

UNIVERSITY OF MIAMI

COFFEE MARKETS, SMALLHOLDER CREDIT, AND LANDSCAPE CHANGE IN
THE BOLAVEN PLATEAU REGION, LAOS

By

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A THESIS

Submitted to the Faculty
of the University of Miami
in partial fulfillment of the requirements for
the degree of Master of Arts

Coral Gables, Florida
May 2012

UNIVERSITY OF MIAMI

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Coffee Markets, Smallholder
Credit, and Landscape Change
in the Bolaven Plateau Region, Laos

(M.A., Geography)
(May 2012)

Abstract of a thesis at the University of Miami.

Thesis supervised by Associate Professor Douglas O. Fuller.
No. of pages in text. (151)

This thesis analyzes relationships between global coffee prices, international development schemes, local trading and credit systems, and landscape dynamics in the Bolaven Plateau region of southern Laos. The region is a complex and rapidly changing resource space serving principally as the productive, socio-ecological base of the Lao coffee commodity chain. Fieldwork conducted there in 2009 entailed in-depth interviews and quasi-survey semi-structured interviews. These latter interviews yielded a database of 503 detailed loan/debt histories for 192 coffee smallholder households between 1987 and 2008. These data reveal a socio-economically exploitative cycle of coffee production, chronic indebtedness, and poverty at the base of the chain. This cycle is shown to have evolved as part of the legacy of the rural credit component of an otherwise highly successful coffee chain development project implemented by the World Bank, and concurrent with the most recent articulation of the global coffee crisis. This cycle serves to maintain a particular set of labor-capital relations which impede the advancement of visions for an alternative, more socio-economically and environmentally equitable Lao coffee commodity chain. Land change detection with Landsat TM, ETM+, and ASTER satellite imagery quantifies the pattern and extent of land-use/land-cover change in the region between 1989 and 2008. These data reveal a sustained conversion of forested to agricultural lands, among other notable landscape changes. These environmental

transformations correspond primarily to the workings of the Lao coffee chain, as conditioned by the chain's socio-economic relations. They also reflect the formation of other, new commodity chains in the resource space. The development of these chains also undermines the pursuit of an alternative Lao coffee network. The geographic configuration of the Bolaven Plateau region therefore constrains the potentialities of the Lao coffee commodity chain, while, reciprocally, the structure of the chain constrains the lands and livelihoods of those bound to it.

TABLE OF CONTENTS

LIST OF FIGURES	v
LIST OF IMAGES	vi
LIST OF MAPS	viii
LIST OF TABLES	ix
ABBREVIATIONS & ACRONYMS	x
CHAPTER I: INTRODUCTION	1
The Lao Coffee Network	1
The Lao Coffee Resource Space	7
Research Questions	11
Theoretical Framework	12
Methods and Data	22
Organization and Argument	24
CHAPTER II: HISTORICAL RESTRUCTURINGS OF THE LAO COFFEE CHAIN	25
French Colonialism and Crop Introduction	25
Wars, Regime Changes, and Sector Disruption	28
Socialist Experimentation and Agricultural Collectivization	31
Post-Socialist Transition and Market Liberalization	36
CHAPTER III: THE CONTEMPORARY STRUCTURE OF THE LAO COFFEE CHAIN	41
Global Coffee Chain Dynamics	41
The National Coffee Sector of Lao PDR	46
Lao Coffee and the Bolaven Plateau Region	50
Actors in the Lao Coffee Commodity Chain	54
CHAPTER IV: SOCIO-ECONOMIC DYNAMICS OF THE BOLAVEN PLATEAU REGION	65
Ethnographic Methods and Data	65
Land-Tenure, Land-Use, Labor, Income	71
Coffee, Credit, Debt	73
The Evolution of Smallholder Credit Sources	92
Labor-Capital Relations in the Bolaven Plateau Region	96
CHAPTER V: SOCIO-ECOLOGICAL DYNAMICS OF THE BOLAVEN PLATEAU REGION	97
Geospatial Methods and Data	97

Regional Land-Use/Land-Cover Change	105
A Shifting Resource Space	111
CHAPTER VI: CONCLUSION	124
REFERENCES & DATA	130
APPENDICES	139
Map A1: Lao People's Democratic Republic Upland Agriculture Development Project Plateau des Bolovens Region	139
Map A2: Lao People's Democratic Republic Upland Agriculture Development Project	140
Map A3: Choropleth and cartogram of the quantity of coffee produced in 2008 in each Lao PDR province	141
Map A4: Destinations and value of Lao coffee exports in 2002	142
Map A5: Destinations and value of Lao coffee exports in 2003	143
Map A6: Destinations and value of Lao coffee exports in 2004	144
Map A7: Destinations and value of Lao coffee exports in 2005	145
Map A8: Destinations and value of Lao coffee exports in 2006	146
Map A9: Destinations and value of Lao coffee exports in 2007	147
Map A10: Hydropower site and mines area map 2008	148
Map A11: Bolaven Plateau region screenshot from hydropower site and mines area 2008	149
Map A12: Laos Project Yuqida Tenement Resource Areas & Exploration Target	150
Map A13: Existing, under construction and planned/proposed hydropower projects in the Lower Mekong Basin, September 2008	151

LIST OF FIGURES

Figure 1: The global coffee commodity chain	16
Figure 2: Conversion of a nodal commodity chain structure to a spatial commodity chain structure	18
Figure 3: Evolution of a nodal commodity chain structure	18
Figure 4: Evolution of a spatial commodity chain structure	19
Figure 5: Temporal transformation of a socio-ecological configuration	20
Figure 6: Integration of a dynamic spatial commodity chain structure and a dynamic socio-ecological configuration	21
Figure 7: Reciprocity between a dynamic commodity chain structure and a dynamic socio-ecological configuration	21
Figure 8: Relationship between the ICO composite indicator price and the USD/LAK currency exchange rate, 1989-1999	39
Figure 9: Global coffee production by coffee type, 1959-2012	42
Figure 10: Coffee prices before, during, and after the global coffee crisis	45
Figure 11: Poverty rates in the agro-/eco-regions of Laos	53
Figure 12: Proportion of households sampled in each village to total household sample (n=192)	70
Figure 13: Sampled public smallholder loans (n=125) in relation to the global coffee price, 1989-2008	77
Figure 14: Average monthly interest rate of sampled public smallholder loans (n=125)	79
Figure 15: Sampled public loans (n=289) in relation to the global coffee price, 1989-2008	88
Figure 16: Average monthly interest rate of sampled trader loans (n=289)	89
Figure 17: Sampled family loans (n=89) in relation to the global coffee price, 1989-2008	90
Figure 18: Average monthly interest rate of sampled family loans (n=89)	91
Figure 19: Quantity and type of all documented smallholder loans (n=503) in relation to the global coffee price, 1989-2008	93
Figure 20: Labor-capital relations of the Bolaven Plateau region	96
Figure 21: Change in the total area of land-use/land-cover, ~1989-2008	109

LIST OF IMAGES

Image 1: Coffee blooms on the Bolaven Plateau region, Laos	2
Image 2: A Lao villager carries a basket of freshly picked coffee cherries	3
Image 3: Lao villagers organize trays of wet-processed coffee for drying	4
Image 4: A smallholder farmer rakes her ground-drying coffee	6
Image 5: A southwest-facing vista from atop the Bolaven Plateau	8
Image 6: The destruction of Pakxong during the Second Indochina War	32
Image 7: A coffee smallholder highlights the differences between a few of the coffee species grown in the Bolaven Plateau region	52
Image 8: Lao coffee smallholders chat among bags of coffee stored in their home	55
Image 9: Ground-dried coffee being hulled (dry-process)	56
Image 10: A typical Lao coffee smallholder family	56
Image 11: A trader's truck is parked to load coffee beneath a comparatively affluent household balcony	58
Image 12: An PCADR-PAB-sponsored wet-processing station in a Bolaven Plateau village (<i>Ban Kapeu</i>) with an active AGPC producers' group	60
Image 13: Banners indicate PCADR-PAB-sponsorship of a wet-processing station in a Bolaven Plateau village (<i>Ban Phoumakho</i>) with an active AGPC producers' group	61
Image 14: Pakxe office headquarters of the Programme de Capitalisation pour l'Appui à la politique de Développement Rural (PCADR) – Point d'Application des Bolovens (PAB)	63
Image 15: Soukdavanh Bouadaphom records the responses of Lao wife and husband during a typical household interview session	70
Image 16: Soukdavanh Bouadaphom and the author interview a Lao father during a typical outdoor interview session	71
Image 17: A Lao smallholder farmer presents his Agriculture Promotion Bank loan booklet	76
Image 18: An extended Lao family displays an account booklet and several receipts for payments made on APB-issued loans	78
Image 19: Account booklet for Agriculture Promotion Bank public loan	80
Image 20: The Pakxong branch Agriculture Promotion Bank	81
Image 21: An agent of the Agriculture Promotion Bank comes to collect a loan payment from a smallholder borrower	84
Image 22: Phongsavanh Bank, a private commercial bank in Pakxe	92
Image 23: A Lao youth manages fire for the sake of expanding his family's cultivable coffee area	110
Image 24: Smoke towers in the distance from a managed fire as young coffee plantings grow in a new coffee plantation	110
Image 25: The author surveys a large swath of newly burned forest on the Bolaven Plateau	111
Image 26: The author surveys a swath of newly burned scrubland / secondary forest on the Bolaven Plateau	112

Image 27: Sign outside the Dak Lak Rubber Company's offices in Pakxe	113
Image 28: One-year-old coffee plantings grow in direct sunlight in the Dak Lak Co. coffee plantation	114
Image 29: A plantation of rubber trees stretches far beyond what the eye can see	115
Image 30: A south-facing view of the Houay Ho dam reservoir	117

LIST OF MAPS

Map 1: Laos and mainland Southeast Asia	9
Map 2: The Bolaven Plateau region: main topographic and administrative features	10
Map 3: Destinations and value of Lao coffee exports in 2008	48
Map 4: Choropleth and cartogram of the area (ha) under coffee production in 2008 in each Lao PDR province	51
Map 5: Smallholder coffee fieldwork villages in the Bolaven Plateau region	68
Map 6: Bolaven Plateau region geospatial study area and collected GPS waypoints	102
Map 7: Landsat TM-based land-use/land-cover in the Bolaven Plateau region, ~1989	106
Map 8: Landsat ETM+-based land-use/land-cover in the Bolaven Plateau region, ~2001	107
Map 9: ASTER-based land-use/land-cover in the Bolaven Plateau region, ~2008	108
Map 10: SARCO mineral tenements in Laos (April 2008)	119
Map 11: Laos Project SARCO Tenements (December 2008)	120
Map 12: The Bolaven Plateau region resource space: coffee, mines, and dams	122

LIST OF TABLES

Table 1: Coffee production by the top-10 ranked producing countries + Laos	47
Table 2: Elevation, absolute location, and basic demographics of sampled fieldwork villages	67
Table 3: Households sampled in each village	69
Table 4: Tenure and use of lands by households within Bolaven Plateau smallholder villages	72
Table 5: Household labor availability and income for Bolaven Plateau smallholder villages	74
Table 6: Correlations between the quantity of smallholder loans by loan type and the ICO composite indicator price, 1999-2008	94
Table 7: Correlations between the quantity of smallholder loans by loan type and the ICO composite indicator price, 2000-2008	95
Table 8: Satellite imagery data used in the analysis	98

ABBREVIATIONS & ACRONYMS

ADB	Asian Development Bank
AFD	Agence Française de Développement (French Development Agency)
AGPC	Association des Groupements de Producteurs de Café du Plateau des Bolovens (Association of Bolaven Plateau Coffee Producer Groups)
AOI	Area of Interest/Investigation
APB	Agriculture Promotion Bank
ASTER	Advanced Spaceborne Thermal Emission and Reflection Radiometer
BOT	Build, Operate, and Transfer
CBL	Central Bank of Laos
CIRAD	Centre de Coopération Internationale en Recherche Agronomique pour le Développement (Center for International Cooperation in Agronomic Research for Development)
CNCL	Conseil National du Café Laos (Lao National Coffee Council)
CNMIM	China Nonferrous Metals International Mining Company
COMECON	Council for Mutual Economic Assistance
EROS	Earth Resources Observation and Science
ETM+	Enhanced Thematic Mapper Plus, Landsat
FAO	Food and Agriculture Organization
FAQ	fair average quality
FIDP	Forest Inventory Planning Department
GIS	Geographic Information System
GoL	Government of Laos
GPS	Global Positioning System
ha	hectare(s)
ICO	International Coffee Organization
IDA	International Development Association
kg	kilogram(s)
km	kilometer(s)
LAK	Lao kip (₭)
LCA	Lao Coffee Association
LDB	Lao Development Bank
LPDAAC	Land Processes Distributed Active Archive Center
LPRP	Lao People's Revolutionary Party
LSC	Lao Service Corporation
m	meter(s)
MAF	Ministry of Agriculture and Forestry, Lao PDR
masl	meter(s) above sea level
MOF	Ministry of Finance, Lao PDR
NASA	National Aeronautics and Space Administration
NBCA	National Biodiversity Conservation Area
NEM	New Economic Mechanism
PAB	Point d'Application des Bolovens (Bolaven Application Point)

PCADR	Programme de Capitalisation pour l'Appui à la politique de Développement Rural (Capitalization Program for the Support of Rural Development Policy)
PDR	People's Democratic Republic, Lao
PRCC-II	Programme de Renforcement des Capacités Commerciales II (Program for Trade Capacity Building II)
SAFReC	Southern Agriculture and Forestry Research Center
SARCO	Sino-Australian Resources Company
SLACO	Sino-Lao Aluminium Corporation Limited
SLIE	Societe Lao Import-Export (Lao Import-Export Company)
SPSS	Statistical Package for Social Science
TM	Thematic Mapper, Landsat
TNC	Transnational Corporation
UADP	Upland Agriculture Development Project
USD	United States dollar (\$)
USDA	United States Department of Agriculture
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
UXO	Unexploded Ordnance
VLRJSC	Viet-Lao Rubber Joint Stock Company
VNIR	Visible and Near Infrared
WGS	World Geodetic System
µm	micrometer(s)/micron(s)

CHAPTER I INTRODUCTION

The Lao Coffee Network

A commodity chain is “a network of labor and production processes whose end result is a finished commodity” (Hopkins & Wallerstein 1986: 159, 1994: 17). The coffee commodity chain emanating from the Lao People’s Democratic Republic (Lao PDR / Laos) constitutes an inconspicuous strand of the global coffee chain. Lao coffee accounts for a mere 0.25-0.30% of the coffee that circulates throughout the world (USDA 2012). Nevertheless, for the approximately 15,000 smallholder producer households in the Bolaven Plateau region for whom it is a first-order crop (Galindo & Sallée 2007: 8), coffee, and the network through which it flows, is key to life.

Coffee Basics

Virtually all coffee that flows through the global coffee chain is either one of two species: *Coffea arabica* (‘Arabica’) or *Coffea canefora* (‘Robusta’) (Daviron & Ponte 2005: 51, ICO 2012a). The coffee plant is a crop that does not bear any fruit until 2-5 years after being planted (Talbot 2004, Daviron & Ponte 2005). Arabica coffee comes from relatively small and low-yielding trees (large bushes) with dark-green, oval-shaped leaves (Bounnavong & Chounthavong 2001). They are grown optimally in cool temperatures (15°-24° C) at 1000-2000 meters above sea level (masl) (ICO 2012a).

Robusta coffee comes from trees that are comparatively larger and higher-yielding than Arabicas (Bounnavong & Chounthavong 2001, Winston et al. 2005). They can grow up to 30 meters (m) tall (ICO 2012a), but are “usually topped periodically to facilitate picking, and to stimulate the growth of side branches and flowering” (Talbot 2004: 33). Robusta trees are grown optimally in warmer temperatures (24°-30° C)

unsuitable to Arabica, at 0-800 masl (Daviron & Ponte 2005: 51). Robusta trees are generally more resistant to pests and coffee leaf rust disease than their Arabica counterparts (Daviron & Ponte 2005: 51).



Image 1: Coffee blooms on the Bolaven Plateau region, Laos. *Source:* Photograph by author, March 8, 2009.

Robusta also has twice the amount of caffeine of Arabica (Daviron & Ponte 2005: 53) and is known to produce a stronger, harsher, more bitter – i.e., more ‘robust’ – final cup. Ultimately, most Robusta coffees are used in roasted coffee blends as a filler to reduce the price of the blend (Daviron & Ponte 2005: 53). For these, and other, reasons, Robusta is perceived as being a lower-quality product and is traded at substantially lower prices than its Arabica counterpart. Most Arabicas enjoy the reputation of being high quality products and correspondingly fetch greater value in the global coffee chain.

Physically, the fruit produced by both Arabica and Robusta trees is virtually identical.¹ Coffee cherries enclose two flat seeds – the coffee bean. The seeds are coated by a thin mucilaginous coating/skin called ‘parchment’ (Talbot 2004, Daviron & Ponte 2005). Once the parchment is removed, one is left with green coffee beans. Both parchment coffee (with the skin of the seed left intact) and green coffee can be stored for several years under proper conditions without decomposing or losing their flavor potential. Green coffee, however, is much lighter and less voluminous, making it the preferred and most common form coffee takes as it is circulated through the global coffee chain (Talbot 2004: 33).



Image 2: A Lao villager carries a basket of freshly picked coffee cherries. *Source:* Photograph by author, February 6, 2009.

¹ According to the International Coffee Organization, Arabica seeds (beans) are more flat in shape while Robusta seeds (beans) are more oval in shape (ICO 2012a).

Coffee Processing Basics

In order for coffee cherries to be transformed into green coffee, they must undergo primary processing. “The main goal of primary processing is the separation of the bean from the skin and pulp of the cherry” (Daviron & Ponte 2005: 52). There are two general modes of primary processing: the wet method and the dry method.

The Wet Method of Coffee Primary Processing

In the wet method of coffee primary processing, ripe (red) cherries are harvested (i.e., picked from coffee bushes/trees) and pulped, typically within 24-hours. Pulping is done in a machine that crushes the cherry and separates the less dense flesh of the fruit from the denser seeds. The resultant parchment coffee is then soaked for a period,



Image 3: Lao villagers organize trays of wet-processed coffee for drying. *Source:* Photograph by author, February 3, 2009.

allowing the mucilage to ferment slightly, and eventually washed away (Talbot 2004: 33). This process is usually done in what is referred to as a ‘wet mill’, consisting of a pulping machine, a fermentation tank, and a washing canal, although it is also often done in a curing plant (Daviron & Ponte 2005: 52). After washing, wet processed coffee is dried on clean racks elevated above the ground. This method also requires a careful handling of coffee cherries and beans during and after harvesting (Galindo & Sallée 2007: 10). Wet method processing produces optimum coffee flavor and is typically performed for Arabica coffees. Wet processed Arabicas are known in the coffee trade as ‘Mild Arabicas’ (Daviron & Ponte 2005: 52).

The Dry Method of Coffee Primary Processing

In the dry method of coffee primary processing, ripe cherries are harvested and set to dry in the sun. Eventually, the fruit dries to the point that the seed separates from the outer layers. The dried fruit are then removed with a huller. Dry method processing produces an inferior flavor (Talbot 2004: 33) and is typically performed for Robusta coffees. Dry processed Arabicas are known in the coffee trade as ‘Hard Arabicas’ or ‘Natural Arabicas’ (Daviron & Ponte 2005: 52).

The Two Circuits of Lao Coffee Exports

Coffee exported from Laos goes through one of two circuits.² The dominant, low-quality circuit – that through which 99% of all Lao coffee flows – is the least lucrative for the majority of actors occupying the early stages of the chain. This circuit is dominated by poorly maintained, minimally processed, low-quality coffees, which generally capture

² This is excluding the nominal circuit for Lao coffee involving domestic consumption, reflecting 0.5% of all Lao-origin coffee flows.



Image 4: A smallholder farmer rakes her ground-drying coffee. Drying coffee on the bare ground, or even on tarpaulins, as in the picture, often results in soil intermixing with the coffee, producing an inferior taste. Many, if not most, Lao coffee farmers process coffee via the dry method. *Source:* Photograph by author, February 22, 2009.

a very small percentage of the total value accrued along the chain. Nevertheless, a small minority of actors at those early stages have positioned themselves to gain substantial profits from this circuit. This advantage evolved out of a particular set of socio-economic, and corresponding socio-ecologic, conditions in the Bolaven Plateau region. In order for this circuit of the Lao coffee chain to persist, these regional conditions (or some variant thereof) have to be perpetuated.

There is an alternative circuit for Lao coffee too. The premium circuit (that through which only 0.5% of all Lao coffee flows) is the most lucrative for the majority of actors occupying the early stages of the Lao coffee commodity chain. This circuit is occupied by specialty and niche coffee products, which capture additional value along the

coffee chain by marketing better-maintained, more carefully processed, higher-quality coffees, which fetch much higher prices on global markets. The advancement of this circuit for Lao coffee requires its own set of socio-economic and socio-ecologic conditions in the Bolaven Plateau region. In order to advance this alternative, premium quality coffee chain, actors in the chain must struggle to transform these regional conditions.

The Lao Coffee Resource Space

The Bolaven Plateau Region

Irrespective of any particular circuit, the resource space on which the Lao coffee network is based is the Bolaven Plateau region. The region's lands and people produce 95-99% of the coffee that brings the Lao coffee chain into existence. Referred to in Lao language as *Phou Phieng Bolaven*, the plateau is centrally located between the Annamite Mountain Range, which forms Laos's border with Vietnam to the east, and the Mekong River to the west, at about 15°N latitude, 106°E longitude (**Map 1**). From the generally flat alluvial plains surrounding the plateau approximately 200-500 masl, the terrain rises – sometimes gradually, sometimes abruptly – to a relatively flat surface ranging 800-1450 masl in most areas (**Map 2**).

The plateau is widely acknowledged to be the most fertile land in all of Laos (WB 1989: 1, VT 2009b), and the most ideal place for coffee production in the country (Tulet 2009). According to some coffee industry experts, a unique combination of biogeophysical variables (soil quality, temperature, rainfall, topography, solar radiation, etc.) makes the region the most ideal place for growing coffee in all of peninsular Southeast Asia (T&CA 2004). The reason for some of these favorable conditions is the

region's geologic origins. Sixteen million years ago, a period of volcanic activity began in the Southeast Asian peninsula. Intermittent eruptions resulted in the flow of lava throughout the Khorat Basin (Robichaud et al. 2001: 101, SARCO 2008). Erosion processes created a landscape characterized by plateaus, escarpments, and intervening lowland plains. Among the features formed is the Bolaven Plateau, enriched with fertile basaltic soils resulting from the lava flows (Robichaud et al. 2001: 101).



Image 5: A southwest-facing vista from atop the Bolaven Plateau. Source: Photograph by author, March 21, 2009.

A Rapidly Changing Resource Space

The Bolaven Plateau region now stands at an historical crossroads. While serving as the productive, socio-ecological base of the increasingly dynamic Lao coffee chain, the



Map 1: Laos and mainland Southeast Asia. The Bolaven Plateau region is in southern Laos, primarily in the province of Champasak. The reference frame on this map indicates the spatial extent of the topographic and political map on the following page. *Source:* Map by author.



Map 2: The Bolaven Plateau region: main topographic and administrative features. *Source:* Map by author.

region is for the first time in history being reconfigured to serve other major commodity chains. A rapid proliferation of land concessions has been and continues to be granted by the Government of Laos (GoL) to transnational corporations (TNCs) seeking to capitalize on the region's myriad agriculture, forestry, hydropower, and mineral commodity chain potentialities, effectively transforming the nature of the region. The socio-ecological configurations emerging from these new chain formations are reciprocally transforming the structure of the chain for which the region has been principally configured, that for Lao coffee. The way these configurations evolve has profound implications for the struggle over the future of the Lao coffee chain.

Research Questions

This research is motivated by the following questions.

- (1) What are the historical structures of the Lao coffee chain vis-à-vis the Bolaven Plateau region?
- (2) What is the contemporary structure of the Lao coffee chain vis-à-vis the Bolaven Plateau region.
- (3) What are the socio-economic dynamics in the Bolaven Plateau region associated with the current structure of the Lao coffee chain?
- (4) What are the socio-ecologic dynamics in the Bolaven Plateau region corresponding to the current structure of the Lao coffee chain?
- (5) How is the structure of the Lao coffee chain conditioned by the geographical configuration of the Bolaven Plateau region, while, reciprocally, the configuration of the region is conditioned by the structure of the chain?

Theoretical Framework

Commodity Chains

The commodity chains approach has its origins in world-systems theory, an analytical framework inherently critical of states as meaningful units of analysis (Wallerstein 2007). Indeed, the commodity chains approach “reformulates the basic conceptual categories needed to analyze new patterns of global organization and change” (Gereffi et al. 1994: 2). Fundamental to this reformulation is a shift toward analyzing, not solely the state territorial units from which commodities flow, but the actual *networks* through which they flow. The chain metaphor is intended to emphasize the linkages along networks between “households, enterprises, and states [...] within the world economy” (Gereffi et al. 1994: 2). This proposition distinguishes the chains-/network-based approach to commodity analysis from the more conventional state-based approach, which focuses primarily on a given commodity sector of a particular state, or on the inter-state trade of a particular commodity or grouping of commodities (cf., Grant 2000). Commodity chains represent the production, circulation, and consumption networks of the world economy.

Getting to the ‘Bottom’ of Commodity Chains

When Hopkins and Wallerstein first coined the term ‘commodity chains’ in 1977, they described the concept as follows:

“take an ultimate consumable item and trace back the set of inputs that culminated in this item – the prior transformations, the raw materials, the transportation mechanisms, the labor inputs into each of the material processes, the food inputs into the labor” (Hopkins & Wallerstein 1977: 128).

If launched from this comprehensive conceptualization, commodity chain analysis would involve following commodities through their entire material life-cycles, from the production of natural resources, through the exchange of commodities, to the consumption of goods, and possibly beyond. However, while nearly all analyses employing a commodity chains perspective “nod toward the importance of raw material inputs at the sources of the chain, there is very little systematic attention to this in most research” (Smith & Mahutga 2009: 67). In the majority of commodity chain analyses, the natural resource foundations of commodities – and, by extension, the socio-ecological foundations of commodity chains – are conspicuously absent.

Recognition of the socio-ecological lacuna in commodity chains research has prompted efforts to, as insisted by Smith (2005), “start at the beginning” of commodity chains³. For example, drawing on earlier work (e.g., Bunker 1984), Smith and Mahutga (2009) emphasize the importance of ‘modes of extraction’ in configuring commodity chain structures, which in turn produce patterns in the evolving international division of labor. Bunker (1984: 1019) himself forwarded this notion of ‘modes of extraction’ in recognition of the fact that “commodities can emerge only from locally based extractive and productive systems”, regardless of how global the commodity chains⁴ for those commodities may be.

Echoing Bunker’s (1984) acknowledgement that all commodities have their origins in natural resources, and that all natural resources have place-specific contexts,

³ This is despite Hopkins’ and Wallerstein’s original insistence to do the opposite: “We move backward rather than forward because we are interested in seeing the loci of the sources of value in a finished product and not the multiple uses to which raw materials are put” (Hopkins & Wallerstein 1986: 160)

⁴ Rather than use the term “commodity chains”, Bunker (1984: 1019) used the term “global exchange systems”. However, as Smith and Mahutga (2009: 68) write: “Although Bunker never explicitly used the term *commodity chains*, he came close at times in referring to ‘global chains of extraction and production’”.

Talbot (2009) states that all commodity chains are ‘rooted’⁵ in processes of material resource extraction taking place in specific geographic locales. Moreover, because of the more direct and easily discerned ‘rootedness’ of tropical – especially tropical *agriculture* – commodity chains, these chains are more amenable to the incorporation of environmental factors and impacts into the analysis (2009: 94-97). Importantly, Talbot also argues that the unique ecological requirements of many tropical commodities strongly influence the structure of the respective commodity chain itself (Talbot 2004, 2009). “One of the most important characteristics of tropical commodity chains is the central role of ecology in the determination of their structures” (Talbot 2004: 39). As Castree (2002) highlights:

[T]he materiality of natural entities in agriculture, forestry and fishing have posed serious historical barriers to capital accumulation, affecting both the technical and institutional organization to major economic sectors.

Despite this ostensibly increased appreciation of the material underpinnings of commodity chains, though, few socio-ecologically sensitive analyses have actually emerged in the literature. For example, notwithstanding Smith and Mahutga’s (2009: 70) exhortations that analysts pay heed to modes of extraction – an approach stressing the significance of the material, socio-natural interface (see, e.g., Gellert 2005) – their analysis of multiple aggregated commodity networks offers no insight into any of the social-ecological circumstances of extraction for the commodities in question.

⁵ Talbot (2009: 94-97) himself may have adopted the language/notion of ‘rootedness’ from Gereffi’s statement that “Global commodity chains (GCCs) are *rooted* in production systems that give rise to particular patterns of coordinated trade” (1994: 96, emphasis added).

Spatializing Commodity Chains (?)

An article by Leslie and Reimer (1999) titled, *Spatializing commodity chains*, would seem to offer the most obvious solution to incorporating socio-ecological considerations into work on commodity chains: spatialize the chains. At the crux of their argument are three propositions they claim will aid analysts in conceiving of commodity chains in “more explicitly spatial terms” (1999: 403): commodity chain narratives are geographically constructed across scales, the symbolic meanings of commodities at the consumption ends of chains are important, and factors such as gender and place should be included in analyses (Leslie & Reimer 1999: 416). While these points are irrefutable, they fall short of fostering conceptualizations of commodity chains in “more explicitly spatial terms”, as the authors claim. Still, while the feat (mis-)advertised by the title of their paper remains unaccomplished, the challenge itself warrants continued pursuit. An explicitly spatialized reformulation of commodity chain analysis could indeed yield powerful insights into the geographical workings of commodity chains.

To achieve this pursuit, this thesis integrates commodity chain analysis with political ecology. The idea of such integration is by no means novel. Turner and Robbins (2008: 300), for instance, allude to how political ecology would engage with a commodity chains approach to examine a hypothetical alpine ecosystem under stress. Furthermore, commodity chain analysis and political ecology share a common intellectual heritage in Marxian materialism (Robbins 2004, Mann 2009); they both recognize that geographical change is historically contingent (Topik 2009); they are both sensitive to processes operating at multiple geographic scales (Neumann 2009); they both focus on a multiplicity of actors and phenomena in producing geographic change

(Rindfuss, Prasartkul, et al. 2003, Zimmerer & Bassett 2003); and they both entail the use of eclectic methodological techniques.

A Conceptual Model for Nodal Commodity Chain Analysis

Gereffi and Korzeniewicz (1994) suggest that commodity chains can be represented schematically: “Specific processes or segments within a commodity chain can be represented as boxes or nodes, linked together in networks” (Gereffi et al. 1994: 2). Talbot (2004: 32) depicts the coffee commodity chain in precisely this manner. In his model (**Figure 1**), boxes represent the major types of actors in the chain while transactions between these types of actors are represented by arrows indicating the linked network. With Talbot’s schematic, one can trace the linkages between coffee producers at

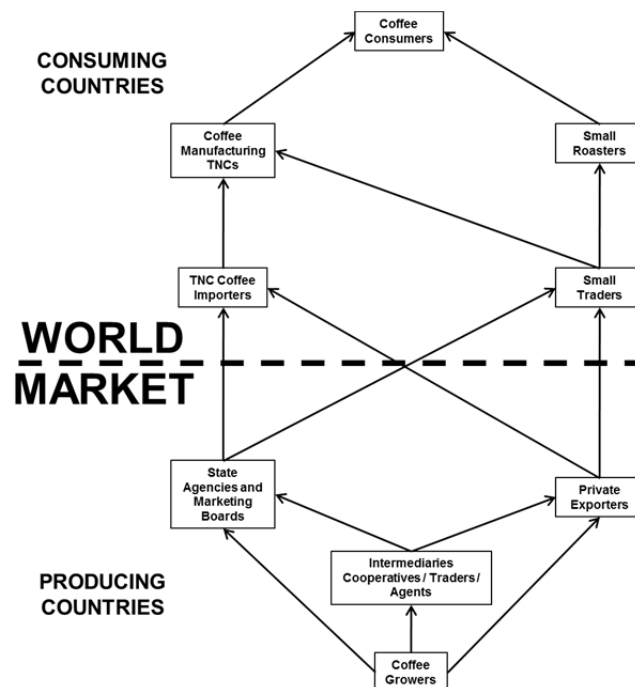


Figure 1: The global coffee commodity chain. *Source:* Talbot (2004: 32).

the beginning, or bottom, of the chain all the way to coffee consumers at the end, or top, of the chain. Between these termini, one can identify the various intermediate actors who

facilitate the flow of the coffee through the chain, including traders, exporters, state agencies, large TNCs and smaller companies, among others. Ponte (2002: 1102) offers an essentially identical schematic of the global coffee chain.⁶

A Conceptual Model for Spatial Commodity Chain Analysis

By organizing commodity networks into their respective nodes and links, these models help analysts trace transactions between actors operating in different nodes. They therefore provide a valuable heuristic for systematically disentangling the complexity of commodity chains. However, while these models aid in identifying the relationships *between* nodes in a network, they offer no information about the myriad socio-spatial processes *constituting* those nodes. In other words, these models offer no clues as to the social, political, economic, or environmental – in sum, the geographical – mechanisms through which the actors in each node are linked to actors in other nodes. Transforming these fundamentally *nodal* network models into fundamentally *spatial* network models can help guide analysis on these mechanisms.

Figure 2a represents a generic (i.e., non-commodity-specific) and highly abstracted version of a nodal commodity chain. The nodes in this network represent a single step in the overall sequence of processes that produce a given commodity. **Figure 2b** represents the same abstracted commodity network as Figure 2a; however, the nodes have been substituted by planes, intended to signify the material spaces through which people interface with their environments to facilitate the various processes within the chain (or the process of the chain itself).

⁶ Ponte's (2002: 1102) model includes more arrows to represent the additional possible transactions connecting different actors in the network. Ponte's model also incorporates text highlighting the physical forms coffee assumes as it moves through the commodity network: dried cherries or parchment coffee, green coffee, and roasted or instant coffee.

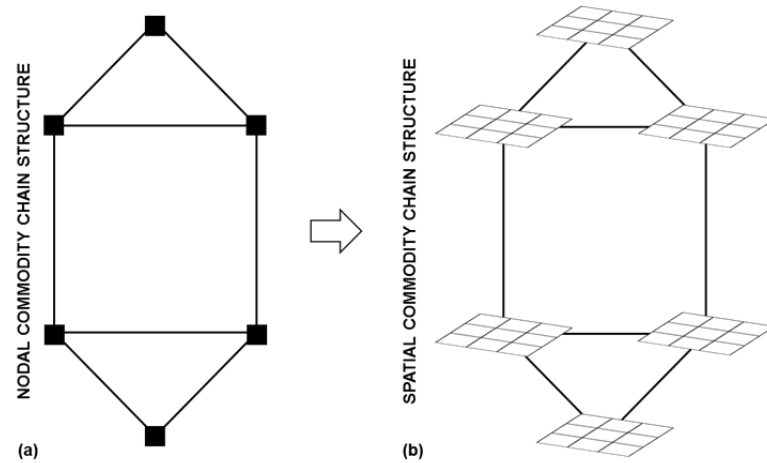


Figure 2: Conversion of a nodal commodity chain structure to a spatial commodity chain structure. *Source:* Author.

One must not forget, though, that commodity chains are temporally dynamic, i.e., prone to evolve. **Figure 3** illustrates how a nodal commodity chain may be restructured over time, with the links between each node shifting in relation to one another, or with new nodes forming altogether as new processing stages develop (see, e.g., Talbot 2004: 11). **Figure 3a** represents the structure of a nodal commodity chain at a hypothetical point in time (*period X*); **Figure 3b** represents the structure of the same chain at a subsequent time (*period Y*); **Figure 3c** at a still later time (*period Z*).

