Oil palm expansion and water ecosystem services in Jambi

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How far oil palm expansion should be allowed until the water source s are not irreversible degraded in Batanghari ?

Policy brief please !!

Outline

Research focus:

Oil palm expansion and hydrological functions

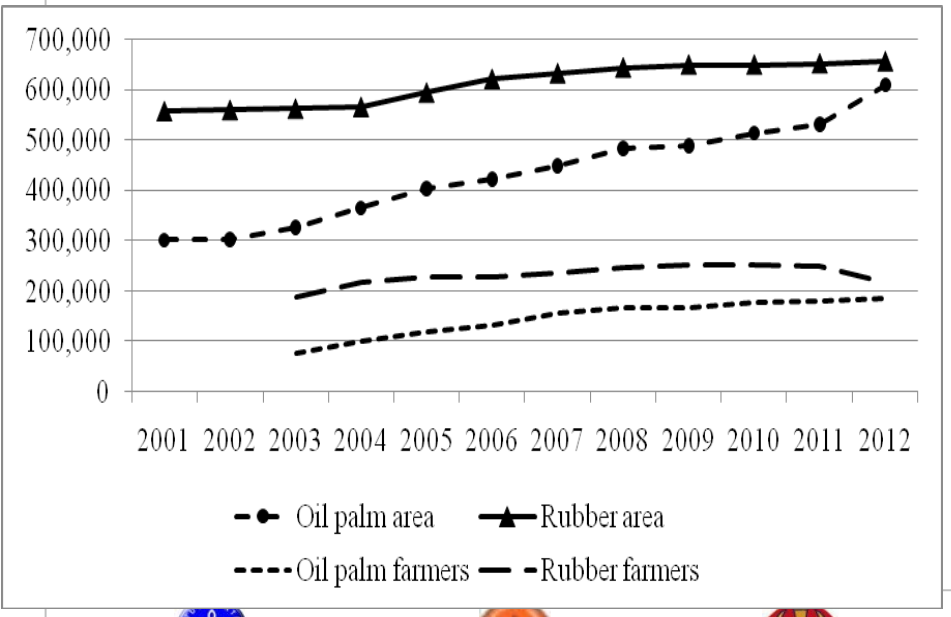
(To upscale result of plot hydrological function *for applied research→policy brief for local government*)

- Case 1: Research on **macro-catchment** related to hydrological functions and water ecosystem services → **funded by DIKTI**
- Case 2: Research on **micro-catchment** related to oil palm water management → **funded by ABS (+start up)**

Introduction

Oil palm expansion in Jambi??

