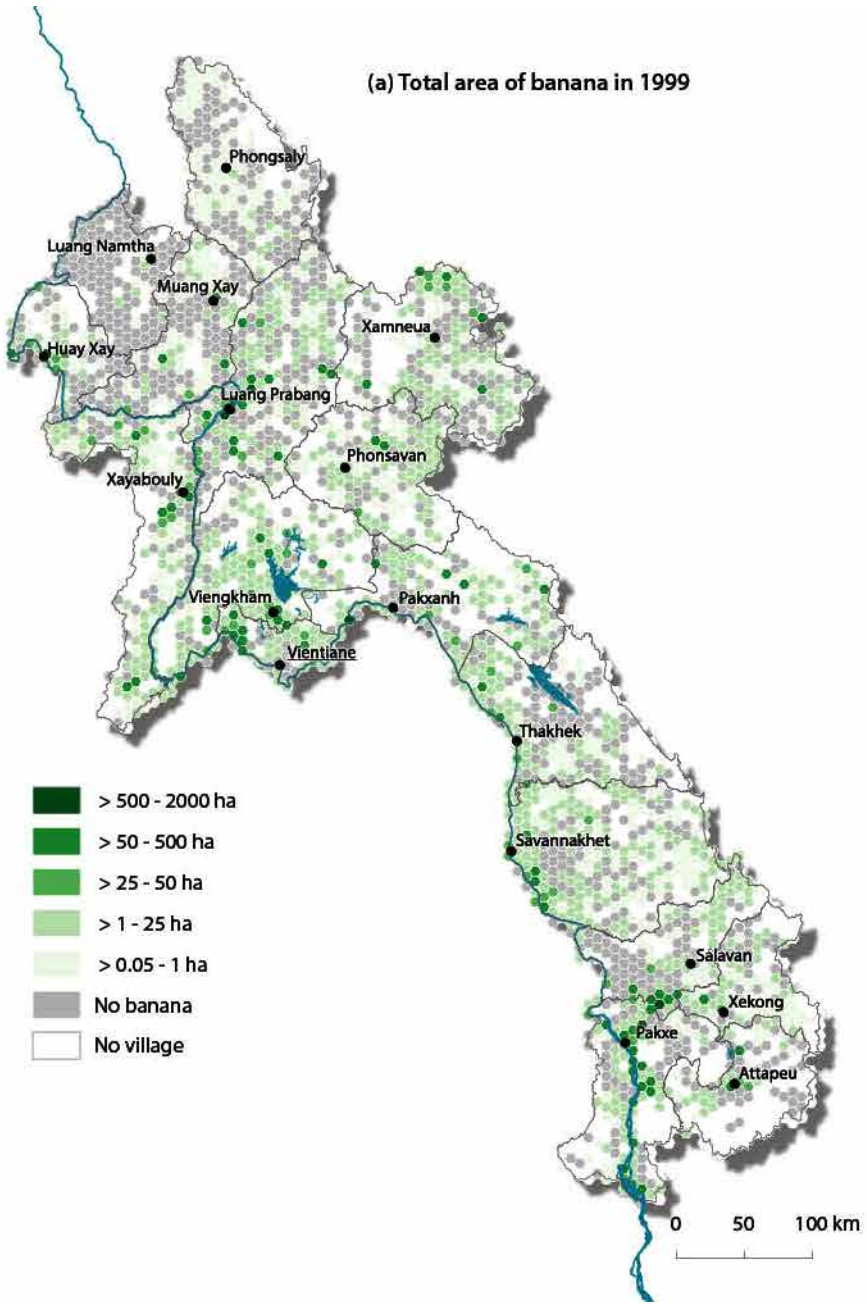
A significant decrease in banana cultivation occurred between 1999 and 2011 – from 28,800 ha in 1999 to 9,500 ha in 2011, which constitutes a decrease of 300 percent. The number of households engaged in banana cultivation also dropped from 130,000 in 1999 to 70,000 in 2011. As with cultivation area, almost all provinces experienced a decline in the number of households engaged in banana farming. In contrast, three provinces, Phongsaly, Savannakhet and Salavan, experienced an increase. In Savannakhet, banana planting occurs in relatively large areas along the Vietnam border and are sold on the Vietnamese market. Salavan has a long history of banana cultivation for the domestic market, as well as for the Vietnamese and Thai markets. Table 6 gives detailed information about the cultivated banana area.

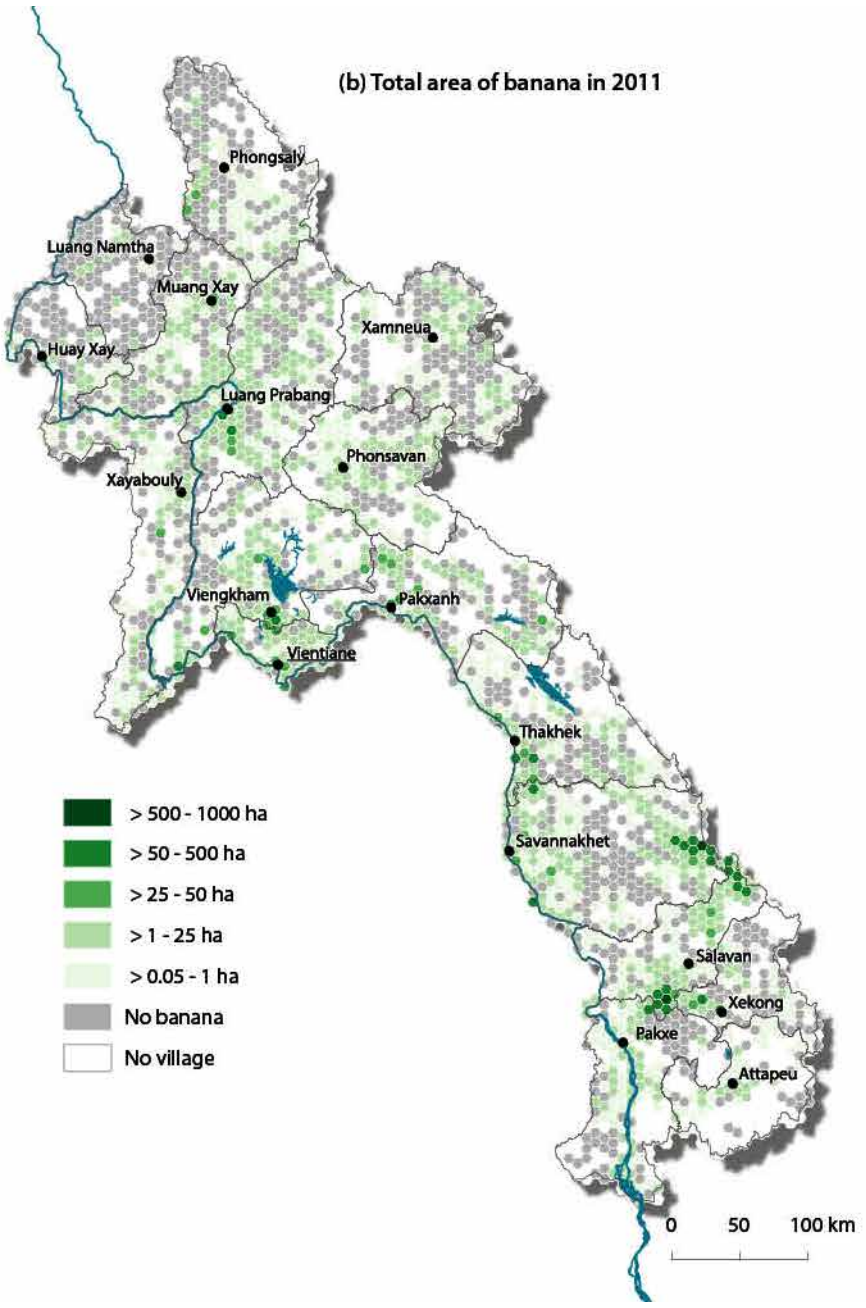
Interpretations

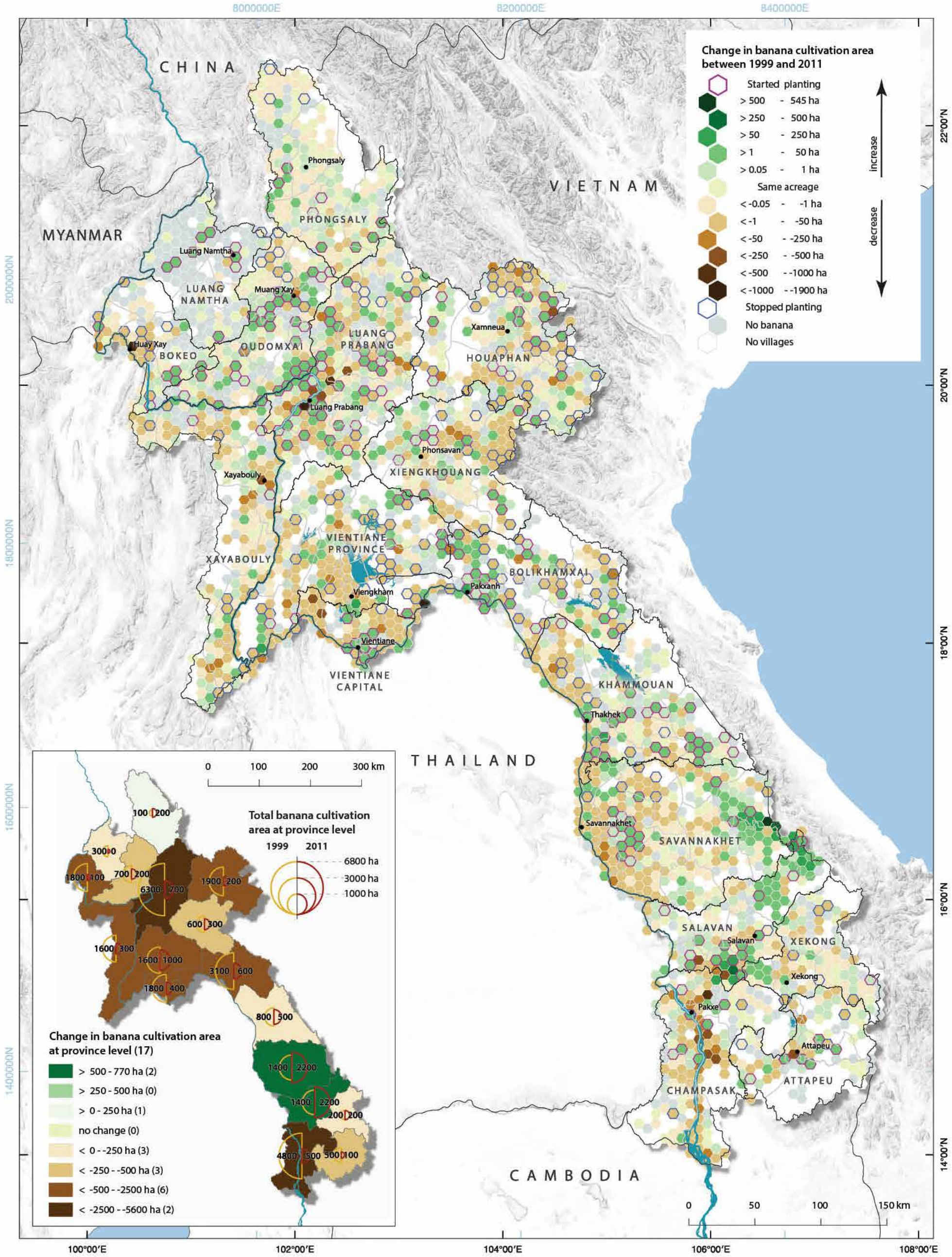
The notable decrease in banana cultivation across the country over the past decade occurred mainly because of a shift to other crops such as maize (see C11), Job's tears (see C12), cassava (see C13) and rubber (see C20). In contrast to the demonstrated decrease in cultivation area and in the total number of households growing banana in the last ten years, commercial banana plantations have developed rapidly, especially in northern Lao PDR, through an influx of Chinese investment. Chinese investors are attracted by cheap land, fertile soils, as well as year-round climatic suitability without a winter season interrupting production as affects the banana sector in China. The most common variety of banana planted in commercial plantations is the "Cavendish banana", the world's leading variety. Although the development of commercial banana plantations in the north generates wages and creates employment for some farmers, there are also various concerns about the impacts of plantations' intensive use of chemicals on plantation workers' health and the surrounding environment.