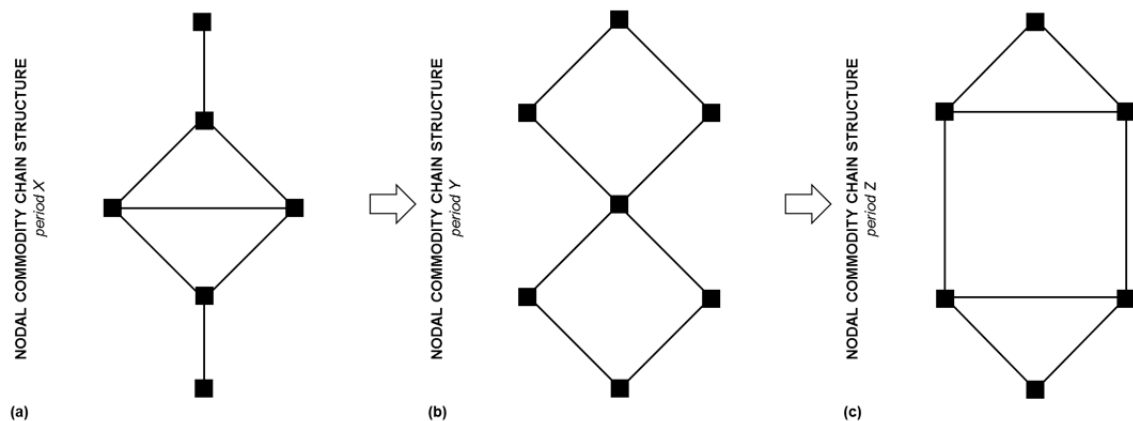


Figure 3: Evolution of a nodal commodity chain structure. *Source:* Author.

The temporally dynamic commodity network depicted in Figure 3 can be spatialized in the same way as done from Figure 1 to Figure 2. In **Figure 4**, the geographically inert and anonymous nodes have been substituted for planes (spaces) representing the socio-spatial configurations constituting each stage of the network. Figure 4 represents a fully spatialized commodity chain whose structure is subject to change over the course of time. **Figure 4a** represents *period X*; **Figure 4b** *period Y*; and **Figure 4c** *period Z*.

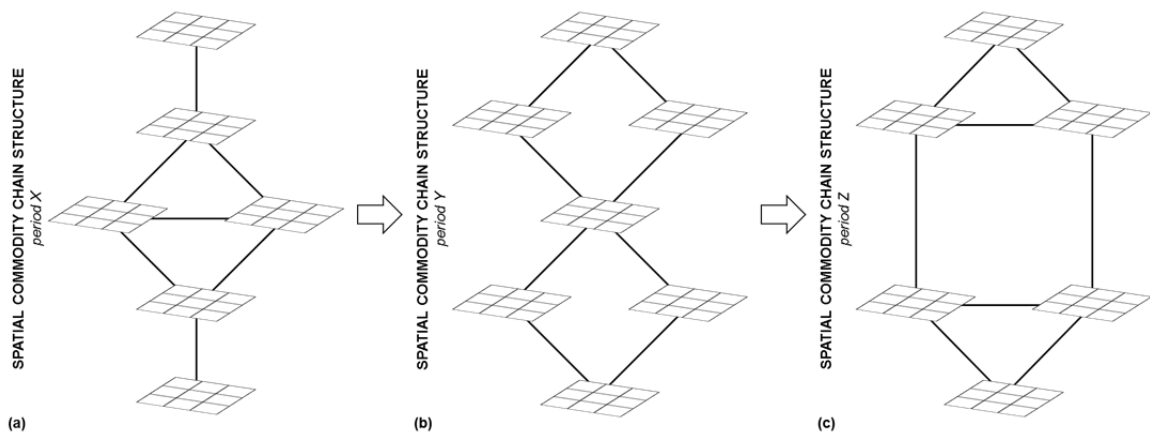


Figure 4: Evolution of a spatial commodity chain structure. *Source:* Author

While Figure 4 represents the evolution of a spatial commodity chain structure, it fails to convey the dynamics taking place at each of the individual spaces contributing to that structure. Surely, just as commodity networks are in constant flux, so too are the spaces enabling these networks. By momentarily looking away from the network structure and redirecting our focus on an individual space within that structure, we can also (in an equally abstract and simplified manner) represent the socio-spatial/socio-natural/socio-ecological⁷ dynamism constituting the plane in question. **Figure 5**

⁷ These terms are used synonymously throughout this thesis. This reflects the author's alignment with Peet's (1998: 2) rhetorical questioning: "[W]hat is space but surface stretches of natural environment? And what are society-nature relations but (in part) the influence of spatio-natural forces, like gravity and the friction of distance, on human activities, and the return effects of social processes on the (natural) qualities of space?"

represents a chronology of three socio-ecological configurations. The spatial pattern of the plane in **Figure 5a** evolves into a different pattern in **Figure 5b**; the pattern of the plane in Figure 5b evolves yet again into a different pattern in **Figure 5c**. The patterns abstracted in this spatial plane at each of the three periods (X , Y , Z) could correspond to any set of socio-ecological processes characterizing the material nature of the place represented by the plane.

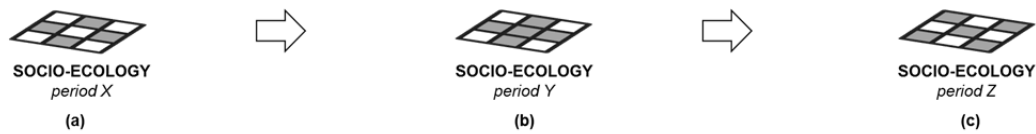


Figure 5: Temporal transformation of a socio-ecological configuration. *Source:* Author.

The models thus far posited aim to evoke clearer notions of the spatiality of networks. They also aim to evoke clearer notions of the materiality of processes constituting space. Figures 4 and 5 help foster the notions that (spatial) commodity chains are dynamic over time, and that the individual spaces constituting the chains are equally dynamic. An integration of these models (**Figure 6**) helps convey the notion that the evolution of a commodity chain structure may coincide with the evolution of a material, socio-ecological configuration, especially if that configuration constitutes the space at the base of the chain, or the resource space.

Figure 6 therefore highlights the simultaneity of changes in the structure of the network and changes in the configuration of the space. However, as noted above, changes in the structure of a network are conditioned by changes in the structure of the spaces which constitute that network, and vice versa. In other words, while changes in commodity chains and their constituent resource spaces may be simultaneous, they are

not, in fact, coincidental. To the contrary, changes in the structure of a commodity chain are always partially, if not wholly, conditioned by changes at minimally one, but usually

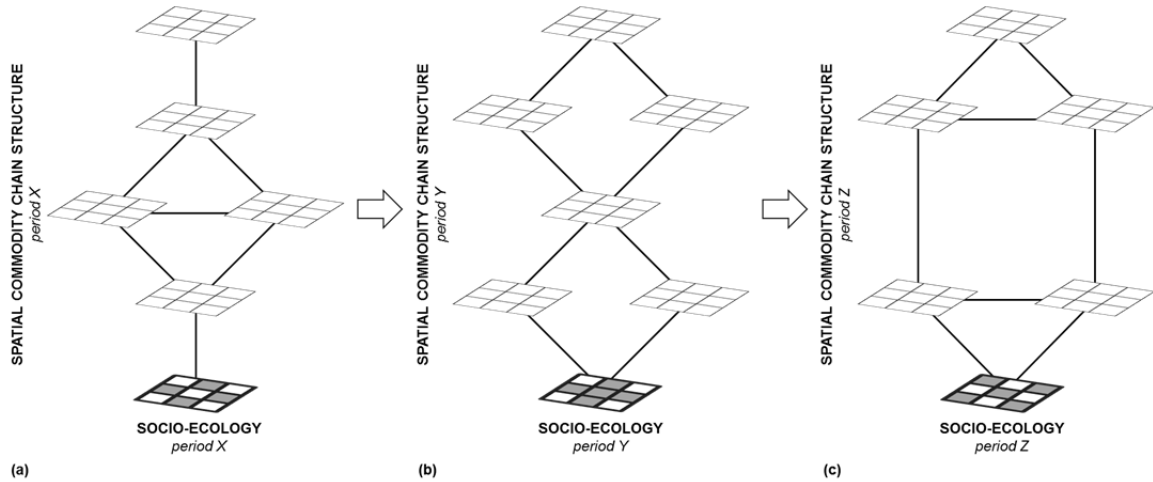


Figure 6: Integration of a dynamic spatial commodity chain structure and a dynamic socio-ecological configuration. *Source:* Author.

multiple places along that chain, especially at the chain's resource space, which functions as its socio-ecological base. Likewise, changes in the geographical configuration of the resource space are always at least partially, if not wholly, conditioned by changes in the structure of the chain. Commodity chains and resource spaces are thus reflexive, mutually conditioning, dialectical, reciprocal.

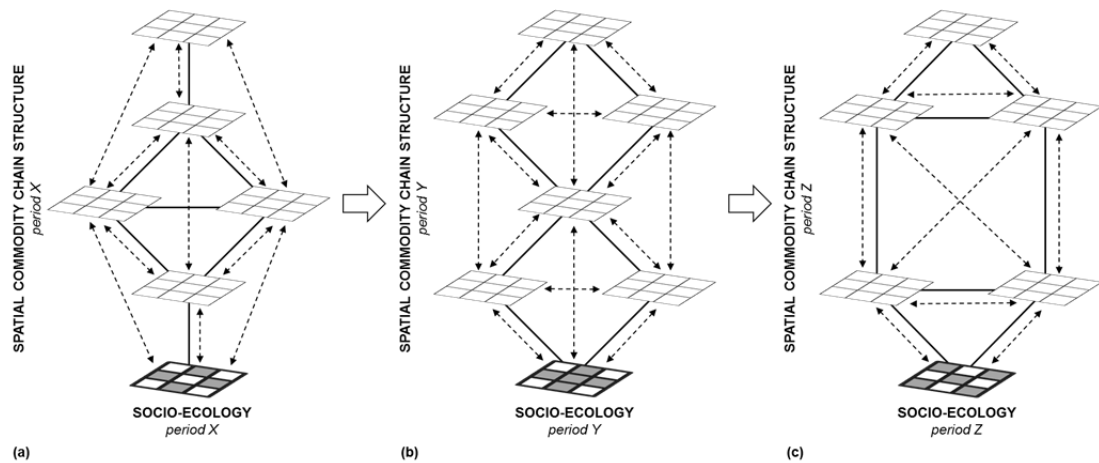


Figure 7: Reciprocity between a dynamic commodity chain structure and a dynamic socio-ecological configuration. *Source:* Author.

This reciprocity is modeled in **Figure 7**. The figure strives to illustrate how changes in any one of the places embedded within a commodity network reverberate through the transactions that link the spaces together at multiple scales. It attempts to better convey the notion that, not only are commodity chains and resource spaces inherently dynamic, but these dynamics are actually co-constitutive of one another.

Methods & Data

To answer the first and second research questions, regarding the historical and contemporary structures of the Lao coffee chain, this study relies primarily on a synthesis of reviews of various academic literatures, reports, and other miscellaneous secondary sources. Historical data on international coffee prices, production, and exports is provided by the International Coffee Organization (ICO) and United States Department of Agriculture (USDA). Lao national coffee export data were collected during a 2009 visit to the Lao Coffee Association (LCA) in Pakxe, the provincial capital of Champasak province. Articles from the official English-language newspaper of Lao PDR, the *Vientiane Times*, are used to capture the structures of the chain. Additionally, several photographs are embedded within the text to aid in illustrating the text visually.

To answer the third, fourth, and fifth questions, regarding the socio-economic and socio-ecological configurations of the Bolaven Plateau region – and their reciprocity – this study relies primarily on two broad sets of applied methods: ethnography and geospatial analysis.

Ethnography

The ethnographic component⁸ of the study was conducted *in situ* during the first three months of 2009. Semi-structured and in-depth interviews were carried out with various actors directly or indirectly related to the Lao coffee sector. These actors include hundreds of smallholder coffee farmers; several seasonally-hired coffee wage-laborers; coffee traders / collectors / informal loan-brokers; the director and staff of the Southern Agriculture and Forestry Resource Center (SAFREc); an agronomy and coffee market specialist directing the efforts of the French Development Agency (AFD) in southern Laos; the president of the LCA (who happens to also be an entrepreneur and owner of one of the most well-known coffee-based enterprises in the country); staff at the LCA; the manager and personnel from the district branches of the national Agriculture Promotion Bank (APB) and Lao Development Bank (LDB); and multiple provincial-, district-, and village-level officials.

Geospatial Analysis

The geospatial component⁹ of this study consists of a land-use/land-cover change analysis based on the classification and change detection of a three time-point series of satellite images of the Bolaven Plateau region study area. This series spans an approximately 20 year period between 1989 and 2008. Imagery was derived from three satellite instruments: Landsat Thematic Mapper (TM), Enhanced Thematic Mapper Plus (ETM+), and Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER).

⁸ A more detailed account of the ethnographic methods employed in this study can be found in Chapter IV.

⁹ A more detailed account of the geospatial methods employed in this study can be found in Chapter V.

The mixed methods data collection and analysis approach employed in this study is intended to address the multiplicity of factors (Rindfuss, Walsh, et al. 2003) contributing to the synergies between the Lao coffee commodity chain and the human-environment relations of the Bolaven Plateau.

Organization and Argument

This chapter has thus far introduced the study. Chapter II explores how the historical development of the Lao coffee chain has been inextricably intertwined with that of the Bolaven Plateau region. Chapter III explicates the contemporary structure of, and struggle for, the Lao coffee chain vis-à-vis the region. Chapter IV delves into the local-level socio-economic dynamics constituting the base of chain. Chapter V explores some of the corresponding regional socio-ecological outcomes related to those socio-economic dynamics. Finally, Chapter VI addresses the final research question by synthesizing the discoveries made in the preceding chapters into a single, coherent argument: The geographical configuration of the Bolaven Plateau region constrains the potentialities of the Lao coffee commodity chain, while, reciprocally, the structure of the chain constrains the lands and livelihoods of those bound to it.

CHAPTER II

HISTORICAL RESTRUCTURINGS OF THE LAO COFFEE COMMODITY CHAIN

This chapter lays out a century-long periodization of the dual development trajectories of the Lao coffee commodity chain and the socio-ecology of the Bolaven Plateau region. It explains how the chain evolved in relation to the region. Four major periods are delineated:

- French Colonialism and Crop Introduction: ~1913-1945
- Wars, Regime Changes, and Sector Disruption: ~1945-1975
- Socialist Experimentation and Agricultural Collectivization: ~1975-1988
- Post-Socialist Transition and Market Liberalization: ~1988-2000

During each of these periods, the Lao coffee commodity chain conformed to the material potentialities afforded to it by the material configurations of the Bolaven Plateau region.

French Colonial Era and Crop Introduction: ~1913-1945

The coffee plant probably entered Laos in 1913¹⁰, twenty years after the country's formal integration into the French colonial empire. According to some accounts, colonists selected plants from botanical gardens in Saigon¹¹ to the northern Bolaven Plateau town of Thateng (Jhai 2008, LMI 2008). Predicting correctly that the plateau's rich volcanic

¹⁰ The most seemingly credible source, the one used here, is Fortunel (2007: 218-219). He cites the mention of coffee in the 1929 work by French colonial Commissioner J.J. Dauplay, *Les Terres rouges du plateau des Boloven*. In this work, Dauplay expresses pessimism about coffee planting experiments conducted in 1913 and 1916, which, by 1921, had survived, but were only about two feet tall. Multiple other sources make less supported claims on the date coffee was introduced to Laos. Galindo and Sallée (2007: 19) state: "The first coffee plantations in the Bolaven Plateau were set around 1920." Another (Winston et al. 2005) states: The French first planted coffee in Lao PDR in the early 1900s." Yet another (Duris et al. 2002: 70) writes: "Coffee [. . .] was introduced into Laos in around 1920." A few sources offer a specific year: "Coffee was first introduced to the Bolaven Plateau in 1927 by French colonial authorities" (Oxfam 2006); "French colonists planted the first coffee trees in Laos around 1915" (Jhai 2008); "French colonists planted the first coffee trees in Laos around 1915, but the experiment failed. Another attempt was made in 1917" (LMI 2008).

¹¹ Modern day Ho Chi Minh City.

soils and cool climate would support coffee production (BBC 2002, Oxfam 2006), the French first brought the typica and bourbon varieties of *Coffea Arabica* (Arabica). It is possible that they brought *Coffea canefora* (Robusta) and *Coffea liberica* (Liberica) too.¹²

Jean Jacques Dauplay, the French colonial Commissioner of Salavan from 1904 to 1921 was pivotal in establishing the colonial-era agricultural activities in the region. In addition to coffee, he introduced cardamom and cabbage, among others (Fortunel 2007). Coffee was set in plantations along roads built (Galindo & Sallée 2007: 19) by local populations through forced labor (corvée) (Stuart-Fox 1997). While Commissioner Dauplay was critical in the organization of agricultural activities in the Bolaven Plateau, his time in the region was also occupied by efforts to end the first ever anti-French insurgency in Laos, the so-called ‘Holy Man’s Revolt’ (Stuart-Fox 1997, Evans 2002), also known as the ‘*Révolte des Boloven*’ (Fortunel 2007: 217). The revolt lasted 35 years; only through its conclusion could the formation of a Lao coffee commodity chain begin in earnest.

Early Lao Coffee Production

With the suppression of the revolt, the region finally enjoyed the stability needed for farming (Fortunel 2007: 219). Coffee was the only crop the French were able to cultivate in a plantation system. Despite the success of rubber cultivation in the neighboring French-controlled territories of present-day Vietnam, it was tried only experimentally in Laos, and never advanced during the period of colonial administration (Stuart-Fox 1995). Coffee quickly spread to become the dominant crop on much of the

¹² Winston et al. (2005) claim that, “Initially, Robusta, Arabica and Liberica species were planted.” The historical accounts of two coffee growing companies (Jhai 2008, LMI 2008) claim that both Arabicas and Robustas were planted by the French; however, they make no mention of Libericas. Galindo and Sallée claim that during colonial administration, “settlers grew exclusively [A]rabica trees of [b]ourbon and [t]ypica varieties” (2007: 19).

Bolaven Plateau, especially after the construction of a gravel road from Pakxe to Pakxong in 1920 (Sallée 2007: 9). Also, an agriculture research and extension center focusing on coffee propagation was constructed near Pakxong in 1930 (Fortunel 2007: 219, Galindo & Sallée 2007: 19, Sallée 2007: 9).

Coffee production in French colonial plantations was most strongly concentrated around this center. Seeds were disseminated throughout nearby villages free of charge (Sallée 2007: 9), and households began to grow coffee in small gardens (Duris et al. 2002, Galindo & Sallée 2007: 19). Also, in 1937-1938, an apparently successful coffee cooperative was set up by the French. The cooperative's aggregate coffee collection amounted to a third of all coffee produced in the Bolaven Plateau in 1939 (Fortunel 2007: 219). By the late-1930s and early-1940s, households at 800-1,200 masl began starting their own small-scale (1-10 ha) plantations (Galindo & Sallée 2007: 19, Sallée 2007: 9). With the seeds produced from the first generation of plants, households from more remote villages began to start their own plots (Sallée 2007: 9).

During this time, coffee production on the Bolaven Plateau is reported by different sources to have reached 5,000-10,000 ha (Fortunel 2007: 219, Galindo & Sallée 2007: 19), no less than 50% of which was maintained by Lao smallholders (Fortunel 2007: 219). All coffee produced during this period was processed via the 'wet' method, which produces a higher quality final product. According to Stuart-Fox (1995: 135), 30 tons of coffee were exported in 1935.¹³ While most of the coffee produced during this period was exported to France (where it was imported and perceived as a high-quality product (Galindo & Sallée 2007: 19)), there was also a small local market at the time

¹³ It is unclear whether these 30 tons came from production sites exclusively on the Bolaven Plateau (Stuart-Fox 1995: 134), although it is quite probable, as no known source documents coffee production in other parts of the national Lao territory during this time.

(T&CA 2004), presumably to serve primarily the demands of French colonists and secondarily to serve any domestic demand by the Lao themselves. At its height in the late 1930s, total coffee production reached 4,500-5,000 tons (Duris et al. 2002, Fortunel 2007, Jhai 2008, LMI 2008).¹⁴

As Fortunel (2007: 219) and Sallée (2007: 9) point out, the French colonists who first advanced coffee production in the region did not, in fact, come directly from France. Rather, they were predominantly veteran French soldiers who had completed their military tenure and retired civil servants who had served as colonial administrators. The coffee pioneers of Laos were thus not well-financed industrialists and had little capital with which to invest in production, unlike the first capitalist coffee planters of Vietnam (Sallée 2007: 9). Thus, while the foundation for a Lao coffee commodity chain had been established, the financial, labor, and technological limitations of the early 20th century Bolaven Plateau region restricted development of that chain.

Wars, Regime Changes, and Sector Disruption: ~1945-1975

World War II

The initial progress made in developing the Lao coffee chain was significantly disrupted by the Second World War. The consumption end of the chain in European, primarily French, markets was dismantled as marine export routes became theaters of warfare (T&CA 2004, Galindo & Sallée 2007: 19). The European coffee futures (in Le Havre, Hamburg, and London) were closed down during the two world wars (Daviron & Ponte 2005: 73). The production end of the chain on the Bolaven Plateau suffered simultaneous disruption as Japan occupied Laos in 1945.

¹⁴ Data on the productive area and quantity of coffee produced during this period is admittedly sketchy at best.

Additionally, coffee leaf rust epidemics revealed the Arabica typica species' vulnerability to the disease. Still more, frosts – especially those of the 'Great Frost of 1949' (LMI 2008) – presented further yield declines (Galindo & Sallée 2007, Jhai 2008). From the 1950s onwards, varieties of more resistant Robusta and Liberica plants replaced Arabica typica as the most dominant species (Duris et al. 2002: 70, Galindo & Sallée 2007, Jhai 2008). As foreign exports declined, so did supply, as coffee farmers were forced to diversify their farms and increase the cultivation of food crops for their own consumption (Galindo & Sallée 2007).

Coffee production did not cease completely, though. While farmers diversified their farms, they also continued to grow coffee for the local market (T&CA 2004), thereby shortening the Lao coffee chain. However, production for primarily domestic consumption had implications for coffee quality, as the Lao market had much lower product standards than its European counterparts (T&CA 2004). Furthermore, along with the shift from Arabica typica to (mainly) Robusta came a decrease in crop maintenance, as Robusta trees generally require less labor to maintain while nevertheless yielding greater quantities. The end of formal French colonial occupation in 1953 also impacted production. According to one source (Fortunel 2007: 219), only 400 ha of coffee were planted on the Bolaven Plateau of 1955. Other sources claim that, by that same year, production amounted to merely 1,500 tons (Duris et al. 2002, T&CA 2004, Jhai 2008). The disruption of the Lao coffee chain continued as internal and external forces fought to control the fate of the newly independent Lao state.

Lao Civil War & the Indochina Wars

It is difficult to separate the Lao Civil War (1953-1975) from the First Indochina War (1946-1954) and Second Indochina War¹⁵ (1955-1975). The specific impacts of these conflicts on the environment of the Bolaven Plateau are unclear. What is clear, though, is that “heavy bombs, rockets, grenades, artillery munitions, mortars, anti-personnel landmines, and improvised explosive devices” were used in abundance during the civil war between the communists and royalists (UXO 2008). In even greater abundance was the ordnance used by the United States military in its effort to stop the movement of North Vietnamese weapons and supplies through the sections of the Ho Chi Minh Trail running adjacent to, and sometimes traversing, Lao territory.

Indeed, one of Laos’s most notorious (and unfortunately true) distinctions is that it is the most heavily bombed country – per capita – on the planet. Over half a million aerial bombings were conducted by United States B52s and other military aircraft between 1964-1973¹⁶ (BBC 2001, UXO 2008, Brady 2011). Over two million tons of ordnance – including more than 266 million sub-munitions released from cluster bombs – were delivered by US forces during this time (UXO 2008). In total, the number of bombs dropped on Laos during this period is greater than the number that fell over all of Europe during World War II (BBC 2001). Strikingly, it is estimated that up to 30% of all ordnance released during this war never exploded. As the Lao National Unexploded Ordnance Programme states: “Such unexploded ordnance (UXO) continues to remain in the ground, maiming and killing people, and hindering socio-economic development and food security” (UXO 2008).

¹⁵ In the United States of America, the Second Indochina War is typically referred to as the Vietnam War.

¹⁶ Sallée (2007: 10) suggests that the US bombing took place between 1970-1971.

With its proximity to the Ho Chi Minh Trail, the Bolaven Plateau was subjected to heavy bombardment, especially during 1970-1971 (Sallée 2007: 10). Life for those residing in the region was extremely hazardous (T&CA 2004). Many farmers, investors, and others involved in the coffee chain fled from the region (and from Laos altogether) to avoid the conflict (Galindo & Sallée 2007). Indeed, “the villagers were scattered and evacuated to refugee camps in Pakxe”, which were eventually closed in 1976 (Sallée 2007: 10). Some sources claim that tons of UXO remain on the Bolaven Plateau (T&CA 2004, Jhai 2008). In light of the intensity of the bombing campaign adjacent to and in the region, one can imagine that, apart from the sheer social, political, and economic devastation, the degree of environmental destruction in the region was considerable (see, e.g., **Image 1**). A TIME magazine news article wrote:

The American B-52s that bombed the sections of the Ho Chi Minh Trail that snuck into the Laotian jungle killed an untold number of civilians and contaminated many coffee fields with craters and unexploded ordinances.

Instability and the associated socio-ecological disfiguration of the Bolaven Plateau region hindered further development of the Lao coffee chain.

Socialist Experimentation and Agricultural Collectivization: ~1975-1989

The Three Revolutions

Following their 1975 victory of the Lao Civil War, the communist Pathet Lao established the Lao People’s Democratic Republic. The new government was eager to carry out ‘three revolutions’ in production relations, science and technology, and ideology and culture (Zasloff 1991). The productive revolution entailed the nationalization and/or collectivization of private enterprises, including agricultural enterprises, such as the production of coffee. The scientific and technological revolution



Image 6: The destruction of Pakxong during the Second Indochina War. This photograph reproduces a painting (official title and date unknown) by Lao artist Mr. Phaivanh Chanthavong on display at the Champasak Province Museum of History. The painting depicts an aerial bombardment of Pakxong – the capital of Pakxong district, and town core of the Bolaven Plateau region – during the Second Indochina War. *Source:* Photograph by author, 18 March 2009. Translation of artist's name by Soukdavanh Bouadaphom.

was intended to apply new technologies to enhance efficiency and increase production. The ideological and cultural revolution involved cultivating the consciousness of Marxist--Leninist class struggle, raising education levels, and unifying the people of Laos with a heightened national awareness (Zasloff 1991). Governing through its political party incarnation, the Lao People's Revolutionary Party (LPRP), the Pathet Lao centralized control over macro-economic planning (WB 1989) in an effort to bring the country to a state of socialist self-reliance. As Evans (1991: 89) explains, the goal of the revolutionary regime in Laos was "to harness the unrealised potential surplus of the previous regime and thereafter produce an ever-expanding investable actual surplus". The implication is that non-socialist (capitalist) regimes, being comparatively more oriented towards the market, are unable to optimize resource allocation and exploitation (Evans 1991).

Agricultural Collectivization in the Bolaven Plateau Region

On the Bolaven Plateau of the mid- to late-1970s, new social and ecological systems began to emerge on a landscape still recovering from the impacts of war. Settlers from the lowlands started to reoccupy the abandoned lands of the region (Galindo & Sallée 2007: 19). Via mandate from the Lao Ministry of Agriculture and Forestry (MAF), state farms and agricultural cooperatives were established from 1981-1984 (WB 1989, Galindo & Sallée 2007, Sallée 2007). The formation of these production and trading cooperatives was seen as conducive to the mobilization of potential agricultural surpluses while also serving to regulate the share of commodities (agricultural and non-agricultural) consumed by farmers (WB 1989). "Furthermore, during this politically volatile period, collectivisation not only promised greater control over consumption and production, but greater political control over the population as well" (Evans 1991: 96).

According to Southeast Asianist Ian Baird, in the 1980s thousands of families living in the lowlands of Khong District, and possibly others, were forced by the government to make seasonal trips to the Bolaven Plateau to clear forest and grow coffee.¹⁷¹⁸ These families would travel back and forth to the plateau during different seasons, farming wet rice paddy in their Khong lowlands during the wet season and developing coffee on the plateau during the dry season. The forced relocation was thus not permanent; some families stayed in the Bolaven Plateau region while others eventually abandoned the areas they had cultivated (Baird 2012).

In the 1989/1990 coffee season, the estimated harvestable coffee area in the Bolaven Plateau was 17,000-20,000 ha (WB 1989, NSC 2006). The value of coffee exports in 1987 amounted to approximately \$8-9 million. Coffee production in the same year was estimated at 4,000-5,000 tons (WB 1989).

Lao Coffee in the Socialist World System

From the rise of the LPRP in 1975 to the late-1980s/early-1990s, nearly all coffee produced in Laos was sold and exported to countries which were either members of or affiliated with the Council for Mutual Economic Assistance (COMECON), an intergovernmental economic organization led by the Soviet Union and comprised of Eastern bloc and other communist states. The price of coffee during this time was set through negotiations between the central government, provincial trading companies, and farmers (WB 1989: 27, Duris et al. 2002: 70). All coffee companies were required to sell

¹⁷ Dr. Ian Baird, currently at the University of Wisconsin, Madison, is a geographer specializing in, among other things, the socio-environmental history of Southeast Asia, especially southern Laos and northern Cambodia. He is “one of the world’s leading authorities on this region and its diverse populations” (Forster 2010). Baird’s expertise is highlighted here only to insist on the credibility of his claims, being as the history he revealed is undocumented in any published works known to the author.

¹⁸ Khong District, 80-140 kilometers south of Pakxe via the Mekong River, is the southernmost district of Champasak province, and thus the southernmost district in Laos.

a certain portion of all procured coffee to the national trading company of Lao PDR, the Societe Lao Import-Export (SLIE), operating through the Lao Ministry of Commerce (WB 1989: 23, 27). Lao officials bartered coffee with COMECON states at prices negotiated every five years (WB 1989: 27). Trade negotiations were typically made on a bilateral basis, and most arrangements were “to reimburse the COMECON debt with former socialist countries” (Sallée 2007: 19).

Important to note is that payment of COMECON debt was based on coffee quantity, rather than quality. State-controlled systems of coffee production in Lao PDR were consequently geared toward the accumulation of greater volumes. From 1982-1987, however, coffee exports stabilized (WB 1989: 3). Additionally, since there was little profitability or other incentive for Lao coffee farmers to maintain their plots in ways that produced higher quality coffee beans, cultivation, harvest, and processing methods were simplified (Galindo & Sallée 2007: 19).

Less pruning and other maintenance activities were performed on coffee trees, allowing them to grow to their natural heights; coffee cherries were picked prematurely (prior to optimal ripeness); and the lower-quality-producing ‘dry’ method of initial processing came to dominate the coffee production/processing culture of the Bolaven Plateau region. Summarizing the state of the Lao coffee industry in 1989, a World Bank report wrote: “[T]he coffee subsector is run down and needs to be rehabilitated” (WB 1989: 3). In these ways, the restructuring of the Lao coffee commodity chain away from its traditional markets and toward the socialist world system impacted the socio-ecological systems of the Bolaven Plateau region.

The period of socialist experimentation and agriculture collectivization represents the first time in the history of the Lao coffee commodity chain that the structure of the chain itself altered the configuration of the region, rather than the inverse. While the Bolaven Plateau region had been constantly transformed by external or extra-local factors (e.g., French colonial ambitions, superpower ideological battles, etc.), these factors had never been precipitated by the political economic machinations embedded in the chain itself. Heretofore, the chain's structure was too embryonic to independently drive changes in the geography of the region. During this period, however, the structure of the Lao coffee network had been sufficiently developed to induce a transformation of its resource space.

Post-Socialist Transition and Market Liberalization: ~1988-2000

The New Economic Mechanism

In 1986, just over a decade after the establishment of Lao PDR the LPRP promulgated the New Economic Mechanism (NEM)¹⁹, and began to transition the Lao state away from socialism (Rigg & Jerndal 1996: 150). The NEM is a complex, multifaceted set of policy prescriptions involving significant macro-economic reversion to capitalist markets.²⁰ Announcements to reform the Ministry of Agriculture and Forestry, which had been responsible for the development of cooperatives and supervision of state farms, came in 1988. According to a World Bank report, MAF reform was

aimed at rationalizing and decentralizing [. . .] by merging departments, reducing centrally-based staff through transfer to provinces and

¹⁹ Some sources use different terms; e.g., the 'New Economic Management System'(UNDP 1991), or the 'New System of Economic Management' (WB 1989).

²⁰ A comprehensive overview of the policy prescriptions/implications of the NEM is provided by the United Nations Development Programme (UNDP 1991).

parastatals, and strengthening provincial and district agricultural services. MAF's production responsibilities were reassigned to provincial agencies and autonomous parastatals, and its role redefined to focus on sectoral planning and coordination, provision of technical assistance to provincial and district agricultural services, and such core activities as research development. (WB 1989)

Along with the liberalization of the agricultural sector in Laos was the cessation of coffee exports for the repayment of COMECON debt (Duris et al. 2002: 70).

The Upland Agriculture Development Project

Lao Coffee Chain Development

For the Bolaven Plateau region in particular, the period of post-socialist transition was marked by implementation of the World Bank's Upland Agriculture Development Project (UADP). The UADP is a project devised, funded, and implemented by the World Bank's International Development Association (IDA). It was executed as an eight year project (1990-1998)²¹ covering two target areas in Laos, one of which was the Bolaven Plateau region²². The UADP aimed at "reducing rural poverty, expanding export earnings, and improving food security, controlling soil erosion and strengthening key agricultural institutions in upland farming areas" (WB 1989, 1998). Specifically, the project's principal beneficiaries were "farming families [. . .] involved in highland coffee production [. . .]" (WB 1989: 8)

The UADP involved uprooting and replacing unproductive trees, and approximately 5,500 ha of new plantings (WB 1989). It also involved a genetic improvement component which included "the introduction and field testing of superior [R]obusta and [A]rabica coffees from abroad to ensure optimal development of the industry in the long term". Moreover, it reintroduced to the region the wet method of

²¹ The UADP was planned initially as a five-year (1990-1995) project.

²² See **Map A1**. The other project area was the Vientiane Region; see **Map A2**.

coffee processing so as to “ensure cleaner coffee with lower processing losses”. New wet processing plants with the capacity to perform the initial stages of coffee processing – cleaning, pulping, hulling, drying – were established to serve Champasak (Pakxong district) and Salavan (Laognam district) provinces, and smaller hand pulpers and hullers were provided for select villages (WB 1989: 9-10). The UADP’s coffee biology, ecology, and agricultural components were decidedly successful.

The UADP’s Rural Credit Component

The UADP also contained an unsuccessful rural credit component. The component involved a total transfer of USD\$1 from the IDA to the GoL’s Ministry of Finance (MOF)²³. In 1994 and 1996, a total of USD\$881,000 was transferred from the MOF to the Central Bank of Laos (CBL) (WB 1998), and further on-lent to “commercial banks in the [Bolaven Plateau region] project area, under subsidiary loan agreements satisfactory to the [GoL] and IDA” (MOF 1991). The main commercial banking institution was the state-operated Agriculture Promotion Bank, which then on-lent the funds to smallholder coffee producers in the Bolaven Plateau region. The World Bank reports that fiscally unsound policies at the CBL and the APB made successful implementation of the rural credit component infeasible; it was cancelled in 1997²⁴. The socio-economic impacts produced partially by the legacy of the UADP’s failed rural credit component are explored in detail in Chapter IV.

²³ At the time of the initial execution of the loan, the Ministry of Finance was known as the Ministry of Economy, Planning, and Finance (MOF 1991, WB 1992).

²⁴ “A review mission in July 1996 found that: (a) the Bank of Laos maintains an interest structure for the agricultural production sub-sector that is negative in real terms and (b) the APM's operations are constrained by its limited power to mobilize funds and its lack of authority to set its interest rates. As the Bank was unable to engage the government in an effective dialogue on these issues, the rural credit component was cancelled in January 1997” (WB 1998: 32).

Additional Boosts to the Lao Coffee Chain

Implementation of the UADP also coincided with some fortuitous events in the global coffee chain that further encouraged the progression of the Lao coffee chain. In 1994, the ICO's composite indicator price²⁵ rose dramatically due to frosts in Brazil that reduced global supply. Following the Asian financial crisis of 1997, the value of the Lao currency, the kip (LAK/₭), was significantly devalued in relation to the US dollar (USD/\$) (**Figure 8**), creating a profitable currency exchange rate for Lao coffee exporters.