Disbun, Jambi



BAPPEDA

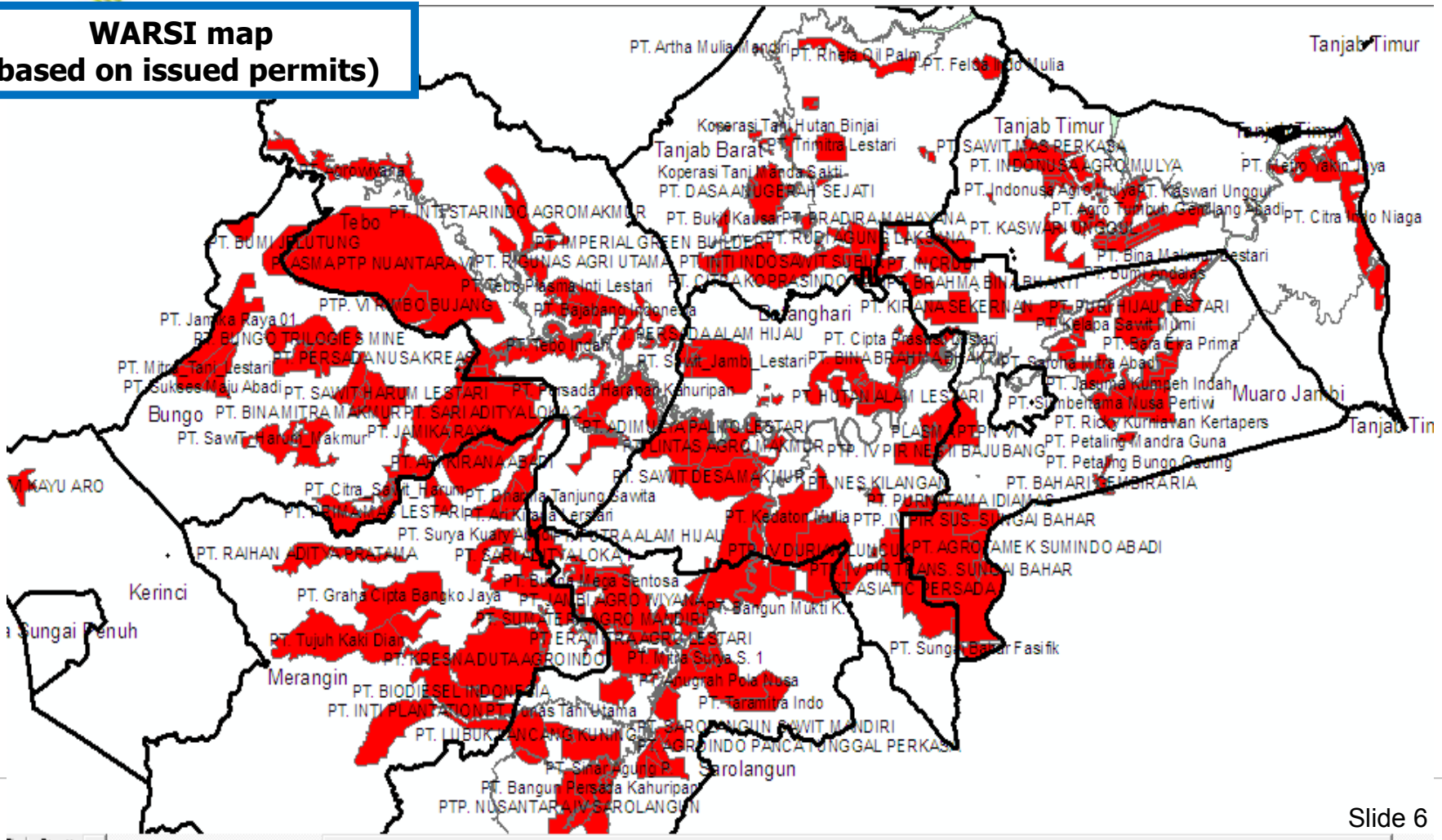
No	Jenis Penggunaan	Luas (Ha)	%
1	Lahan Permukiman	46.607,13	0,95
2	Sawah	128,116,22	2,61
3	Tegalan/Ladang	299.937,92	6,12
4	Perkebunan Campuran	788.125,35	16,1
5	Perkebunan Lain	687.567,25	14
6	Kebun Sawit	770.867,78	15,7
7	Rawa	35.380,89	0,72
8	Bandara	114,41	0,002
9	Semak/Belukar	524.381,99	10,7
10	Mangrove	10.534,27	0,21
11	Hutan	1.539.629,30	31,4
12	Lain-lain	68.715,49	1,4
	Jumlah	4,899,978,00	100.00%

	NAMA	Area (ha)
2	PLASMA PTP NUANTARA VI	90,111
3	PTP. IV PIR TRANS. SUNGAI BAHAR	45,841
4	PT. KRESNA DUTA AGROINDO	44,530
5	PT. INTI INDOSAWIT SUBUR	32,113
6	PT. SARI ADITYA LOKA 2	32,107
7	PT. Agrowiyana	26,574
8	PT. Tujuh Kaki Dian	25,571
9	PT. Buana Mega Sentosa	22,084
10	PTP. IV DURIAN LUNCUK	20,334
11	PT. ASIATIC PERSADA	19,484
12	PT. INTI PLANTATION	18,768
13	PT. Anugrah Pola Nusa	18,456
...	...	...
155	PT. Tunjuk Langit Sejahtera	344
156	PT. Sinar Agung P.	316
157	Koperasi Serba Usaha Pelangi	284
158	PT. Humusindo_Makmur_Sejati	278
159	PT. Artha Mulia Mandiri	274
160	Keltan_Bulan_Purnama	248
161	PT. LADANG SAWIT SEJAHTERA	244
162	Keltan_Jasa_Indah	199
163	PT. ABADI MAHA WIJAYA	197
164	PT. Flora Segatama	179
165	Koperasi Maju Bersama	120
...	Keltan_Umar_Majid	48
167	T. Sari Aditya Loka	29
	Jumlah Total	1,199,134