Table 6: Total and change of banana area between 1999 and 2011

Province	Total ha Banana 1999	Total ha Banana 2011	Change 1999 to 2011
Vientiane Capital	1,799.5	354.2	-1,445.3
Phongsaly	85.2	173.1	88.0
Luang Namtha	277.0	38.6	-238.4
Oudomxai	679.6	239.6	-440.1
Bokeo	1,764.6	89.6	-1,674.9
Luang Prabang	6,288.3	715.0	-5,573.3
Houaphan	1,879.7	180.3	-1,699.4
Xayabouly	1,647.5	262.5	-1,385.0
Xiengkhouang	617.5	274.2	-343.2
Vientiane	1,600.1	959.2	-640.8
Bolikhamxai	3,073.8	579.9	-2,493.8
Khammouan	760.4	518.6	-241.8
Savannakhet	1,422.8	2,156.4	733.6
Salavan	1,388.4	2,156.3	767.9
Xekong	199.9	197.2	-2.8
Champasak	4,784.6	491.6	-4,293.0
Attapeu	511.5	93.6	-417.8
Total	28,780.2	9,480.0	-19,300.2






Change in banana cultivation area between 1999 and 2011
Started planting
> 500 - 545 ha
> 250 - 500 ha
> 50 - 250 ha
> 1 - 50 ha
> 0.05 - 1 ha
Same acreage
< -0.05 - -1 ha
< -1 - -50 ha
< -50 - -250 ha
< -250 - -500 ha
< -500 - -1000 ha
< -1000 - -1900 ha
Stopped planting
No banana
No villages
increase
decrease
CHINA
MYANMAR
VIETNAM
LAOS
THAILAND
CAMBODIA
PHONGSALY
LUANG NAMTHA
BOKEO
OUDOMXAI
LUANG PRABANG
HOUAPHAN
XIENGKHOUANG
XAYABOULY
VIENTIANE PROVINCE
VIENTIANE CAPITAL
BOLIKHAMXAI
KHAMMOUAN
SAVANNAKHET
SALAVAN
XEKONG
CHAMPASAK
ATTAPEU
Phongsaly
Luang Namtha
Muang Xay
Huay Xay
Luang Prabang
Xamneua
Phonsavan
Xayabouly
Viengkham
Vientiane
Paksanh
Thakhek
Savannakhet
Salavan
Xekong
Pakxe
Attapeu
0 100 200 300 km
Total banana cultivation area at province level
1999 2011
6800 ha
3000 ha
1000 ha
Change in banana cultivation area at province level (17)
> 500 - 770 ha (2)
> 250 - 500 ha (0)
> 0 - 250 ha (1)
no change (0)
< 0 - -250 ha (3)
< -250 - -500 ha (3)
< -500 - -2500 ha (6)
< -2500 - -5600 ha (2)
0 50 100 150 km
8000000E
8200000E
8400000E
2000000N
1800000N
1600000N
1400000N
22°00'N
20°00'N
18°00'N
16°00'N
14°00'N
100°00'E
102°00'E
104°00'E
106°00'E
108°00'E

C23 Cardamom

Introduction

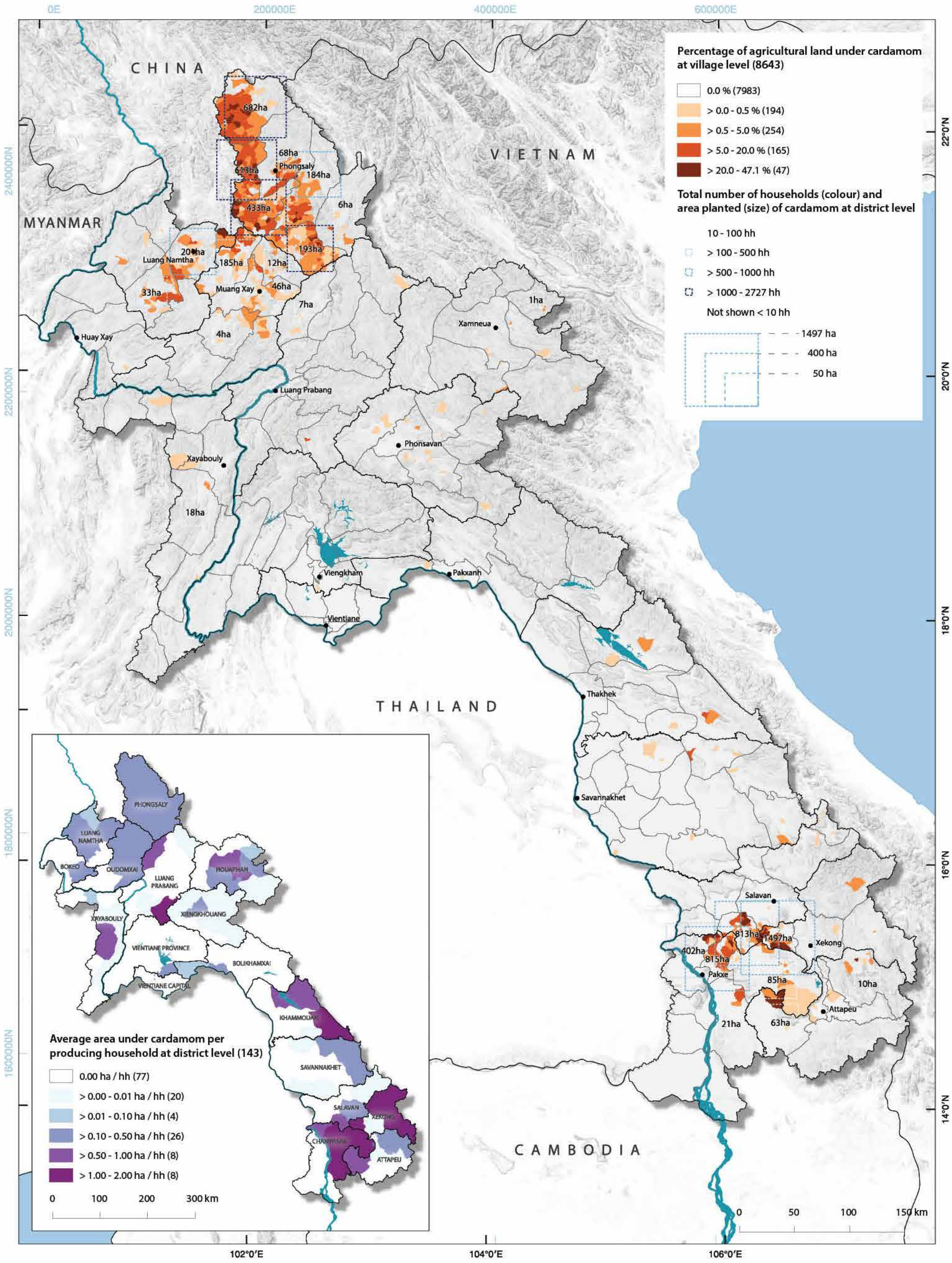
Cardamom (*Amomum spp.*) is an herbaceous, perennial plant in the *Zingiberaceae* family, which is commonly known as ginger. In the Lao PDR, cardamom grows naturally at elevations of 700 - 1,200 masl, particularly on the banks of flowing water in forests where the humidity is high and in areas with some shade. Cardamom has been found growing wild in secondary forests over the last 50 years, particularly in northern Lao PDR, and when collected wild is considered as non-timber forest product (NTFP). But more recently, Lao farmers in some areas have begun engaging in cardamom cultivation through commercial mono-cropping systems. There are many cardamom species occur in the Lao PDR, but only two are valuable for export markets: Pakxong cardamom and Guangdong cardamom.

Cardamom production became popular in the Lao PDR between 1975 and 1980 in Bachiangchaleunsouk and Pakxong Districts of Champasak Province, and Laongam District of Salavan Province. Cardamom seeds contain essential oils, camphor, acetate, limonene and other esters. They are used as ingredients for a number of pharmaceutical supplements, in some countries in meat seasoning, to flavour coffee in the Middle East, and in baking in Europe and the USA. Cardamom is largely exported in raw form or semi-processed to China and Thailand, Vietnam, Myanmar, and the Republic of Korea for traditional medicines. According to the Ministry of Commerce and Industry, around 200 to 250 tons were exported from the Lao PDR in 1999, although because exports are often inaccurately recorded, real exports of cardamom may have exceeded these numbers.

Patterns of cardamom cultivation in 2011

Overall, 6,427 ha of cardamom are cultivated in the Lao PDR, of which 1,497 ha are in Thateng District, the westernmost district of Xekong Province. There are two main producing areas: one in northeast and southeast of Pakxe (around the Bolaven Plateau), which constitutes approximately half of the total national production area, and a second in the north along the border with China, primarily in western Phongsaly, northern Oudomxai and Luang Namtha. East of Pakxe, there are 19 villages which use more than 20 percent (up to 47 percent) of their agricultural land for cardamom cultivation, and in the above described northern region, 29 such villages. Only a few cardamom growing areas are planted in the remaining part of the country.