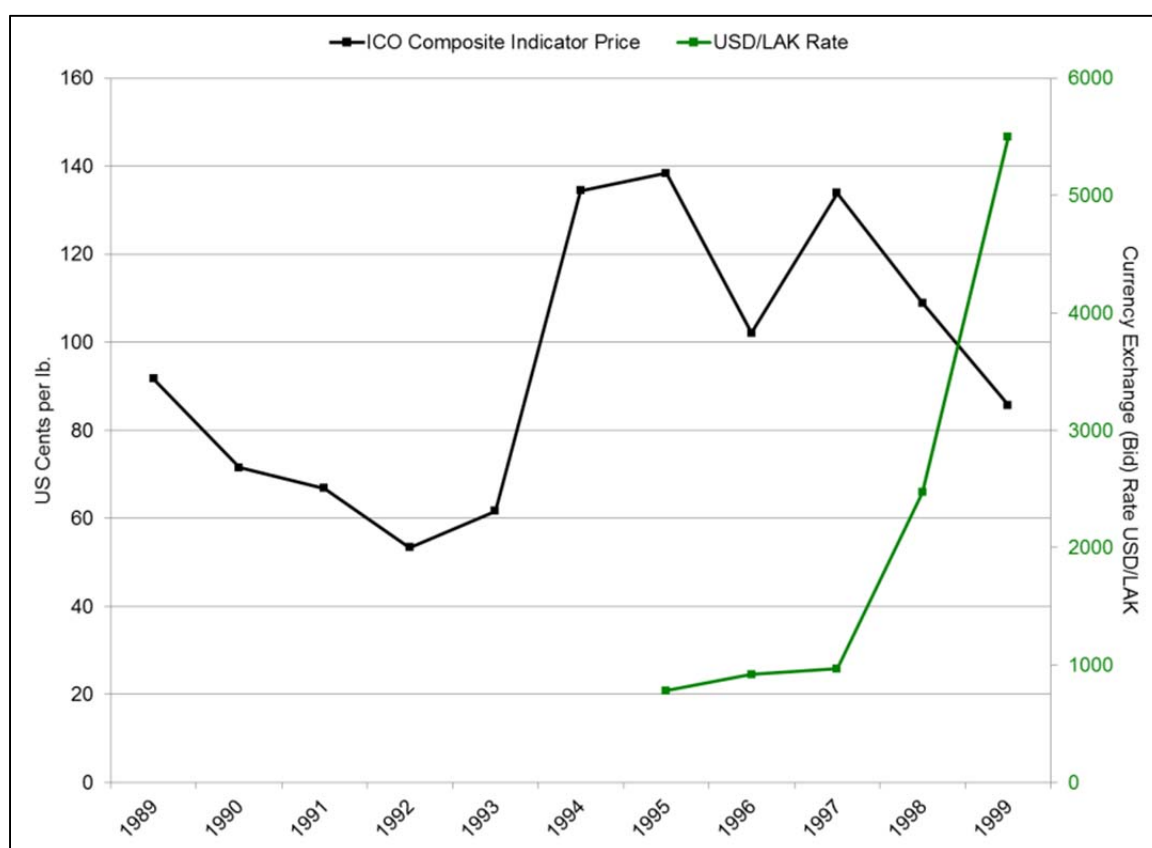


Figure 8: Relationship between the ICO composite indicator price and the USD/LAK currency exchange rate, 1989-1999. *Source:* International Coffee Organization composite indicator price data from ICO (2012b). Currency exchange rate data from OANDA (2012).

²⁵ The ICO's composite indicator price is the "overall benchmark for the price of green coffee of all major origins and types, considered to be the best available measure of levels of green coffee transactions on a global basis" (ICO 2012c).

Coupled with the UADP's coffee components, these additional boosts ensured that the end of the 20th century marked a time of unprecedented prosperity for the people of the Bolaven Plateau region's coffee-based economy.

CHAPTER III

THE CONTEMPORARY STRUCTURE OF THE LAO COFFEE CHAIN

This chapter describes the contemporary structure of the Lao coffee chain (from around the early-2000s to the present). It presents the chain at multiple geographic scales, beginning with global-level processes, moving ‘down’ to world-regional- and national-level processes, and ultimately arriving at the local-level dynamics among the actors producing the chain in the Bolaven Plateau region.

Global Coffee Commodity Chain Dynamics

The Rise of Robusta

The ratio of Robusta production to total global coffee output has steadily increased since the first half of the twentieth century. With the introduction of coffee production in several African colonies during the mid-20th century, the world harvest of Robusta increased from nearly 0% in 1920 to about 27% at the end of the 1960s (Daviron & Ponte 2005: 53). The 1980s marked a significant increase in Robusta production led by Asian countries, especially Indonesia and India. The 1990s were marked by even more remarkable jumps in Robusta production, led predominantly by Vietnam and Brazil (Daviron & Ponte 2005: 53). The last half century has been marked by a near doubling of the share of Robusta in world production (**Figure 8**). As Daviron and Ponte (2005: xvi) point out: “[T]he international coffee market is awash in coffee of ‘low quality’, while there is a dire shortage of ‘high quality’ coffee – and it is the latter that is generating sales growth.”²⁶

²⁶ It should be noted that Robusta is not necessarily ‘low quality’ coffee, although it is generally produced as such, and is treated in the international marketplace as such.

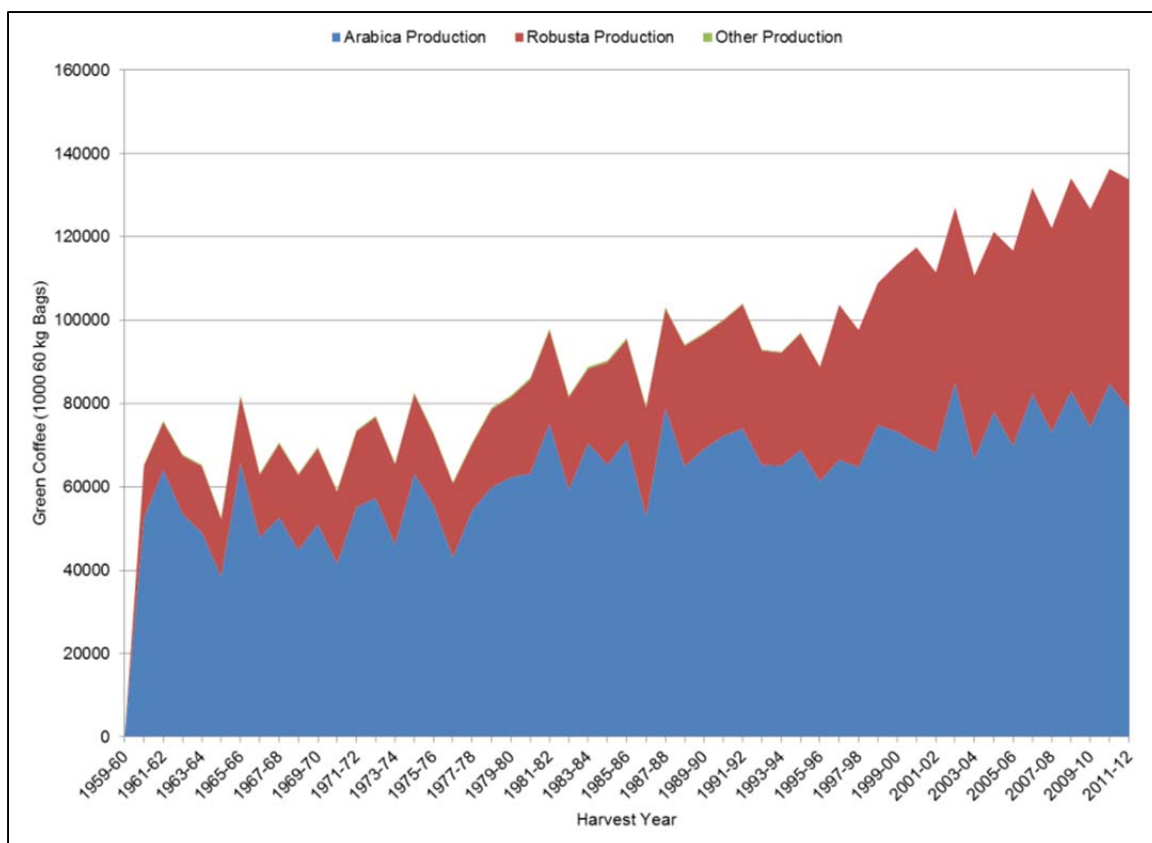


Figure 9: Global coffee production by coffee type, 1959-2012. *Source:* Data compiled from USDA (2012). Production, Supply and Distribution Online. United States Department of Agriculture Foreign Agricultural Service. available at: <http://www.fas.usda.gov/psdonline/psdQuery.aspx>.

The Disintegration of the International Coffee Agreement

In 1989, the last International Coffee Agreement (ICA) endowed with the authority to establish export quotas for individual countries, and thereby regulate international coffee prices, was disintegrated (Ponte 2002, Talbot 2004). While an active ICA remains in existence today, it lacks the market intervention mechanisms contained in the pre-1989 ICAs, effectively incapacitating the agreement as a raiser and stabilizer of global coffee prices (Osorio 2002). The ICA is administered by the International Coffee Organization (ICO), whose governing body consists of all ICO member states. (Laos is not currently, and has never been, an ICO member; however, it applied for membership

in the late 1980s (WB 1989: 27), and its acceptance to the intergovernmental organization appears imminent (VT 2009a, 2010c, 2010a)).

The first ICA was signed in 1962 by nearly all producing and consuming countries at the time (Ponte 2002). It and subsequent agreements created a target price band for coffee, as well as corresponding export quotas for each producing state. As explained by Ponte (2002: 1104), under the ICA system, export quotas were relaxed when the ICO composite indicator price rose above the target price; quotas were tightened when the indicator price fell below the target price. There is general consensus amongst coffee analysts that this system was successful in raising and stabilizing the international coffee price (Ponte 2002: 1104). This success was permitted by the participation of essentially all concerned state actors, at both ends of the global coffee chain.

However, the ICA was far from a perfect system. Producing states would squabble over prices, and some states would free-ride on the quotas of other states. The quotas themselves were expensive to negotiate, so they remained relatively static. Also, the entire quota system was undermined by the increased export and trade of coffee by non-ICO states, often at prices lower than those mandated by the ICA system. Therefore, ICO consuming member states – representing primarily the roasting companies within those states – began to stray away from the ICA system, as they worried that the

strictness of the export quotas would allow their competitors to purchase from non-member producing states at more favorable prices²⁷ (Ponte 2002).

The Global Coffee Crisis

The term ‘global coffee crisis’ refers broadly to the highly disproportionate nature of the global value chain for coffee (for a thorough explanation, see Talbot 2004). The most recent articulation of the global coffee crisis began towards the end of the 1990s, when the price of coffee on the world market dropped to levels that in many cases failed to cover farmers’ costs of production. The five year period of sustained low prices between 2000 and 2004 and the striking socio-economic impacts that resulted from this period has come to epitomize what is meant by the term ‘global coffee crisis’ (**Figure 10**).

According to the ICO, in the early-1990s export earnings by coffee producing states were \$10-12 billion; retail sales of coffee (taking place predominantly in ‘developed’, more industrialized states) amounted to approximately \$30 billion. By the early-2000s, retail sales of coffee amounted to \$70 billion (an *increase* of 133%), while producing countries received only \$5.5 billion (a *decrease* of at least 45%). The world market price for coffee in the 1980s was \$1.20/lb; in the early-2000s, it was about \$0.50/lb (the lowest in real terms for a century) (Osorio 2002:1).

²⁷ Lao PDR is one of the non-member states which inadvertently undermined the ICA system. Up until the late-1980s, the only legitimate entities in Laos authorized to procure coffee at the farm level were those of the state. The majority of all coffee produced in Laos was procured by Societe Lao Import-Export (SLIE) for the interstate trade with the Soviet, Eastern bloc, and other communist states associated with the Council for Mutual Economic Assistance (COMECON). However, after meeting annual COMECON exchange quotas, the remainder of the coffee produced in Laos was sold to private exporters who somehow had managed to gain export licenses following the implementation of macro-economic liberalization policies. These exporters sold coffee to states outside the pre-1989 ICA, primarily via Thailand and Singapore (WB 1989: 27).

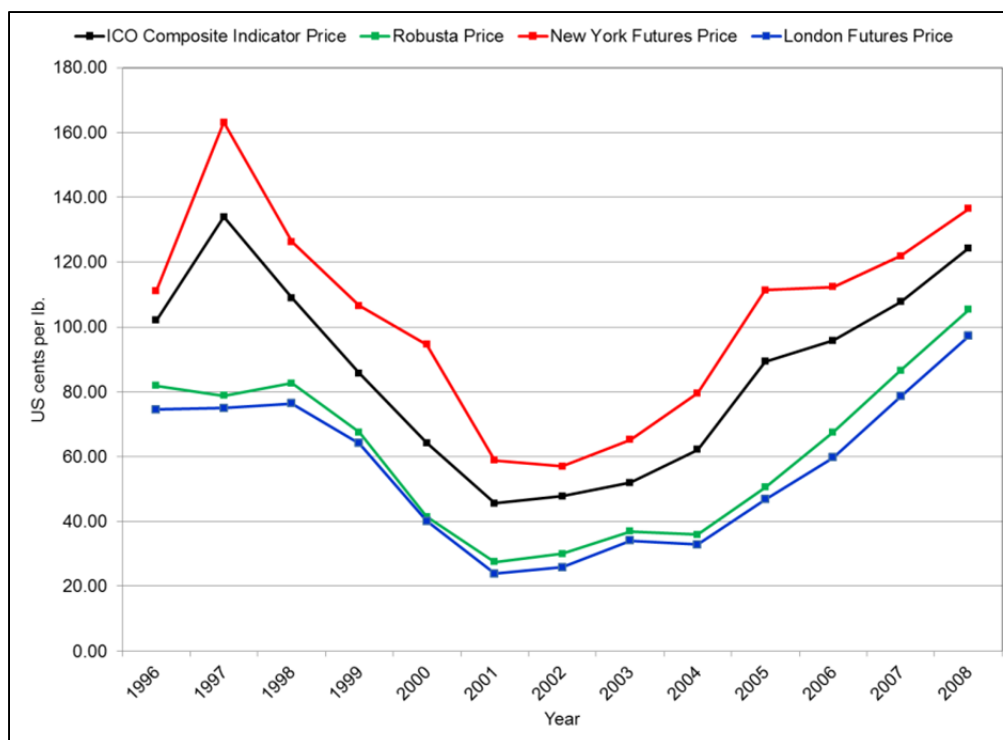


Figure 10: Coffee prices before, during, and after the global coffee crisis. *Source:* Coffee price data from ICO (2012b).

The crisis is attributed partially to the demise of the ICA system, which fostered quotas for producing countries, thereby helping to balance global coffee supply with global coffee demand (Osorio 2002). At the end of the 1990s, Vietnam surpassed both Indonesia (in the 1998/1999 season) and Colombia (in 1999/2000) in coffee production²⁸, thereby making it the country with the second greatest output in the world, only after Brazil, whose output far exceeds that of all other producing countries (**Table 1**).

The ICO summarizes the socio-economic impacts of the global coffee crisis on coffee producers in three categories, depending on the costs of production and level of technological inputs at the farm level:

²⁸ Indonesia had occupied the number three position since 1981; Colombia had been number two since before the Second World War.

- (1) where costs of production are low and technological development is high, coffee farmers can still make a living, albeit with low rates of return, which reverberate through rural economies in terms of reduced consumption and increased unemployment;
- (2) where coffee is a cash crop in an otherwise subsistence farm, consumption of medicine, communications, and education is reduced;
- (3) where farming households rely principally on coffee for income, indebtedness typically increases and farmers are often forced to abandon their farms and/or switch to alternative crops. (Osorio 2002)

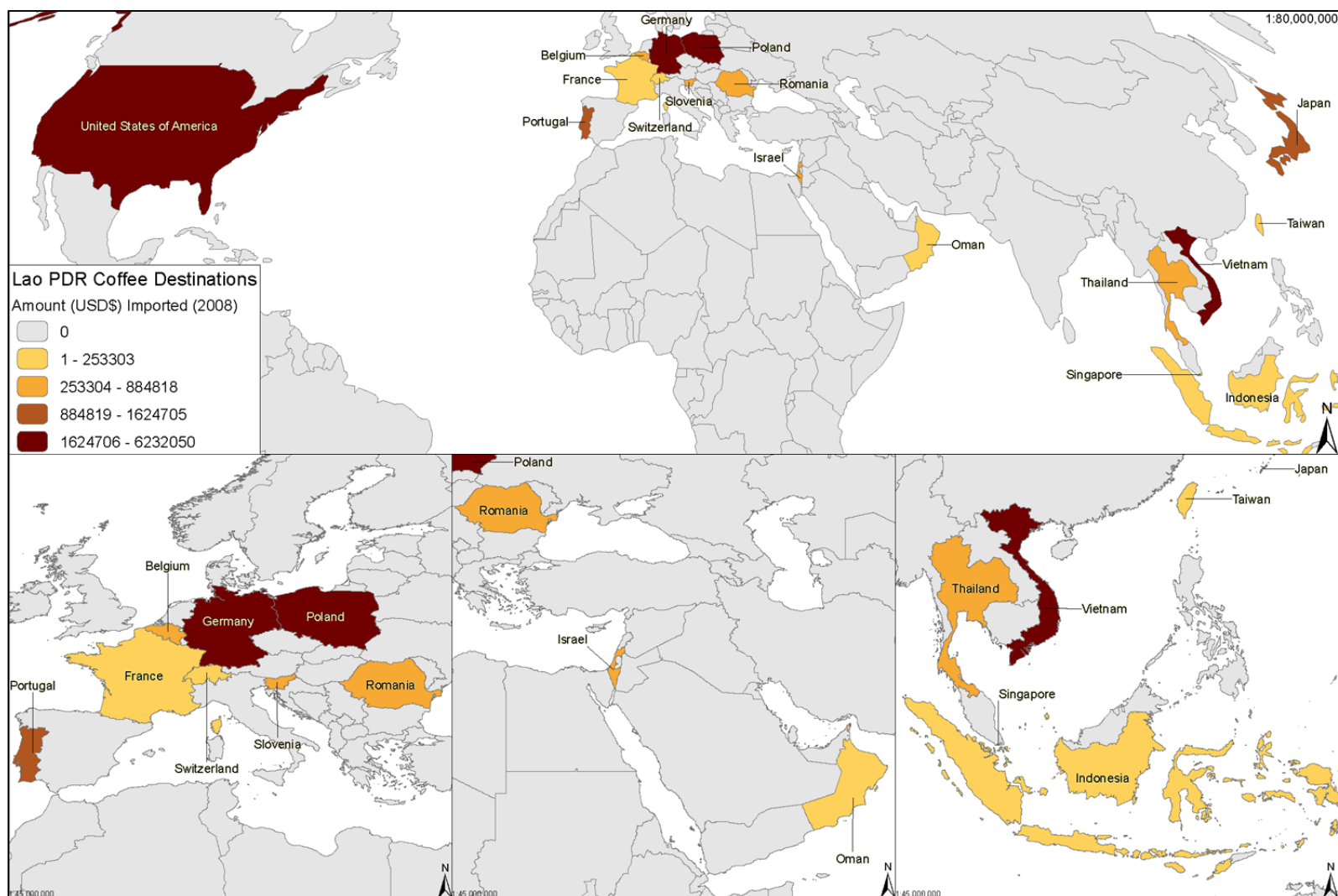
The National Lao Coffee Sector of Lao PDR

Lao Coffee Export Geography

The contemporary geography of Lao coffee exports is irregular. It reflects the legacies of both colonial- and socialist-era flows, as well as increasing regionalization, whereby other Asian, including Southeast Asian, states import Lao coffee. Poland, France, Belgium, Switzerland, Germany, and Romania are the commonest importers, but countries as varied as Oman, the USA, Japan, and New Zealand, among others, also receive Lao coffee. Poland, a former COMECON state, imports the largest quantity of Lao coffee, and most consistently too. As Galindo and Sallée point out, exports to Vietnam have increased dramatically in the last several years, but very little empirical data on this phenomenon is available, so the ultimate use of Lao coffee in Vietnam (e.g.,

Table 1: Coffee production by the top-10 ranked producing countries + Laos. *Source:* Data compiled from USDA (2012). Production, Supply and Distribution Online. United States Department of Agriculture Foreign Agricultural Service. available at: <http://www.fas.usda.gov/psdonline/psdQuery.aspx>.

Rank (2008/2009)	Country	Coffee Production (1,000 60kg bags) in Annual Harvest									Percent of Total (2008/2009)
		2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	2006/ 2007	2007/ 2008	2008/ 2009	
1	Brazil	34,100	35,100	53,600	33,200	43,600	36,100	46,700	39,100	53,300	39.75
2	Vietnam	15,333	12,833	11,167	15,000	14,500	16,335	19,500	18,000	16,980	12.66
3	Indonesia	6,495	6,160	6,800	7,250	8,450	9,450	7,500	8,000	10,000	7.46
4	Colombia	10,500	11,950	11,712	11,053	11,532	11,953	12,164	12,515	8,664	6.46
5	Mexico	4,800	4,200	4,350	4,300	4,000	4,200	4,500	4,350	4,550	3.39
6	India	5,020	5,010	4,588	4,508	4,672	4,617	4,665	4,660	4,375	3.26
7	Peru	2,824	2,550	2,760	2,870	3,550	2,420	4,400	2,800	4,000	2.98
8	Guatemala	4,564	3,530	3,802	3,671	3,817	3,715	4,050	4,110	3,980	2.97
9	Ethiopia	2,768	3,756	3,693	3,875	4,068	4,000	4,036	3,906	3,650	2.72
10	Honduras	2,821	3,098	2,496	2,968	2,575	3,204	3,460	3,642	3,225	2.40
	World Total	117,521	111,518	127,102	110,750	121,262	116,721	131,819	122,153	134,103	84.06
29	Laos	392	430	537	464	385	300	420	355	350	0.26



Map 3: Destinations and value of Lao coffee exports in 2008. *Source:* Map by author; Lao PDR coffee export data provided by LCA (2009).

for re-exportation by Vietnamese companies, or for local consumption) is unknown)²⁹

Map 3 illustrates the officially reported export geography of Lao coffee in 2008.³⁰

Non-Existent Quality Standards for Lao Coffee

Most internationally traded coffee is classified according to its quality characteristics. This is possible only when the exporting state has established export standards, typically referred to as ‘fair average quality’ (FAQ). No such standards yet exist in Lao PDR. The Lao Coffee Association – whose membership consists solely of coffee exporters – is the main body that would be responsible for developing such standards. As explained by Galindo and Sallée (Galindo & Sallée 2007: 11), most exporters have specialized in the selling of coffee ([R]obusta and [A]rabica) without any quality standards”.

Lao Coffee Price Penalty

Lao Robustas produced are especially desirable to international coffee buyers because of their particularly low prices (Galindo & Sallée 2007). Partly because of the non-existent quality standards, the overwhelming majority of Lao coffee suffers a price penalty in the international marketplace. It is sold for approximately \$100-150 per metric ton (mt) less than the Robusta futures prices set in London. In addition to the lack of quality export standards, this penalty is due also to the poor reputation of not only Lao coffee itself, but also the reliability of Lao coffee exporters (Galindo & Sallée 2007: 8).

²⁹ The relative ease with which Vietnamese traders can access Lao coffees, within the context of the ‘competition for coffee space’ occurring in the central Vietnamese highlands (see, e.g., Doutriaux et al. 2008), leads the present author to believe that Vietnamese traders use comparatively inexpensive Lao coffees in their own stocks for re-export.

³⁰ See the Appendices for maps of the 2002-2007 Lao coffee export geographies.

Lao Coffee Production Geography

Nearly all (95-99%) coffee production in Lao PDR takes place in the four southern provinces administering the Bolaven Plateau region: Champasak, Salavan, Xekong, and Attapeu. Some production takes place outside of the region as well, primarily in Luang Phrabang province (**Map 4**). Between 20 to 25 tons of coffee is currently produced in the Bolaven Plateau region each year, generating US\$33-50 million for the Lao state (VT 2009b, 2012b). National production is dominated by Robusta, which accounts for approximately 75%, with Arabica accounting for the remaining 25³¹. The GoL and other parties to bring the proportion of Arabica half Robusta (Winston et al. 2005). *Coffea liberica* (Liberica) is grown for commercial purposes in Laos, albeit nominally and only in older plots (Winston et al. 2005)³²; it is likely that within the next several years it will disappear entirely from the region.

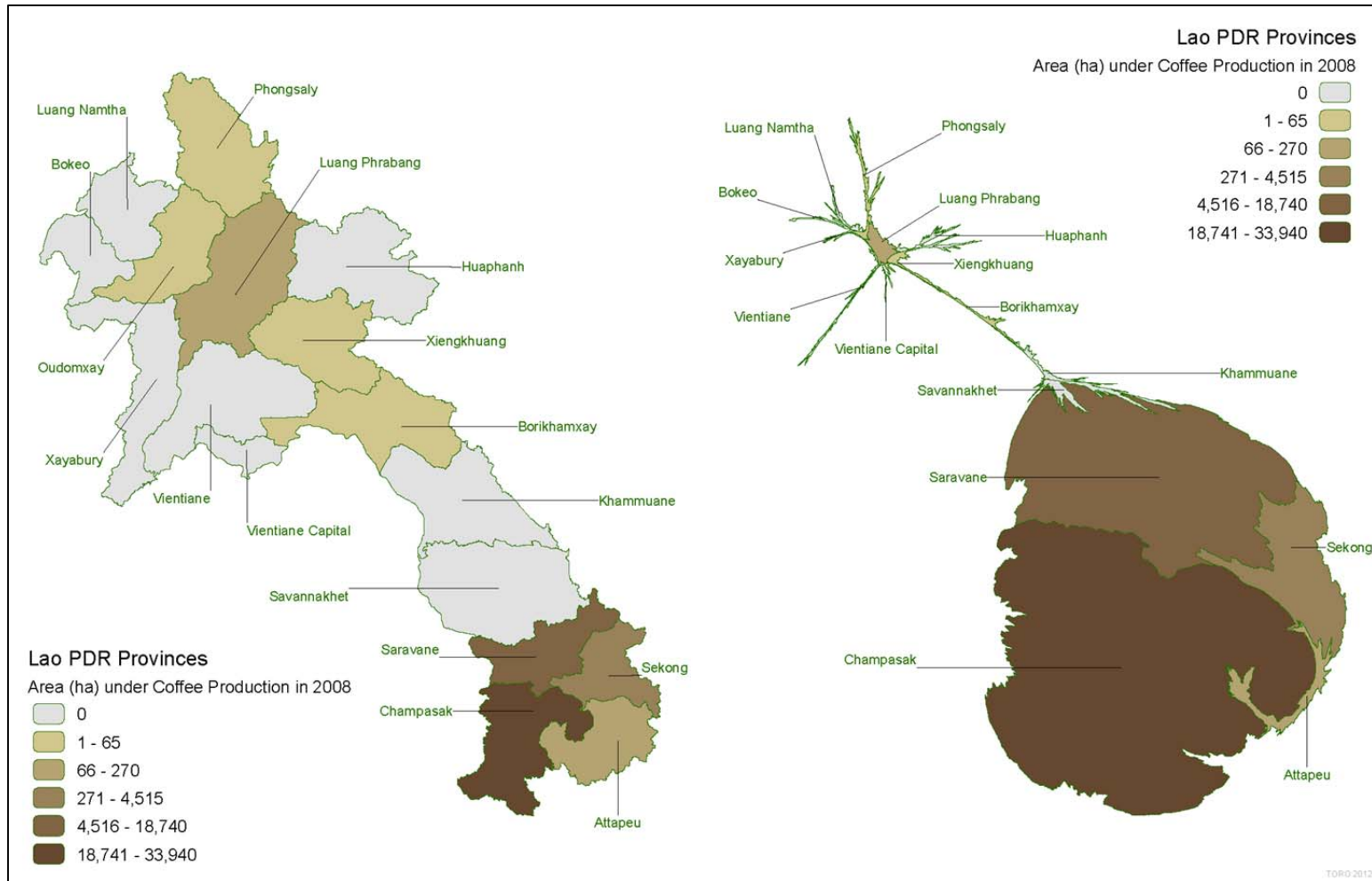
Lao Coffee and the Bolaven Plateau Region

Coffee as a Poverty Reducer

Overall, the coffee economy of the Bolaven Plateau has been remarkably successful in reducing the incidence of poverty in the region. According to estimates used by Epprecht et al. (2008: 28), the region enjoys the lowest rate of poverty of any comparable agro-/eco-region in the country (**Figure 9**). However, as described by one *Vientiane Times* newspaper article:

³¹ One source estimates that Robusta production comprised 87 percent in 2007. A Food and Agriculture Organization (FAO)-sponsored source, indicating 2001 figures, claimed Robusta production comprised 88 percent of total production (Winston et al. 2005). Another source noted that Robusta output for the 1999/2000 season was 96 percent (Duris et al. 2002). An additional source stated that the figure was greater than 90 percent (T&CTJ 2002). Yet another source stated that it comprised 80 percent (Boungnavong & Chounthavong 2001). As for Arabica: one source stated that 25 percent of coffee production in Laos was of the Arabica species (Jhai 2008).

³² *Coffea liberica* and *Coffea excelsa* both grow in Laos. They were once considered separate species, but it has since been determined that they are too similar taxonomically to warrant distinction as separate species. Plants formerly classified as *Coffea excelsa* are now subsumed under the species *Coffea liberica*.



Map 4: Choropleth and cartogram of the area (ha) under coffee production in 2008 in each Lao PDR province. Although they represent the same data, these two maps visualize those data in very different ways. The cartogram distorts the geometric representation of the provinces by adjusting their sizes proportionate to their respective values for the variable in question: area (ha) under coffee production in 2008. *Source:* Maps by author; Lao PDR provincial coffee production data from NSC (2006). A similar choropleth and cartogram illustrating the total quantity (tons) of coffee produced in each province can be found in the Appendices (**Map A3**).

To the casual traveler, the residents of [the Bolaven Plateau³³] appear to be wealthy. Their gardens are resplendent with the green and ripe red of coffee trees growing in the fertile soil of the Bolaven Plateau. [. . .] This image, however, is false; many families in the [region³⁴] are still living below the poverty line. [. . .] It seems that some families have to work just a little bit harder, and are not benefiting from the developments taking place [. . .].



Image 7: A coffee smallholder highlights the differences between a few of the coffee species grown in the Bolaven Plateau region. From the reader's perspective, the leaves he is holding represent the Robusta (left); Arabica, catimora dwarf variety (center); and Liberica (right) coffee species. *Source:* Photograph by author, February 3, 2009.

³³ The article (VT 2007) was describing specifically a subset of the Bolaven Plateau population – ‘the residents of Thataeng district, Xekong’ – however, as will be shown in Chapter IV, this quote can be applied to many parts of the entire region.

³⁴ Again, the article (VT 2007) referred specifically to the “district”, that is, Thateng district.

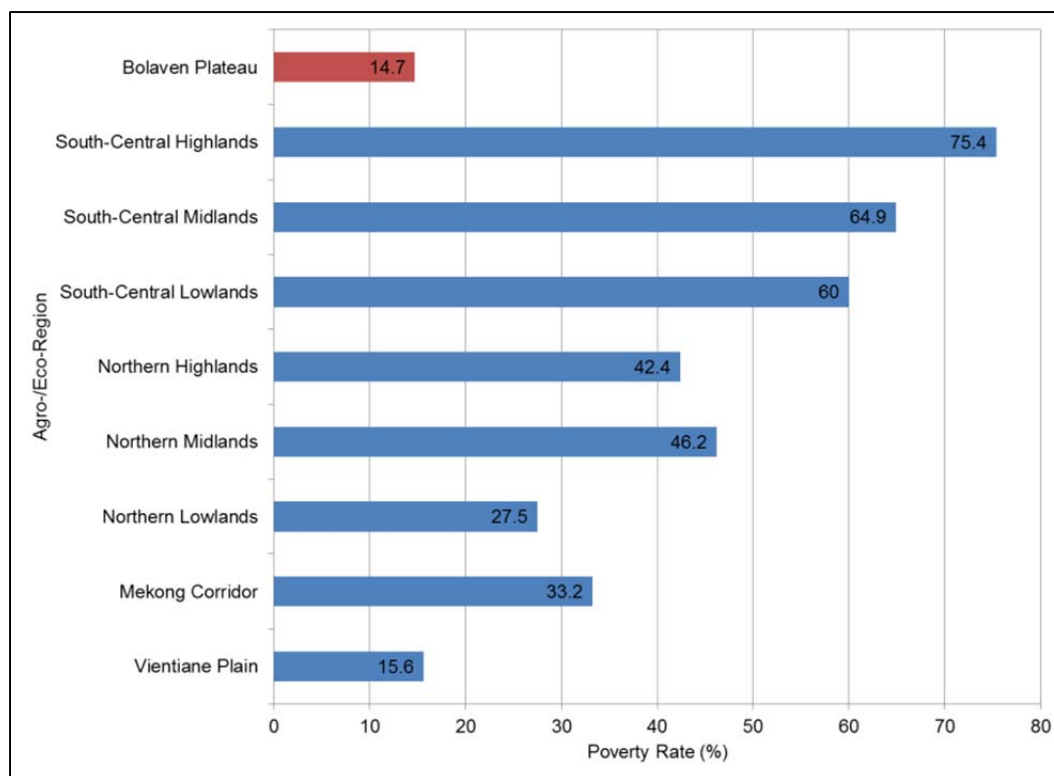


Figure 11: Poverty rates in the agro-/eco-regions of Laos. *Source:* Data adapted from the 2002-2003 Lao Expenditure and Consumption Survey, as reported in Epprecht (2008: 21).

The Rural-Urban Nexus

Pakxe, the provincial capital of Champasak, serves as the geographical nexus between the source of coffee in the Bolaven Plateau (to the east), and the export gate of that coffee on Laos' border with Thailand (to the west). Coffee must travel over land from small plots or industrial plantations on the Bolaven Plateau – where it is picked, sorted, and usually minimally processed – to large factories either in Pakxe, or along the road between Pakxong and Pakxe, where all other pre-export processing procedures are performed. The coffee is then stored in warehouses before it is put on a truck and travels through the Vongtao / Chong Mek border crossing between Laos and Thailand. It then makes its way south to the international port outside of Bangkok where it is put on a ship headed for its various international destinations.

The greatest concentration of the financial capital that stimulates the Lao coffee sector is in Pakxe. Pakxe, and to a lesser extent the national capital of Vientiane, are the places from which almost all financial capital flows *to* rural producers; the place to which almost all coffee capital flows *from* rural producers; and the place where the most substantial benefits gained through the early stages of the Lao coffee chain are enjoyed by the coffee sector elite. Pakxe is the third most populous, and one of the most historically and economically important cities in the country. Like all major Lao cities (save for Louang Phrabang), Pakxe is located along the lowland banks of the Mekong River. The production of coffee in the rural Bolaven Plateau region is one the primary impetuses for the increasing rate of urbanization in Pakxe, as well as in the intermediary sites of coffee trading and processing in the towns surrounding the plateau, namely Laongam and Thateng. The most important town center serving as an intermediary site of the Bolaven coffee supply chain is Pakxong, the only town located on the plateau itself. Despite the important intermediary roles played by the towns of Laongam, Thateng, and Pakxong, Pakxe remains the indisputable core from which control of the rural coffee economy of the Bolaven Plateau emanates.

Actors in the Lao Coffee Commodity Chain

At its socio-ecological base of the Bolaven Plateau region, the Lao coffee network operates through a chain of relationships between three main types of actors: producers, traders, and exporters.

Lao Coffee Producers

Smallholder producers are the core of the Lao coffee sector. They are the hundreds of coffee-farming families who inhabit most of the Bolaven Plateau region.

They consist primarily of those farming families holding less than five hectares of productive coffee trees. Use of the term ‘producers’ here refers to those groups identified by Galindo and Sallée (2007: 39) as:

[. . .] small-scale diversified coffee producers growing robusta and some arabica. Besides coffee, these farmers develop other crops (associated or not to coffee plantations) like vegetables, tea, fruit trees, etc. They have very little cattle and depend for a large part on coffee. They sell both processed and unprocessed coffee (especially [A]rabica) depending on their capability to process coffee (either in private or collective mills). A significant percentage makes pre-harvest loans.

as well as

[. . .] small-scale diversified coffee producers that depend largely on coffee. These farmers have very little livestock (generally only poultry), and have very little access to other sources of income besides coffee (high coffee-dependency). A significant percentage sells unprocessed coffee (especially [A]rabica cherries) and makes pre-harvest loans.



Image 8: Lao coffee smallholders chat among bags of coffee stored in their home. *Source:* Photograph by author, February 21, 2009.



Image 9: Ground-dried coffee being hulled (dry-process). *Source:* Photograph by author, February 22, 2009.



Image 10: A typical Lao coffee smallholder family. Note the ground-drying coffee behind the villagers. *Source:* Photograph by author, February 1, 2009.