WARSI map (based on existing plantation and issued permits)

Oil palm expansion in Jambi

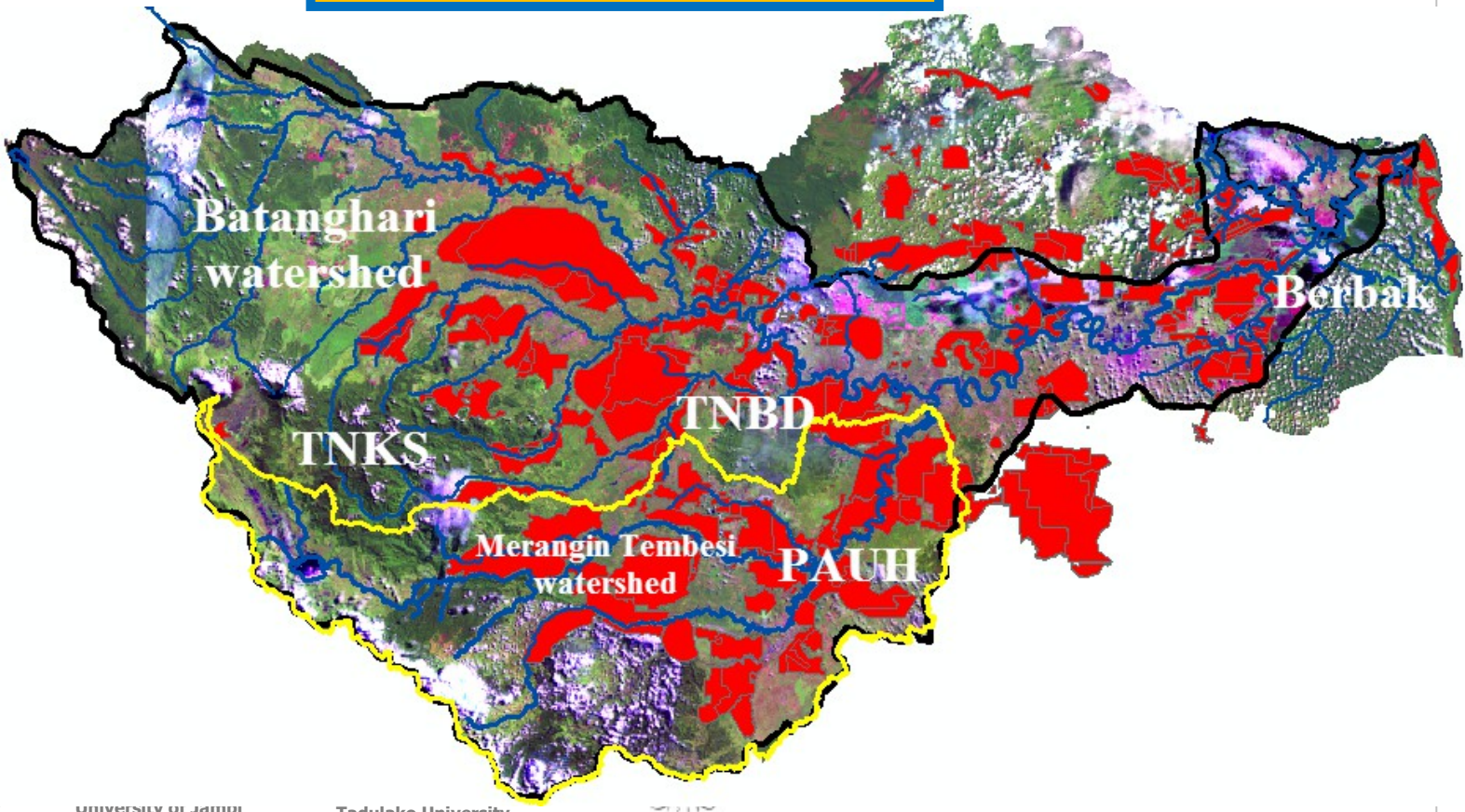
WARSI map
(based on issued permits)