Around two-thirds of the 13,252 households engaged in cardamom production are located in the area in the north highlighted in the small inset map. Here, the average producing area is 0.1 - 0.5 ha per household compared to the south where producing households have on average 1.0 - 2.0 ha of cardamom.


Percentage of agricultural land under cardamom at village level (8643)
0.0 % (7983)
> 0.0 - 0.5 % (194)
> 0.5 - 5.0 % (254)
> 5.0 - 20.0 % (165)
> 20.0 - 47.1 % (47)
Total number of households (colour) and area planted (size) of cardamom at district level
10 - 100 hh
> 100 - 500 hh
> 500 - 1000 hh
> 1000 - 2727 hh
Not shown < 10 hh
1497 ha
400 ha
50 ha
CHINA
VIETNAM
MYANMAR
THAILAND
CAMBODIA
682ha
68ha
613ha
Phongsaly
184ha
6ha
433ha
193ha
20ha
Luang Namtha
185ha
12ha
33ha
Muang Xay
46ha
7ha
1ha
Xamneua
Huay Xay
4ha
Luang Prabang
Phonsavan
Xayabouly
18ha
Viengkham
Pakxanh
Vientiane
Thakhek
Savannakhet
Salavan
813ha
1497ha
Xekong
402ha
815ha
Pakxe
85ha
10ha
Attapeu
21ha
63ha
0 50 100 150 km
Average area under cardamom per producing household at district level (143)
0.00 ha / hh (77)
> 0.00 - 0.01 ha / hh (20)
> 0.01 - 0.10 ha / hh (4)
> 0.10 - 0.50 ha / hh (26)
> 0.50 - 1.00 ha / hh (8)
> 1.00 - 2.00 ha / hh (8)
0 100 200 300 km
PHONGSALY
LUANG NAMTHA
BOKEO
OUDOMXAI
LUANG PRABANG
HOUAPHAN
XAYABOULY
XIENGKHOUANG
VIENTIANE PROVINCE
BOLIKHAMXAI
VIENTIANE CAPITAL
KHAMMOUAN
SAVANNAKHET
SALAVAN
XEKONG
CHAMPASAK
ATTAPEU
0E
200000E
400000E
600000E
2400000N
2200000N
2000000N
1800000N
1600000N
22°0'N
20°0'N
18°0'N
16°0'N
14°0'N
102°0'E
104°0'E
106°0'E

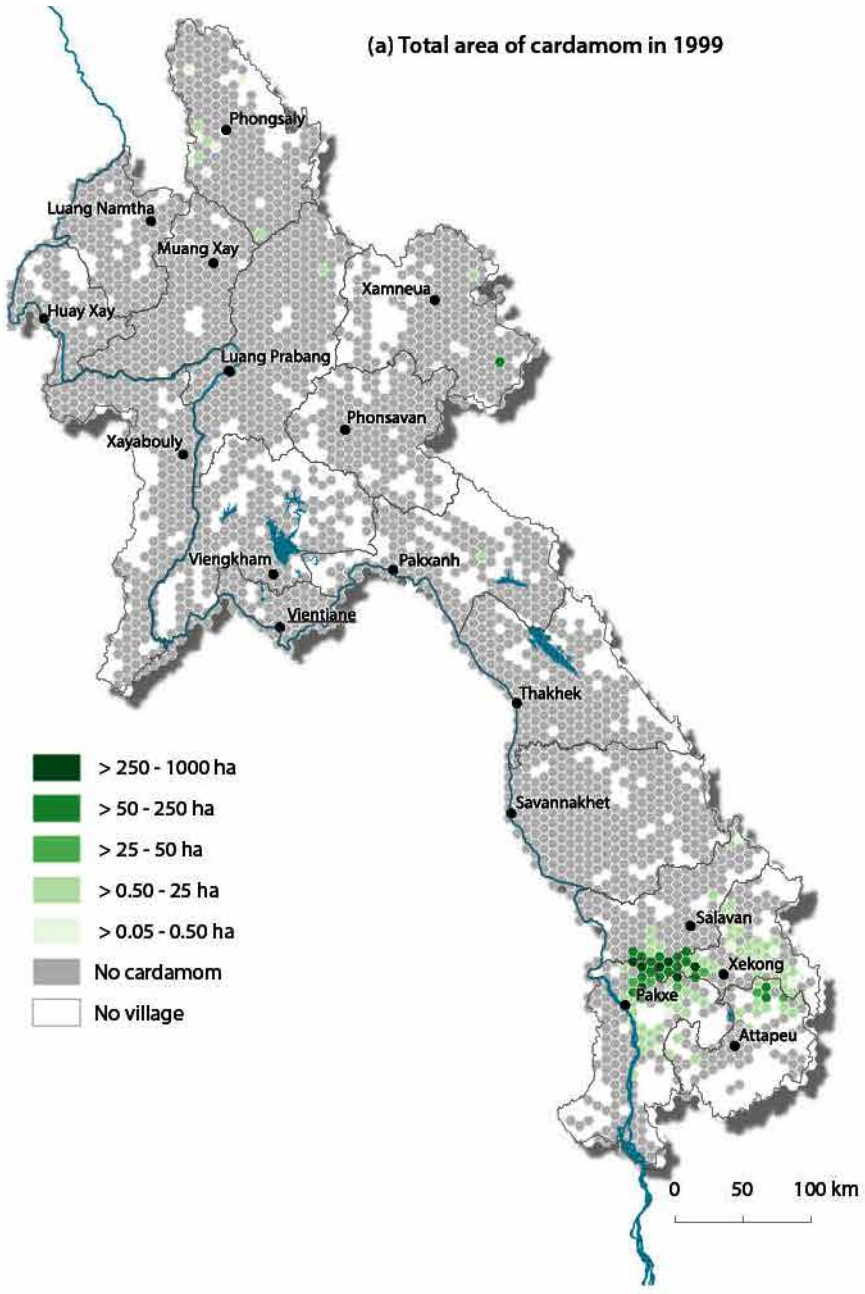
Changes in cardamom cultivation patterns between 1999 and 2011

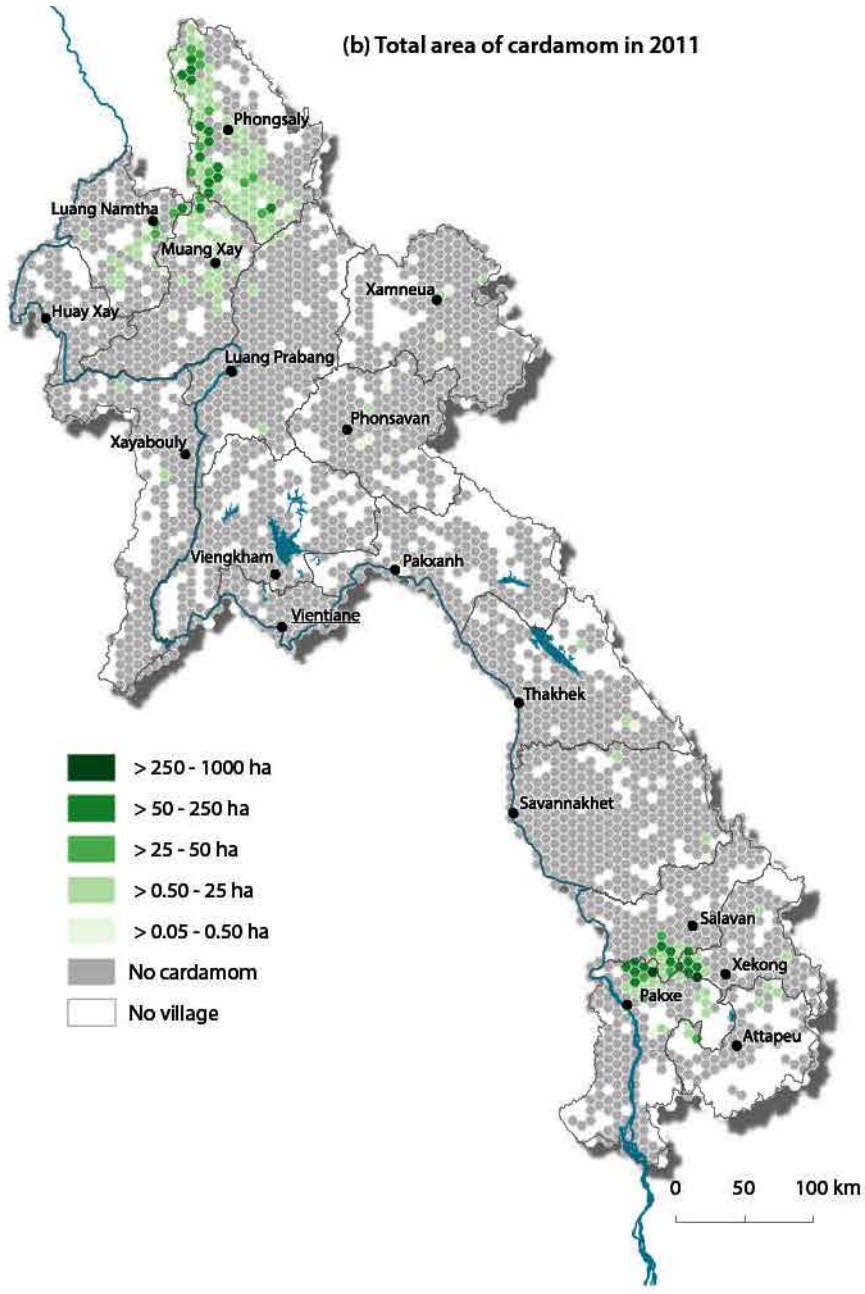
The cardamom cultivation area decreased from 8,813 ha in 1999 to 6,427 ha in 2011. While cultivating cardamom in the north is mainly new, cardamom has been grown around the Bolaven Plateau since before 1999. In the south, the area devoted to cardamom decreased by more than a half, from over 8,000 ha in 1999 to less than 4,000 ha in 2011. The overall increase in cardamom cultivation in the north therefore does not outweigh the significant decrease in production in the south. Overall, the area under cardamom production in the Lao PDR has decline by 27 percent in the last decade.