Lao Coffee Traders

A diverse group of actors is encompassed by the term ‘traders’. Invariably, though, all traders serve as intermediaries between producers and exporters – they buy the product of the former and sell it to the latter. There is often more than one segment of traders between producers and exporters along the chain. Traders typically purchase the harvests of many farmers within a single village, or multiple villages, and aggregate the collected bags of coffee so as to have greater leverage on the price they can fetch from higher level traders, or wholesalers, or from exporters themselves. The majority of traders work on behalf of wholesalers or exporters; a small, but gradually growing, group of traders works independently.

Traders are also coffee smallholder producers too. A trader typically owns or has access to a vehicle capable of transporting large quantities of bagged green beans (typically a large Hyundai truck; see, e.g., **Image 11**). A trader also must have access to dispensable cash capital. These two critical factors – access to a means of bulk transport and access to cash – differentiate trader-producers from standard producers. Traders often use the money capital of wholesalers and/or exporters to purchase coffee from approximately 5-20 village coffee collecting territories (Duris et al. 2002: 71), as well as to the administration of loans to their fellow smallholders.

Several small wholesale companies based primarily in Pakxe, Laognam, Pakxong, and Thateng comprise a higher level of intermediary traders. Wholesale companies typically have warehouses where coffee purchased from villages is stored before being sold to exporters. Concurrent with the revitalization of the Lao coffee sector since the early-1990s has been the expansion of the role of traders beyond their conventional

activities of purchasing, collecting, and reselling coffee; many traders are increasingly focusing their activities on the brokering of pre-harvest extension loans. This issue is covered extensively in the Chapter IV.



Image 11: A trader's truck is parked to load coffee beneath a comparatively affluent household balcony. *Source:* Photograph by author, February 24, 2009.

Lao Coffee Exporters

Exporters in the Lao coffee commodity chain consist primarily of urban-based elite who control virtually all financial capital in the sector. Through the Lao Coffee Association (LCA), this group acts as a cartel that controls all official coffee exporting activities for the country. The organization was created in 2004 by a decree by then-Prime Minister Khamtai Siphandon intended to bolster the coffee industry through more efficient export practices and data collection procedures (Galindo & Sallée 2007). At its

inception, the LCA consisted of 15 coffee exporting company members (Fortunel 2007: 224). As of March 2009, the organization consisted of 31 exporting companies (LCA 2008, VT 2010c), no more than a few of which are also involved in coffee roasting. Dominant among all exporters is a single, vertically integrated company called Dao Heuang which purchases the vast majority of all Bolaven Plateau coffee and is responsible for 60-70 percent of all Lao coffee exports (Galindo & Sallée 2007), not to mention a substantial portion of all Lao coffee products consumed domestically.

Most of the cash used to distribute high interest loans throughout the region comes from the few dozen coffee exporting companies with membership in the Lao Coffee Association. Despite the price penalty for Lao-origin coffees on the international market, these companies' exporting (and, in an increasing number of cases) processing, roasting, and even café retailing activities undoubtedly position them in the most lucrative segments of the commodity's domestic value chain. As mentioned above, the owners of these firms are primarily urban elite based in Pakxe; as such they hold deep ties to the broader national elite based primarily in Vientiane. Some of these elite include families who exiled themselves to France upon the declaration of the Lao People's Democratic Republic by the Pathet Lao in 1975 only to return several years later after the new regime began to shift towards more neoliberal economic policies and former political tensions had been eased.

Foreign Technical Aid Programs

PCADR-PAB

It is important to also note some of the foreign technical aid programs intended to advance the Lao coffee chain active in the Bolaven Plateau region. Among the most

notable projects is the Capitalization Program for the Support of Rural Development Policy - Bolaven Application Point (PCADR-PAB)³⁵. Supported financially by the French Development Agency (AFD)³⁶ and the Center for International Cooperation in Agronomic Research for Development (CIRAD)³⁷, PCADR-PAB focused on the improvement smallholders' ability to produce, process, and market high-quality Arabica and Robusta coffees. A main component of PAB's approach involved sponsoring the construction of wet-processing stations in participating villages, such as the one depicted in **Image 12**.



Image 12: An PCADR-PAB-sponsored wet-processing station in a Bolaven Plateau village (*Ban*³⁸ Kapeu) with an active AGPC producers' group. *Source:* Photograph by author, March 20, 2009.

³⁵ PCADR – Programme de Capitalisation pour l'Appui à la politique de Développement Rural; PAB – Point d'Application des Bolovens.

³⁶ AFD – Agence Française de Développement.

³⁷ CIRAD – Centre de Coopération Internationale en Recherche Agronomique pour le Développement.

³⁸ In Lao language, '*Ban*' means 'village'.

As of early-2009, the PAB had established 53 village-based groups of coffee producers, (known as ‘producers’ groups’) throughout Pakxong, Laognam, and Thateng districts (Tulet 2009). A total of 2,625 smallholder families are associated with the producers’ groups. According to one of the program’s reports (Pedregal 2008: 2):

The [producers’] groups were put together in order to produce and market high-quality coffee, aiming at improving producer incomes, as well as contributing to recognition of a local skills base and promoting environmental preservation.



Image 13: Banners indicate PCADR-PAB-sponsorship of a wet-processing station in a Bolaven Plateau village (*Ban Phoumakò*) with an active AGPC producers’ group. *Source:* Photograph by author, February 3, 2009.

AGPC

Following the original Bolaven Application Point project, a secondary level organization was formed, the Association of Bolaven Plateau Coffee Producer Groups

(AGPC)³⁹. In addition to the original PAB goals of improving producers' coffee production and commercialization capacity, AGPC has the following additional functions (Tulet 2009: 27, VT 2010b):

- to assist producers in the pursuit of political representation at provincial, national, and international levels;
- to enhance the exportation capacity of producers;
- to facilitate the entrance of producers into the national market for roasted (value-added) coffee products;
- to establish symbolic signs of coffee quality for marketization, including, e.g., Fair Trade and organic certifications, as well as pursue legal markers of geographic indication (Sallée 2007, Schüßler 2009).

The defining characteristic of the PCADR-PAB/AGPC programs has been its focus on advancing the Lao coffee chain by extending technical assistance to, and improving the lives of, smallholder coffee producers.

PRCC-II

The PCADR-PAB project ended in 2009. It has been followed by a second phase project, the Program for Trade Capacity Building II (PRCC-II)⁴⁰. Initiated in 2010, PRCC II will expire in 2014. Through PRCC-II, the Association of Bolaven Plateau Coffee Producer Groups program has remained active. Indeed, one of the main objectives of PRCC-II is to enable the AGPC “to become an autonomous and professionally efficient organization”. The overarching goal of PRCC-II is to “strengthen the capacities of all actors of the Lao coffee supply chain” (Sibounheuang 2011). Perhaps the most important

³⁹ AGPC – Association des Groupements de Producteurs de Café du Plateau des Bolovens.

⁴⁰ PRCC-II – Programme de Renforcement des Capacités Commerciales II.



Image 14: Pakxe office headquarters of the Programme de Capitalisation pour l'Appui à la politique de Développement Rural (PCADR) - Point d'Application des Bolovents (PAB). *Source:* Photograph by author, March 27, 2009.

means by which PRCC-II has pursued this goals is through the creation of an unprecedented government agency, the Lao National Coffee Council (CNCL)⁴¹, also known as the Lao Coffee Board.

The Lao Coffee Board

The CNCL, the first-ever national Lao Coffee Board, was officially established through a decree⁴² by the Prime Minister on June 25, 2010 (Saysana 2011, Sibounheuang 2011). While intended to enhance the operational capacities of all actors in the Lao coffee chain through the perpetuation of PCADR-PAB activities (e.g., maintaining organic, Fair Trade, and similar certifications, etc.), the programmatic emphasis of PRCC-II is on

⁴¹ CNCL – Conseil National du Café Laos.

⁴² Decree number 58 (Sibounheuang 2011).

bolstering the sustainability of the AGPC producers' groups. In other words, the PRCC-II approach to bolstering the Lao coffee chain as a whole is to target its resources on Lao coffee smallholder producers.

This inherent emphasis on producers has prompted a certain degree of tension between officials at PAB/AGPC and the Lao Coffee Association, an organization whose conventional activities overwhelmingly reflect the interests of Lao coffee exporters.⁴³ Some of this tension can be discerned in news articles published in the *Vientiane Times*. For instance, in April 2010, the current president of the LCA, Mr. Sinouk Sisombat, was quoted as saying:

The problem in the past has been that some growers formed their own collective groups and other groups processed coffee individually and these groups didn't work together with the [Lao Coffee A]ssociation

The collective groups to which Mr. Sisombat was referring are those organized by the through the AGPC. Indeed, since early-/mid-2010 – when the CNCL was first being developed – at least two *Vientiane Times* articles pertaining to the CNCL contained language stressing how the Lao Coffee Association desired greater cooperation among all Lao coffee chain actors (VT 2010c, 2010b). Prior to the development of the CNCL, however, the LCA made no calls for such holistic engagement with non-exporting actors in the chain, especially not with smallholder producers.

⁴³ Indeed, many refer to the Lao Coffee Association as the 'Lao Coffee *Exporters* Association', as its membership consists only of coffee exporting companies.

CHAPTER IV

SOCIO-ECONOMIC DYNAMICS OF THE BOLAVEN PLATEAU REGION

This chapter examines the dynamics among the three basic types of actors facilitating the primary stages of the Lao coffee commodity chain: producers, traders, and exporters. It scrutinizes the coffee-trading and credit-lending systems linking these actors. In-depth and semi-structured interviews reaffirm previous reports (Thawaensimphet et al. 2003, Galindo & Sallée 2007) that, in addition to coffee production, usury and chronic debt are central features of life for smallholders in the region. Empirical data derived from ethnographic methods also reveal relationships between the quantity and quality of smallholder loans, the World Bank's Upland Agriculture Development Project, and the global coffee crisis. These data also aid in illuminating the mechanisms through which an exploitative set of labor-capital/client-patron relations operate in the region.

Ethnographic Methods and Data

Semi-Structured Interviews

Between the months of January and March⁴⁴ of 2009, ethnographic fieldwork was conducted in the Bolaven Plateau Region. This portion of this project was possible only through the aid of an indispensable Lao language translator and research assistant, Ms. Soukdavanh Bouadaphom.⁴⁵ Smallholders from a total 192 coffee smallholder households distributed throughout 10 Bolaven Plateau villages were interviewed for this study⁴⁶. The interviews were primarily semi-structured, yet entailed highly standardized

⁴⁴ This period coincided with the annual Robusta harvest in the Bolaven Plateau region.

⁴⁵ Ms. Bouadaphom translated my questions (from English to Lao) to the villagers as well as the villagers' responses (from Lao to English) back to me. She also assisted with multiple translations of official government and corporate documents, and maintained her own records of all conducted interviews (so as to cross-reference with my own). Additionally, Ms. Bouadaphom provided critical cultural insights into Lao mores and norms, and provided essential guidance on innumerable logistical and planning issues.

⁴⁶ Other fieldwork conducted by the author and Ms. Bouadaphom during this period for an interrelated, but separate, study is documented in Delang and Toro (2011).

(i.e., virtually uniform, quasi-survey) inquiry into each household's domestic economy. Through these standardized interviews, three main sets of information, intended to assess regional socio-economic conditions, were gathered:

- (1) tenure and use of lands by households within each village (e.g., number of hectares owned and cultivated by each household, type of cultivation performed on each hectare, etc.);
- (2) available labor and income of each household (e.g., number of people residing in each household, worker-to-people ratio in each household, annual household income, etc.); and
- (3) comprehensive household experience with credit and debt via various types of loans (e.g., amount of money borrowed annually, creditor type, terms/conditions and associated interest rate of loan, etc.).

In this chapter, these quantitative data are presented and analyzed through the use of descriptive statistics, the aid of graphs, and with simple correlations.

In-Depth Interviews

In numerous instances, the progression of a semi-structured interview began to raise additional, more open-ended questions pertaining to a household's (or individual's) particular experience with coffee production, borrowing, and debt. In these cases, the course of the interview would deviate from the standard line of inquiry and include questions tailored more towards the specifics of the information being relayed. What resulted, then, are interviews of a more in-depth, qualitative nature. Some of the most illuminating – and striking – information was relayed in the form of personal anecdotes

and excerpts. These qualitative data augment the contextual clarity of the quantitative data.

Village Sample

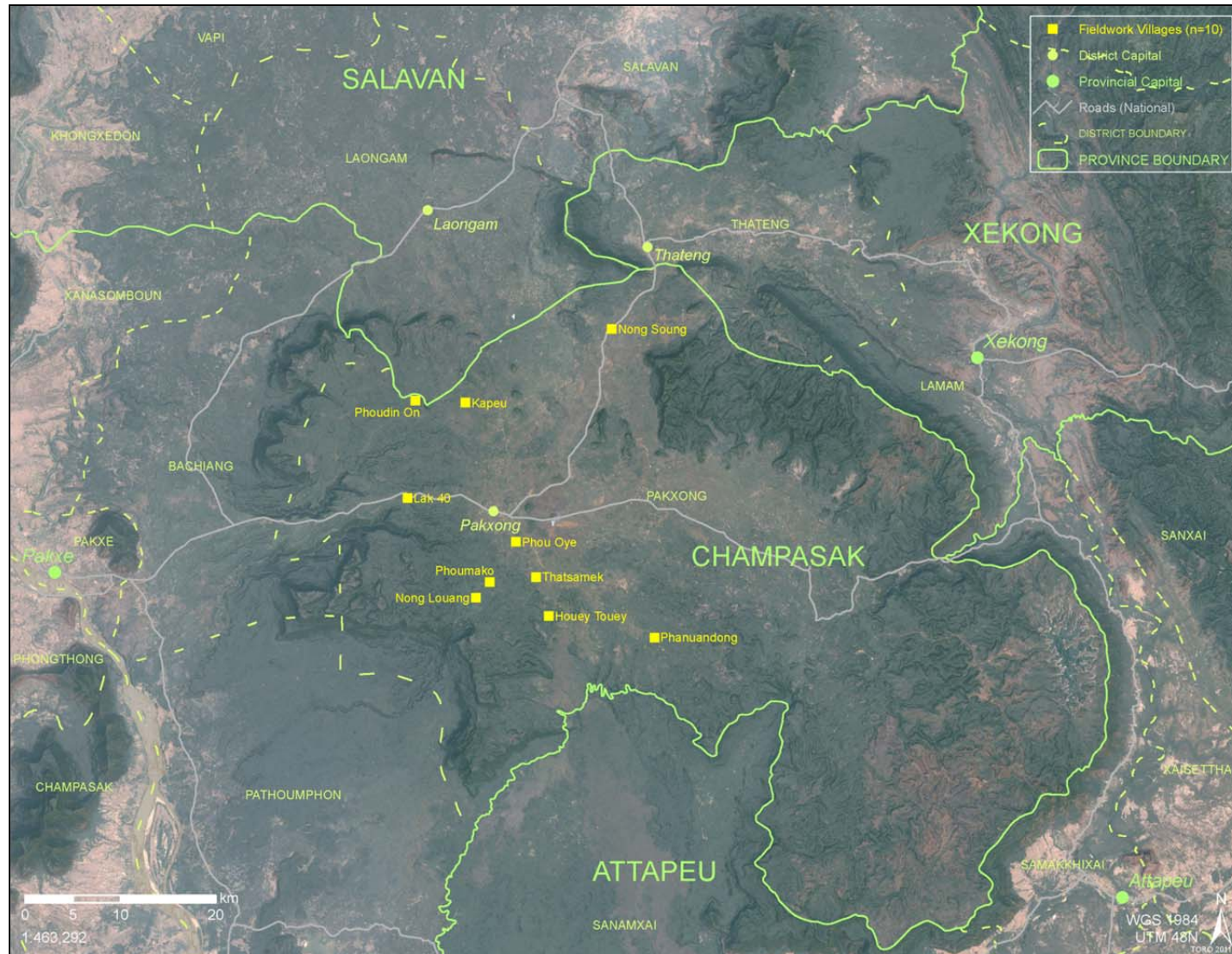
The 10 villages sampled are located in the western/central zone of the Bolaven Plateau region where smallholder coffee production is predominant. All sampled villages are located at relatively high elevations (1002-1312 masl) in Pakxong district (**Table 2**, **Map 5**). Villages were chosen through a non-random selection process based on two criteria: (1) geographic variability, including accessibility of / distance to major roads, and, by extension, to markets⁴⁷; and (2) demographic variability, based on the total number of persons and/or households in each village⁴⁸. Ms. Bouadaphom and I traveled to the villages on a rented motorbike. After determining whether the geographical and demographic characteristics of a particular village warranted inclusion into the sample, she and I would generally move through the village on foot.

Table 2: Elevation, absolute location, and basic demographics of sampled fieldwork villages. *Source:* GPS waypoint and socio-demographic data collected during author's fieldwork; National Statistics Center Village GPS Points, with Basic Socio-Demographic and Socio-Economic Data (NSC 2008).

Village (Ban)	Elevation (masl)	Latitude	Longitude	Number of Households	Total Population	Number of Women	Number of Men
Lak 40	1002	15.1914	106.1443	195	1218	586	632
Nong Louang	1274	15.0962	106.2106	82	472	215	257
Phoumako	1312	15.1107	106.2249	46	261	129	132
Phou Oye	1301	15.1445	106.2479	93	505	250	255
Phanoundong	1034	15.0573	106.3850	186	1422	712	710
Houey Touey	1201	15.0786	106.2817	86	596	296	300
Thatsamek	1283	15.1156	106.2696	43	201	113	88
Nong Soung	1046	15.3508	106.3446	159	840	445	395
Kapeu	1165	15.2817	106.2016	160	960	473	487
Phoudin On	1089	15.2839	106.1524	62	362	185	177
Mean	-	-	-	111	684	340	343

⁴⁷ As perceived by the author and his Ms. Bouadaphom while in the field, based partially on rudimentary maps of the region, motorbike driving distances, and road conditions, among other factors.

⁴⁸ As determined through initial inquiry with the village head(s) and/or other knowledgeable villagers prior to commencing the quasi-survey interviews.



Map 5: Smallholder coffee fieldwork villages in the Bolaven Plateau region. *Source:* Map by author.

Household Sample

The 192 households sampled from within the 10 villages were also selected non-randomly, based primarily on the geographic distribution of households within each village. Fifteen percent (15%) of the total number of households in each village was chosen as the minimum acceptable sample size: no less than 15% of all households in a particular village were interviewed; the maximum of households interviewed in any village is 24%. Among the 10 villages, the average number of households is 111, with a range of 152 (minimum=43; maximum=195); the average number of households sampled in each village is 19 (17%) (**Table 3**).

Table 3: Households sampled in each village.

Village (<i>Ban</i>)	Number of Households	Households Sampled	Percent of Households Sampled
Lak 40	195	34	17.44
Nong Louang	82	15	18.29
Phoumak	46	11	23.91
Phou Oye	93	18	19.35
Phanoundong	186	28	15.05
Houey Touey	86	15	17.44
Thatsamek	43	8	18.60
Nong Soung	159	24	15.09
Kapeu	160	25	15.63
Phoudin On	62	14	22.58
Mean	111.2	19.2	17.27

Figure 12 illustrates the proportion of households sampled from each village in relation to the total household sample (n=192) for all villages. The 8 households sampled in *Ban* Thatsamek account for the smallest proportion (4%); the 34 households sampled in *Ban* Lak 40 account for the largest (18%).

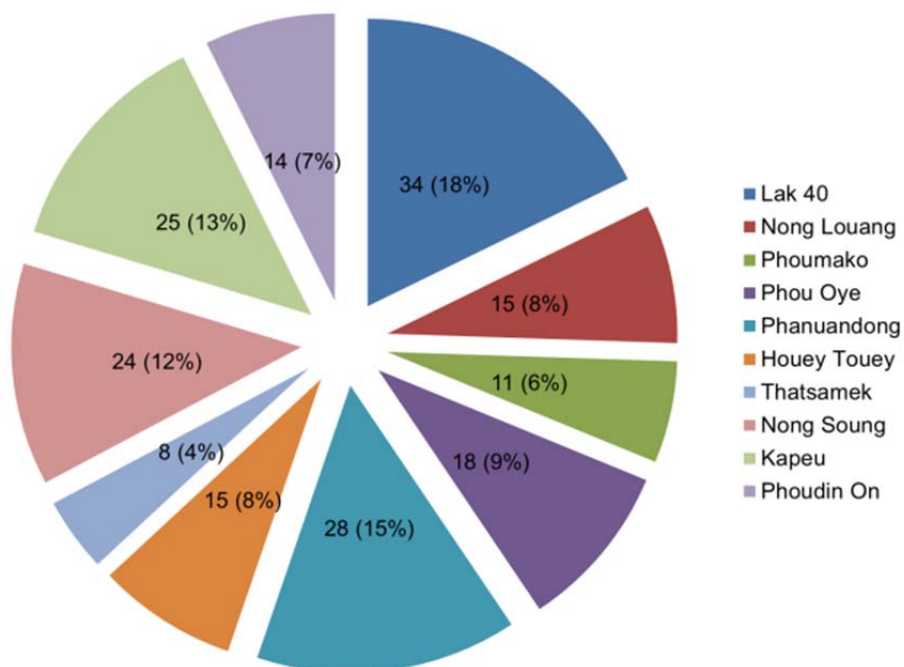


Figure 12: Proportion of households sampled in each village to total household sample (n=192).



Image 15: Soukdavanh Bouadaphom records the responses of Lao wife and husband during a typical household interview session. *Source:* Photograph by author, February 2, 2009.



Image 16: Soukdavanh Bouadaphom and the author interview a Lao father during a typical outdoor interview session. Source: Photograph by Lao child (name unknown), February 24, 2009.

Land-Tenure, Land-Use, Labor, and Income

Land-Tenure and Land-Use

Land-tenure and land-use data derived from inquiry into sampled households' agricultural lands indicate that households in the Bolaven Plateau region hold on average 4.76 ha of land, of which nearly all is productive (4.13 ha / 87 %). Ninety-four percent (94%) of that productivity is concentrated on coffee cultivation. Robusta coffee occupies on average 69% of coffee among sampled households; Arabica the other 31%. A small average (6%) of productive smallholder lands is used for non-coffee agriculture, often for vegetable gardens for subsistence purposes. Sampled villages have on average 0.64 ha of forested or otherwise uncultivated land (constituting an average of 13% of all land owned by the households). These tenure/use data are summarized in **Table 4**.

Table 4: Tenure and use of lands by households within Bolaven Plateau smallholder villages. *Source:* Primary data collected during author's fieldwork.

Village (Ban)	Mean of 10-Village Sample of Bolaven Plateau Households (n=192)								
	Arabica Coffee Land (ha)	Robusta Coffee Land (ha)	Total Coffee Land (ha)	Other Agriculture Land (ha)	Total Productive Land (ha)	Coffee Land / Productive Land Ratio	Forest or Uncultivated Land (ha)	Total Land (ha)	Coffee Land / Total Land Ratio
Lak 40	1.00	3.37	4.37	0.03	4.40	0.99	0.09	4.49	0.97
Nong Louang	1.33	3.08	4.42	0.00	4.42	1.00	0.00	4.42	1.00
Phoumako	1.41	1.95	3.36	0.07	3.44	0.98	0.00	3.44	0.98
Phou Oye	2.22	2.94	5.17	0.06	5.22	0.99	0.75	5.97	0.87
Phanoundong	0.45	2.48	2.94	0.13	3.07	0.96	1.15	4.22	0.70
Houey Touey	1.06	1.55	2.61	0.15	2.76	0.95	0.75	3.51	0.74
Thatsamek	1.56	1.50	3.06	0.10	3.16	0.97	0.69	3.85	0.80
Nong Soung	0.40	0.97	1.37	1.29	2.65	0.51	1.04	3.70	0.37
Kapeu	1.64	2.98	4.62	0.17	4.79	0.96	1.08	5.87	0.79
Phoudin On	2.35	5.29	7.64	0.20	7.84	0.97	0.18	8.01	0.95
Mean of Means	1.22	2.67	3.89	0.25	4.13	0.94	0.63	4.76	0.82

Labor and Income

Labor and income data indicate that an average of 6 persons reside in each coffee household. On average, approximately 3 of the persons residing in each household actively contribute their labor to the farming activities of the household, meaning that about half of the household members are available as agricultural workers. For each hectare of *productive* coffee land, approximately 0.84 (~1) persons contribute to the cultivation, maintenance, and harvest of that land. This ratio is slightly lower (0.79) when looking at the number of agricultural workers in each household in relation to the *total* number of productive hectares owned by that household.

Based on the household data reported for the 2008 harvest season, and using 2008 currency values, income for sampled households range from approximately K6.7 million (~\$780)⁴⁹ in *Ban Houey Touey* to approximately K30.5 million (~\$3,550)⁵⁰ in *Ban Phou Oye*. Average household income for sampled households in all villages is approximately K19 million (~\$2,220). Income variability between villages is attributable partially to the location of each household in relation to the road, and therefore market, network. Villages located along major (paved) roads have better market access; these villages are generally more exposed to and oriented toward coffee trading circuits in the Bolaven Plateau region and beyond. Household labor and income data are summarized in **Table 5**.

Coffee, Credit, Debt

It has been established that coffee production is a central feature of smallholder livelihoods in the Bolaven Plateau region. Credit and debt are also major elements of Lao

⁴⁹ Or about \$2.15/day (\$785/year) for the entire household, which, in this particular village (*Ban Thatsamek*) averages about 6.73 people per household, or \$0.32/person/day.

⁵⁰ Or about \$9.75/day (\$3560/year) for the entire household, which, in this particular village (*Ban Phou Oye*) averages about 5.28 people per household, or \$1.85/person/day.

Table 5: Household labor availability and income for Bolaven Plateau smallholder villages. *Source:* Primary data collected during author's fieldwork.

Village (Ban)	Mean of 10-Village Sample of Bolaven Plateau Households (n=192)							
	People in Household	Workers in Household	Worker/People Ratio	Worker / Coffee Land Ratio	Worker / Productive Land Ratio	Worker / Total Land Ratio	Income (2008 Harvest, LAK)	Income (2008 Harvest, USD) ⁵¹
Lak 40	6.06	3.50	0.58	0.80	0.80	0.78	24,823,529K	\$2,894
Nong Louang	5.53	2.87	0.52	0.65	0.65	0.65	13,000,000K	\$1,516
Phoumako	6.27	3.91	0.62	1.16	1.14	1.14	14,181,818K	\$1,653
Phou Oye	5.28	3.11	0.59	0.60	0.60	0.52	30,527,778K	\$3,559
Phanoundong	6.54	3.04	0.46	1.03	0.99	0.72	13,571,429K	\$1,582
Houey Touey	6.73	2.80	0.42	1.07	1.01	0.80	6,733,333K	\$785
Thatsamek	6.00	3.38	0.56	1.10	1.07	0.88	9,625,000K	\$1,122
Nong Soung	4.96	3.04	0.61	2.23	1.15	0.82	14,416,667K	\$1,681
Kapeu	7.32	3.64	0.50	0.79	0.76	0.62	23,900,000K	\$2,786
Phoudin On	6.43	3.64	0.57	0.48	0.46	0.45	29,285,714K	\$3,414
Mean of Means	6.13	3.28	0.54	0.84	0.79	0.69	19,041,667K	\$2,219

⁵¹ The conversion of mean household income for the 2008 harvest from LAK to USD is based on historical currency exchange rates between January 1, 2008 and December 31, 2008. The average daily currency bid (sell) rate for USD/LAK during this period was: 8,577.41 (OANDA 2012).

coffee smallholder life (Duris et al. 2002, Thawaensimphet et al. 2003, Galindo & Sallée 2007, Tulet 2009).

Typology of Smallholder Loans

Bolaven Plateau smallholders have access to four main types of loans, classified by creditor type:

- *formal* loans from public institutions,
- *informal* loans from private traders,
- *informal* loans from family members, and
- *formal* loans from private institutions.

One of the most fundamental features of this typology is that the predominance of each creditor type has evolved over time: formal public loans were most prevalent in the mid- and late-1990s; since the early-2000s, informal trader loans have become dominant, and strikingly so; informal family loans began in the late-1990s, and have been steadily increasing since then; formal private loans are a relatively new phenomenon and have started to become common in the region only since the late-2000s. These four loan types are presented in this order, and some of the reasons for this temporality explained.

Formal Loans from Public Institutions

Formal loans from public institutions refer primarily to loans issued by the Agriculture Promotion Bank.⁵² The APB was established in Laos in 1993 as “a state-owned policy bank, and has since been considered as the country development bank, focusing on the agricultural sector. [. . .] APB is the main public instrument in rural finance” (APB 2011). The Pakxong district branch opened in 1995.

⁵² In this work, formal loans from public institutions can also refer to loans issued by the Lao Development Bank, and Lao-Vietnamese Government Cooperation Bank.



Image 17: A Lao smallholder farmer presents his Agriculture Promotion Bank loan booklet. Many smallholder households possess such blue loan booklets documenting the details of their debt with the public bank. *Source:* Photograph by author, March 20, 2009.

Periods of heightened APB lending are documented for 1995, markedly so for 1998/1999, and for 2003 (**Figure 13**). The first two of these periods – 1995 and 1998/1999 – correspond roughly to fund disbursements as part of the rural credit component of the World Bank’s Upland Agriculture Development Project: a tranche of \$200,000 was disbursed in November 1994, and another of \$681,000 was disbursed in January/February 1996. Proceeds from these two disbursements were used for sub-loans to farmer groups in the Bolaven Plateau region provinces of Champasak, Salavan, and Xekong (WB 1998). These funds were injected into the Lao coffee chain through a multi-faceted lending scheme executed through the various district-level APB branches, particularly that in Pakxong. The World Bank also reported the ‘demonstration effect’ its

UADP activities were having in the region, stating that: “the APB is also lending to coffee farmers outside the project” (WB 1998: 6). Indeed, according to one report (Thawaensimphet et al. 2003: 22), the APB made available K11 billion (\$3.25 million) in credit to coffee producers in 1998/1999, some of which necessarily came from non-UADP funds.

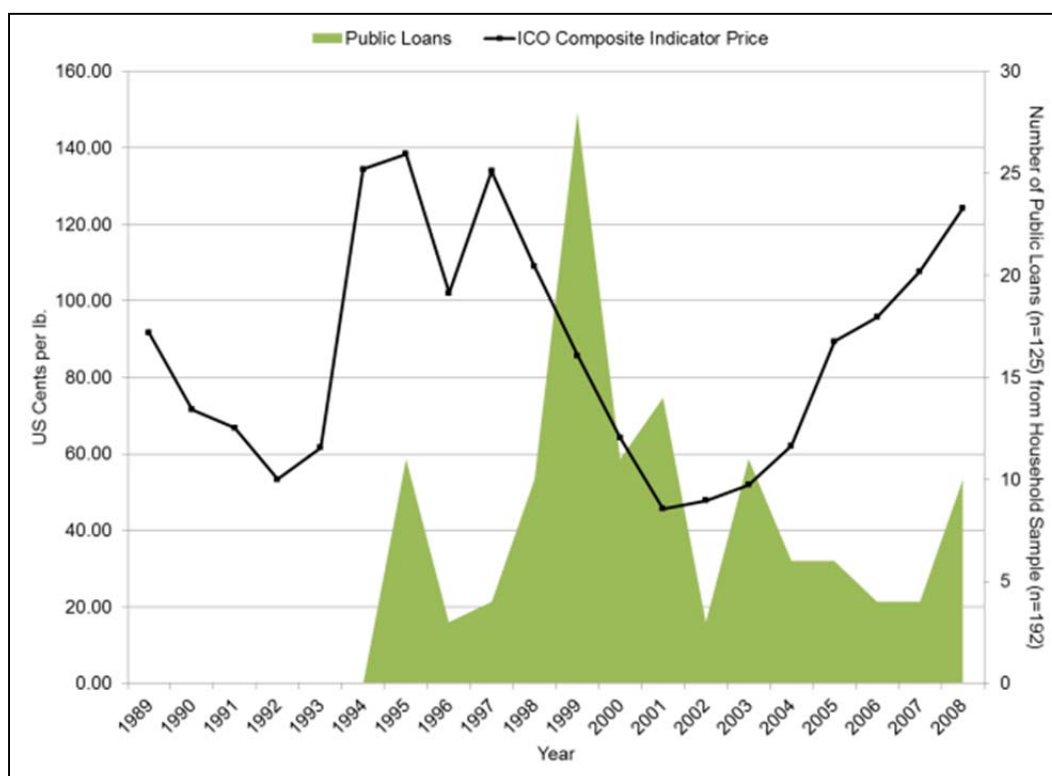


Figure 13: Sampled public smallholder loans (n=125) in relation to the global coffee price, 1989-2008. *Source:* Loan data collected during author’s fieldwork; International Coffee Organization composite indicator price data from ICO (2012b).

In the mid-1990s – the beginning of APB lending in the region – farmers could borrow bags of rice, fertilizer, basic farming equipment like barbed wire (all at subsidized prices), and money. In most cases, a village head would serve as the legal representative of a group of borrowers – typically consisting of 5-10 villagers – and would be

responsible for assuring the bank that the represented villagers were credible borrowers.

No collateral was needed to enter into a loan with the bank during this early period.



Image 18: An extended Lao family displays an account booklet and several receipts for payments made on APB-issued loans. Source: Photograph by author, February 6, 2009.

Based on 125 public loans⁵³ sampled from the comprehensive debt histories of 192 households, interest rates for public loans range from 6.50-39.00% per year (0.54-3.30% per month). The average rate is 1.52% per month. These rates fluctuated significantly during the period represented by the data, with rates being the highest in 1997, the same year coffee prices spiked (**Figure 14**).

⁵³ These 125 public loans include 12 from the Lao Development Bank and one (1) from the Lao-Vietnamese Government Cooperation Bank. The other 112 came from the Agriculture Promotion Bank.

Controversial Interest Rates at the Agriculture Promotion Bank

A large number of Bolaven farmers who have borrowed from the bank claimed that it charged an interest rate of 30% per year (2.5% per month) for its early loans. This claim is common among interviewed farmers. They produced APB-issued account booklets detailing the terms, conditions, balances, and payments of their loans with the bank (see, e.g., **Image 17**, **Image 18**, and **Image 19**).

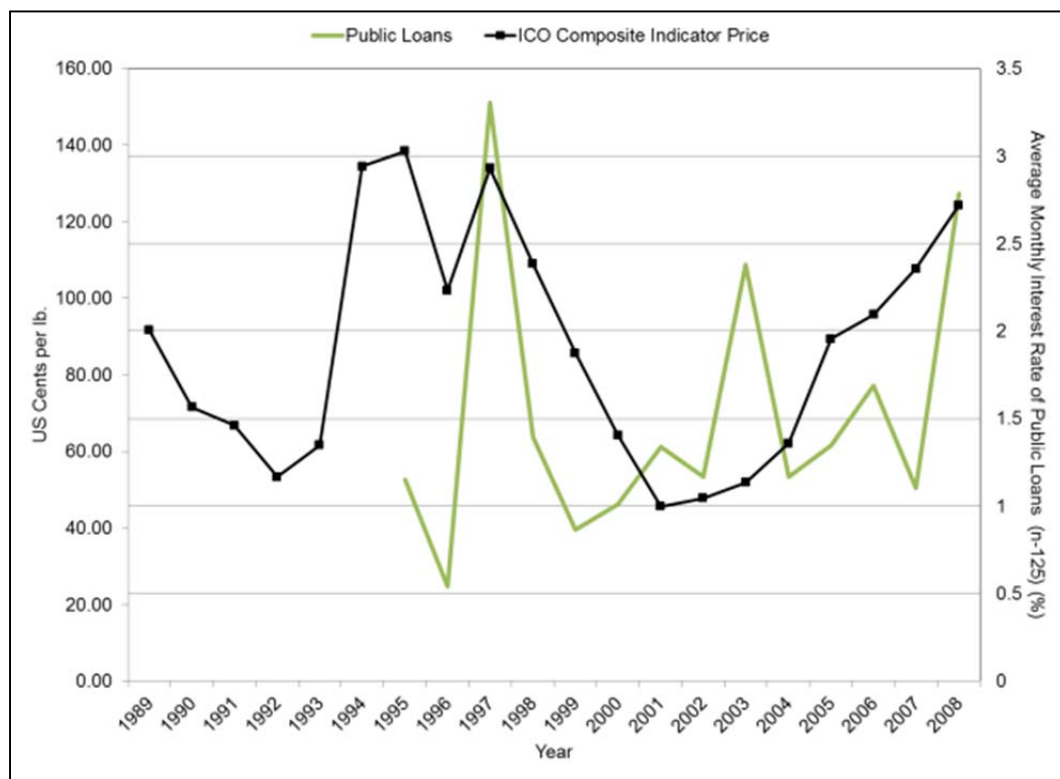


Figure 14: Average monthly interest rate of sampled public smallholder loans (n=125). *Source:* Loan data collected during author's fieldwork; International Coffee Organization composite indicator price data from ICO (2012b).