Case 1: WATER ecosystem service in Merangin Tembesi watershed (beyond plots)

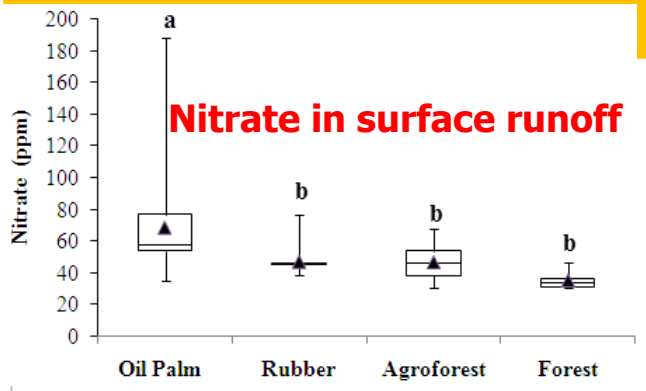
Benefit to human well-being

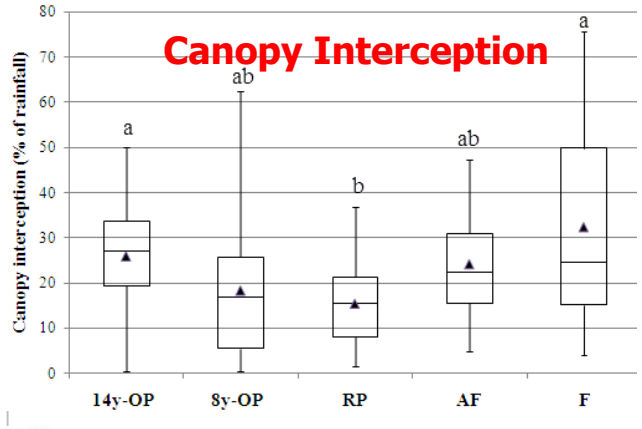
Watershed as unit of analysisi

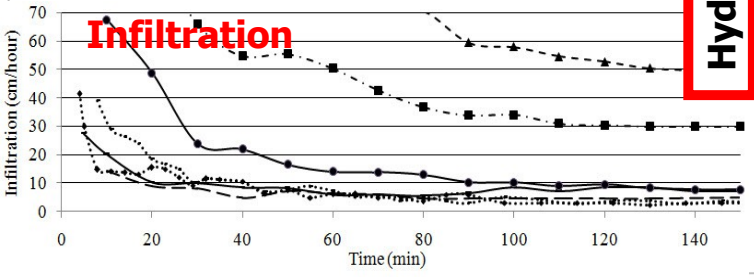


Merangin Tembesi outlet

Methodology



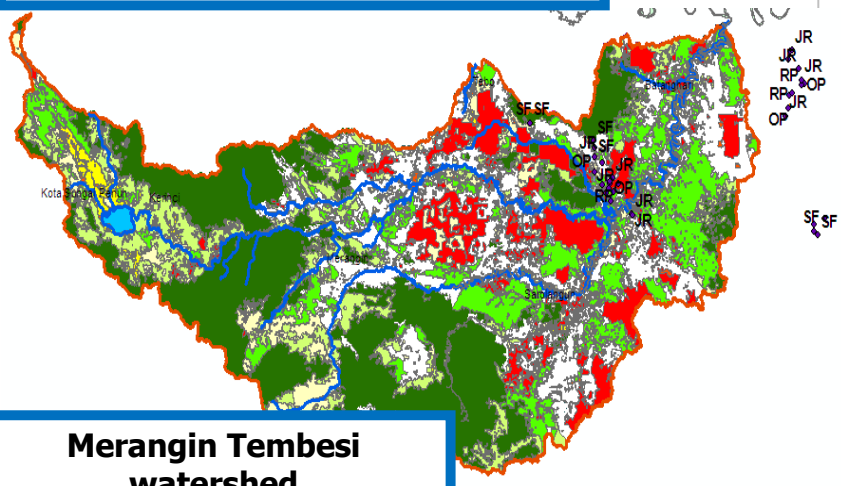




Hydrological functions (PLOT level)