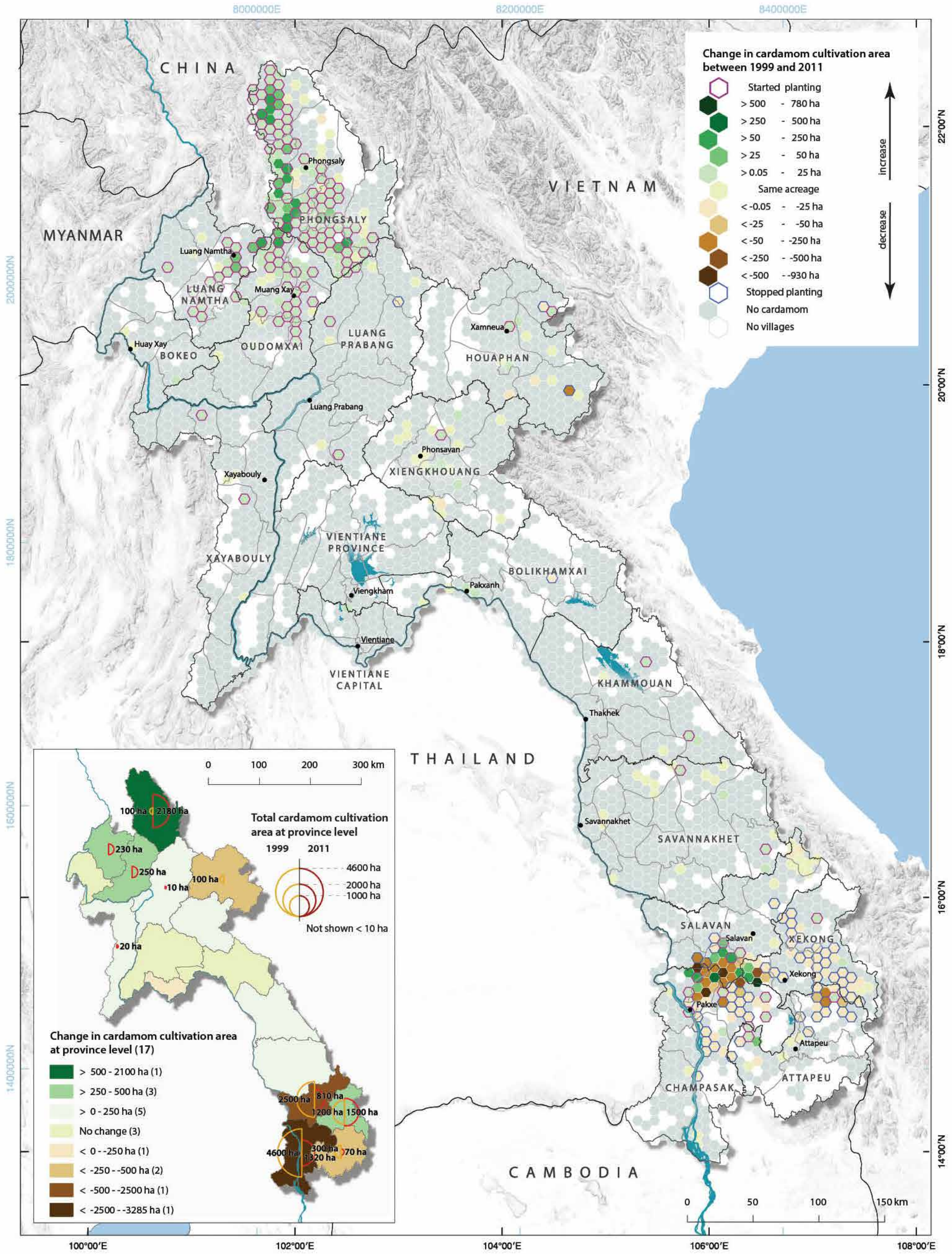
Interpretations

Cardamom in the Lao PDR is mostly produced under agro-forestry systems. There is high market demand for cardamom and decent prices paid to producing households by local collectors or trade partners in neighbouring countries. Still, due to the strong promotion of commercial cash crops such as rubber (see C20) and coffee (see C21), the overall cardamom production area has decreased over the past 10 years.

The decline in production area in the south was caused by low prices for Pakxong cardamom – the variety primarily grown there – as well as for wild cardamom. High transportation costs from Champasak to China, the main market, also make cultivating cardamom in the south less attractive. An important driving force for the increase in cardamom producing area in the north is the establishment of various rural development projects by both the GoL and international development agencies attempting to scale up cash crop production, especially for crops like cardamom which can be grown organically and have clear market demand.






Change in cardamom cultivation area between 1999 and 2011
Started planting
> 500 - 780 ha
> 250 - 500 ha
> 50 - 250 ha
> 25 - 50 ha
> 0.05 - 25 ha
Same acreage
< -0.05 - -25 ha
< -25 - -50 ha
< -50 - -250 ha
< -250 - -500 ha
< -500 - -930 ha
Stopped planting
No cardamom
No villages
increase
decrease
CHINA
MYANMAR
VIETNAM
THAILAND
CAMBODIA
PHONGSALY
LUANG NAMTHA
BOKEO
OUDOMXAI
LUANG PRABANG
HOUAPHAN
XIENGKHOUANG
VIENTIANE PROVINCE
XAYABOULY
BOLIKHAMXAI
VIENTIANE CAPITAL
KHAMMOUAN
SAVANNAKHET
SALAVAN
XEKONG
CHAMPASAK
ATTAPEU
Phongsaly
Luang Namtha
Muang Xay
Huay Xay
Luang Prabang
Xamneua
Phonsavan
Xayabouly
Viengkham
Pakxanh
Vientiane
Thakhek
Savannakhet
Salavan
Xekong
Pakxe
Attapeu
0 100 200 300 km
Total cardamom cultivation area at province level
1999 2011
4600 ha
2000 ha
1000 ha
Not shown < 10 ha
100 ha 2180 ha
230 ha
250 ha
10 ha
100 ha
20 ha
2500 ha
810 ha
1200 ha 1500 ha
4600 ha
300 ha
1920 ha
70 ha
Change in cardamom cultivation area at province level (17)
> 500 - 2100 ha (1)
> 250 - 500 ha (3)
> 0 - 250 ha (5)
No change (3)
< 0 - -250 ha (1)
< -250 - -500 ha (2)
< -500 - -2500 ha (1)
< -2500 - -3285 ha (1)
0 50 100 150 km
8000000E
8200000E
8400000E
2000000N
1800000N
1600000N
1400000N
22°00'N
20°00'N
18°00'N
16°00'N
14°00'N
100°00'E
102°00'E
104°00'E
106°00'E
108°00'E

C24 Tea

Introduction

Tea (*Camellia sinensis*) is one of the most popular aromatic beverages in the world. The world's oldest tea was 3,200 years old and was found in the Fengqing County of Yunnan Province in southwestern China, which neighbours the Lao PDR (Heiss and Heiss, 2007). Tea production started in the Lao PDR in two different periods and regions. First, northern Lao PDR produced tea around 600 years ago and the connection of the Lao tea trade with China was recorded as far back as the 7th Century. Second, in 1920, the French colonial government brought tea into the Lao PDR from central Vietnam to the fertile volcanic soils of the Bolaven Plateau in Champasak.

There are three main categories of tea plants: wild forest tea, cultivated forest tea (locally known as "ancient tea") and commercially cultivated tea. The wild and the cultivated forest tea plants are mostly grown in the north, particularly in Phongsaly, while commercially cultivated tea is more commonly grown in the southern provinces.

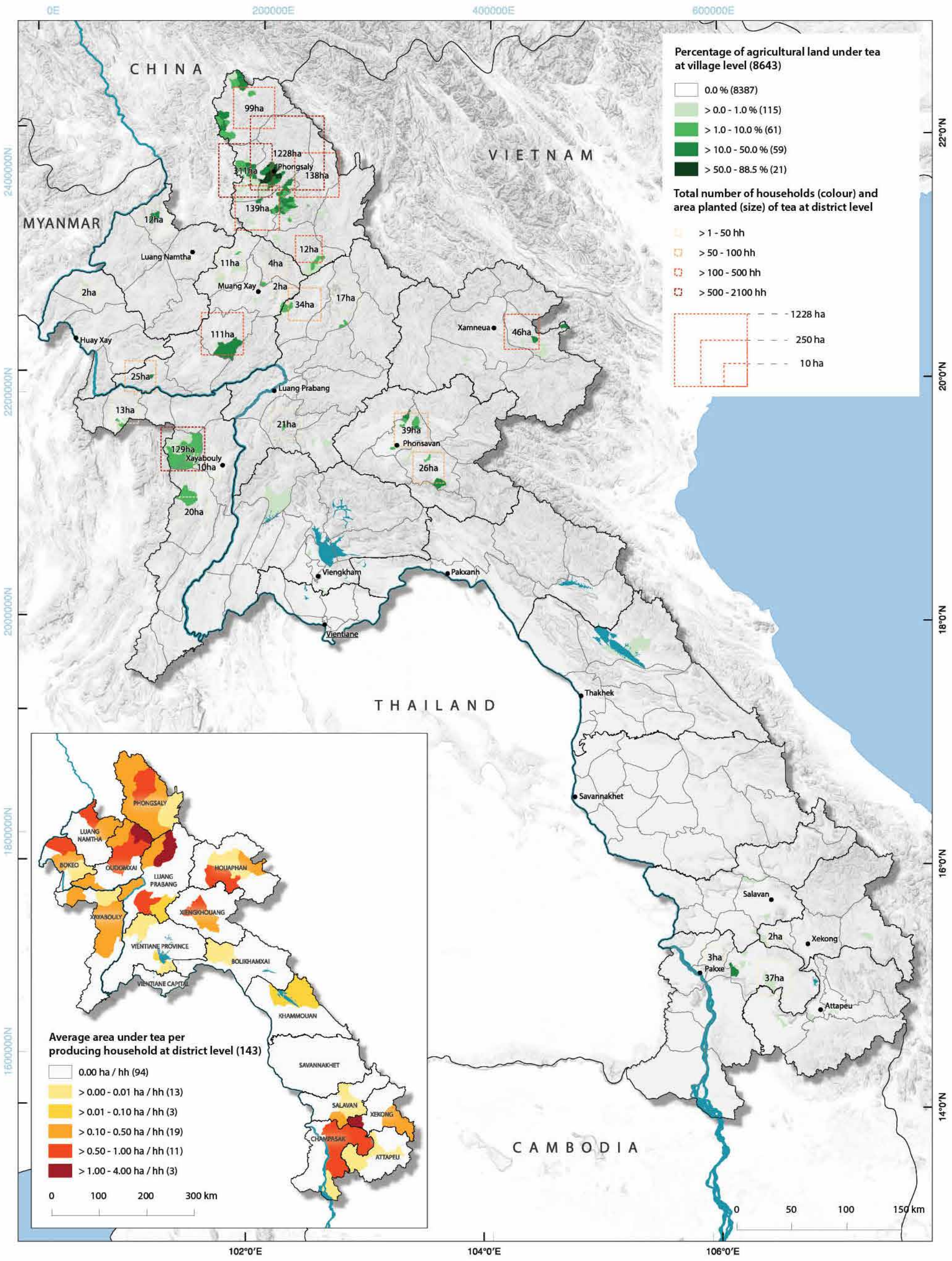
Despite the crop's long history, the Lao tea sector is relatively underdeveloped in comparison to its potential. As tea cultivation is one of the main agricultural activities of many ethnic minorities and particularly women in remote and rural communities in the uplands, tea has a great potential to contribute significantly to poverty reduction and rural development in the Lao PDR. Tea produced in the Lao PDR is mainly exported to China as Lao tea leaves are highly valued on the Chinese market.