During an interview with the manager of the Pakxong APB, he dismissed the farmers' claims as simply untrue. Upon further questioning, though, and after insisting that I had seen many villagers' loan booklets with 30% rates, he modified his position. He explained that the rate of 30% was imposed only on those borrowers who were

actively engaged in trading activities.⁵⁴ When I correspondingly inquired about the numerous claims by farmers that they had received rates of 14-30% per year from the APB, the manager clarified:

The Agricultural Promotion Bank separates interest rates based on the types of activities for which the monies are used. . . . Rates of 30, 26, and 22 – which are very rare – apply only to traders and people in the service sector. Rates of 14, 12, and lower apply to farmers.



Image 19: Account booklet for Agriculture Promotion Bank public loan. Note the 30% interest rate for the K10.5 million loan. To maintain the borrower's anonymity, information such as the dates and amounts of payments are concealed. *Source:* Photograph by author, February 9, 2009.

Complaints Against and Alleged Malpractice at the Agriculture Promotion Bank

Many farmers claim to have had bad experiences with the APB. For instance, one farmer from *Ban Lak 40* complained that he had been pressured by an APB official to take a loan with the bank. He claimed that, although he did in fact need the money, he

⁵⁴ Thawaensimphet et al. (2003: 11) confirm that the prior APB loan rate for “unharvested coffee” was indeed 30%. Their report also suggests that a rate of 30% no longer applies to producers borrowing against unharvested coffee, but rather only to “trade-related activities”.

was initially very reluctant to borrow from the bank because he feared he would be unable to pay the interest. However, upon listening to the exhortations of a bank official – who insisted that the price of coffee (which at the time was relatively high) would either remain high or increase – he felt more comfortable to borrow from the bank. He went on to say:

The way the bank works is not fair. When I took out the loan, the price of coffee was much higher, but now the price of coffee has dropped and it is more difficult to repay the loan. I thought they [the APB officials] knew more than me; I trusted them.

During the boom in coffee prices, it seems the APB provided many coffee growers with highly optimistic market forecasts, despite the notorious volatility in the world market price for coffee.



Image 20: The Pakxong branch Agriculture Promotion Bank. *Source:* Photograph by author, March 17, 2009.

Others complain about nepotism in the APB and how access to the bank's credit options is limited only to those who have friends or relatives working in the bank. A woman from *Ban Phou Oye* protested:

You must know somebody in the bank in order to get a loan. It is very hard to get a loan if you do not know anybody in the bank. When the people from the bank come to get money from us [the village borrowers], then you should invite them into your home to come drink *lao lao* [rice whisky] and eat food. You should be very friendly with them so they can help you. They can make it easy for you [to get a loan].

Another farmer (who for the previous nine years had borrowed from a trader just as many times) echoed this sentiment when he responded to my question about why he had never tried to borrow from the APB: "I don't know how to borrow from the APB. And I don't know anyone from the APB who can help me." Another common smallholder complaint against the APB is the claim that the bank employs extremely misleading and/or complicated contracts and terms.

Agriculture Promotion Bank Restructuring and Retroactive Debt Collection

The most common complaint about the APB's practices center on the bank's recently reformed debt collection policies. A 2009 interview with the branch manager of the Pakxong district APB corroborates the implication made by many farmers that the APB's collection tactics had recently become more draconian. Because the vast majority, if not all, early loans were made without collateral, the APB had no real enforcement mechanism or bargaining power to ensure that borrowers repaid. Bank officials claim the bank sustained severe financial losses as the number of defaulted loans began to grow. Indeed, the APB itself reports that:

In 2002, a diagnostic study that included the first external audit of APB found that 88% of APB [loans] were non-performing. The bad financial situation resulted from a lack of profit orientation, poor lending

mechanisms, and weak provisioning. APB entered in 2003 in a formal phase of restructuring, including phasing out of policy and subsidised lending, adoption of market-based principles, improvement of lending policies, recapitalisation and strengthening of information systems and management capabilities (APB 2011).

According to the APB Pakxong branch manager, around 2007/2008, in compliance with the instruction and authorization of the Central Bank of Laos and provincial and district officials, the APB began a campaign to recuperate its losses by proclaiming and asserting its authority to induce repayment by confiscating their property titles. Many allege that APB officials would enter the villages and threaten families with taking away their houses, land, vehicles, or some combination thereof. As of the first quarter of 2009, this strategy has supposedly been successful. The Pakxong branch APB manager claimed that the more aggressive collection policy has motivated the borrowers of defaulted loans to finally begin to pay-off, or finish paying-off, their bad debts. He went on to state that as of early 2009, approximately 70% of defaulted loans had now been collected because of the new policy.

This claim is supported by borrowers on the other end of the new collection policy too, but not in the same positive way. One farmer in *Ban Lak 40* who had borrowed from the APB in 1995, and failed to repay on time, grumbled:

When I first borrowed [from the APB], it was easy; they made it easy. But now they've made it so difficult because they come and put pressure on us by taking land titles. Now, in 2009, they take land titles for loans from 1995! . . . If they really want to help people, they mustn't take such high collateral from us.

Sharing his own perspective on borrowing from the APB in the late-2000s, a farmer from *Ban Nong Louang* commented: "It's now difficult to borrow from the bank [APB]. We must have collateral, but we are poor and don't have enough."



Image 21: An agent of the Agriculture Promotion Bank comes to collect a loan payment from a smallholder borrower. *Source:* Photograph by author, February 9, 2009.

Nearly all villagers who had ever borrowed from the APB were asked whether they thought the public bank works – as it was created to work – for the benefit of the people. The response of one rather indignant producer from *Ban Lak 40* was:

They [the APB and its officials] say they want to help people but the way they ‘help’ us is by getting money from us. They don’t help people; they eat people!

Another producer from *Ban Phoumako* echoed the same sentiment (with a bit less hyperbole): “The bank doesn’t help people for free. The bank helps people by first helping itself.”

Thus, while the new collection policy may have been successful at collecting old debt, it has been detrimental in its fostering of antagonism between the producers – in whose interest the APB is intended to work – and the bank itself. While not all

respondents were uniform in their discontent with the bank's policies and practices, there is undoubtedly an overall trend of anti-APB sentiment among the majority of interviewed coffee farmers.

Informal Loans from Private Traders

Between the months of January and March, when farmers are busy selling their harvested coffee to various collectors and traders, there is generally no fear of immediate financial insecurity. During this time, farmers earn highly anticipated cash payments for the coffee they were able to produce and sell; this is when coffee-growing families earn the overwhelming majority of their annual household incomes. As the year progresses, though, the cash earned from the harvest disappears as it is gradually exchanged primarily for food (rice), and secondarily school supplies and medicine. What results is a “rice-gap period” coinciding with the end of the rainy season, from June to September (Galindo & Sallée 2007: 48). Informal loans from traders are usually taken during these months. Some farmers also borrow from traders in the months immediately preceding the harvests, even as late as November, only after they have been able to properly evaluate the anticipated size of their respective harvests, and are confident of their ability to repay the amount borrowed.

I don't want to borrow money. Who wants to borrow money? But if there's no food, and if I can't look for work because I'm too busy working my own land, what can I do? I must borrow from the traders (Interviewed Lao coffee smallholder, February 2009).

As explained by Galindo and Sallée (Galindo & Sallée 2007: 69), farmers often sell ‘green coffee’⁵⁵ (referring to the fact that the cherries are still green and growing on

⁵⁵ In Lao language, ‘*café khiaw*’ (Galindo & Sallée 2007: 69).

the trees when the transaction is made) in return for cash as a pre-harvest loan. These pre-harvest loans are executed in two main ways:

- (1) farmers borrow money at an interest rate set by the trader/lender, and
 “[t]here is a tacit agreement that farmers will sell most of their coffee to the lender” (Galindo & Sallée 2007: 70).
- (2) farmers borrow money and agree to repay in coffee (not with money),
 at a pre-set price determined by the trader/lender. “The price is always set below the market price at the moment of the selling (in most cases it is half the market price)” (Galindo & Sallée 2007: 70).

When asked, most producers who actively borrow money every year say that they strongly prefer entering into informal loan arrangements with traders than into formal loans with the public APB. This is despite the extortionate interest rates imposed by traders, which are significantly higher than those of the APB. Among the 289 trader loans sampled from the 192 households, the average interest rate is 111.12% per year (9.26% per month)⁵⁶ (**Figure 16**).

Advantages to Borrowing from Traders

For most families, securing a loan from a trader is the fastest and simplest route to securing the funds needed to pay for food and cover other critical domestic needs. Typically no contract is signed, no collateral is required⁵⁷, and no permission or authorization from the village head is obtained. Perhaps the most important factor that

⁵⁶ Comparably exorbitant rates have been confirmed in other sources too: “[N]early all small-scale producers can only access the informal loan sources, which usually have an [annual] interest rate of at least 100 percent” (Thawaensimphet et al. 2003: 24). “[F]armers can either reimburse in money (actually they reimburse while selling coffee, at market’s price and with monthly interest rates ranging from 15 to 25%) or in coffee, with no interest rate but with a selling price which is about half the average market price” (Sallée 2007)

⁵⁷ Although, Galindo and Sallée (Galindo & Sallée 2007: 70) report that “[I]n some cases it happens that the buyer takes livestock or farmer’s assets (motorbike, etc.) as a guarantee.

makes traders a more preferred source of credit is their role as coffee collectors. Most producers do not own the means of transportation necessary to independently move their coffee out of their respective villages to access buyers (wholesalers and exporters).⁵⁸ Because traders possess an appropriately large vehicle, they are typically the ones responsible for transporting coffee to the nearest district capitals of Pakxong, Laognam, or Thateng, or to Pakxe. Traders buy/collect other farmers' bagged coffee and then sell the aggregated loads to higher level traders (wholesalers) in one of these market centers, or directly to an export company. Traders are thus essential in supporting the livelihoods of farmers not solely because of their lending activities, but because they offer producers an outlet through which to sell their coffee. They act as that critical link in the commodity chain which moves coffee from growers to merchants. Moreover, producers borrow from traders/collectors who often live in the same or a nearby village, so there is often a preexisting, personal relationship between borrowers and lenders. "The collectors know the farmers well and have longstanding links with the wholesalers and exporters for whom they work" (Duris et al. 2002: 71).

Traders also offer producers an unmatched degree of expediency when providing cash payment for coffee. When asked about his rationale for not selling to a producers' group (at a much higher price per unit of coffee), one farmer from *Ban Phoumako* responded:

This year I sold to a trader because I did not produce a lot [of high quality coffee], and I can get money much faster by selling to a trader. I know the price isn't good, but if I sell to the [producers'] group, it will take such a long time [to receive payment]. I have to sell to the trader to get money quickly and buy medicine for my family.

The fact that those same traders offer reliable sources of loan monies provides a sense of short-term security for farmers who, without access to such loans, struggle to pay for basic necessities, especially during the off-harvest season. Additionally, not only can traders offer cash payment for coffee quickly, but they can also provide cash for loans just as quickly. In times of a medical emergency, or even for the sake of holding important social functions (e.g., weddings), producers are dependent on fast cash from traders. Farmers' desperation to pay for domestic expenses and, more often than not, maintain good informal credit leaves them willing to accept prices below those to which an alternative, more lucrative strand of the Lao coffee commodity chain would otherwise entitle them.

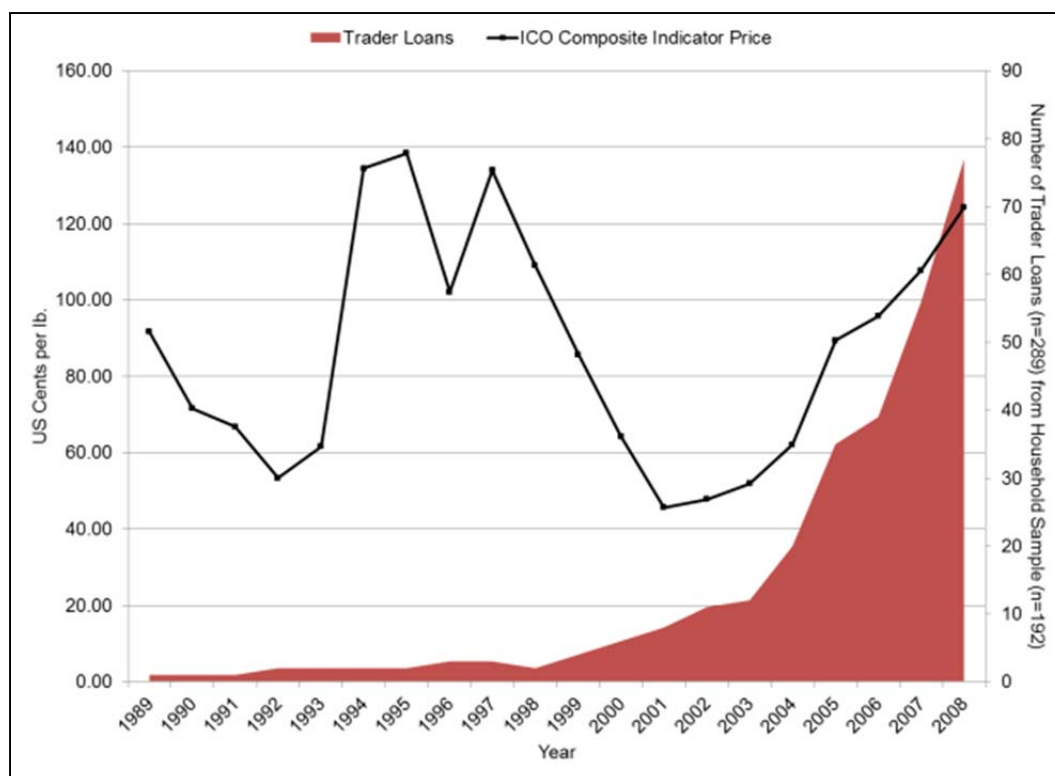


Figure 15: Sampled public loans (n=289) in relation to the global coffee price, 1989-2008. *Source:* Loan data collected during author's fieldwork; International Coffee Organization composite indicator price data from ICO (2012b).

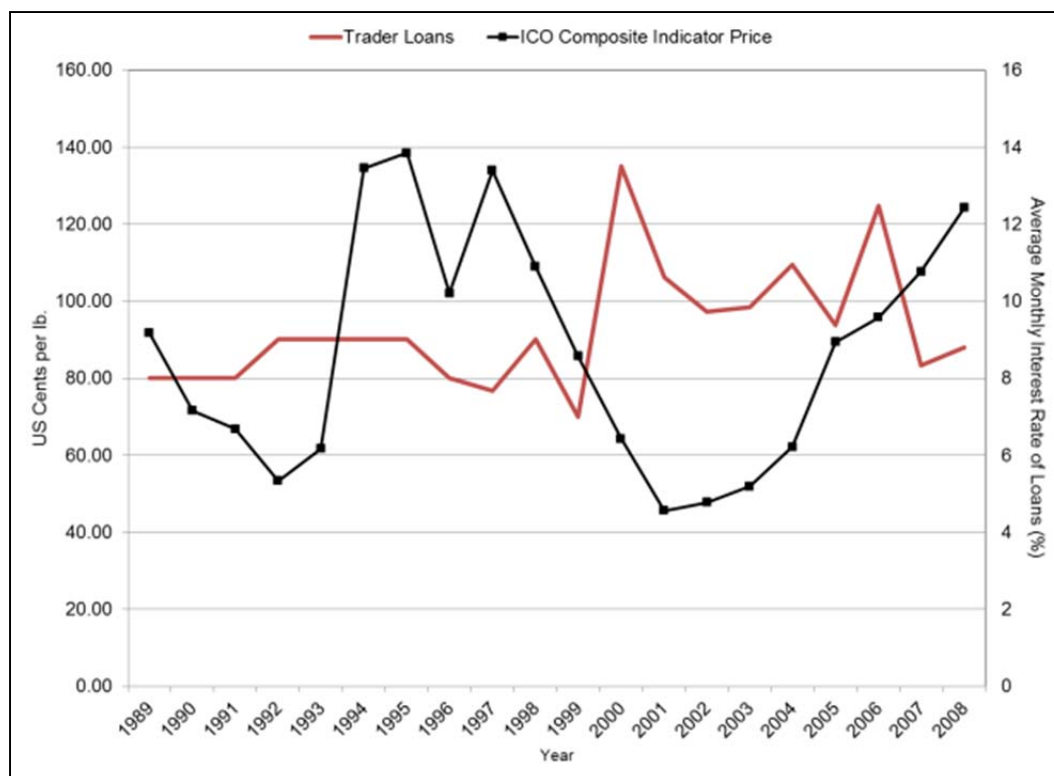


Figure 16: Average monthly interest rate of sampled trader loans (n=289). *Source:* Loan data collected during author's fieldwork; International Coffee Organization composite indicator price data from ICO (2012b).

Almost all of those farmers interviewed said that this was their least preferred method of repayment, but the only one at their disposal. As Galindo and Sallée (2007: 48) summarize: “Thanks to credit, wholesalers have a certain security on coffee supply. Loans are granted based on the trust between the wholesaler and the producer. This is why their good knowledge of farmers is a key aspect.”

Loans from Family

The underlying prerequisite for borrowing from family members is that they have available funds to offer to as loans in the first place, which is indeed quite rare. Informal loans taken out with family members carry the least regular/systematic terms and conditions. When such loans are taken out with family member, the terms of borrowing are unpredictable, and typically not as altruistic as one might expect, considering the

source. Oftentimes, family members charge interest for the loans they grant, typically less than, but sometimes rivaling, the rates offered by traders (**Figure 18**).

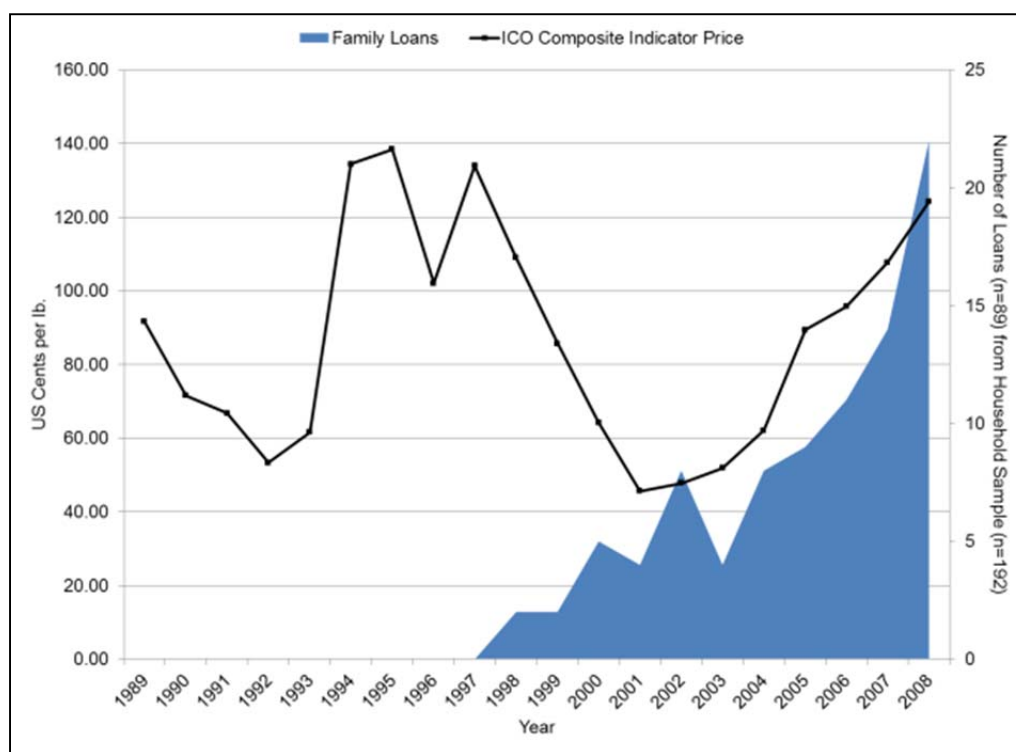


Figure 17: Sampled family loans (n=89) in relation to the global coffee price, 1989-2008. *Source:* Loan data collected during author's fieldwork; International Coffee Organization composite indicator price data from ICO (2012b).

Loans from Private Institutions

A new type of loan source is expanding in Laos: formal loans from private commercial banking institutions. During a visit to *Ban Phoudin On*, a group of about 10 men were gathered together in the home of the village head. Each individual in the group was copying a hand-written contract template which each needed to personalize and submit in order to apply for a loan from the just-opened Phongsavanh Bank in Pakxe (**Image 22**).

As reported by the men in the group, Phongsavanh Bank had, prior to its grand opening, sent representatives throughout various villages to distribute flyers promoting its

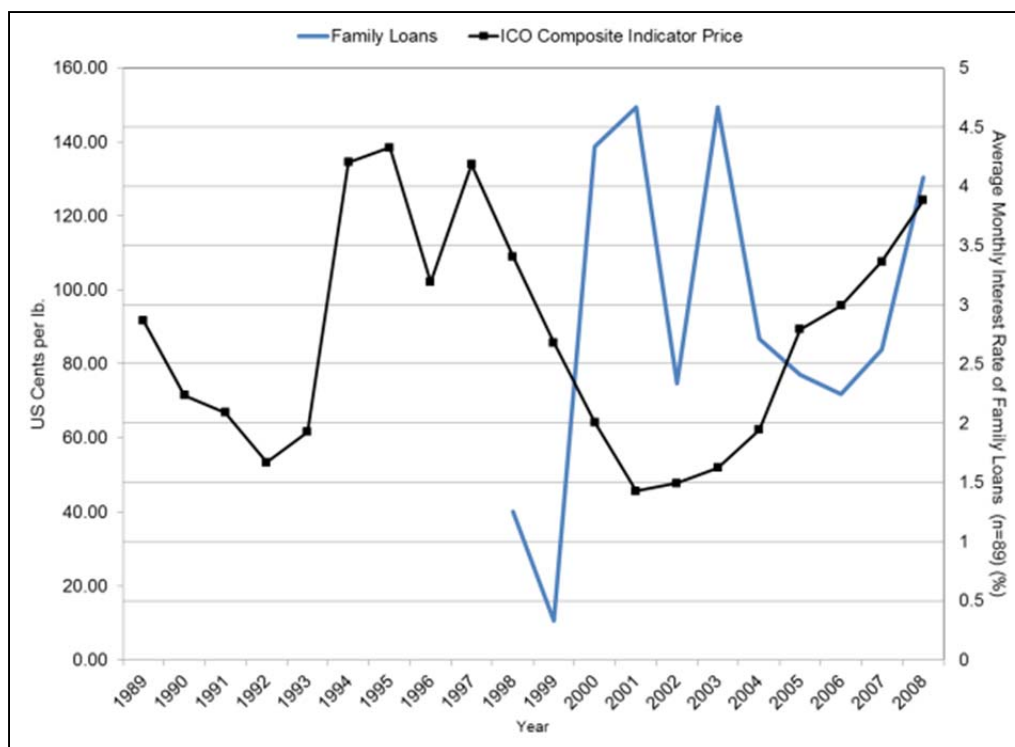


Figure 18: Average monthly interest rate of sampled family loans (n=89). *Source:* Loan data collected during author's fieldwork; International Coffee Organization composite indicator price data from ICO (2012b)

new loan programs. The flyers highlighted the bank's comparatively low interest rates of 15% per year. The farmers – most of whom still have outstanding debt with the APB from the mid- and late-1990s, and most of whom have regularly borrowed from traders in the preceding several years – expressed excitement about the bank's advertised interest rates. When compared with the lowest rates offered by trader loans (5-8% per month), the prospect of private bank loans at 1.25% per month is enticing. Among the 192 households interviewed, none had ever taken out a formal loan with a private commercial entity; hence, no quantitative data were collected on these types of loans.

As Lao PDR becomes increasingly engaged with the capitalist economy – with all of the new legal and financial systems needed to facilitate market-based transactions – a corresponding investment in the financial services sector will inevitably follow. One would expect, then, that an increase in the number of



Image 22: Phongsavanh Bank, a private commercial bank in Pakxe. This photograph was taken shortly after the bank's grand opening. *Source:* Photograph by author, March 26, 2009.

private commercial banking institutions will give way to greater competition amongst such firms, thereby increasing the range of credit options available to smallholder coffee farmers in the Bolaven Plateau region (and throughout the entire country more generally). The current and future impacts of smallholder credit provision by private institutions in the Bolaven Plateau (and in Laos as a whole) warrant further examination.

The Evolution of Smallholder Credit Sources

As illustrated by **Figure 18**, the market for credit – both formal and informal – is expanding in the Bolaven Plateau region. The share of formal loans being taken out with the Agriculture Promotion Bank and other public institutions has decreased since 2002. However, the proportion of informal loans granted by traders has increased exponentially

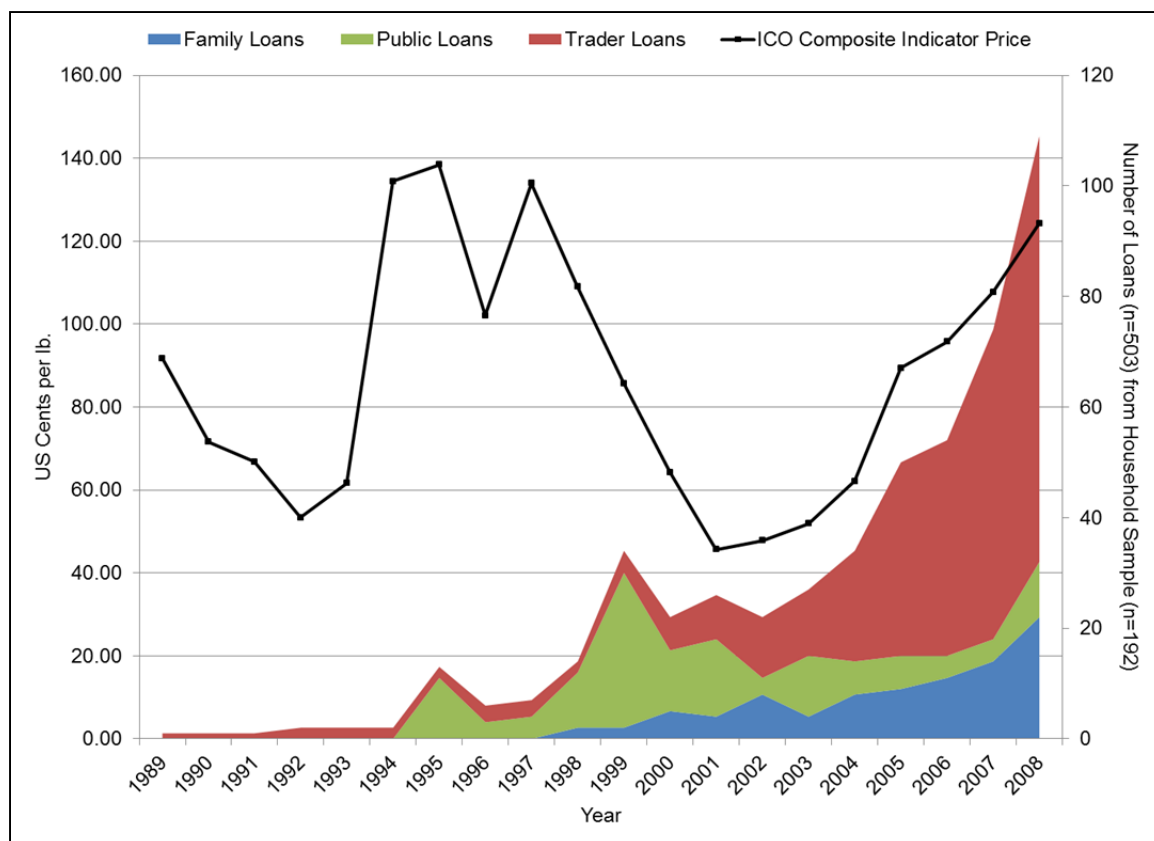


Figure 19: Quantity and type of all documented smallholder loans (n=503) in relation to the global coffee price, 1989-2008. *Source:* Loan data collected during author's fieldwork; International Coffee Organization composite indicator price data from ICO (2012b).

since 2002 as well. Loans brokered by coffee traders/collectors are overwhelmingly dominant. Money lent by family members has also been on the rise since the late-1990s.

Informal Credit Substituting for Formal Credit

As described above, the greatest concentration of public loans from the Agriculture Promotion Bank were issued in the mid- and late-1990s, corresponding with the rural credit component of the World Bank's Upland Agriculture Development Project. According to the World Bank, the UADP was cancelled because "the AP[B]'s^[59] operations [were] constrained by its limited power to mobilize funds and its lack of authority to set its interest rates" (WB 1998: 32). The APB's mid- to late-2000s

⁵⁹ There was an obvious typo in the World Bank's 1998 Implementation Completion Report for the UADP, which, in this particular instance, erroneously abbreviated the Agriculture Promotion Bank as 'APM'.

restructuring of its operations toward a more private-sector-based banking model suggest that this may have indeed been the case. For whatever reason, it is clear that the rural credit component of the UADP, as well as the APB's non-UADP operations in the late-1990s and early-2000s were generally unsuccessful for the bank. Perhaps the most detrimental failure of the APB, though, was its fostering of antipathy and distrust among the rural populations it is intended to serve.

Smallholder Credit and the Global Coffee Crisis

Also depicted by Figure 18 is the discernible relationship between the market for smallholder credit in the Bolaven Plateau region and the global price for coffee. Simple bivariate Pearson correlations were run in Statistical Package for Social Science (SPSS) software to quantify the strength of this relationship. Significant positive correlations were found between the ICO composite indicator price and the quantity of trader loans (.868), family loans (.780), and total loans (.914) reflecting 1999-2008 (**Table 6**). These correlations are slightly stronger from 2000-2008 (**Table 7**).⁶⁰

Table 6: Correlations between the quantity of smallholder loans by loan type and the ICO composite indicator price, 1999-2008. Shaded correlations indicate significance at the 0.01 level (two-tailed).

	Public Loans	Trader Loans	Family Loans	Total Loans
ICO Composite Indicator Price	-.048	.868	.780	.914
Significance Level (Two-Tailed)	.895	.001	.008	.000

⁶⁰ Identical correlations were run for all preceding years represented in the loan/debt dataset (whose earliest loan observation was in 1989). However, only from 1998 forward were any significant correlations found. Correlations run with data for 1998-2008 found only trader loans (.669) and total loans (.692) as being statistically significant (at the 0.05 significance level) with the ICO composite indicator price.

Table 7: Correlations between the quantity of smallholder loans by loan type and the ICO composite indicator price, 2000-2008. Shaded correlations indicate significance at the 0.01 level (two-tailed).

	Public Loans	Trader Loans	Family Loans	Total Loans
ICO Composite Indicator Price	-.286	.961	.902	.944
Significance Level (Two-Tailed)	.455	.000	.001	.000

These correlations indicate that a relationship – although an admittedly non-causal relationship – exists between the global coffee crisis and its recession and its recession, and the expansion of the smallholder credit market in the Bolaven Plateau region. Of the three loan types for which quantitative data were collected – (1) formal formal loans from public institutions, (2) informal loans from private traders, (3) and informal loans from family members) – this relationship is strongest for informal loans brokered by traders.

These data suggest a particular evolution of smallholder credit in the Bolaven Plateau region. Concurrent with and immediately following the introduction of rural credit to the region via the Upland Agriculture Development Project, the Agriculture Promotion Bank was the primary source of smallholder credit in the region. As the global coffee crisis hit and farmers began to default on their APB loans – effectively losing their access to formal sources of credit – they began to rely on alternative credit sources. Recognizing the potential profitability of the newly established smallholder credit market, Lao coffee exporters began to inject their own capital into the sector, enjoining coffee traders to not only buy and collect coffee on their behalf, but to broker loans on their behalf too. Even family members began to lend to each other. Smallholder credit has thus evolved to be a central feature of life in the Bolaven Plateau region.

Labor-Capital Relations of the Bolaven Plateau Region

These data also suggest the operation of a class-based, patron-client dynamic operating in the Bolaven Plateau region. The Lao coffee chain elite, exporters, gain their capital through their oligopolistic dominance over the Lao coffee commodity, and thereby control the early stages of the Lao coffee commodity chain. Exporters systematically use this capital to underwrite loans brokered and administered by traders to producers. In this way, exporters ensure regular control over annual coffee supplies for export and maintain their relative prosperity as the main value-capturing agents in the

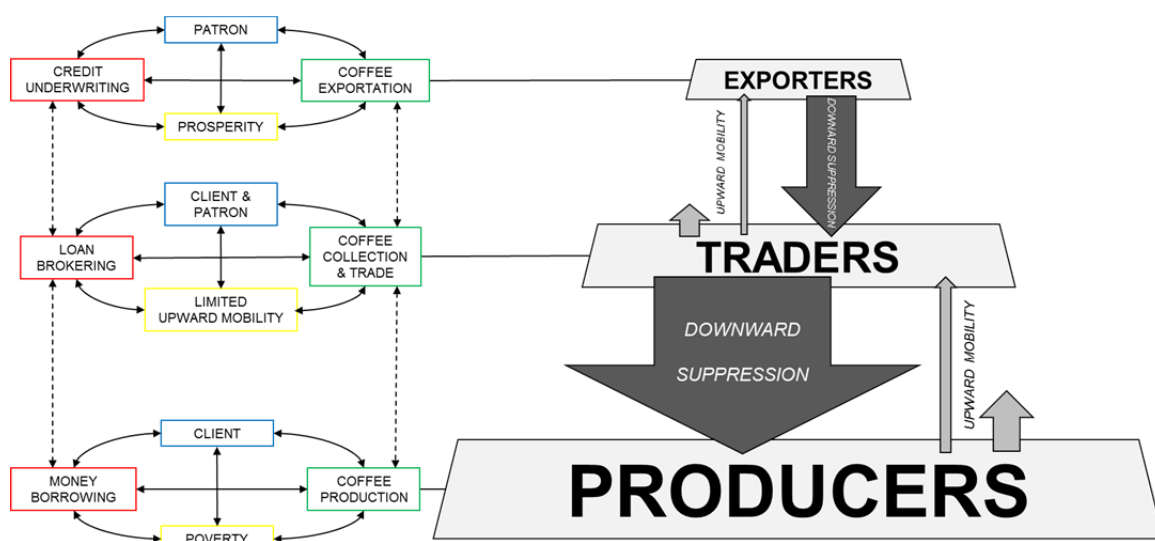


Figure 20: Labor-capital relations of the Bolaven Plateau region. *Source:* Author.

pre-export stages of the chain. Through this dynamic, exporters serve as patrons to their client traders. These traders, in turn, serve as patrons to their client producers. These exploitative labor-capital relations keep smallholder coffee producers in the Bolaven Plateau region entangled in a web of coffee, credit, and debt.

CHAPTER V

SOCIO-ECOLOGICAL DYNAMICS OF THE BOLAVEN PLATEAU REGION

This chapter examines the dynamics among the human actors producing the productive base of the Lao coffee commodity chain, and the resource space from which that commodity base is produced. A land-use/land-cover change analysis for the Bolaven Plateau measures the extent and pattern of landscape change in the region over the last 20 years or so, coinciding with the neo-liberalization of the Lao state and recent expansion of the Lao coffee chain. This analysis reveals the sustained conversion of forested lands to accommodate expanded agricultural activities, attributable most to smallholder coffee production. This analysis also highlights the establishment in the region of new commodity chains. These chains correspond to new land-use configurations in the resource space which pose challenges to, and conflict with, the historically dominant smallholder coffee land-use system in the region.

Geospatial Methods and Data

Satellite Imagery

Sets of remotely sensed satellite imagery were acquired from three different instruments: Landsat Thematic Mapper (TM), Enhanced Thematic Mapper Plus (ETM+), and Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER). Four scenes of Landsat TM data; four scenes of Landsat ETM+ data; and six scenes of ASTER data were collected. The Landsat TM and ETM+ scenes were gathered from the United States Geological Survey (USGS) Earth Resources Observation Science (EROS) center; the ASTER scenes from the National Aeronautics and Space Administration (NASA) Land Processes Distributed Active Archive Center (LPDAAC). All data were acquired after having already been geo-rectified by their respective distributors. The spatial

resolution for the TM, ETM+, and ASTER images is 28.5 m, 30 m, and 15 m, respectively. All raw images were gathered in the World Geographic System (WGS) 1984 datum and subsequently projected to Universal Transverse Mercator (UTM) Zone 48N. Some of this information is summarized in **Table 8**.

Table 8: Satellite imagery data used in the analysis.

