The Nature Conservancy
Protecting nature. Preserving life.™

World Agroforestry Centre
TRANSFORMING LIVES AND LANDSCAPES

Are conditional and realistic REDD+ mechanisms feasible? A case of a rich forested district in Indonesia

II. Profitability Analysis of Land Use Systems at District Level in REDD+ Feasibility

Arif Rahmanulloh, Suseno Budidarsono and Muhammad Sofiyuddin

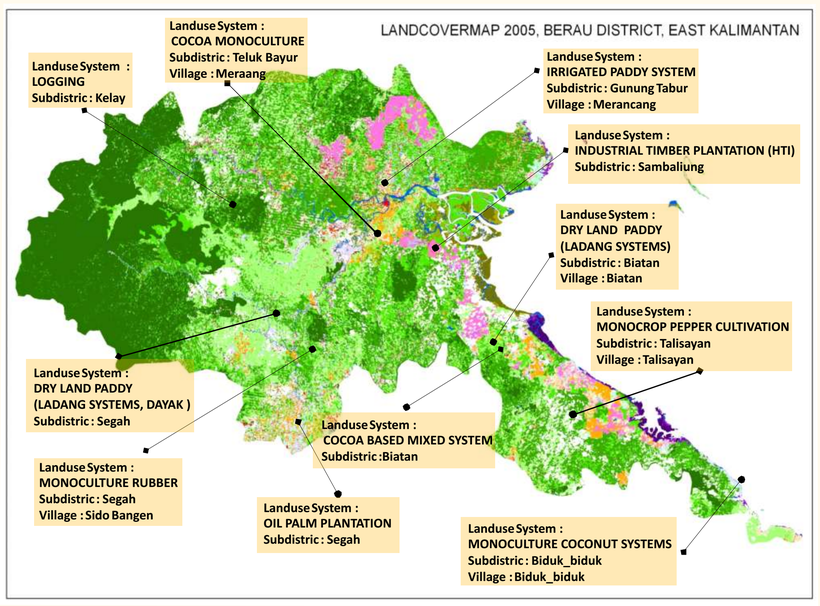
Introduction

- Profitability analysis is one out of three components used to estimate opportunity cost of REDD+ at district level of Berau. Two other components are carbon stock accounting/monitoring and driver analysis of land use/cover change. To upscale in landscape level, spatial analysis derived land use cover change during the period of study (1990-2005).
- To quantify economic return of each main land use systems in Berau district, it provides clear comparison of benefit accepted by the people, operators or other parties affected by designed land-use change intervention (REDD+)


Objectives

- Profitability analysis aims to clarify the profitability of the main land use systems , factor input of each land use systems, emphasizing on the labor requirements and policy related issues in land use changes

Result & Discussion



Major land uses exists in Berau district as showed by the above map. It consists of rubber monoculture, pepper, cocoa, paddy rice cultivation, oil palm, acacia plantation and logging activity. The pink boxes point location of selected main land use.

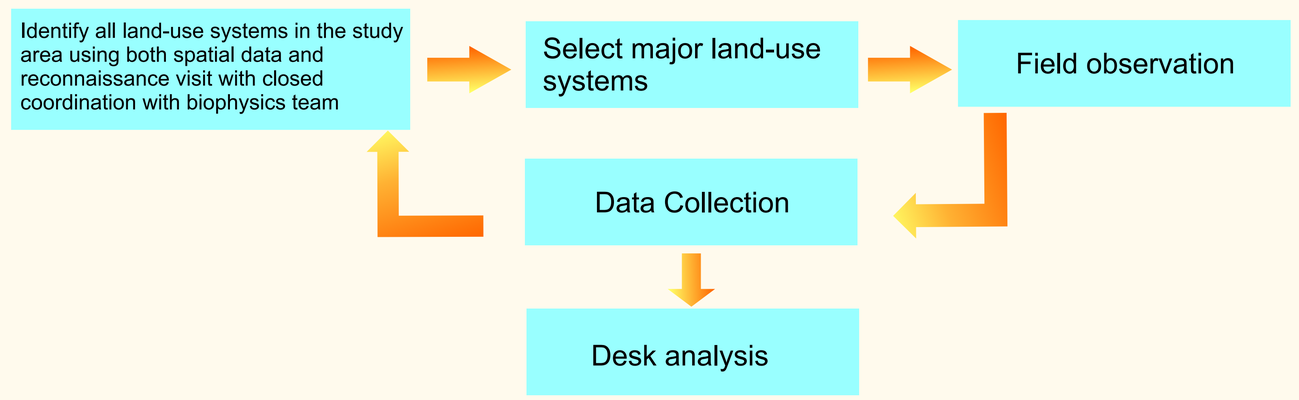
Assumptions

This study applies several macro-economic assumptions below, in seek of profitability value