Patterns of tea cultivation in 2011

Overall, 2,497 ha of tea is cultivated in the Lao PDR, of which around 95 percent is in the north. The main map shows that the main tea areas are located in Phongsaly, Xayabouly (Xaisathan District) and Oudomxai (Beng and Pakbeng Districts). In each of these provinces there is at least one district where more than 100 ha of tea are grown. In Phongsaly District, Phongsaly Province, 1,228 ha are cultivated by 2,100 households. Tea is also cultivated in Xiengkhouang, around the province capital of Phonsavan. Women from various ethnic groups such as Khmu, Lao Tai, Prai, Akha, Hmong, Tai Lue and Hor are most commonly engaged in hand picking the tea leaves.

In Phongsaly, roughly 5 percent of the total agricultural land is devoted to tea cultivation. 21 villages there use more than 50 percent (up to 88.5 percent) of their agricultural land for tea. In total, there are 6,205 households in the Lao PDR cultivating tea, of which 74 percent are in Phongsaly, 15 percent in Xayabouly and 4 percent in Oudomxai.

As the inset map shows, tea production on small plots of less than 1 ha on average is observed in 46 districts. Three districts in Oudomxai, Luang Prabang and Xekong Provinces, namely La, Ngoy and Thateng Districts, cultivate tea on an average area greater than 1 ha and up to 4 ha per household.


0E
200000E
400000E
600000E
2400000N
2200000N
2000000N
1800000N
1600000N
22°0'N
20°0'N
18°0'N
16°0'N
14°0'N
102°0'E
104°0'E
106°0'E
CHINA
MYANMAR
VIETNAM
THAILAND
CAMBODIA
Percentage of agricultural land under tea at village level (8643)
0.0 % (8387)
> 0.0 - 1.0 % (115)
> 1.0 - 10.0 % (61)
> 10.0 - 50.0 % (59)
> 50.0 - 88.5 % (21)
Total number of households (colour) and area planted (size) of tea at district level
> 1 - 50 hh
> 50 - 100 hh
> 100 - 500 hh
> 500 - 2100 hh
1228 ha
250 ha
10 ha
99ha
1228ha
Phongsaly
311ha
138ha
139ha
12ha
Luang Namtha
11ha
4ha
12ha
Muang Xay
2ha
2ha
34ha
17ha
111ha
Huay Xay
Xamneua
46ha
25ha
Luang Prabang
13ha
21ha
39ha
Phonsavan
129ha
Xayabouly
10ha
26ha
20ha
Viengkham
Pakxanh
Vientiane
Thakhek
Savannakhet
Salavan
2ha
Xekong
3ha
Pakxe
37ha
Attapeu
0 50 100 150 km
Average area under tea per producing household at district level (143)
0.00 ha / hh (94)
> 0.00 - 0.01 ha / hh (13)
> 0.01 - 0.10 ha / hh (3)
> 0.10 - 0.50 ha / hh (19)
> 0.50 - 1.00 ha / hh (11)
> 1.00 - 4.00 ha / hh (3)
0 100 200 300 km
PHONGSALY
LUANG NAMTHA
BOKEO
OUDOMXAI
LUANG PRABANG
HOUAPHAN
XAYABOULY
XIENGKHOUANG
VIENTIANE PROVINCE
BOLIKHAMXAI
VIENTIANE CAPITAL
KHAMMOUAN
SAVANNAKHET
SALAVAN
XEKONG
CHAMPASAK
ATTAPEU

Changes in tea cultivation patterns between 1999 and 2011

In 1999, about 80 percent of the area devoted to tea (1,339 ha) was in the south, while the north was home to the remaining 20 percent. The total tea cultivation area has continuously decreased in the south, especially in Champasak. Many agricultural households there have abandoned tea cultivation for other crops with higher economic benefits. As a consequence, over 96 percent or about 1,025 ha of tea has been abandoned or left unmanaged.

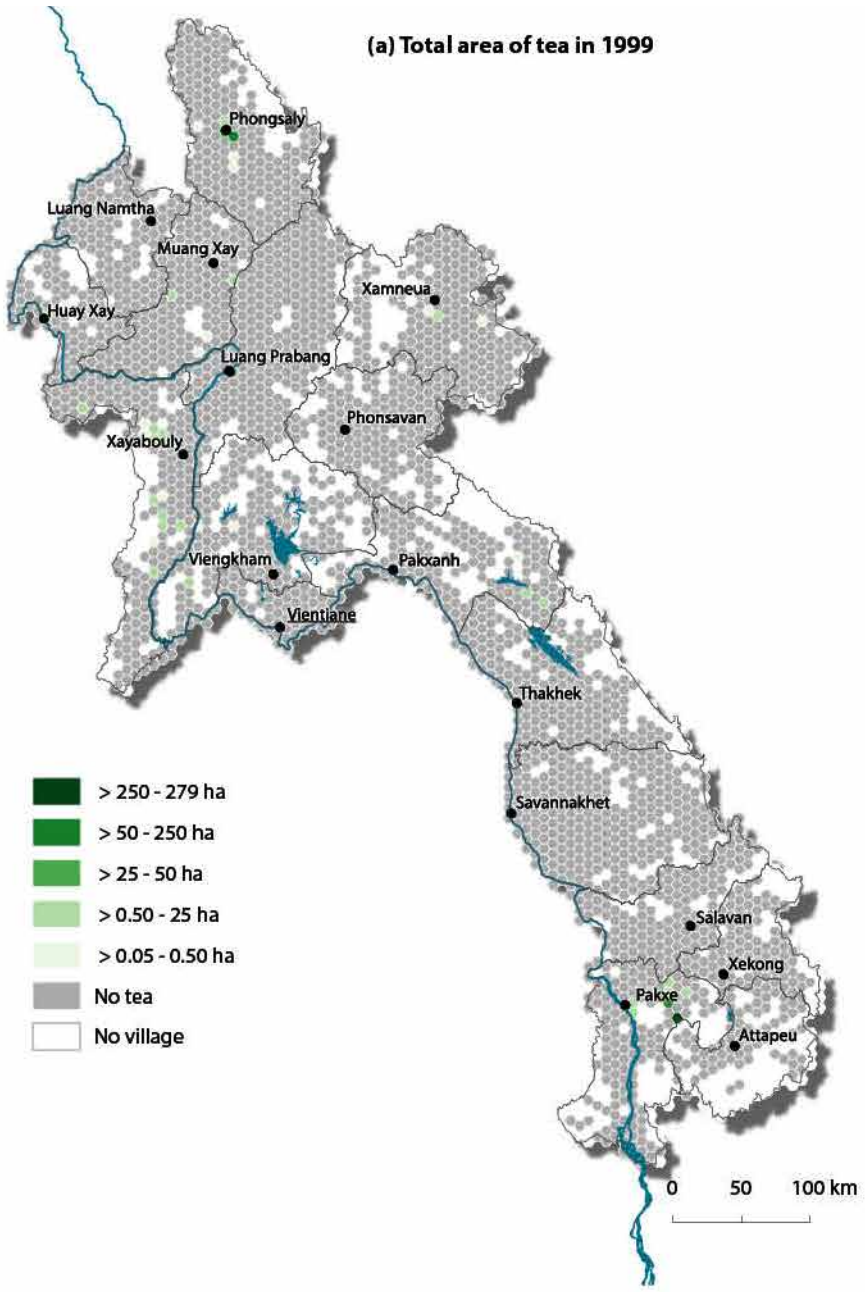
Despite the decrease in tea production in Champasak, the overall cultivation area has almost doubled. Phongsaly has experienced an eleven fold increase from 174 ha in 1999 to 1,928 ha in 2011. The tea cultivation area in Oudomxai and Xayabouly also increased by 150 ha and 120 ha respectively during the same period. Along with this increase in area under tea, over 4,000 more households are engaged in tea cultivation (from 2,041 households in 1999 to 6,205 in 2011). The highest increase in tea cultivating households occurred in Phongsaly, whereas the highest decline was recorded in Champasak over the same period.