PERIOD REPRESENTED	ACQUISITION DATE	INSTRUMENT	PATH / ROW	SPATIAL RESOLUTION	SOURCE
late-1980s (~1989)	1989-02-17	Landsat TM	125 / 049	28.5 m	USGS EROS
	1989-01-08	Landsat TM	125 / 050	28.5 m	USGS EROS
	1989-12-25	Landsat TM	126 / 049	28.5 m	USGS EROS
	1989-12-25	Landsat TM	126 / 050	28.5 m	USGS EROS
early-2000s (~2001)	2000-11-25	Landsat ETM+	125 / 049	30 m	USGS EROS
	2002-02-13	Landsat ETM+	125 / 050	30 m	USGS EROS
	2000-11-29	Landsat ETM+	126 / 049	30 m	USGS EROS
	2000-12-31	Landsat ETM+	126 / 050	30 m	USGS EROS
mid-/late-2000s (~2008)	2007-01-26	ASTER VNIR	-	15 m	NASA LPDAAC
	2007-01-10	ASTER VNIR	-	15 m	NASA LPDAAC
	2007-01-10	ASTER VNIR	-	15 m	NASA LPDAAC
	2009-01-22	ASTER VNIR	-	15 m	NASA LPDAAC
	2009-12-01	ASTER VNIR	-	15 m	NASA LPDAAC
	2010-02-10	ASTER VNIR	-	15 m	NASA LPDAAC

Image Temporality

These image data correspond to the late-1980s, early-2000s, and late-2000s, respectively, representing the Bolaven Plateau region over approximately 19 years. The temporality of these first two observations – late 1980s, early-2000s – is intended to correspond to environmental conditions in the region towards the *end* of the period of socialist experimentation and agricultural collectivization (~1975-1988), and the *end* of the initial phase of post-socialist transition and market liberalization (~1988-2000), as described in Chapter II. The temporality of the last observation – late-2000s – is intended to correspond to contemporary environmental conditions in the Bolaven Plateau region, as described in Chapter III.

Study Area

The spatial extent of the study area for this analysis was set by visualizing the maximum area covered by all three observations of satellite imagery, while ensuring that

the primary coffee producing areas in the Bolaven Plateau region – i.e., the districts of Pakxong (Champasak province), Laognam (Salavan province), and Thateng (Xekong province) were included in the area of interest/investigation (AOI) (**Map 6**). The total area of the AOI is 963,876 ha (9638.76 sq. km).

Image Processing

Image Compositing

For the eight TM and ETM+ scenes, false color composite images were generated using Idrisi (versions Andes and Taiga) geographic information system (GIS) software. The false color images were generated by compositing Landsat spectral band 2 (green, 0.52-0.60 μm); band 3 (red, 0.63-0.69 μm), band 4 (near infrared (NIR), 0.76- 0.90 μm) into the blue, green, and red image bands, respectively, using Idrisi's *image compositing* module. False color composites were also generated for the six ASTER scenes. Following initial difficulties importing and handling the ASTER data in Idrisi, the ArcGIS (version 10.0) GIS software platform was used for all ASTER image processing procedures. Band 1 (green, 0.52-0.60 μm), band 2 (red, 0.63-0.69 μm), and band 3n⁶¹ (0.76-0.86 μm) from the ASTER Visible and Near Infrared (VNIR) subsystem⁶² were composited together into the blue, green, and red image bands, respectively. This was done using ArcGIS's *composite bands* tool. The Landsat and ASTER false color composites were used to guide the digitization of vector geometry polygons. The polygons served as training sites

⁶¹ ASTER VNIR is the 'nadir' near infrared band, as opposed to ASTER VNIR band 3b, which is the 'backward' near infrared band.

⁶² ASTER collects data from 14 channels of the electromagnetic spectrum through three instrument sub-systems. The first sub-system (VNIR) covers the visible and near-infrared region of the spectrum; the second sub-system (SWIR) covers the short-wave region; the third (TIR) covers the thermal infrared region (Jensen 2007).

to sample raster pixels and guide the extraction of spectral signatures from the satellite imagery.

Image Mosaicking

Each set of scenes associated with each of the three time-points was then mosaicked. It is generally discouraged to classify mosaicked imagery. If the individual images within a mosaic were acquired during different dates and times (as were the imagery in question), it is generally preferable to classify each image separately, and then subsequently mosaic the classified images⁶³. However, due to extremely poor and inconsistent results when attempting (over multiple iterations) to classify individual images prior to mosaicking, it was decided to classify the images subsequent to mosaicking. The Landsat imagery were mosaicked with the *image mosaicking* module in Idrisi; the ASTER imagery with the *mosaic to new raster* tool in ArcGIS. In all cases, the chosen mosaic overlap method was that which reduced or eliminated any portion of the images containing cloud cover.

Extracting Spectral Signatures

Supervised, maximum-likelihood classification was performed on the image mosaics. Groups of pixels from each image mosaic were sampled to serve as training sites on which the spectral signatures guiding the maximum-likelihood classifications would be based. Pixel sampling was guided partially, and when appropriate, by a dataset of 209 waypoints collected *in situ* with a hand-held global positioning system (GPS) unit;

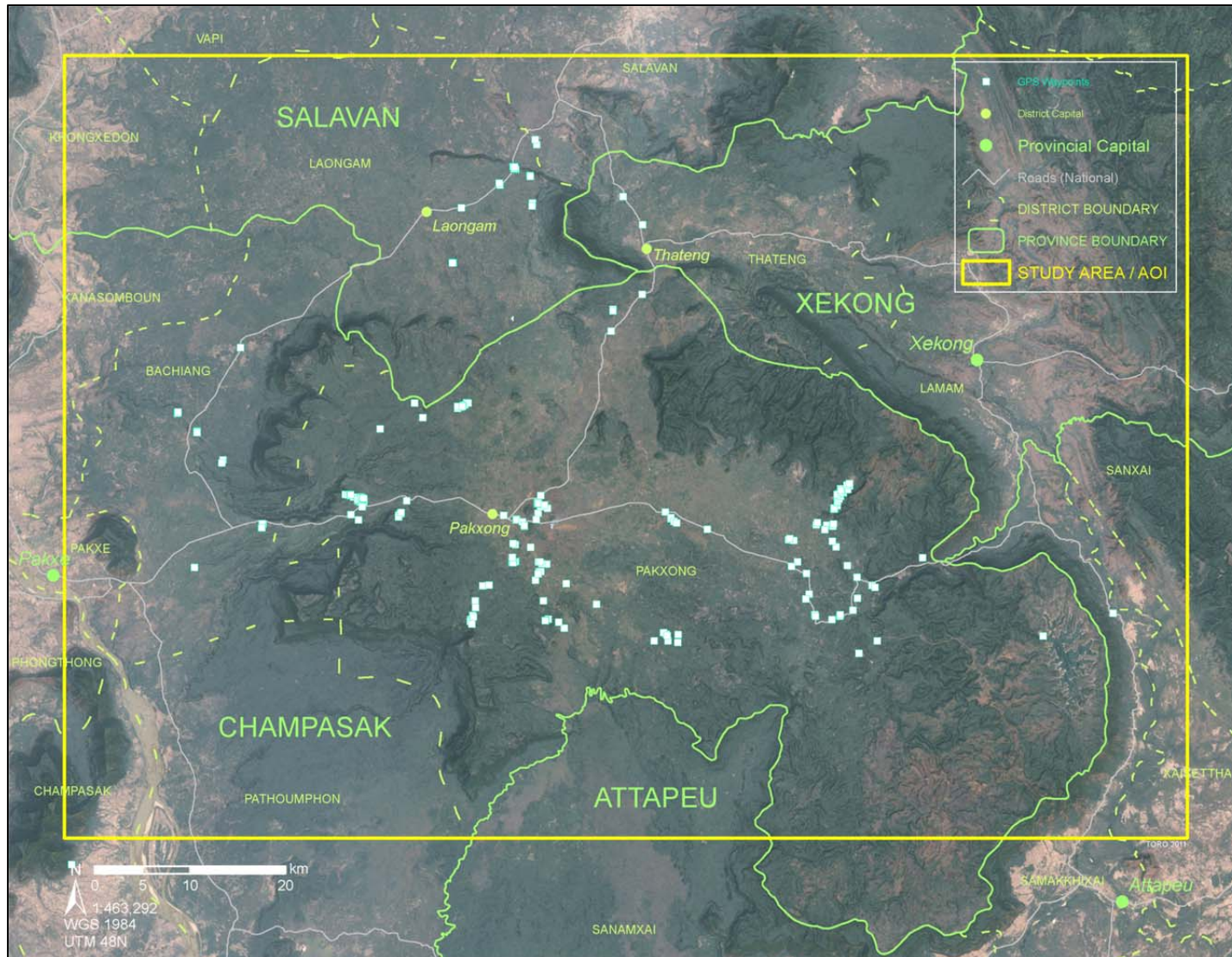
⁶³ “Care must be taken when classifying a mosaicked image. If the separate images were acquired at different times, then it may be necessary to develop training sites for some landcovers for each time. For example, if you mosaic a May image and a July image, the signatures for a deciduous forest type might be quite different. You might treat each as a separate class, then collapse the classes after classification. Alternatively, you might classify each image, then mosaic the classified images” (Idrisi 2011).

this fieldwork was conducted during the first three months of 2009, concurrent with the ethnographic fieldwork (**Map 6**). Training sites were also developed using land-use/land-cover data for the AOI from the Forest Inventory Planning Department (FIPD 2002), as well as on interpretation of publically-available imagery provided by GoogleEarth.

Determination and Descriptive Resolution of Land-Use/Land-Cover Classes

The presence of coffee trees is notoriously difficult to detect from non-coffee forest cover through remote sensing methods. As noted by Cordero-Sancho and Sader (2007: 1578) “The spectral response of forest and coffee crops in the reflected waveband region ($<3.0\ \mu\text{m}$) can be similar, because both cover types consist of woody species of variable density and structure”. Indeed, even after incorporating a coffee environmental stratification model, Cordero-Sancho and Sader were able to achieve only 65% overall accuracy in their effort to differentiate coffee from forest in Costa Rica – the best yet reported in published research (Cordero-Sancho & Sader 2007).

Coffee grown on the Bolaven Plateau can be found thriving in many degrees of forest cover. At one extreme end of the spectrum, one can find 30-foot coffee trees growing among/within thick patches of secondary forest (yet still being harvested, although perhaps with less consistency and obviously without proper maintenance). On the other end of the spectrum, one can find 1-2-foot high coffee bushes recently planted in large swathes of cleared land, without any cover whatsoever. These are the extremes; it is common to encounter many intermediary manners of hybrid coffee-forest covers. Coffee production in the Bolaven Plateau region (especially for Robusta coffee, which occupies no less than 75% of all coffee surfaces in the region) is particularly difficult to



Map 6: Bolaven Plateau region geospatial study area and collected GPS waypoints. *Source:* Map by author.

differentiate from forest, as many Robusta trees grow within relatively thick-shaded secondary forest.

In their study examining the relationship between land-use/land-cover change in the Western Ghats coffee growing region of southern India and global coffee prices during the global coffee crisis, Ambinakudige and Choi (2009) assert:

Differentiating [coffee and forest] was not problematic in our study for two reasons. First, an extensive field survey in the study area helped us to distinguish forest patches (small in areal coverage) from coffee patches. Second, the government has planted forests with mostly teak trees in the study area. Teak is clearly separated from coffee patches in Landsat images.

While field research was conducted for the present research, it was not sufficient to confidently differentiate coffee from forest throughout the entire study area. Also, while teak is grown along with coffee in some part of the Bolaven Plateau region – especially in the western parts of the plateau, near Bachiang and Laognam districts – this is not widespread.

Land-Use/Land-Cover Classes

In light of these limitations, it was decided to classify the images with land-use/land-cover classes that are relatively descriptively coarse; that is, in aggregated categories that subsume other, more specific uses or covers. The following eight (8) classes were chosen:

- | | |
|------------------|----------------|
| (1) forest; | (5) barren; |
| (2) agriculture; | (6) water; |
| (3) rice; | (7) cloud; |
| (4) built; | (8) grassland. |

The ‘cloud’ class is not an actual land-use/land-cover class; rather, it is a pseudo-class created to account for minimal cloud presence in some of the imagery. The selection of these eight classes was based partially on the land-use and land-cover classification system for use with remote sensor data as outlined by Anderson et al. (1976: 14-15). Training polygons were digitized over image pixels representing each of these eight land classes. Once a sufficient number of pixels was sampled for each class, spectral signatures were extracted from all available bands from each set of images. In Idrisi (for the Landsat imagery), this was done with the *signature extraction* module; in ArcGIS (for the ASTER imagery), this was done with the *create signatures* tool.

Maximum Likelihood Classification

Thirteen separate (and tedious) iterations of polygon digitizing and spectral signature development were required to produce acceptable land-use/land-cover maps. The classification method used was that of Gaussian maximum likelihood. As Lillesand and Kiefer (1994: 554) explain, the Gaussian maximum likelihood classifier operates under the assumption that the distribution of classes to which the training data (in this case vector polygons) corresponds is normally distributed, hence the descriptor ‘Gaussian’.⁶⁴

Maximum likelihood classifications algorithmically compute the probability of a particular image pixel belonging to a particular class. “After evaluating the probability [of a pixel falling] in each category, the pixel would be assigned to the most likely class (highest probability value) or be labeled ‘unknown’ if the probability values are all below

⁶⁴ The term ‘Gaussian’, used to refer to normal statistical distributions, is derived from the German mathematician Karl Friedrich Gauss, to whom the discovery of the statistical phenomenon of normal distribution is attributed.

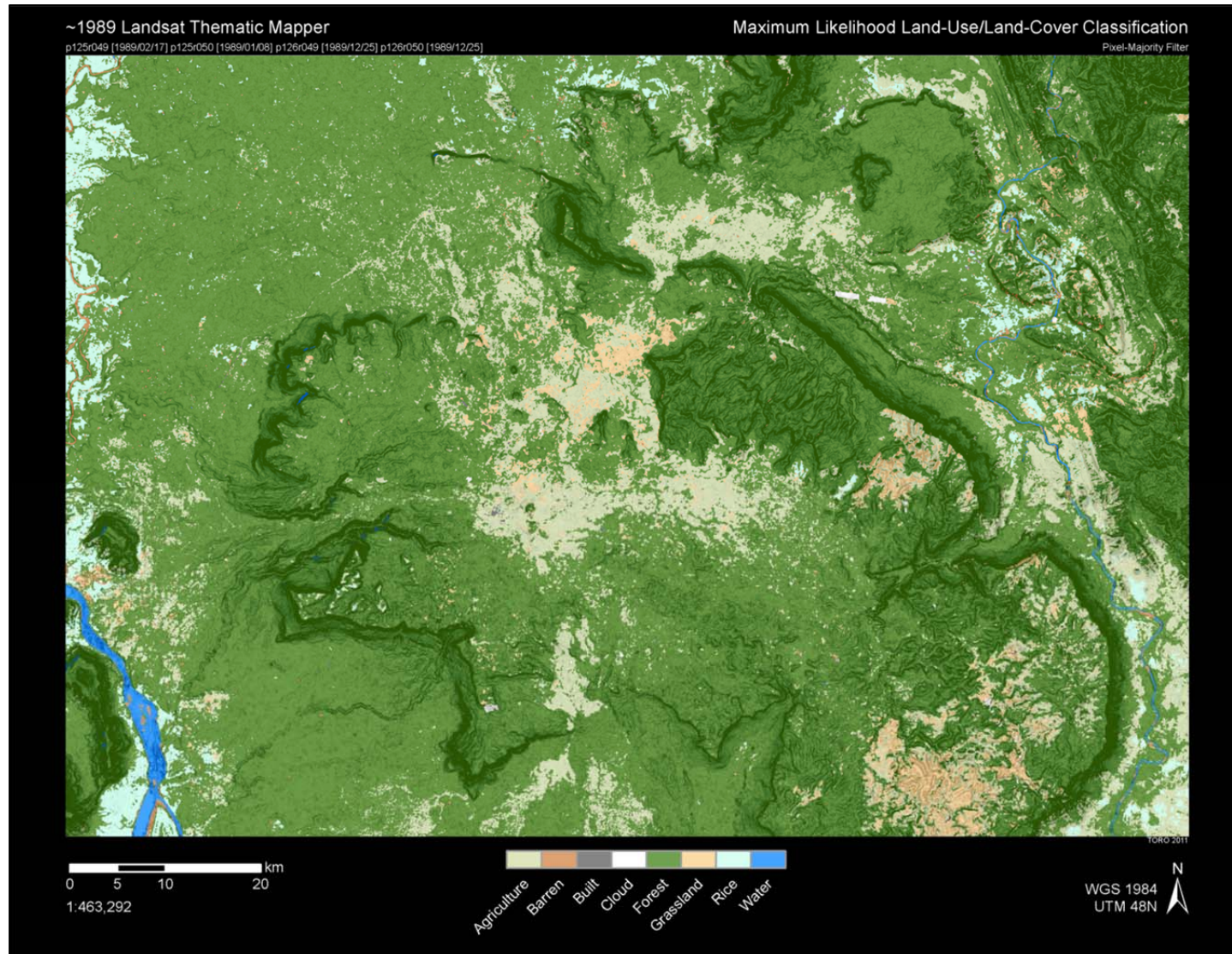
a threshold set by the analyst” (Lillesand & Kiefer 1994: 555). An equal class membership probability was allotted for each of the six categories, excluding no proportion of pixels in the classification process. The operation was run in Idrisi Andes using the *maximum likelihood classification* module, and in ArcGIS with the tool by the same name. Song et al. (2001: 232) assert that atmospheric correction is unnecessary when multi-date composite imagery is placed in a single dataset and classified as if it were a single image – as was done in the present study. For this reason, no atmospheric correction procedures were performed.

Land-Use/Land-Cover Maps

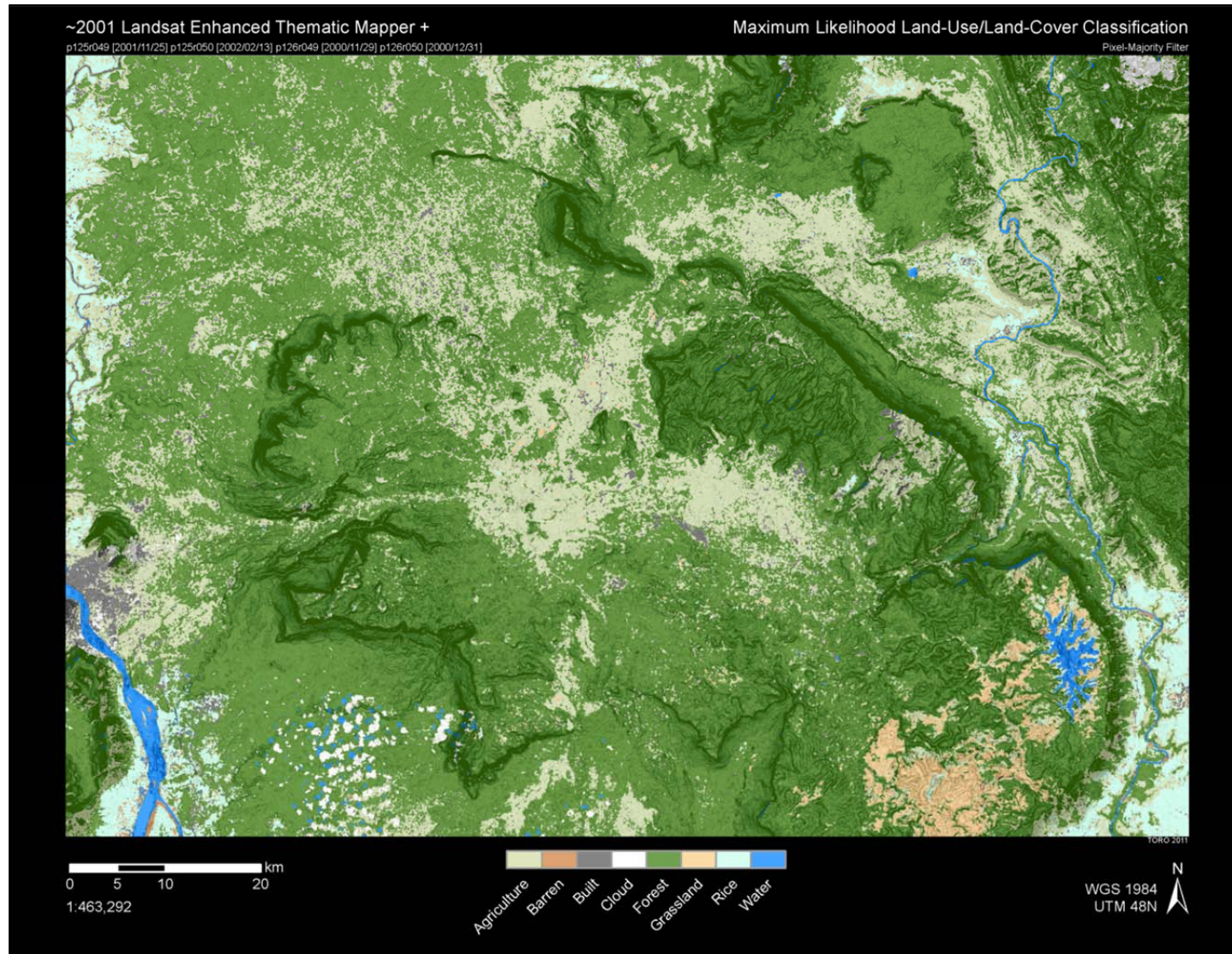
These procedures produced three land-use/land-cover maps, one for ~1989 (**Map 7**), one for ~2001 (**Map 8**), and one for ~2008 (**Map 9**). To the author’s knowledge, these are the first satellite imagery-based land use/cover classifications ever performed exclusively for the Bolaven Plateau region.

Regional Land-Use/Land-Cover Change

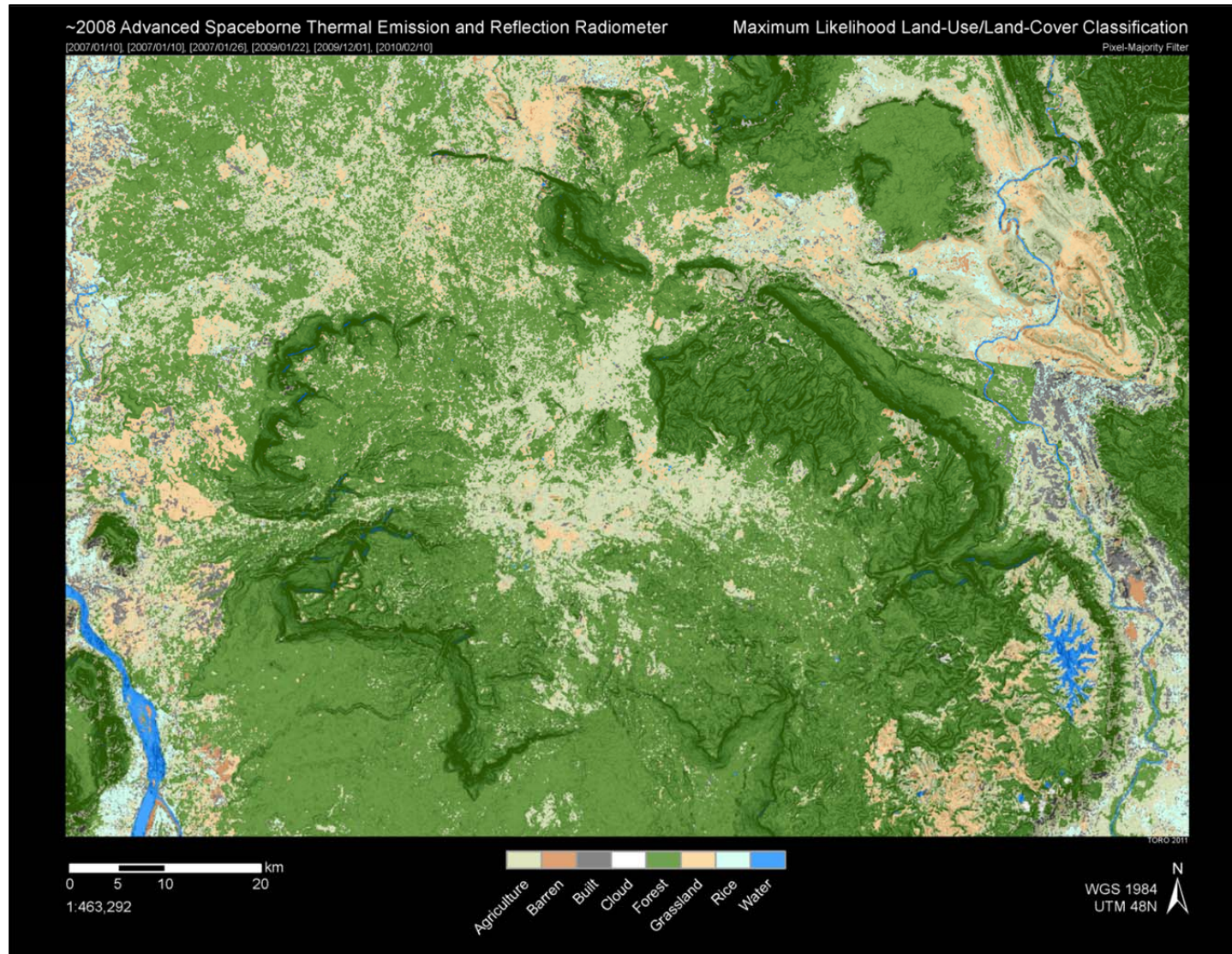
The classified raster images were inputted into the Idrisi *land change modeler* module to examine land-use/land-cover changes in the Bolaven Plateau region over the represented period. This module allows for the generation of descriptive statistics based on various raster overlay scenarios. For this study, the most important overlay scenario was that which informed the extent of land-use/land-cover change over the approximately 19 year period covered by the images (**Figure 21**).



Map 7: Landsat TM-based land-use/land-cover in the Bolaven Plateau region, ~1989. *Source:* Map by author.



Map 8: Landsat ETM+-based land-use/land-cover in the Bolaven Plateau region, ~2001. *Source:* Map by author.



Map 9: ASTER-based land-use/land-cover in the Bolaven Plateau region, ~2008. *Source:* Map by author.

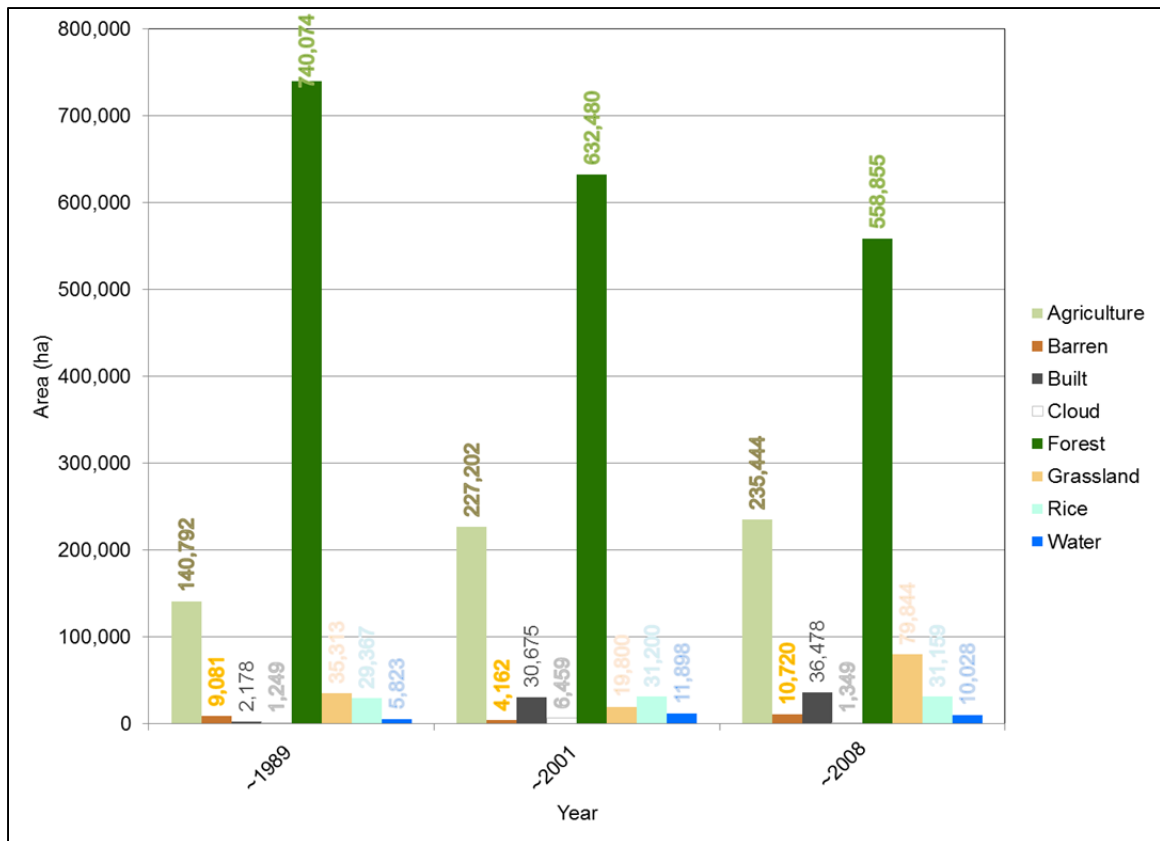


Figure 21: Change in the total area of land-use/land-cover, ~1989-2008.

Figure 21 reveals, among other landscape changes, a sustained conversion of forested to agricultural lands. From ~1989 to ~2001, forested lands were reduced by 17.01%; from ~2001 to ~2008, they were reduced an additional 11.64%; if we look at the change in land-use/-cover maps from ~1989 to ~2008, we find the loss of forest to agricultural lands to be 24.49%. The majority of forest conversions are due to the expansion of agriculture in the Bolaven Plateau region during the period analyzed. The most dominant crop cultivated above 500 masl in the agriculture class is coffee. However, some of the conversion of forest and other lands has been brought about by other, incipient commodity chains in the resource space.



Image 23: A Lao youth manages fire to expand his family's cultivable coffee area. *Source:* Photograph by author, February 3, 2009.



Image 24: Smoke towers in the distance from a managed fire as young coffee plantings grow in a new coffee plantation. *Source:* Photograph by author, February 8, 2009.

A Shifting Resource Space

The exploitation of the Bolaven Plateau resource space has recently begun to go far beyond smallholder coffee production (Tulet 2009). Relatively new and historically-geographically unprecedented commodity chains are being established in the region. The introduction and/or aggressively expanded commodity networks correspond to new land-use configurations in the region as a resource space. The most notable⁶⁵, and socio-environmentally transformative, types of commodity chains include:



Image 25: The author surveys a large swath of newly burned forest on the Bolaven Plateau. The landscape of the Bolaven Plateau region is extremely dynamic. *Source:* Photograph by Soukdavanh Bouadaphom, March 09, 2009.

⁶⁵ Other important economic activities changing the socio-ecological configuration of the region include factory-based primary product processing (e.g., of coffee, rubber, and bauxite/alumina), ecotourism, and logging / timber extraction.

- industrial (large-scale, plantation-style) agriculture,
- hydroelectric power generation via dams, and
- bauxite mineral extraction.



Image 26: The author surveys a swath of newly burned secondary forest / scrubland on the Bolaven Plateau. The regional landscape of the Bolaven Plateau is changing rapidly. *Source:* Photograph by Soukdavanh Bouadaphom, March 25, 2009.

Industrial Agriculture

Industrial Coffee Production

Large-area industrial agriculture plantations are increasingly being established in the Bolaven Plateau region. Formerly, there was only one such large-area industrial plantation in the region, that belonging to the largest coffee exporting company in the country, Dao Heuang, located about 20 kilometers west of Pakxong on the major national road (route 16-A). Now, however, there are a growing number of Vietnamese and

Singaporean coffee plantations in the region. Notable among the companies establishing these coffee plantations is the Dak Lak Rubber Company, named after Vietnam's Dak Lak province, the principal coffee-growing province in the country's Central Highlands.



Image 27: Sign outside the Dak Lak Rubber Company's offices in Pakxe. Source: Photograph by author, March 17, 2009.

A 2009 interview conducted with an official from Dak Lak Rubber Co. at the company's Pakxe offices, the official indicated that there were approximately 250 hectares of coffee already planted on the plateau, and that the company intended to expand its coffee holdings to about 500 total hectares, or possibly more, in the near future. Dak Lak Rubber Co.'s coffee holdings are just one example of the growing Vietnamese control over the resource space of the Bolaven Plateau. The Dak Lak coffee plantations are additionally noteworthy because their establishment required the acquisition of land that was either productive (i.e., with coffee trees actively maintained and harvested) or semi-productive (i.e., with coffee growing under thick canopies of

secondary forest and irregularly maintained and harvested). Dak Lak Rubber Co. appropriated these productive and semi-productive coffee lands from the residents of the nearby smallholder coffee communities through official (i.e., government authorized) means, resulting in mixed socioeconomic outcomes for the former Lao small-area land owners.



Image 28: One-year-old coffee plantings grow in direct sunlight in the Dak Lak Co. coffee plantation. *Source:* Photograph by author, February 8, 2009.

Another noteworthy Vietnamese plantation was recently established in the central part of the plateau. This coffee plantation, owned by the Vietnamese company Tin Nghia, is located directly adjacent to those owned by the powerful Dao Heuang company.

Industrial Rubber Production

Along the lower elevations surrounding the plateau are a growing number of rubber plantations, especially in Bachiang district, in the northeast corner of the region.

The company responsible for vast majority of rubber plantations in Bachiang is the Viet-Lao Rubber Joint Stock Company (VLRJSC).

While actively establishing coffee plantations, Dak Lak Rubber Co. is, as its name indicates, engaged primarily in developing rubber plantations, also mainly in Bachiang district. The Dak Lak official interviewed confirmed that the company had by early 2009 established 7,500 ha of rubber. Notwithstanding the rubber holdings by Dak Lak, the sheer expanse of rubber plantations in Bachiang owned by VLRJSC is nothing short of remarkable (**Image 29**). Rows upon rows of rubber trees extend for distances far too great to be captured from any single vantage point on the ground. Some of the environmental impacts of the VLRJSC rubber plantations in Bachiang district include: the loss of wildlife habitats (including aquatic and riparian habitats), intensified soil



Image 29: A plantation of rubber trees stretches far beyond what the eye can see. *Source:* Photograph by author, February 16, 2009.

erosion, increased stream and river sedimentation, possible water contamination by chemical fertilizers, and amplified waste management issues in the affected villages. Some of the social impacts of these rubber plantations include significant loss of land tenure and overall access to land, the loss of the subsistence- and revenue-generating resources formerly available on those lost lands (e.g., non-timber forest products, fish, etc.), the influx of external (i.e., non-local) wage laborers, and inadequate compensation by VLRJSC for usurped lands. These environmental and social impacts are elaborated in Obein (2007).

Hydropower Dams

Multiple hydropower dams have been built, or are planned for upcoming construction, in the Bolaven Plateau region as well. One prominent example is the Houay Ho dam, completed in 1998. This particular dam redirects water from the Houay Ho stream and diverts it to the Xekong River. The overall project consists of a 150 megawatt, 76-meter-high dam and an approximately 35 sq km reservoir (**Image 30**). The reservoir is conspicuous in the land-use/land-cover classification map for ~2001; it is absent in the ~1998 map. Following previous research on this dam's transformation of socio-environmental systems on the Bolaven Plateau region (IRN 1999a, Sayboulaven 2003, Khamin 2008b), some of the deleterious social impacts of this project have been examined by Delang and Toro (2011).

Apart from the Houay Ho dam, there are at least two other existing dams in the region: Xeset 1 and Xeset 2. There are also several other dams planned for the various water circuits on which the region's human and non-human (floral and faunal)



Image 30: A south-facing view of the Houay Ho dam reservoir. *Source:* Photograph by author, March 3, 2009.

communities depend. These include the Xeset 3, Houay Lamphan Gnai, Xekong 3, Xekong 4, Xenamnoy, Xekatam (Khamin 2008a), and Xepian Xenamnoi (IRN 1999b), among others.

Bauxite Mineral Extraction and Alumina Processing

The GoL has also granted multiple land concessions to primarily a slew of international, primarily Chinese, investors for the sake of exploiting the region's confirmed and potential bauxite mineral reserves (LNA 2007, SARCO 2008, VT 2008a, 2009c). One specific corporation, Sino Australian Resources Company (SARCO) – a joint venture between the China Nonferrous Metals International Mining Company

(CNMIM) and the Australian Ord River Resources Corporation⁶⁶ – has led the push to transform the socio-ecological configuration of the region toward the mining sector. According to Ord River Executive Chairman, John Towner, “The Lao Bolaven Plateau has the potential to be one of the biggest bauxite deposits in the world” (Ord 2006).