Parameterization of SWAT Model

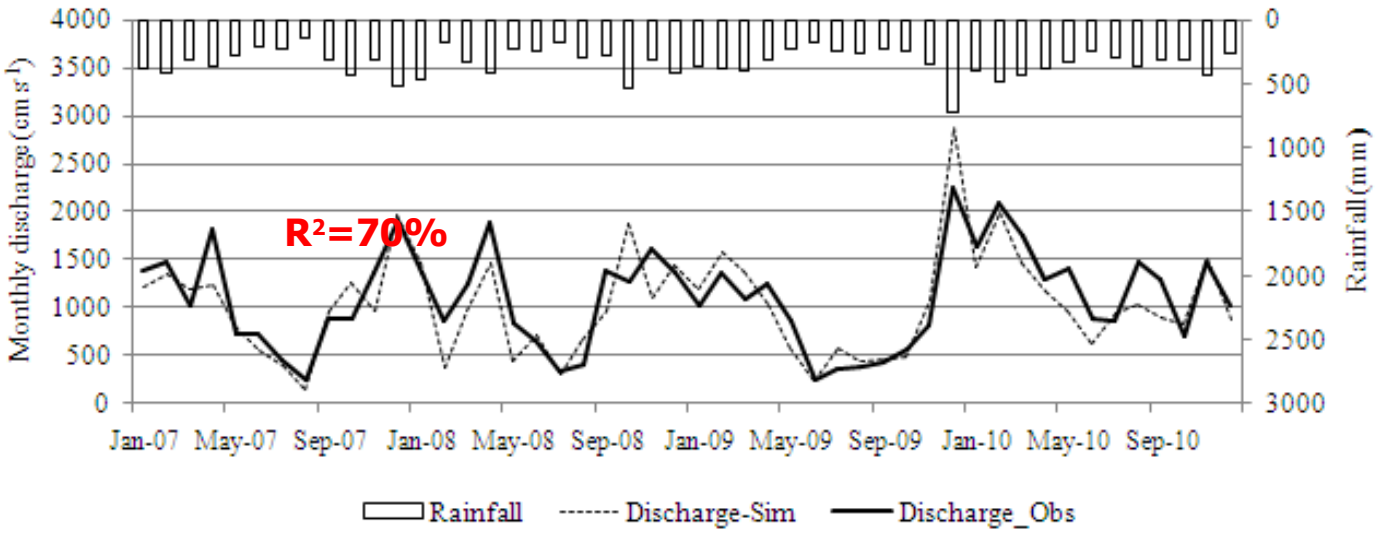
Water yield, water quality



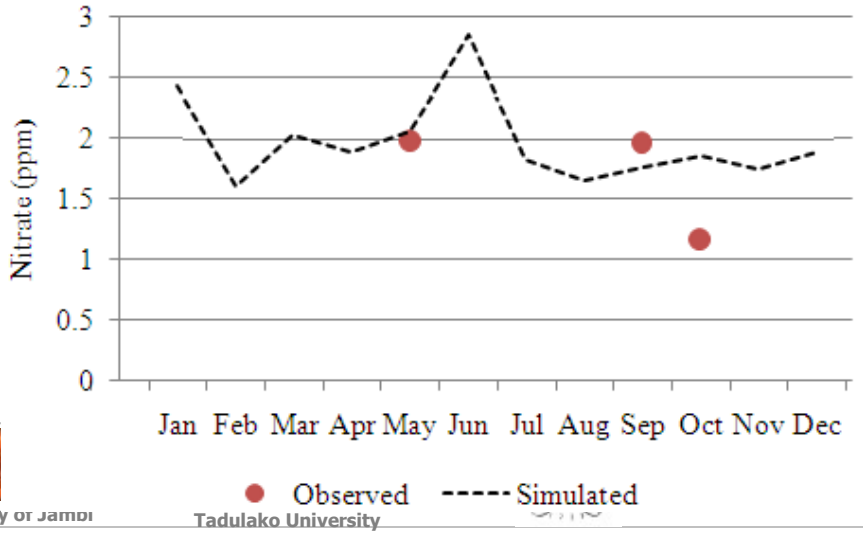
Merangin Tembesi watershed

Model Calibration and Validation