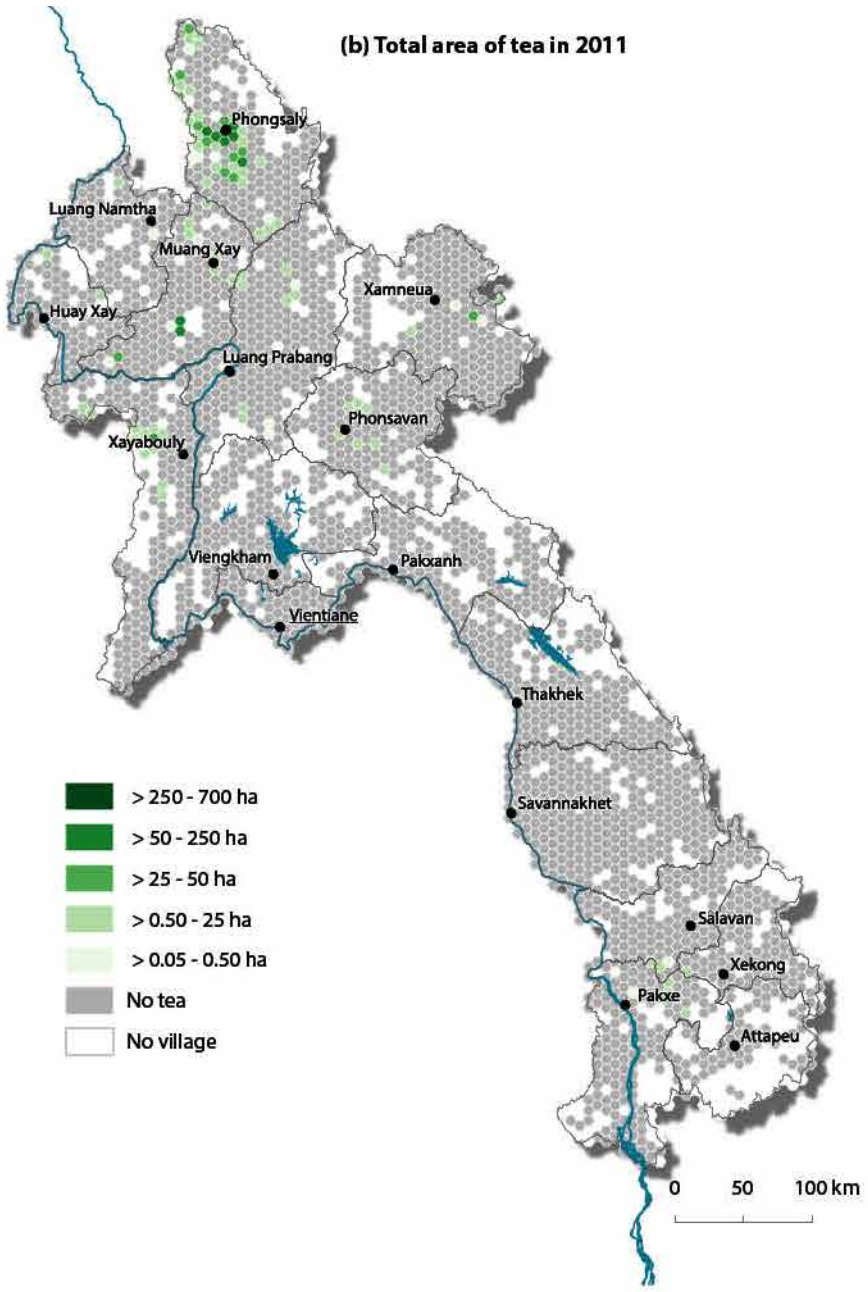
Interpretations

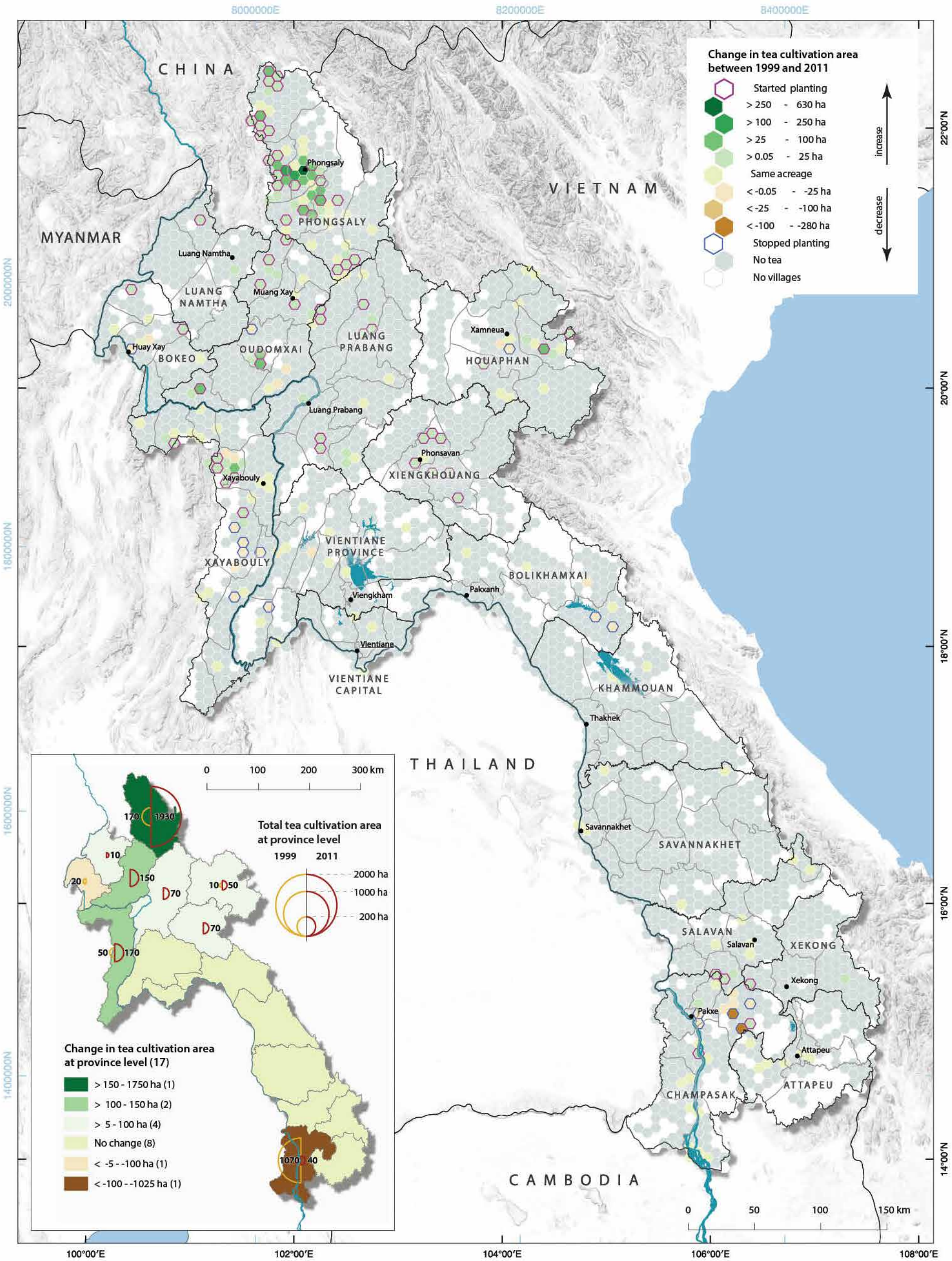
Tea production in Champasak drastically dropped between 1999 and 2011 for a number of reasons. First, as the coffee price went up, farmers in the south have become more interested in planting coffee than tea. Many tea trees have not be picked or actively managed for production for years as a result. There has also been an issue of labour shortage caused by labour migration to administrative centres and neighbouring countries (mainly Thailand), which has negatively affected the domestic agricultural sector more broadly in the Lao PDR. Finally, despite high demand from China for Lao tea, tea prices in the south do not compare with those offered to farmers in the north. This difference is mainly due to high transportation costs from the south and Chinese buyers' preference for northern Lao tea.

Various programs supporting smallholder farmers have been initiated by the GoL and international donors, including a range of poverty eradication and sustainable livelihood programs targeting the rural poor in remote upland communities where tea is often a preferred crop.

The high market demand for tea, coupled with the scarcity of land for tea cultivation in China, has led to dramatic price increases, particularly for northern provinces where Chinese tea companies have expanded their own tea cultivation areas, while also providing some technical support to smallholder farmers, often in partnership with provincial government authorities. The expansion of market opportunities for tea in these areas has contributed to local economic growth, sometimes benefitting households engaged in tea production.






Change in tea cultivation area between 1999 and 2011
Started planting
> 250 - 630 ha
> 100 - 250 ha
> 25 - 100 ha
> 0.05 - 25 ha
Same acreage
< -0.05 - -25 ha
< -25 - -100 ha
< -100 - -280 ha
Stopped planting
No tea
No villages
increase
decrease
CHINA
MYANMAR
VIETNAM
LAO PDR
THAILAND
CAMBODIA
Phongsaly
PHONGSALY
Luang Namtha
LUANG NAMTHA
Muang Xay
OUDOMXAI
Huay Xay
BOKEO
LUANG PRABANG
Luang Prabang
Xamneua
HOUAPHAN
Phonsavan
XIENGKHOUANG
Xayabouly
XAYABOULY
VIENTIANE PROVINCE
Viengkham
Vientiane
VIENTIANE CAPITAL
Paksanh
BOLIKHAMXAI
KHAMMOUAN
Thakhek
Savannakhet
SAVANNAKHET
SALAVAN
Salavan
XEKONG
Xekong
Pakxe
CHAMPASAK
Attapeu
ATTAPEU
8000000E
8200000E
8400000E
2000000N
1800000N
1600000N
1400000N
22°00′N
20°00′N
18°00′N
16°00′N
14°00′N
100°00′E
102°00′E
104°00′E
106°00′E
108°00′E
0 100 200 300 km
0 50 100 150 km
Total tea cultivation area at province level
1999 2011
2000 ha
1000 ha
200 ha
170 1930
10
150
20
70
10 50
70
50 170
1070 40
Change in tea cultivation area at province level (17)
> 150 - 1750 ha (1)
> 100 - 150 ha (2)
> 5 - 100 ha (4)
No change (8)
< -5 - -100 ha (1)
< -100 - -1025 ha (1)

C25 Mango

Introduction

Mango (*Mangifera indica*) is a fruit tree grown throughout the country for household consumption as well as for sale. Many local varieties of mango are planted in the Lao PDR, referred to in Lao language as *Muangpar, Kasor, Kasen, Muangnang, Muangkeo, Oklong, Ngaxang,* and *Muangkhai.* However, growers are interested in planting new varieties, especially those with strong market demand such as *Khiaosawoei, Namdokmai, Nangseam, Falan, Choko Anan, Maha Chank, Nangkhanvanh, Thongdam, Salaya, Chokhounthip* or *Norred*. Mango is eaten both green (under ripe) and ripe in the Lao PDR.