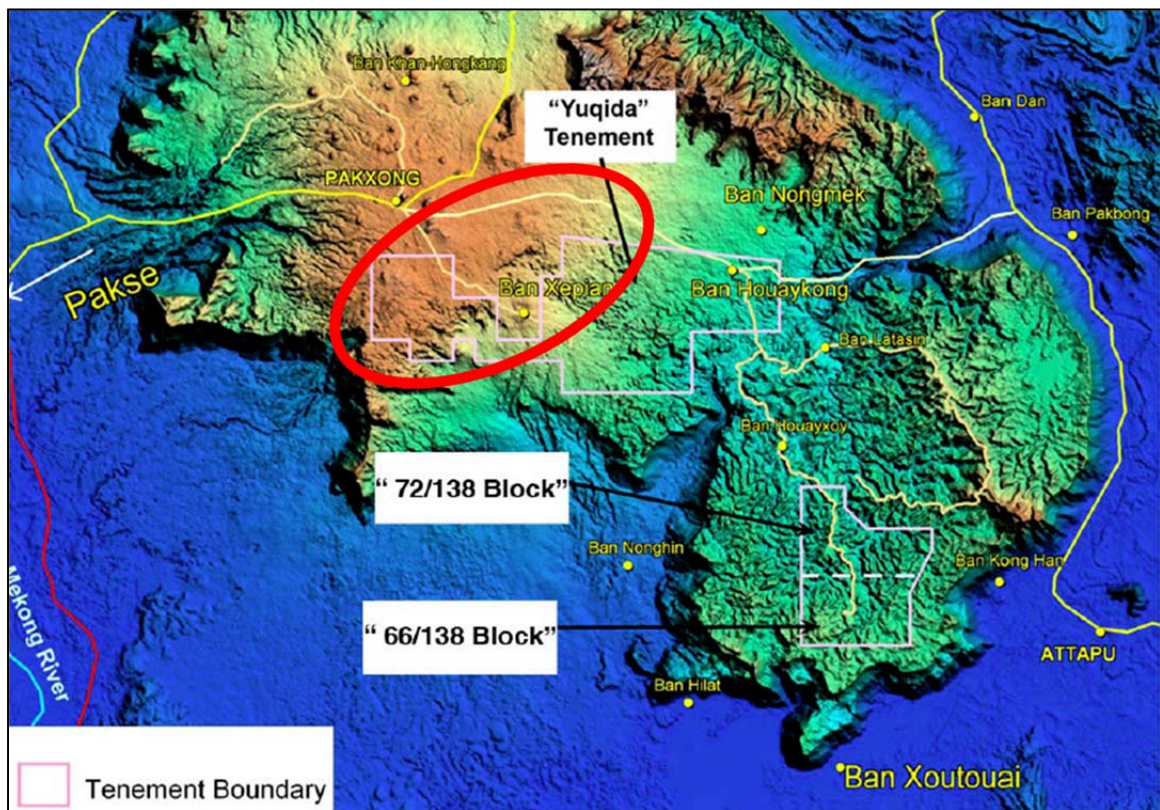
SARCO has been engaged in resource definition drilling on behalf of an acquired bauxite tenement held by a solely Chinese corporation called Yuqida Mining Group, Ltd. This particular mineral concession, referred to as the ‘Yuqida 589’ tenement, is 589 sq km in area. Moreover, the Yuqida site is only one of two already conceded tenements. SARCO is also performing exploration and definition drilling on behalf of a Lao corporation called Lao Service Incorporation Co., Ltd. in what is referred to as the ‘LSI 138’ tenement, (measuring 138 sq km, and consisting of two sub-tenements, ‘LSI-66’ and ‘LSI-72’).

To date, SARCO has mineral survey and exploration access to an already contracted 727 sq km tenement area (589 sq km in the Yuqida tenement and 138 sq km in the LSI tenement). Additionally, according to company statements made throughout 2008, the Chinese-Australian joint venture had an application for an additional 867 sq. km area in its “final stages of approval” (Ord 2008b, 2008c). A May 2008 company document asserted that SARCO was pursuing yet another 555 sq. km mineral concession in the Bolaven Plateau region (Ord 2008b: 5). If the two additional tenement areas (measuring 867 sq. km and 555 sq. km) are conceded to SARCO, the company will control a mineral concession area totaling approximately 2,150 sq. km. The geomorphic Bolaven Plateau proper – i.e., the relatively flat surface of the tableland – is

⁶⁶ CNMIM holds a 51% share in SARCO; Ord River Resources holds a 49% share (Ord 2011, 2012b).

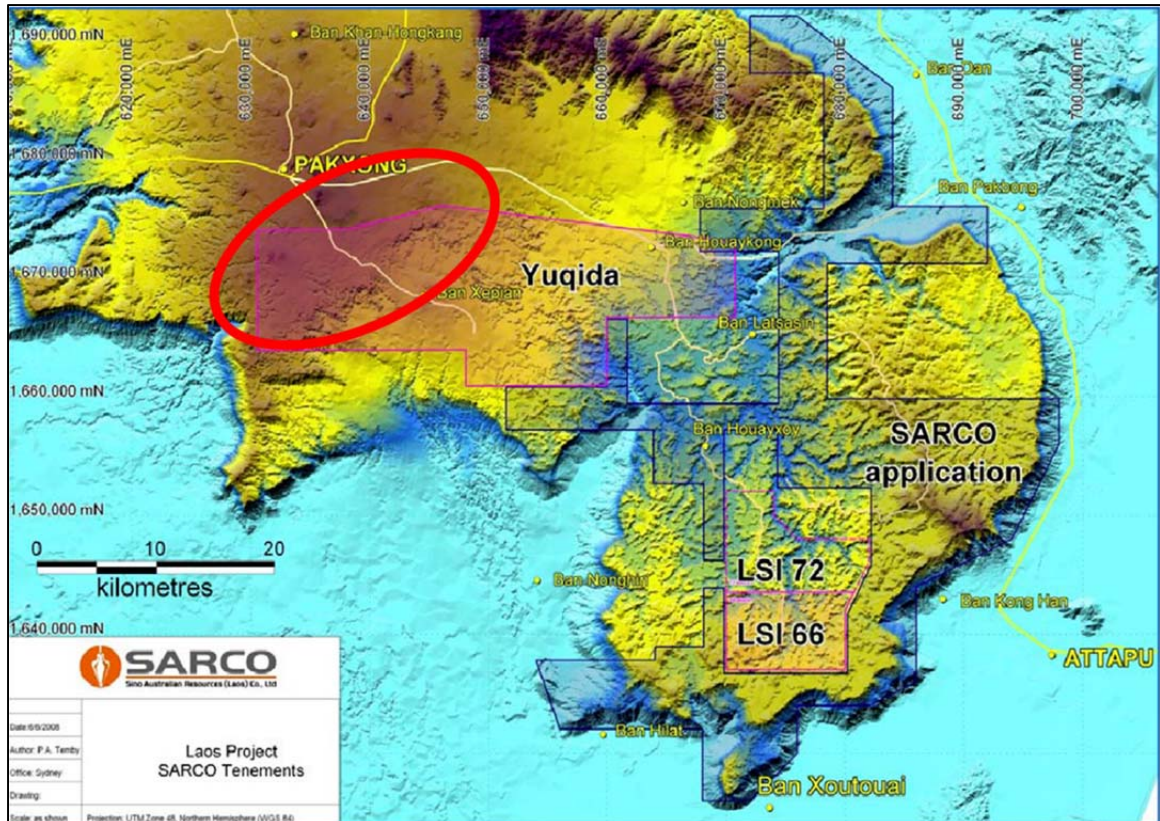
approximately 3,750-4,000 sq. km.⁶⁷ Thus, if the GoL concedes to SARCO these additionally requested tenements, the company will have effective resource rights to a space no less than 50% of the size of the plateau proper. Importantly, this figure excludes any other existing or planned mineral concessions by other bauxite/alumina prospecting companies operating in the region.

With regard to the 589 sq. km Yuqida tenement in particular, one finds that between April and May of 2008, the areal demarcation of the tenement was altered and expanded. The depiction of the Yuqida area in an April 2008 SARCO map (**Map 10**) is



Map 10: SARCO mineral tenements in Laos (April 2008). Note the red oval added by the author; it highlights the difference in the areal demarcation of the Yuqida tenement as depicted in this map and that depicted in Map 11. *Source:* (Ord 2008d).

⁶⁷ If we delineate the Bolaven Plateau region as that area greater than 500 masl (i.e., the area used primarily for coffee cultivation), the region is approximately 4,800 sq. km.



Map 11: Laos Project SARCO Tenements (December 2008). Note the red oval added by the author; it highlights the difference in the areal demarcation of the Yuqida tenement as depicted in this map and that depicted in Map 10. *Source:* (Ord 2008a).

more irregularly shaped, ostensibly to reduce the encroachment onto smallholder coffee lands in the central Bolaven Plateau region (or perhaps to the reduce the appearance of such encroachment). However, in subsequent SARCO maps depicting the Yuqida tenement in, e.g., May 2008 and December 2008 (**Map 11**), the tenement is larger, and more clearly highlights the encroachment of the concession into lands actively cultivated by Lao smallholder coffee farmers. Indeed, in a May 2008 presentation reporting some of the progress made by SARCO on its Bolaven Plateau bauxite project, the company acknowledged openly that: “Agriculture areas were found to cover most of the Yuqida tenement with small areas of forest still left” (Ord 2008e).

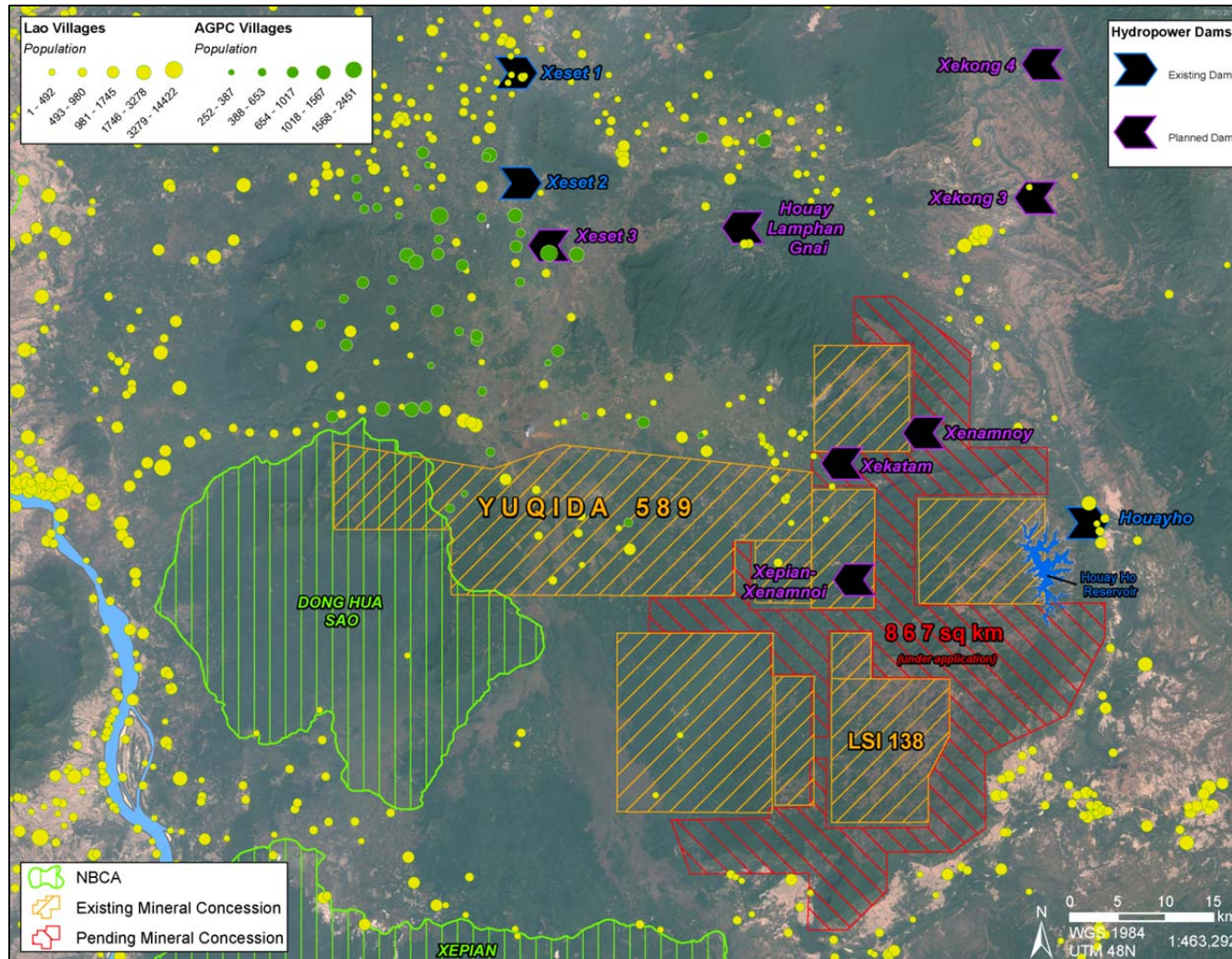
Recognizing the imminent land-use conflicts between the emergent bauxite/alumina commodity chain and the established coffee commodity chain, an official with another bauxite/alumina investment company, the Lao Service Corporation (LSC), was quoted as saying (VT 2008b):

We are happy to compensate for any losses in accordance with the current effective laws and regulations of Laos, such as investment promotion, mining and environment laws.

An employee from yet another company prospecting for bauxite/alumina in the Bolaven Plateau region, the Sino-Lao Aluminium Corporation Limited (SLACO), acknowledged that his company was planning to spend US\$2-3 million to relocate families to accommodate bauxite mining (VT 2008a).

According to an estimate made by SARCO, the company's total estimated bauxite resource on the Bolaven Plateau (i.e., in all its concession holdings) was 130 million tons in December 2008 (Ord 2008f). This estimate was increased to 226 million tons in April 2012 (Ord 2012a). It is important to make note of these figures because, according to one *Vientiane Times* article, once 300 million tons of bauxite is estimated to exist, SARCO will gain the authority to initiate feasibility studies for a full-scale alumina refinery to be built in the southeast of the Bolaven Plateau region, in Sanamxai district, in Attapeu province (VT 2008c).

As depicted in **Map 12**, the existing and proposed mineral concessions are predominantly in the southern and southeastern parts of the Bolaven Plateau. The new tenement SARCO is hoping to acquire will be the first making significant leeway into the northeastern part of the plateau. While most of the Bolaven Plateau region resource space is dominated by smallholder coffee production (save for the region's southeast), the



incipient land-uses associated with industrial agriculture, hydroelectric power, and mineral extraction are beginning to fragment and reduce land-uses associated with smallholder production. Regarding the most ominous of these new chains, that for bauxite mineral extraction and alumina processing, an anonymous official from the Lao Coffee Association was quoted in a recent *Vientiane Times* article (VT 2012a) as saying:

Land officials conducted a survey and discovered that the proposed bauxite mine would encroach onto about half of the land that is currently under coffee cultivation. [. . .] If the government does not limit the size of the area to be mined, I think about half of the coffee plantations will disappear.

A simple geographic reality underlies all commodity chains rooted in, or taking root, in the Bolaven Plateau region: space is limited. Stated more precisely: resource space is limited.

CHAPTER VI CONCLUSION

The historical-geographical trajectory of the Lao coffee commodity chain has produced a particular set of reflexive socio-economic and socio-ecological relations in the Bolaven Plateau region, the productive base of the chain. The rural credit component of the World Bank's Upland Agriculture Development Project was pivotal in transforming regional socio-economic dynamics by introducing smallholder credit mechanisms to the region. Growth in the smallholder credit market in the region was found to be positively correlated to the global coffee price. As prices for coffee in the global marketplace began their steady ascent, so too did the various forms of formal and informal lending systems.

Despite the expansion of the Lao coffee chain brought about through on-going liberalization and corresponding investment inflow, a fundamentally antagonistic set of socio-political (power) relations between agents of capital (coffee exporters and their trader intermediaries) and agents of labor (i.e., smallholder coffee farmers) came to characterize the chain's socio-economic base. Smallholder credit evolved to become one of the critical mechanisms by which these antagonistic social relations have been perpetuated.

While upward socio-economic mobility for some smallholders in the region does exist, it often comes only through acting as clients on behalf of exporting patrons and locking their fellow smallholders into an exploitative cycle of coffee, credit, and debt. Smallholder coffee producers' access to markets has become inextricably linked to the execution of pre-harvest extension loans brokered by traders with the financial capital of exporters.

Opportunities for upward mobility are thereby suppressed for the majority of Lao coffee producers. These overlapping socio-economic/socio-political relations have thus far undermined – yet not completely prevented – the development of a network for an alternative, high-quality Lao coffee commodity. Foreign technical aid programs such as PCADR-PAB and PRCC-II have striven to structure an alternative Lao coffee chain toward the more lucrative markets for premium specialty and niche-market coffees, which often carry value-adding certifications (e.g., Fair Trade, organic, shade grown, etc.). Despite these endeavors, though, the Lao commodity chain has been structured toward the markets for lower-quality coffees with essentially no unique geographic identity. This is despite the fact that the Bolaven Plateau could, theoretically, produce some of the best quality coffees in the world.

The lower-quality coffees that dominate the Lao coffee chain are produced by smallholders compelled to produce greater quantities for the coffee-exporting oligopoly whose market niche has been carved by focusing on lower quality products. As Galindo and Sallée summarize (Galindo & Sallée 2007: 50):

The strategy of most Lao exporters consists in seeking a short term profit by selling coffee to the highest bidder. This has been possible thanks to an advantageous market frame, a sustained demand of this type of coffee in the international market, a quite permissive quality control system and very low transformation costs. The main consequence has been the setting up of a system that doesn't reward coffee quality at all stages of coffee trade (from producer to exporter).

The common smallholder compulsion to produce greater quantities of coffees rather than greater quality coffees is commonly attributable to producers' desperation to repay debts from previous years. In many instances, these debts were acquired originally

during the global coffee crisis, and have simply continued to be compounded year after year.

While the low-quality/high-quantity market niche has proven to be relatively lucrative for the coffee chain minority comprising the Lao coffee exporting elite, its profitability is limited for the vast majority of the Lao coffee peasantry who toil at the socio-ecological interface to bring the Lao coffee chain into existence. The socio-economic relations of the Bolaven Plateau region thereby serve to perpetuate the status quo of the Lao coffee chain within the broader global coffee network. Whether intentional or not, Lao coffee exporters deny their coffee producing counterparts the opportunity to pursue in earnest an alternative incarnation of the Lao coffee chain, one which would bring enhanced socio-economic benefits to all involved actors. Understanding the socio-economic/socio-political dynamics that characterize the structure of the Lao coffee network is crucial to developing strategies to restructure the network toward its full market potential.

As Dicken et al. (2001: 94) assert, though, “in addition to making points about evolving power relations within networks, we must also acknowledge the power to create, join or escape networks”. The analyses contained in the preceding chapters make clear that in the case of the Lao coffee network, smallholder producers are limited by the socio-economic structures embedded at the base of the chain to escape the fundamentally exploitative status quo. The same class-based, client-patron dynamics denying producers liberation from the status quo Lao coffee network are the same dynamics preventing the creation of a more socio-economically equitable and socio-ecologically sustainable alternative to that network.

All commodity chain networks are socio-spatially embedded throughout various, increasingly globalized locales. Every commodity chain therefore effects real geographic change in the places through which the industrial processes of the chain are carried out. Identifying the socio-ecological transformations brought about by the Lao coffee commodity chain – an agricultural (primary product) commodity network – is relatively simple when compared to performing the same task for other, more synthetic and industrially-processed chains (such as, say, those for telecommunications devices, which entail the convergence of dozens of other constituent chains). Indeed, one need only look directly at the resource space on which the Lao coffee chain is productively based in order to discern how the socio-economic structure of the chain has impacted its socio-ecological base.

The land-use/land-cover change analysis conducted for the Bolaven Plateau region reveals the continued expansion of agricultural activities the Lao coffee commodity chain's primordial resource space. While the region is particularly fertile and supports several different agricultural commodities, its exceedingly dominant land-use has been configured to support smallholder coffee production. It is thus reasonable to attribute the persistent conversion of forested to agriculture lands primarily to the land management activities of smallholders coffee farmers. The sustained investment influx in the Lao coffee sector and the increased viability of market-based channels for the commercialization of Lao coffee over the last two decades has prompted smallholders to attempt to capitalize on the increased profitability of their farming livelihoods. This has resulted in the clearing of more forests and scrublands for coffee production.

One must not overlook, though, how the socio-economic dynamics embedded in the Lao coffee chain condition the modes by which smallholder farmers interface with their Bolaven Plateau resource space. For example, in a less usurious setting, one would expect most Lao smallholders to invest their borrowed monies heavily in the purchase of new, higher quality coffee seedlings, the expansion of coffee plots, the hiring of additional seasonal laborers, etc. However, since many farmers regularly borrow money to cover standard domestic expenses such as food, education, and medicine, the intensity of agricultural expansion one might have otherwise expected to witness upon the landscape has not occurred. Indeed, the most important interaction between the Bolaven Plateau region's coffee-based economy and its coffee-based ecology does not rest with the way Lao coffee smallholders have radically altered regional environmental conditions. Rather, it lies with the way Lao coffee smallholders have been unable to alter their landscapes in ways that have brought security to their coffee smallholding way of life. And, increasingly, this way of life is under threat by those wishing to exploit the Bolaven Plateau region for its myriad other commodity chain potentialities.

Recently, as the Bolaven Plateau has been socio-spatially reconfigured to accommodate new, non-smallholder coffee commodity chains, the prospects for moving toward an alternative, more socio-ecologically just and sustainable Lao coffee chain seem even more threatened. The class antagonism manifest in the Bolaven Plateau region has thus far impeded the organization of a truly cohesive and united lobby representing all actors in the Lao coffee chain. The newly established Lao National Coffee Council seems to be the only body capable of organizing the producers, the true foundation of the chain, to play a more active role in the future of their coffee commodity network, the future of

their coffee resource space. However, the CNCL is a politically fragile institution subject to the hostility of those members of the Lao Coffee Association reluctant to relinquish oligopolic control over the Lao coffee commodity chain. Only by unfettering the Lao smallholder producers from their current socio-economic chains can a truly holistic Lao coffee *community* be built. And only through such a community can the Lao coffee commodity network be structured in such a way as to produce a socio-ecology in the Bolaven Plateau region capable of supporting a truly vibrant Lao coffee commodity chain. For, ultimately, the geographic configuration of the Bolaven Plateau region constrains the potentialities of the Lao coffee commodity chain, while, reciprocally, the structure of the chain constrains the lands and livelihoods of those bound to it.

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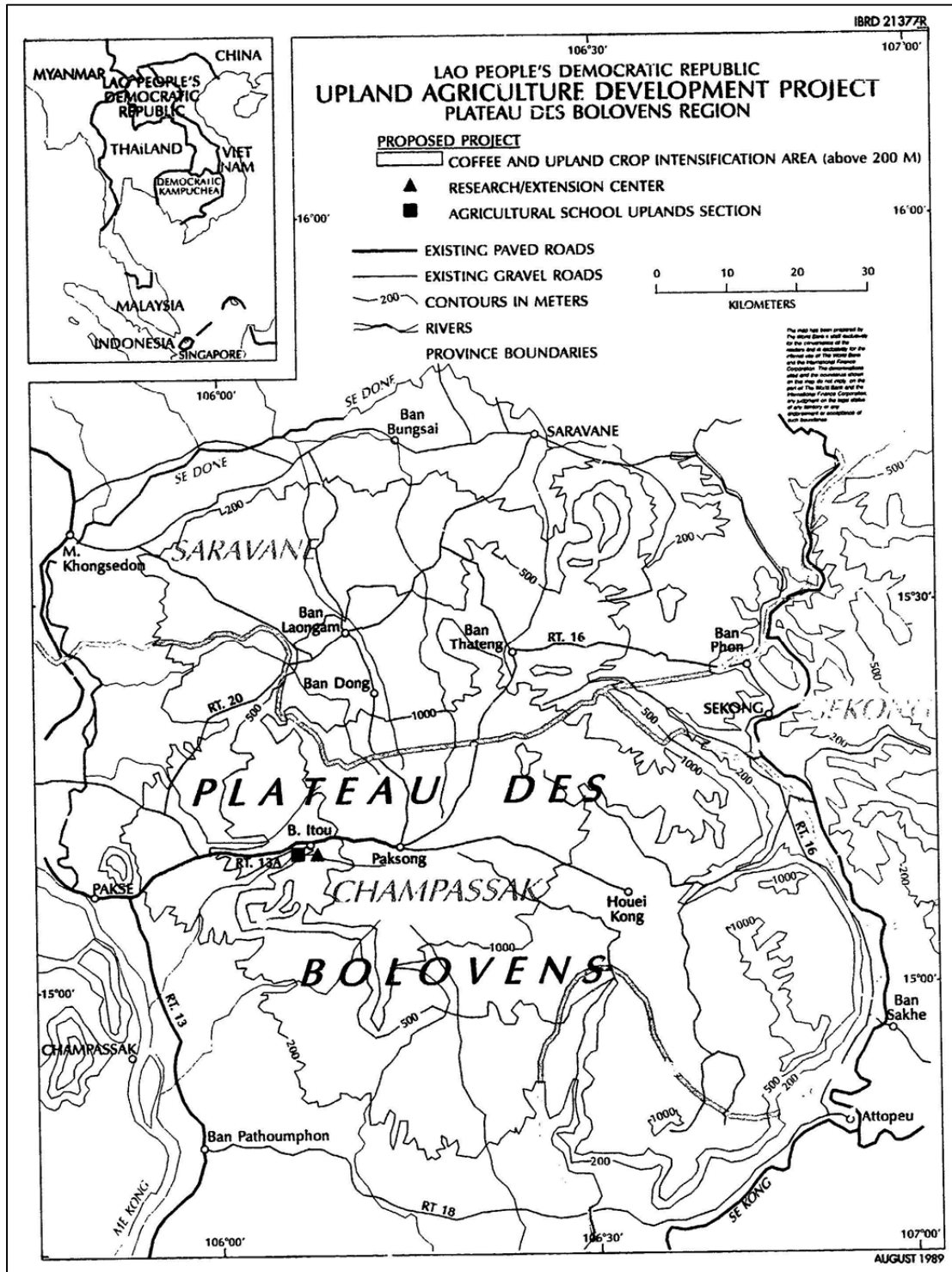
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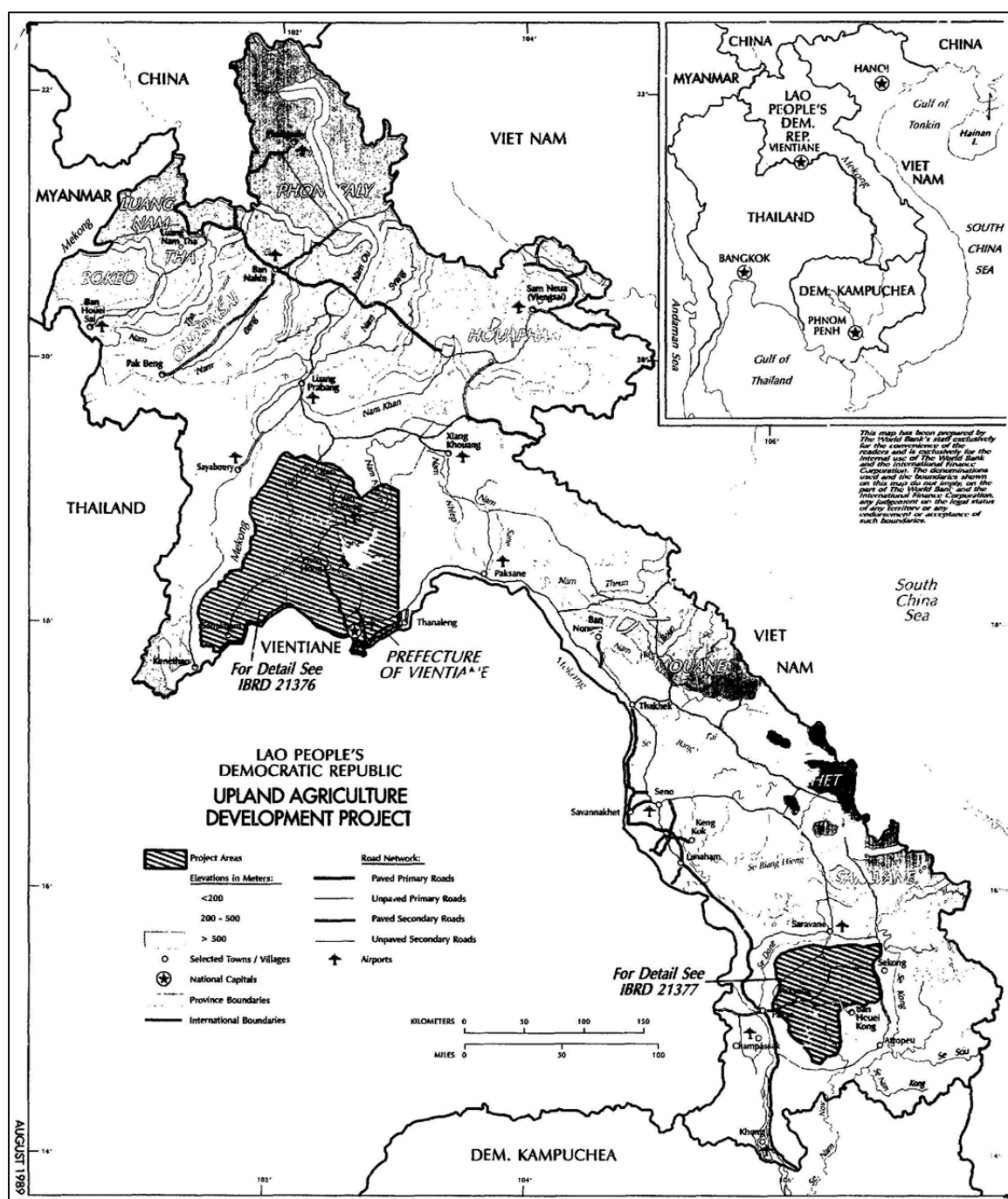
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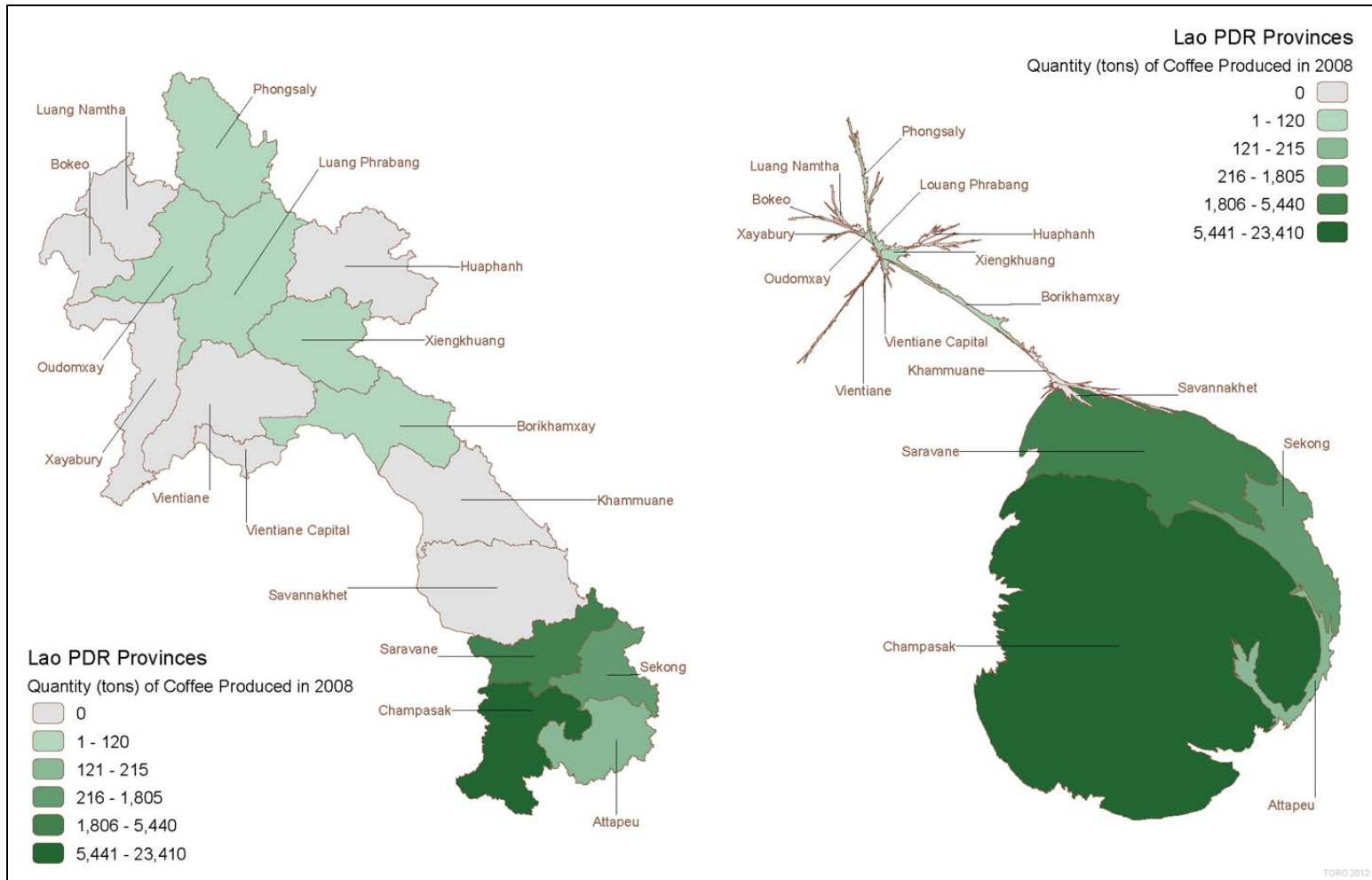
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APPENDICES