Water yield

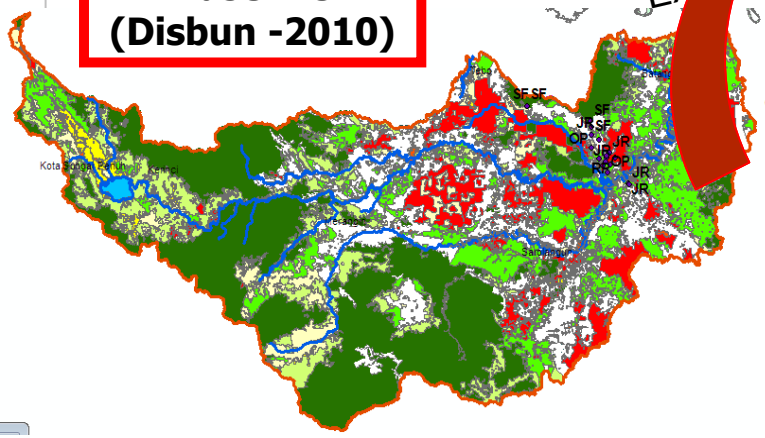


Nitrate load



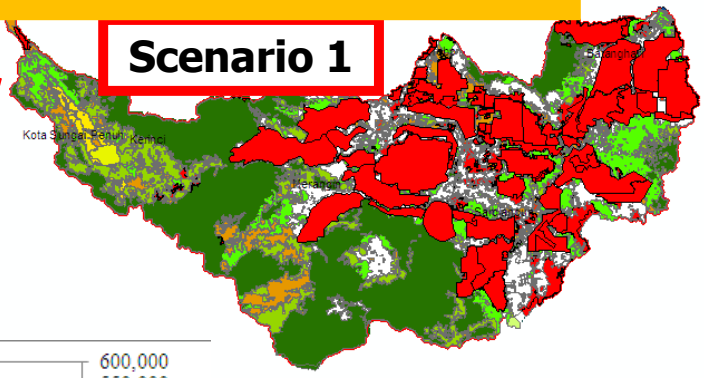
Results

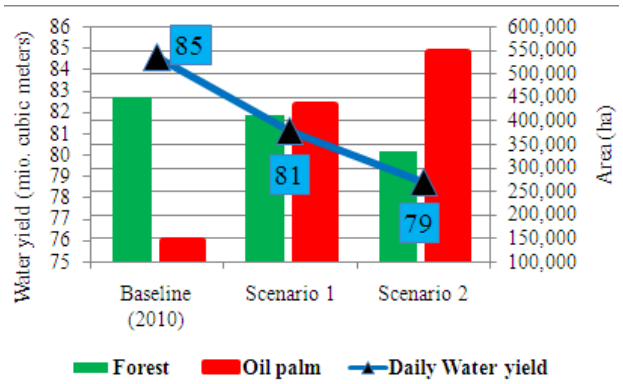
Baseline (Disbun -2010)