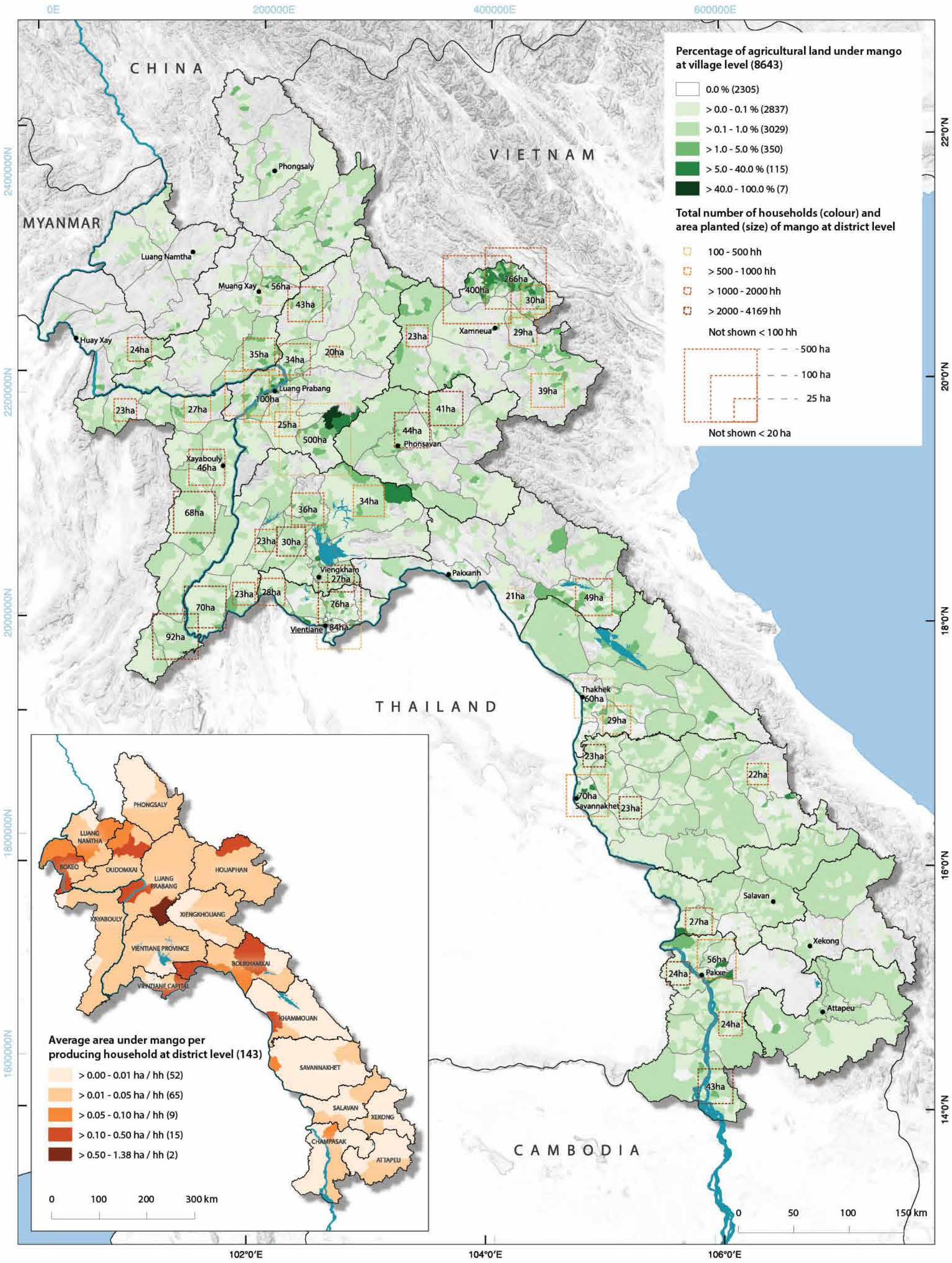
Patterns of mango cultivation in 2011

There are 3,955 ha of mango planted by 184,800 households across the Lao PDR. Most villages grow mango but use only a fraction of their agricultural land for it – often there are just a few mango trees in a village – while only 27 percent of all agricultural villages do not grow mango at all. In Phoukhoun District, Luang Prabang Province, 500 ha of mango is cultivated by 438 households. In Houaphan, the two very northern districts bordering Vietnam, namely Et and Xiengkho Districts, also stand out with 400 ha and 266 ha of mango under cultivation, but here it is cultivated by 1,976 households and 1,988 households respectively.

The inset map shows that mango is actually grown in all districts but in many districts households only grow a few square metres of mango on average. Especially from Khammouan to the far south of the Lao PDR, in western Xiengkhouang, and in Phongsaly, the average area per household is small. The highest average areas per household are found in the above mentioned districts of Phoukhoun in Luang Prabang Province and in Chanthabouly District in Vientiane Capital.

Table 7: Total and change of mango area between 1999 and 2011

Province	Total ha mango 1999	Total ha mango 2011	Change 1999 to 2011
Vientiane Capital	1,083.8	209.2	-874.6
Phongsaly	54.4	54.0	-0.5
Luang Namtha	72.3	42.3	-30.1
Oudomxai	200.7	148.5	-52.3
Bokeo	865.8	34.6	-831.2
Luang Prabang	2,167.3	856.9	-1,310.4
Houaphan	1,545.4	817.6	-727.8
Xayabouly	842.2	363.8	-478.4
Xiengkhouang	265.9	135.2	-130.7
Vientiane	215.5	293.0	77.6
Bolikhamxai	277.2	118.2	-159.0
Khammouan	481.0	195.8	-285.1
Savannakhet	435.5	298.6	-136.8
Salavan	189.5	120.0	-69.5
Xekong	28.7	19.6	-9.1
Champasak	442.0	205.0	-237.0
Attapeu	33.3	42.5	9.2
Total	**9,200.5**	**3,954.8**	**-5,245.8**


Percentage of agricultural land under mango at village level (8643)
0.0 % (2305)
> 0.0 - 0.1 % (2837)
> 0.1 - 1.0 % (3029)
> 1.0 - 5.0 % (350)
> 5.0 - 40.0 % (115)
> 40.0 - 100.0 % (7)
Total number of households (colour) and area planted (size) of mango at district level
100 - 500 hh
> 500 - 1000 hh
> 1000 - 2000 hh
> 2000 - 4169 hh
Not shown < 100 hh
500 ha
100 ha
25 ha
Not shown < 20 ha
Average area under mango per producing household at district level (143)
> 0.00 - 0.01 ha / hh (52)
> 0.01 - 0.05 ha / hh (65)
> 0.05 - 0.10 ha / hh (9)
> 0.10 - 0.50 ha / hh (15)
> 0.50 - 1.38 ha / hh (2)
0 100 200 300 km
0 50 100 150 km
CHINA
VIETNAM
MYANMAR
THAILAND
CAMBODIA
Phongsaly
Luang Namtha
Muang Xay
Huay Xay
Luang Prabang
Xayabouly
Vientiane
Viengkham
Xamneua
Phonsavan
Pakxanh
Thakhek
Savannakhet
Salavan
Xekong
Pakxe
Attapeu
PHONGSALY
LUANG NAMTHA
BOKEO
OUDOMXAI
LUANG PRABANG
HOUAPHAN
XIENGKHOUANG
XAYABOULY
VIENTIANE PROVINCE
VIENTIANE CAPITAL
BOLIKHAMXAI
KHAMMOUAN
SAVANNAKHET
SALAVAN
XEKONG
CHAMPASAK
ATTAPEU
22°0'N
20°0'N
18°0'N
16°0'N
14°0'N
102°0'E
104°0'E
106°0'E

Changes in mango cultivation patterns between 1999 and 2011

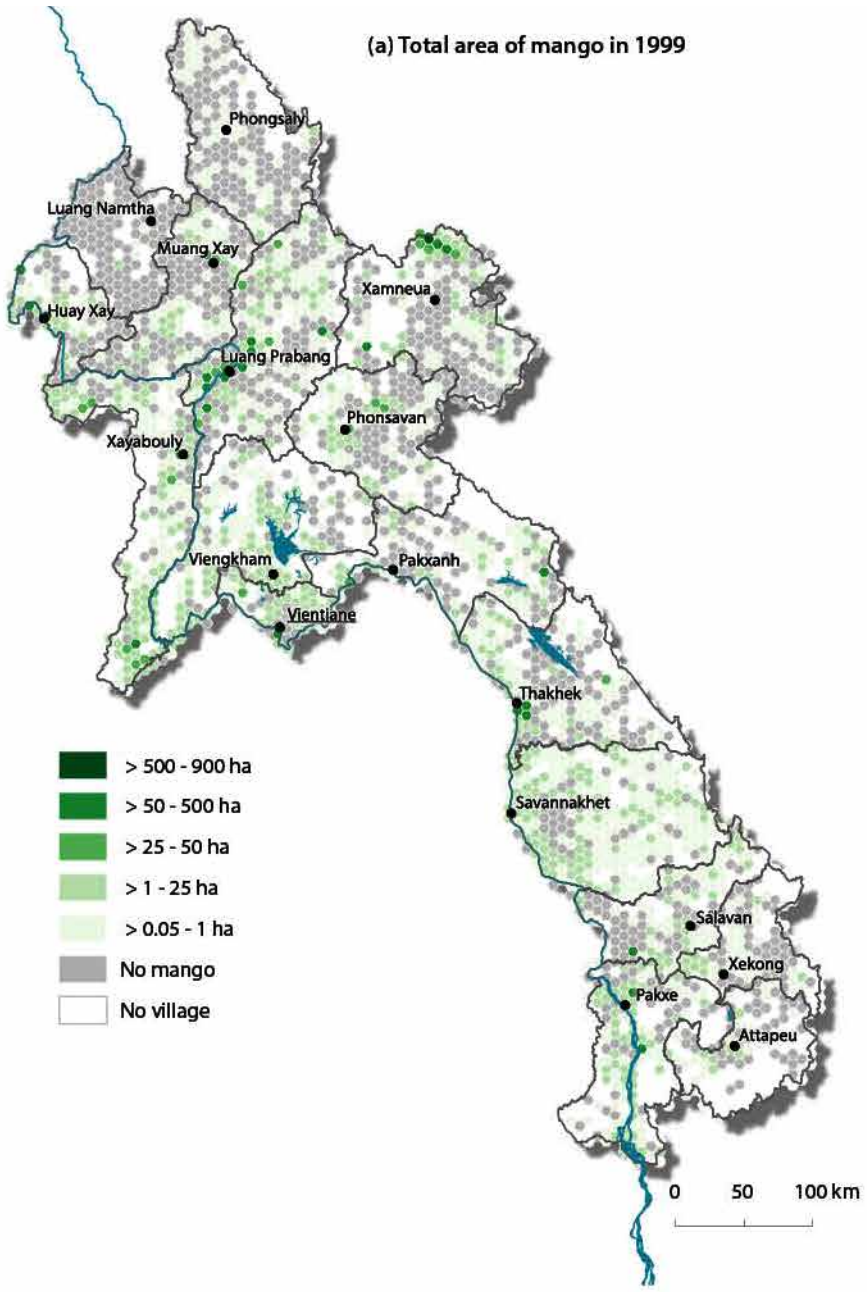
A significant decrease in mango cultivation area was recorded between 1999 and 2011 – from 9,200 ha in 1999 down to 3,955 ha in 2011. In almost all provinces, a decline is apparent, starting from only a few ha up to 1,300 ha in Luang Prabang. In contrast, only two provinces (Vientiane Province and Attapeu) experienced a slight increase in mango planting area. The mango production area in Phongsaly remained unchanged and the regions around Luang Prabang town, Huay Xay (the capital of Bokeo Province), southern Xayabouly, the suburbs of Vientiane Capital and western Savannakhet all lost remarkable areas under mango production. Table 7 gives detailed information about the mango cultivation area in 1999 and 2011 per province.