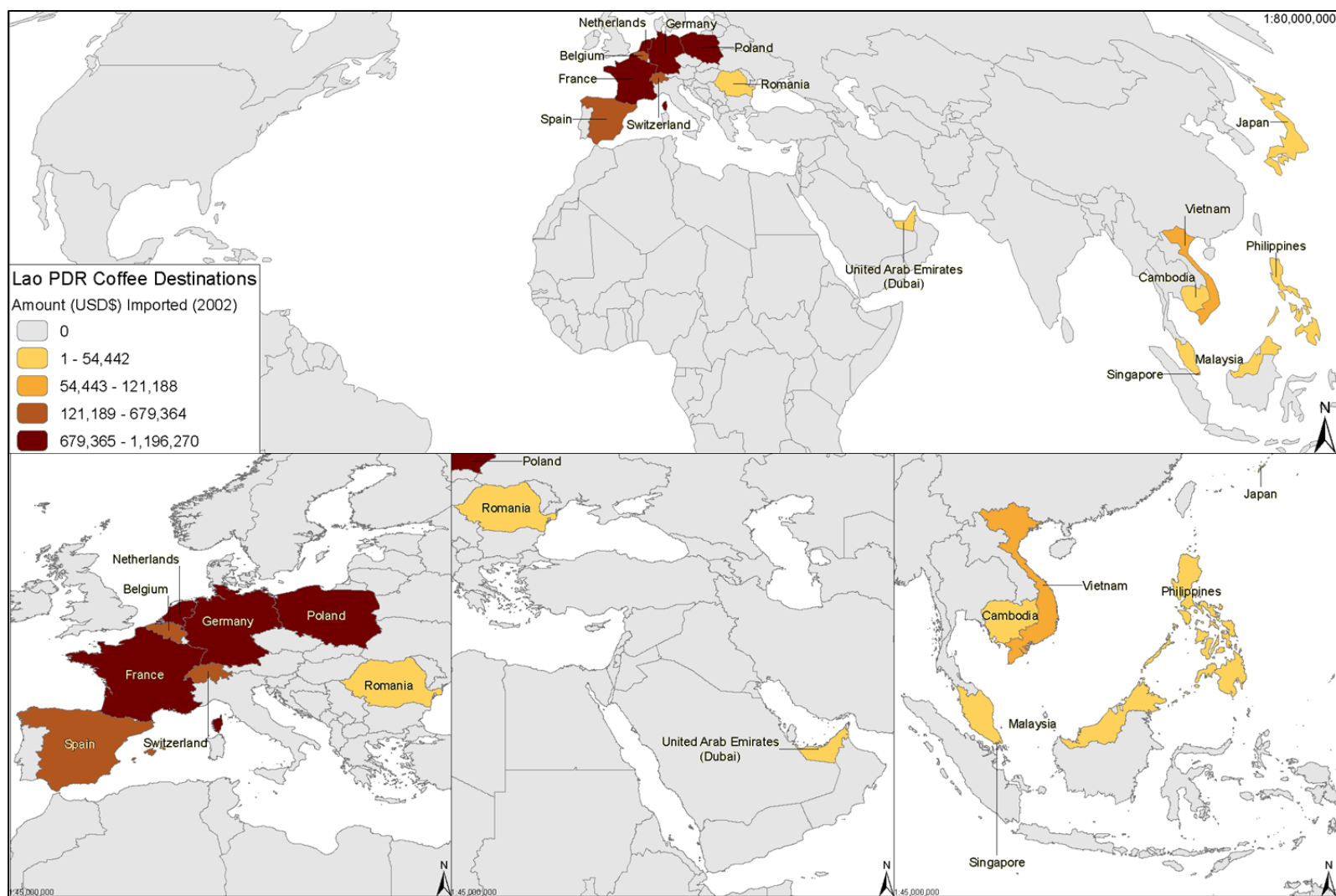


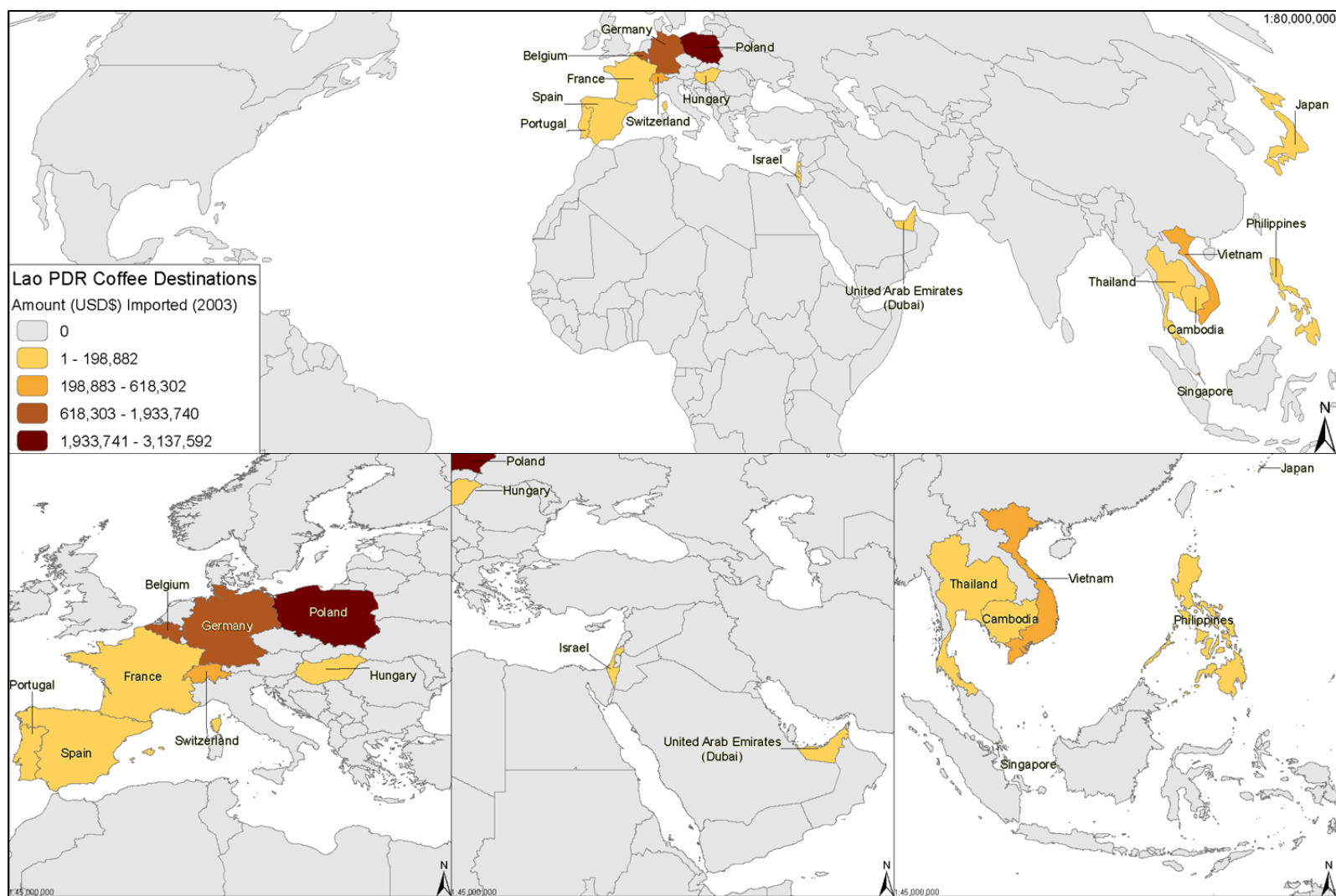


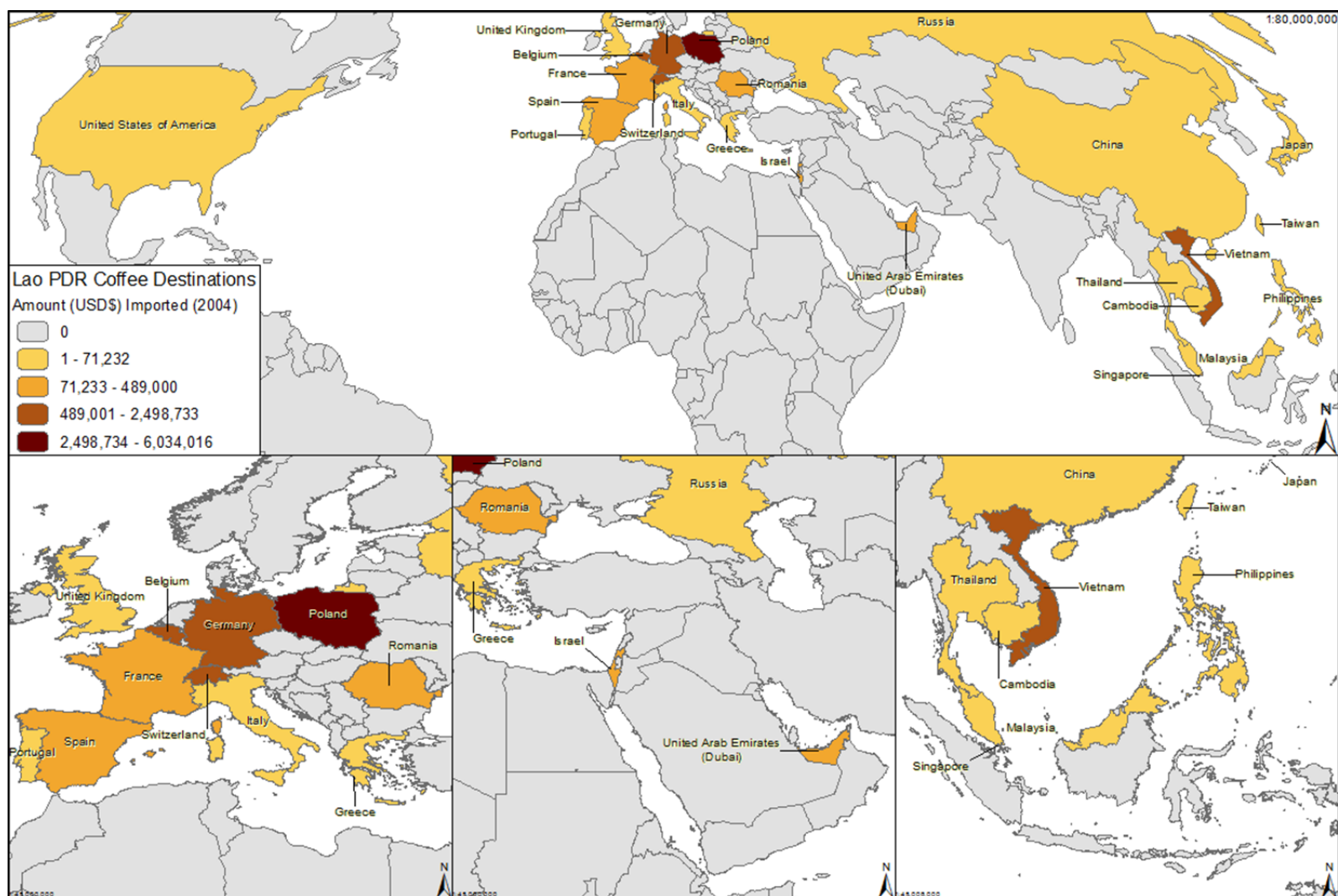
Map A2: Lao People's Democratic Republic Upland Agriculture Development Project. *Source:* WB (1989: 99). Staff Appraisal Report Lao People's Democratic Republic Upland Agriculture Development Project. The World Bank.



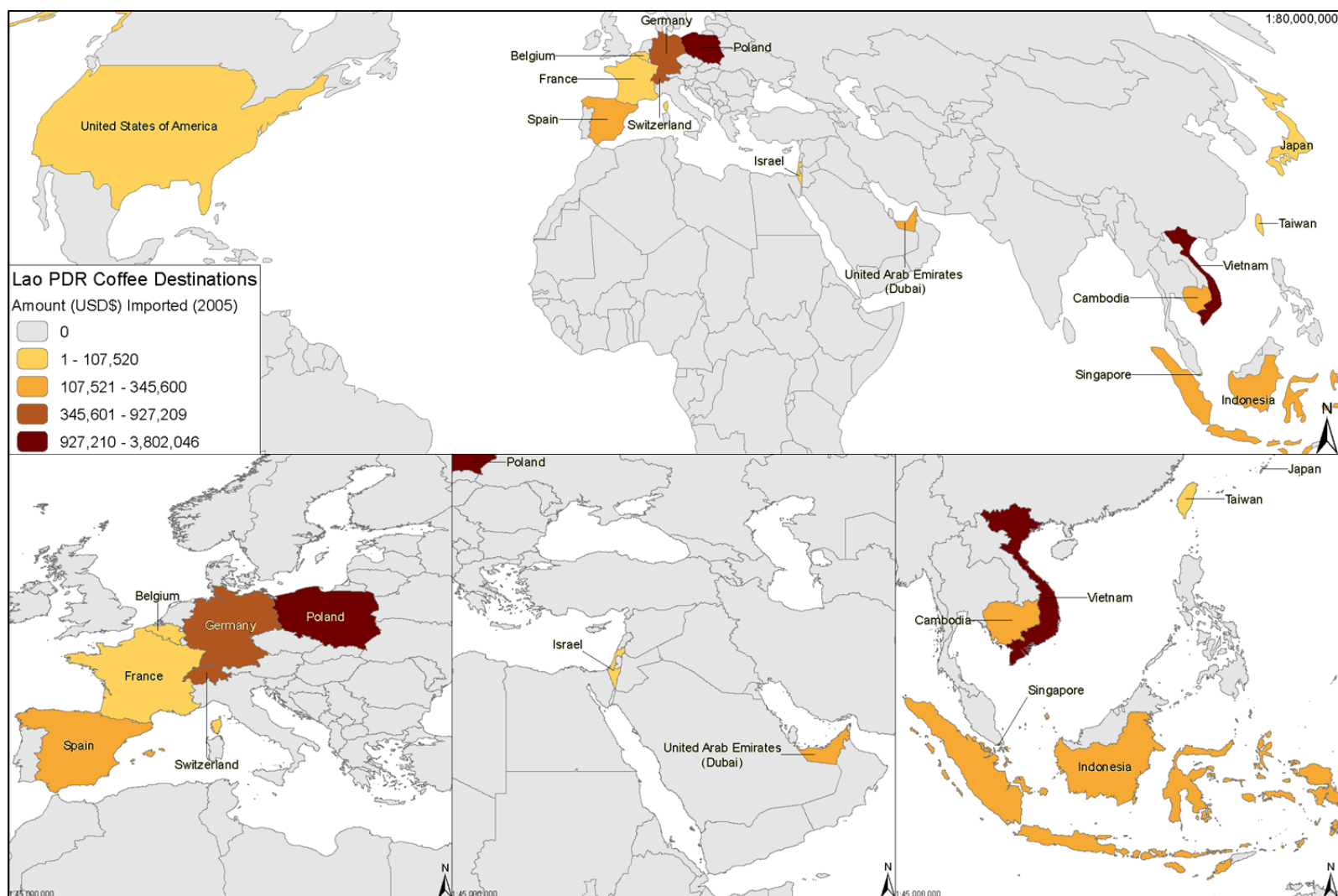
Map A3: Choropleth and cartogram of the quantity of coffee produced in 2008 in each Lao PDR province. Although they represent the same data, these two maps visualize those data in very different ways. The cartogram distorts the geometric representation of the provinces by adjusting their sizes proportionate to their respective values for the variable in question: quantity (tons) of coffee produced in 2008. *Source:* Maps by author; Lao PDR provincial coffee production data from NSC (2006).



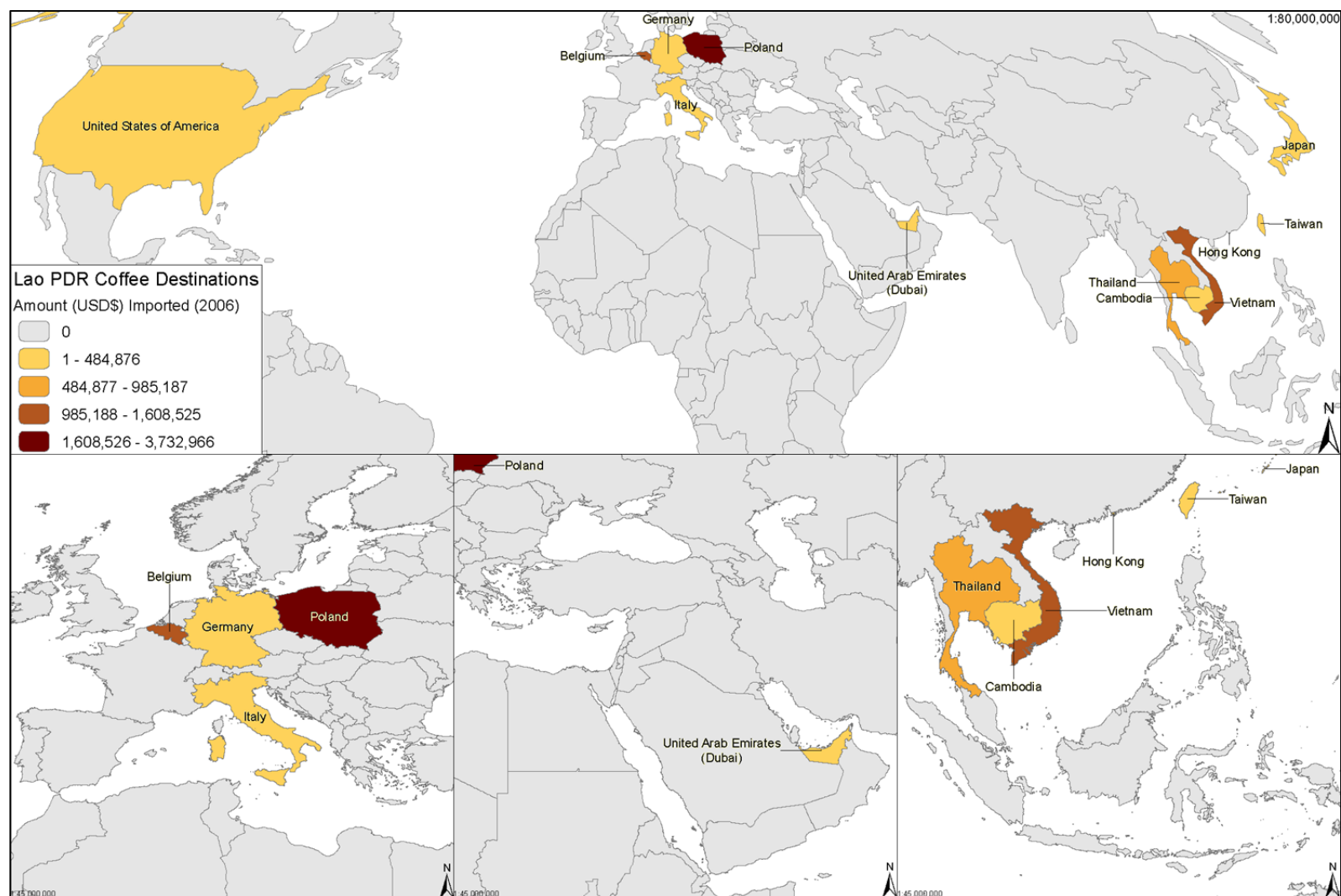


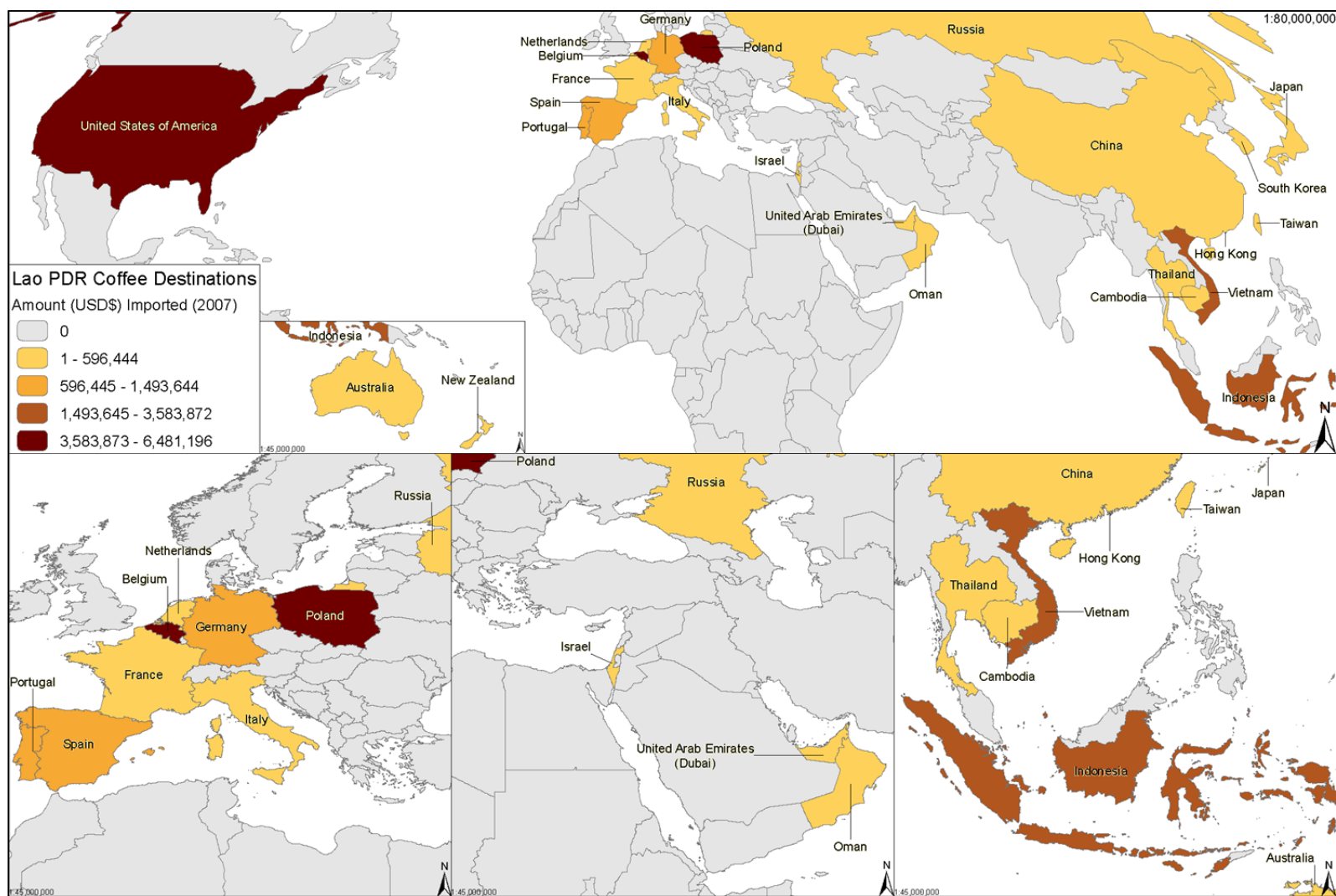


Map A6: Destinations and value of Lao coffee exports in 2004. *Source:* Map by author; Lao PDR coffee export data provided by LCA (2009).

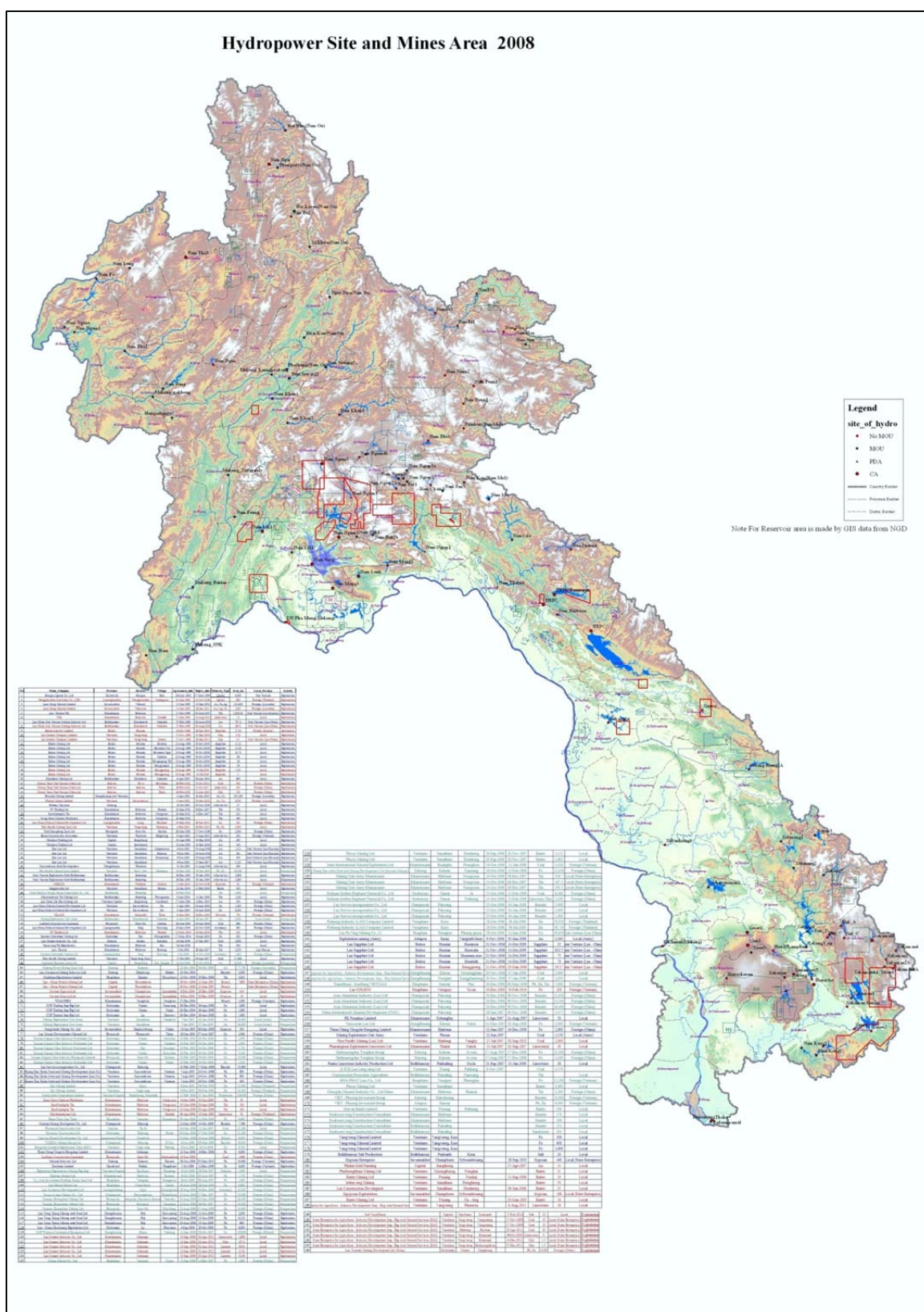


Map A7: Destinations and value of Lao coffee exports in 2005. *Source:* Map by author; Lao PDR coffee export data provided by LCA (2009).

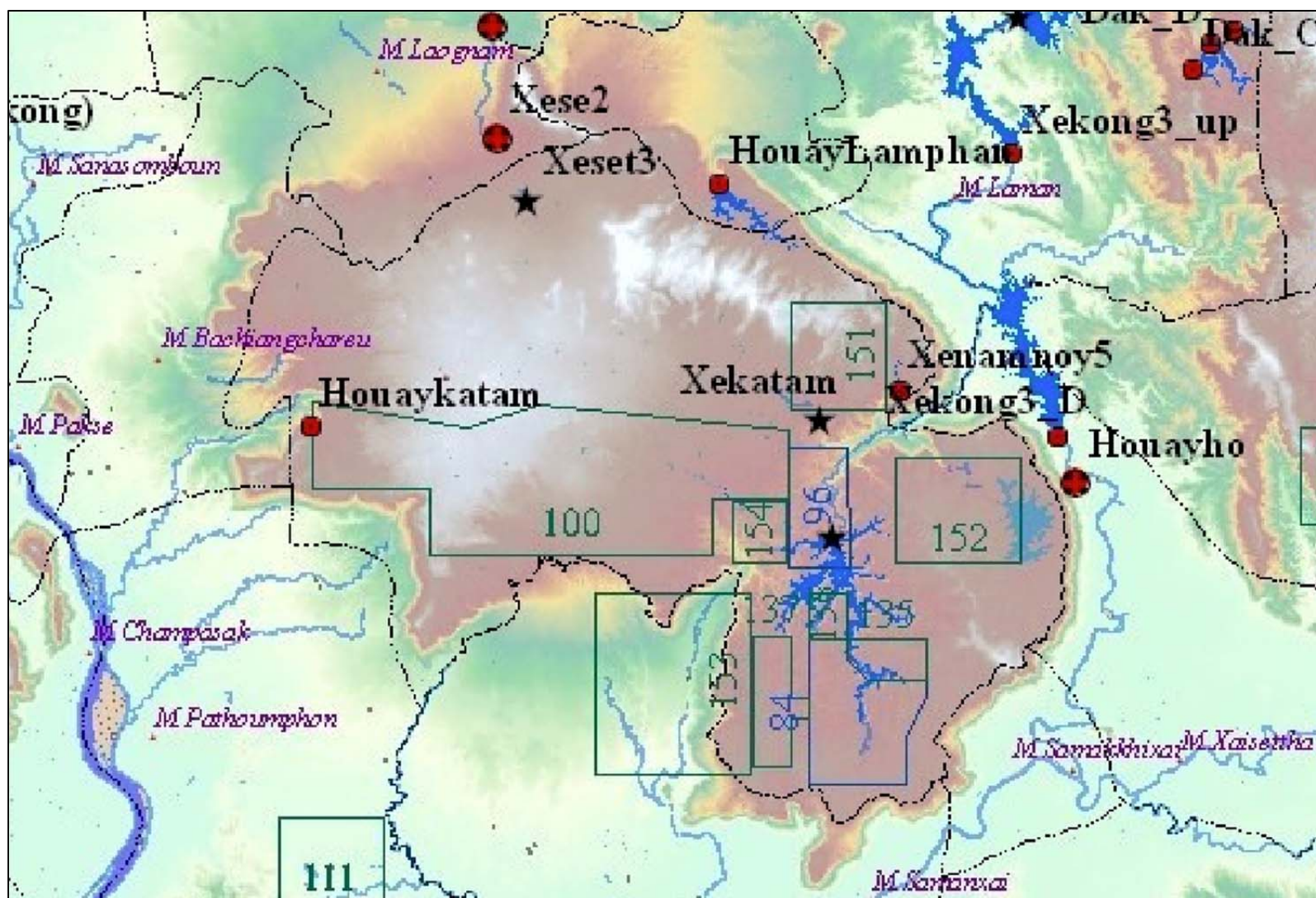




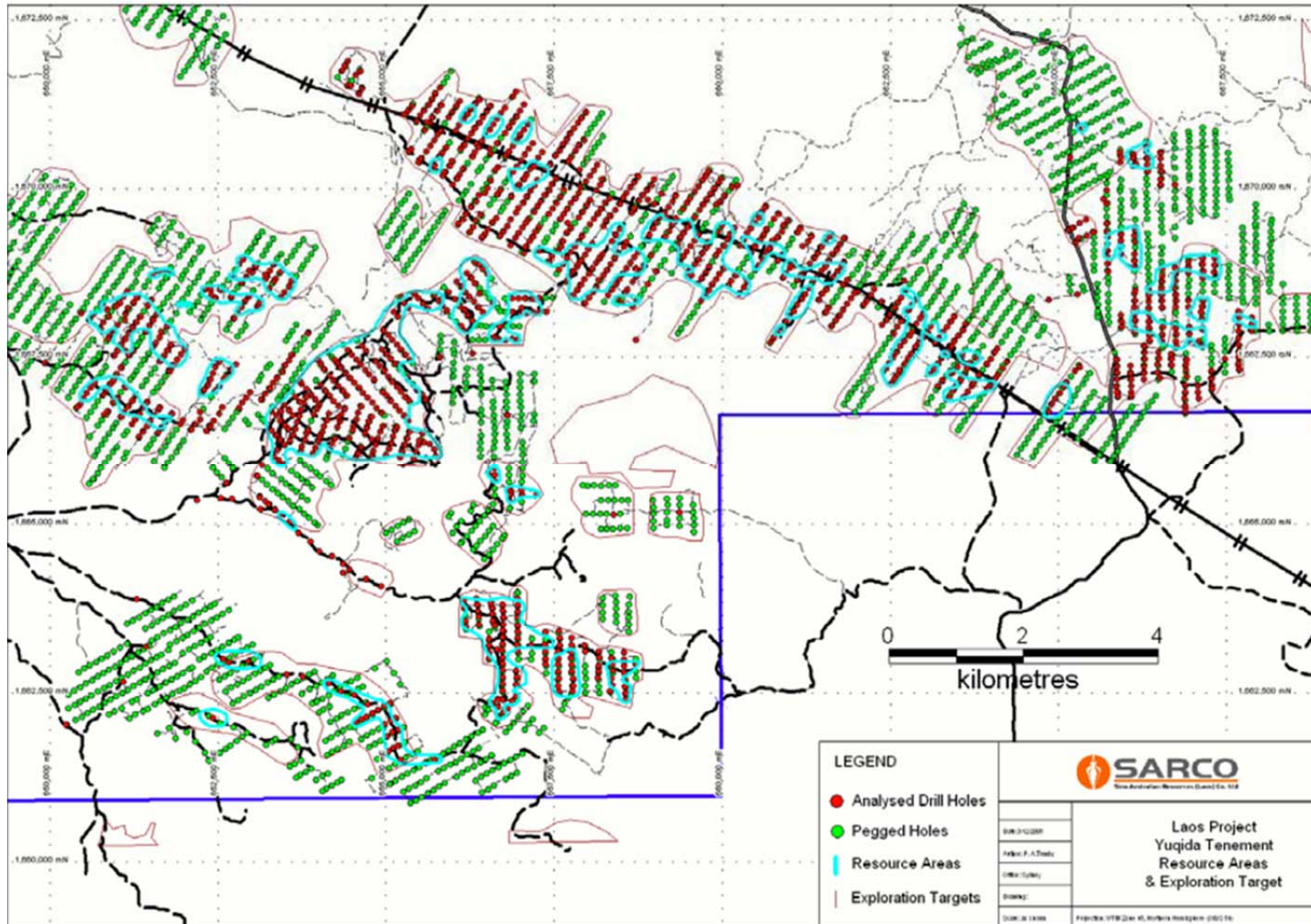
Map A9: Destinations and value of Lao coffee exports in 2007. Note the inclusion of Australia and New Zealand. *Source:* Map by author; Lao PDR coffee export data provided by LCA (2009).



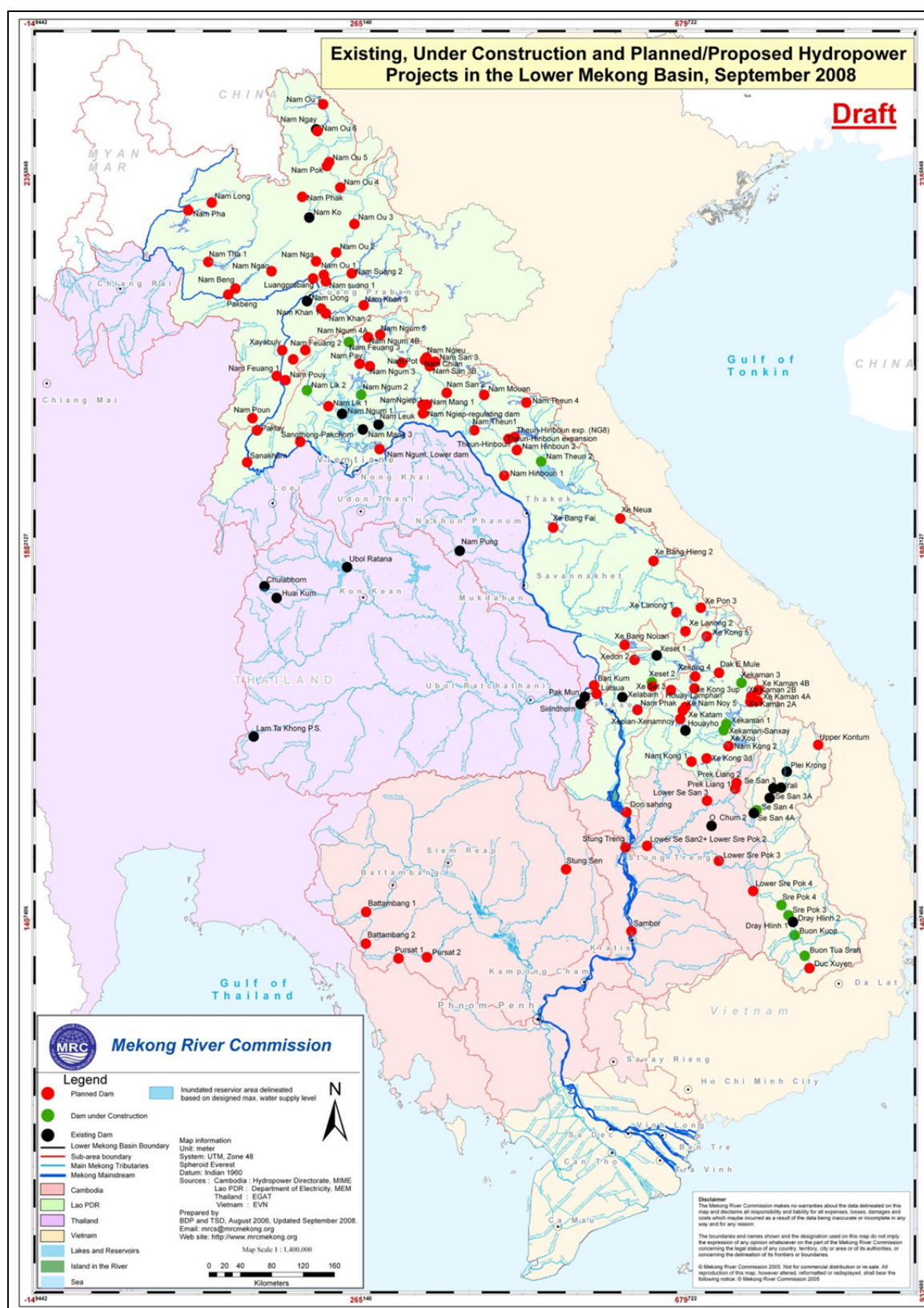
Map A10: Hydropower site and mines area map 2008. *Source:* Unknown (plausibly from the Lao PDR Ministry of Mines and Dams).



Map A11: Bolaven Plateau region screenshot from hydropower site and mines area 2008. *Source:* Unknown (plausibly from the Lao PDR Ministry of Mines and Dams).



Map A12: Laos Project Yuqida Tenement Resource Areas & Exploration Target. *Source:* [Map extracted from] 38% Increase to 130 MT [million tons] of Bauxite in Total Indicated Resource Estimate for Bolaven Plateau Bauxite Exploration. 4 December. Sydney: Ord River Resources (Ord 2008a).



Map A13: Existing, under construction and planned/proposed hydropower projects in the Lower Mekong Basin, September 2008. *Source:* Mekong River Commission (MRC 2008).