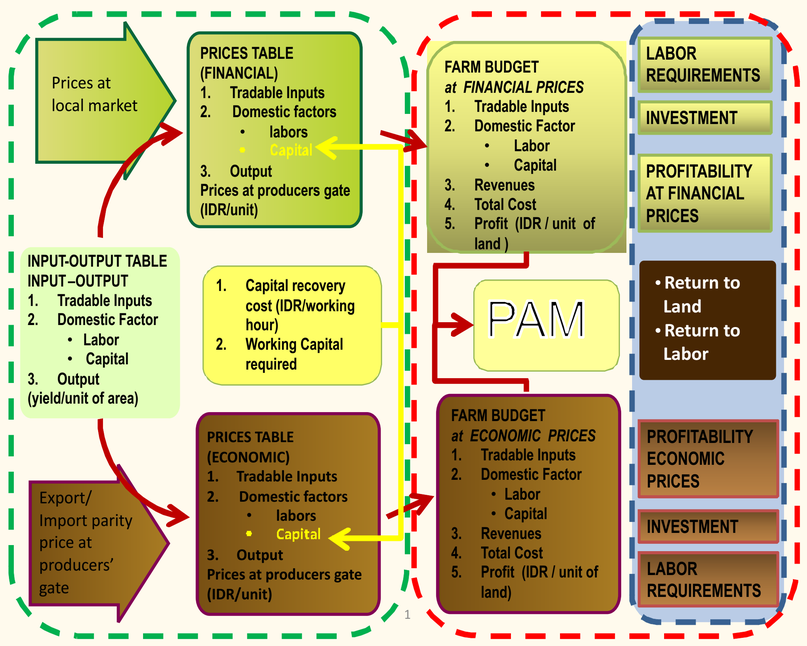
Parameters	Jul-09
Exchange rate	IDR 9,680/ US$ 1
Wage rate in Kalimantan	IDR 44,000 / ps-day
Real interest rates (net of inflation):	
Private	10 % per year
Social	5 % per year

Methodology

Using the recurring steps, the analysis begin with the identification of main land uses in the study area (1). Then several land-uses were selected based on its urgency, scale of area and scale of firms/operators (2). Field observation was conducted to confirm with the preliminary information as well as to portray the comprehensive description of the study area (3). During the data collection process, any findings could lead to the Step 1 (Identification) to adjust a list of selected land-use. Desk analysis to calculate profitability was conducted using Policy Analysis Matrix (PAM) approach.



Steps by Steps Profitability Assessment applying PAM methodology



The Policy analysis matrix (PAM) is a matrix of information about agricultural and natural resources policies and factor market imperfection, that is created by comparing multi years land use system budget calculated at financial prices (reflecting actual market) and economics prices (reflecting efficiency).

The term of private refers to observe revenues and cost reflecting market prices received or paid by farmers, merchant, or processors in the agricultural system. Private profitability calculations show the competitiveness of agricultural systems at given current technologies, output values, import cost and policy transfer

Social profitability calculation is the accounting matrix utilized social prices. These valuations measure comparative advantages or efficiency in the agricultural commodity system

Any divergence between the observed private prices and the estimated social prices must be explained by the effect of policy or by the existence of market failure

PAM Table and return to labor

Main land use system	RETURN TO LAND*) (NPV, IDR 000/ha)			RETURN TO LABOUR*) IDR/ps-day	
	at private prices	*at social prices*	*Divergences*	*at private prices*	*at social prices*
Logging					
low density (17 m3/ha)	3,851	9,074	-5,222	97,851	129,514
high density (40 m3/ha)	17,086	39,611	-22,525	281,057	417,314
HTI Acacia mangium	5,566	12,603	-7,037	34,057	50,205
Oil Palm	33,146	137,699	-104.553	127,976	222,395
Paddy					
Dry (Dayak)	-30,768	-65,769	35,001	17,302	8,917
Dry (Coastal)	-24,809	-35,978	11,169	18,722	8,963
Cocoa based Mix Garden	2,920	13,029	-10,109	50,011	65,766
Cocoa Monoculture	13,038	32,551	-19,513	61,200	62,384
Coconut Monoculture	3,404	15,863	-12,458	53,476	79,313
Pepper Monoculture	28,069	64,503	-36,433	61,253	69,243
Rubber Monoculture	12,199	68,902	-56,703	59,996	96,029

The paddy rice cultivation practiced communities, stands out being 'unprofitable' either in terms of potential profitability or smallholder production incentives. This does not necessary mean that there are no positive cash flow. Instead, would be more profitable to do other things with the land, labor and capital than to devote them to the activity. However, communities keep practicing the systems to secure their staple food.

Oil palm plantation is the most profitable system in Berau district. The system began to appears in Berau since 10 years ago and mostly operated by large-scale investor.

More info: **Suseno Budidarsono** (s.budidarsono@cgiar.org)
World Agroforestry Centre
Southeast Asia Regional Office