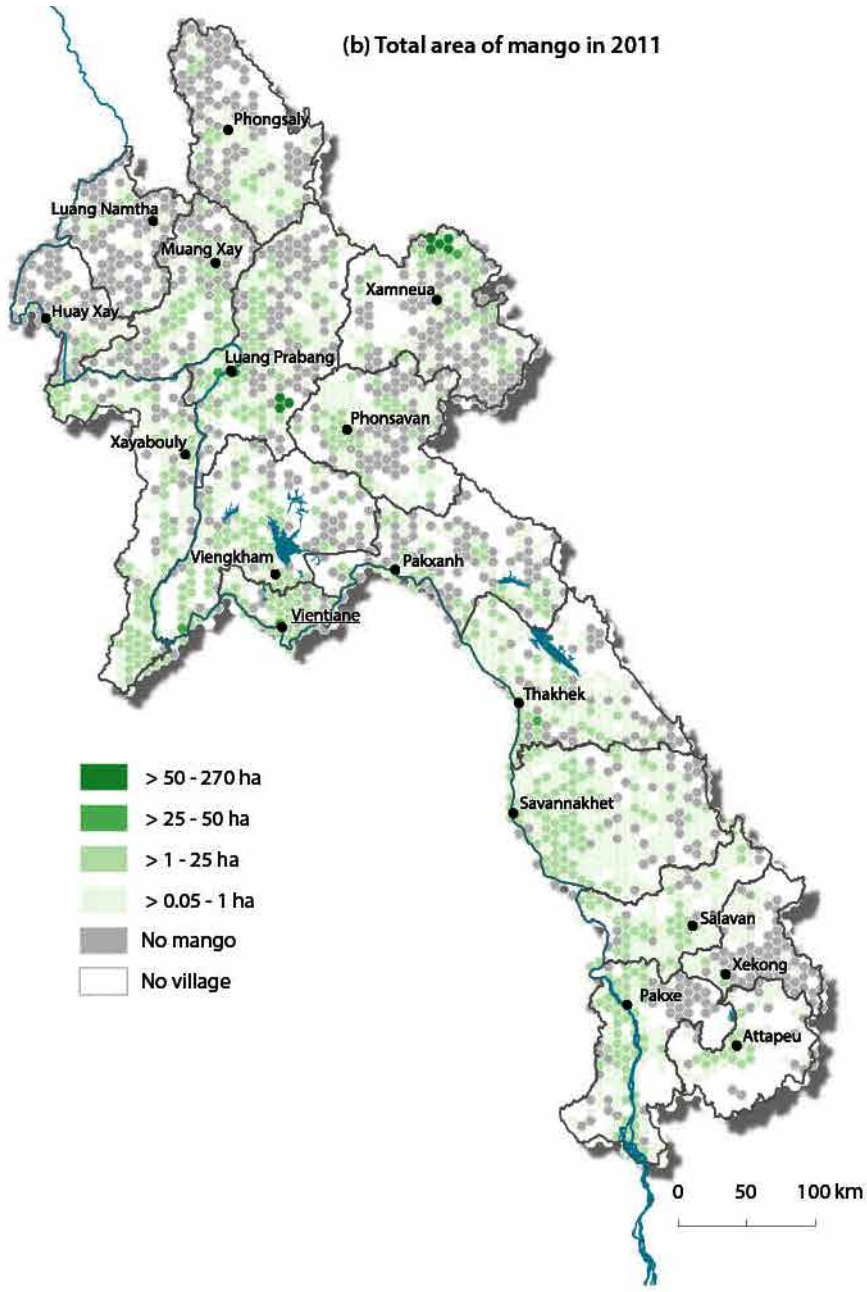
In comparison to the cultivation area, the number of households engaged in mango cultivation did not decrease so significantly. In 1999, 191,000 households cultivated mango, whereas in 2011 185,000 households still had mango trees which is only a decrease of 3 - 4 percent.

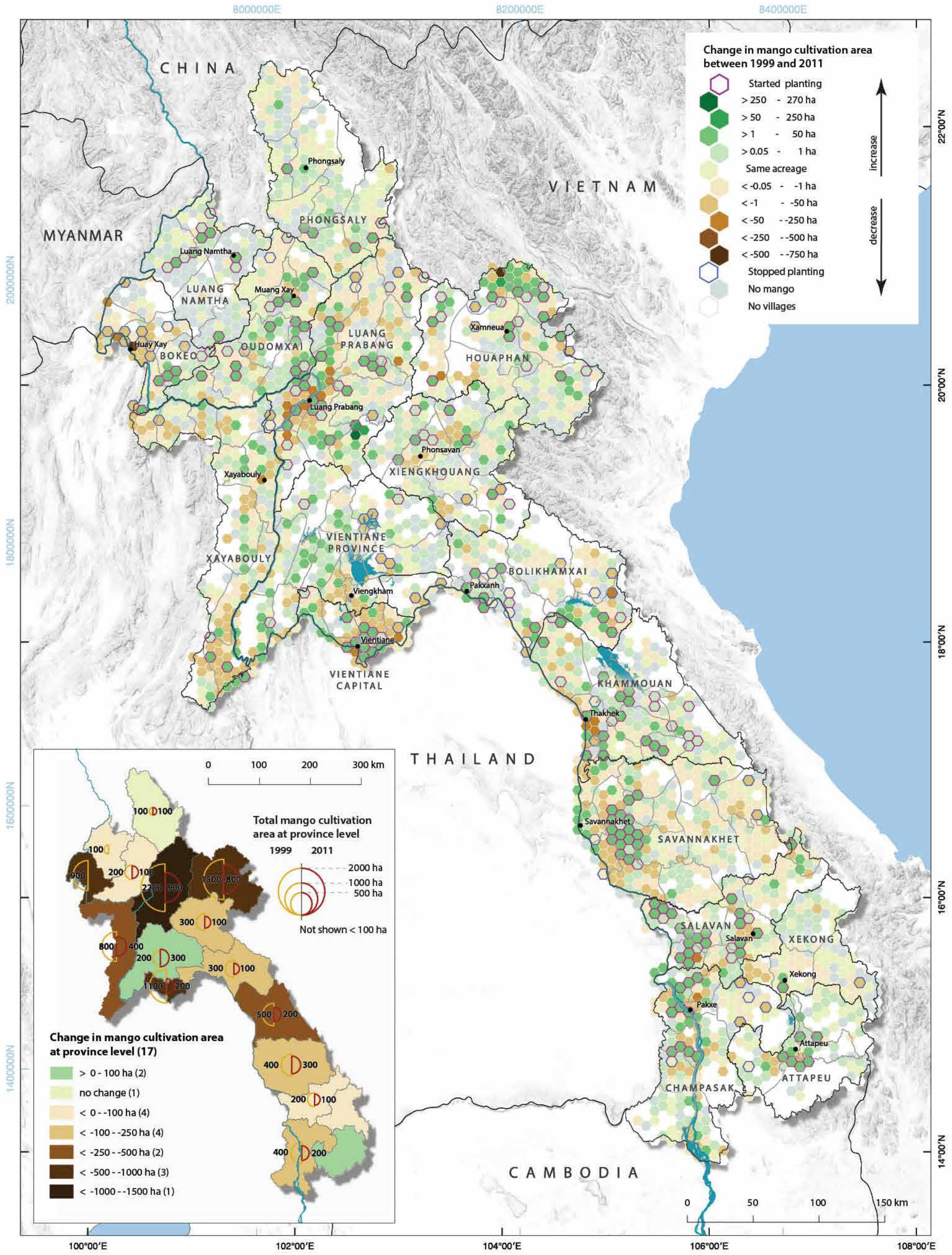
Interpretations

The reduction in areas under mango production across the country over the past decade was mainly a result of increased imports of mangoes from Thailand, which has increased competition on the domestic mango market. Anthracnose (a fungal infection) is the most common disease threatening mango trees, and its rising occurrence in the Lao PDR was another cause for the drop in the mango cultivation area. Moreover, declines in Luang Prabang, Houaphan and Bokeo were due to cold weather in some past years which, because mango trees prefer frost-free tropical and warmer subtropical climates, killed off or damaged some mango cultivation areas.

The lack of standardization of local mango seeds used and the mostly organic production in the Lao PDR, lead to a high diversity of mangoes produced. On the other hand it leads to low productivity and inefficiencies in management of pest invasions. A lack of engagement in producing during the off-season as well as poor post harvesting technologies have all put Lao mango farmers at a competitive disadvantage compared to neighbouring countries, especially compared to Thailand.






Change in mango cultivation area between 1999 and 2011
Started planting
> 250 - 270 ha
> 50 - 250 ha
> 1 - 50 ha
> 0.05 - 1 ha
Same acreage
< -0.05 - -1 ha
< -1 - -50 ha
< -50 - -250 ha
< -250 - -500 ha
< -500 - -750 ha
Stopped planting
No mango
No villages
increase
decrease
CHINA
MYANMAR
VIETNAM
THAILAND
CAMBODIA
PHONGSALY
LUANG NAMTHA
OUDOMXAI
BOKEO
LUANG PRABANG
HOUAPHAN
XIENGKHOUANG
VIENTIANE PROVINCE
XAYABOULY
VIENTIANE CAPITAL
BOLIKHAMXAI
KHAMMOUAN
SAVANNAKHET
SALAVAN
XEKONG
CHAMPASAK
ATTAPEU
Phongsaly
Luang Namtha
Muang Xay
Huay Xay
Xamneua
Luang Prabang
Phonsavan
Xayabouly
Viengkham
Vientiane
Pakxanh
Thakhek
Savannakhet
Salavan
Xekong
Pakxe
Attapeu
8000000E
8200000E
8400000E
2000000N
1800000N
1600000N
1400000N
22°00'N
20°00'N
18°00'N
16°00'N
14°00'N
100°00'E
102°00'E
104°00'E
106°00'E
108°00'E
0 100 200 300 km
0 50 100 150 km
Total mango cultivation area at province level
1999 2011
2000 ha
1000 ha
500 ha
Not shown < 100 ha
Change in mango cultivation area at province level (17)
> 0 - 100 ha (2)
no change (1)
< 0 - -100 ha (4)
< -100 - -250 ha (4)
< -250 - -500 ha (2)
< -500 - -1000 ha (3)
< -1000 - -1500 ha (1)