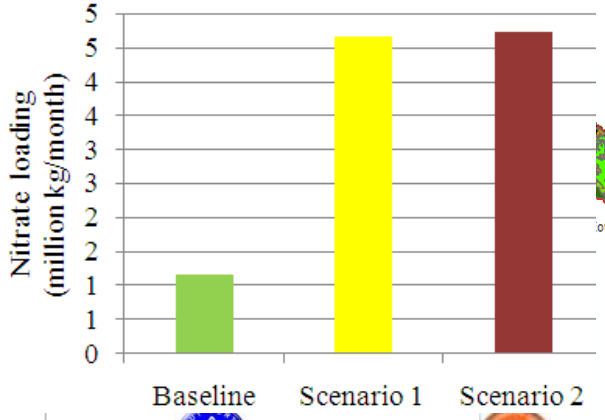
Existing Issued Permits Mapping (WARSI)

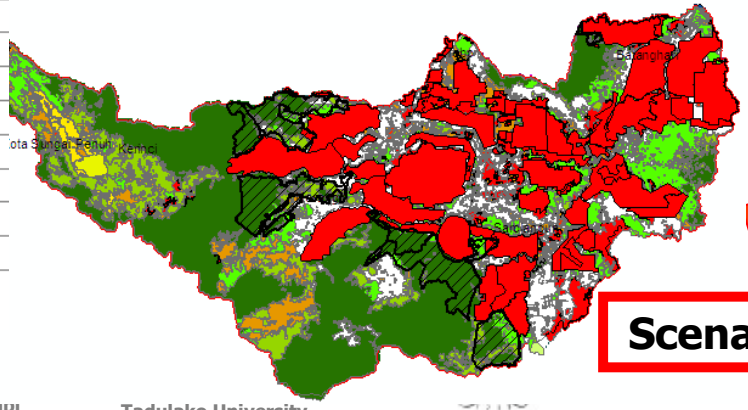
Scenario 1





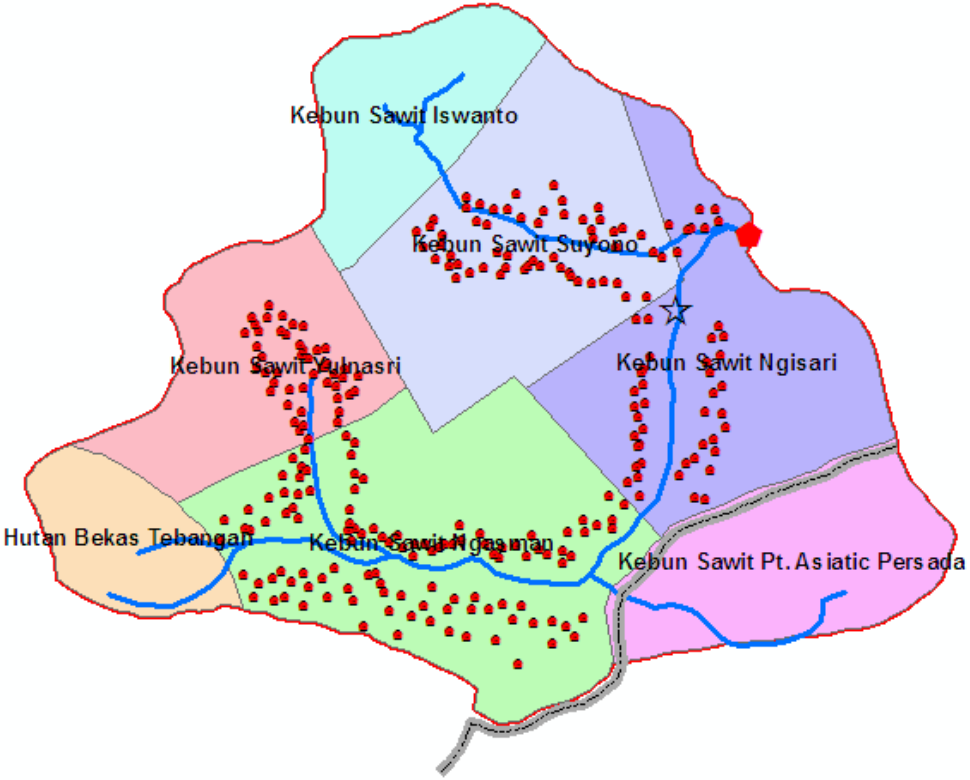
Future conversion of left over forest production

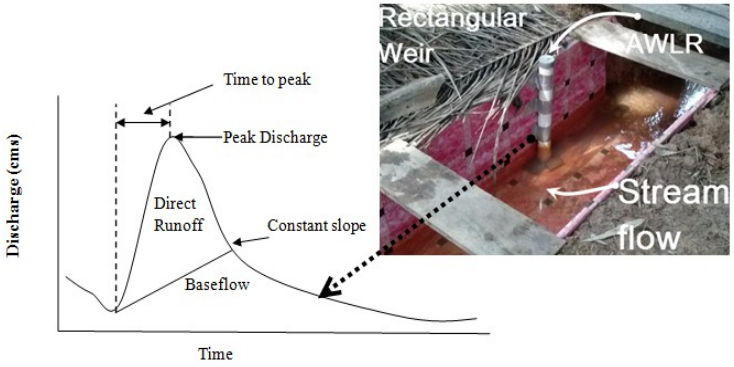




Scenario 2

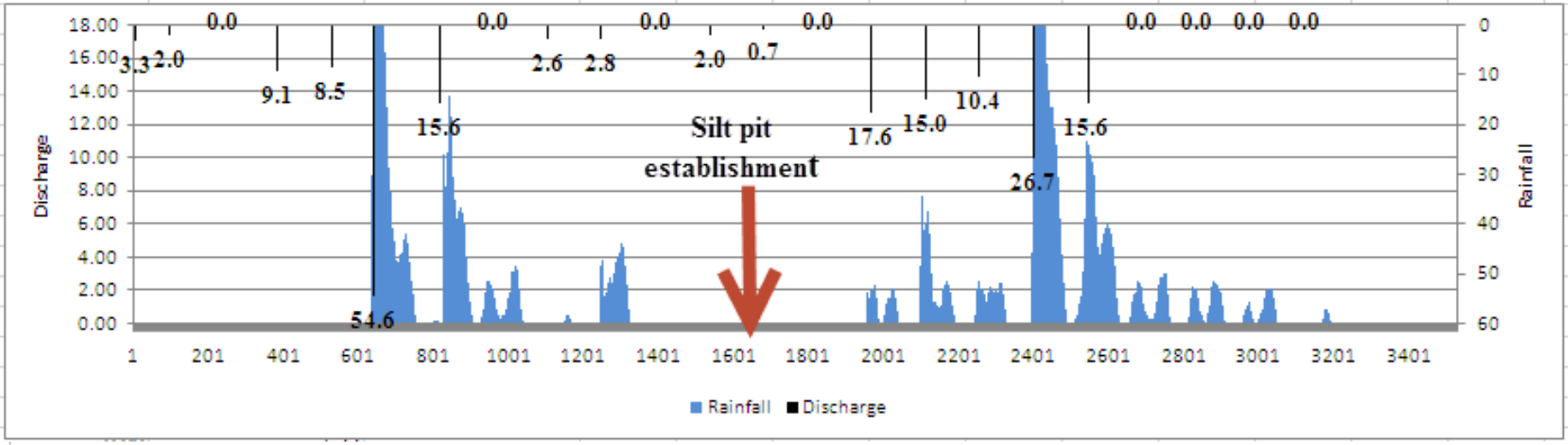
Case 2. Water Management in Oil Palm





Silt Pit (20x15 ha=300 silt pit)

Impact of silt pit on streamflow



Conclusion

- Forest conversion and oil palm expansion decrease hydrological function significantly in plot scale. (How far are they reflected in landscape or catchment scale in term of water ecosystem services ??).

- Expansion of oil palm in forested area 2x more sensitive in term of water ecosystem services then that of non-forested

- Management practices such as silt pit can reduce runoff