Alternative to Shifting cultivation

Slash and Mulch

Northern Chin State- Myanmar





Slash and Mulch is part of several agro-ecological itineraries and activities implemented by farmers in the frame work of the project " Promoting Agriculture Diversification and Economic Integration in Northern Chin State" Myanmar

Livelihoods and Food Security Trust Fund

Uplifting Livelihood and Food Security

Sustainable Farming Systems, Natural Resource Management and Economic Integration

- Northern Chin State -

6 Intervention thematics

Alternative to Shifting Cultivation - Rice Quality Seed Production
System of Rice Intensification - Soil Fertility Management
Marketing and Value Chain - Nutrition Awareness and Dietary Diversification

5 townships and **118 villages**
4508 Farmer groups members - 49% women
107 co- associate farmers who experiment and demonstrate
18 Producer groups in 3 townships - **4 main crops and products** for market and value Chain

A dynamic extension approach
23 Farmer Field Schools (FFS)
More than 100 Farmer Field Days (FFD)
15 Cluster Level Technical Sharing Workshops

CORAD- Empowering our communities

Shifting cultivation- Slash and burn

Changing context

- Shorter and shorter rotation
- Less soil fertility and crop yield

Pressure on productive assets

- Decline of forest cover
- Soil erosion
- Land slide

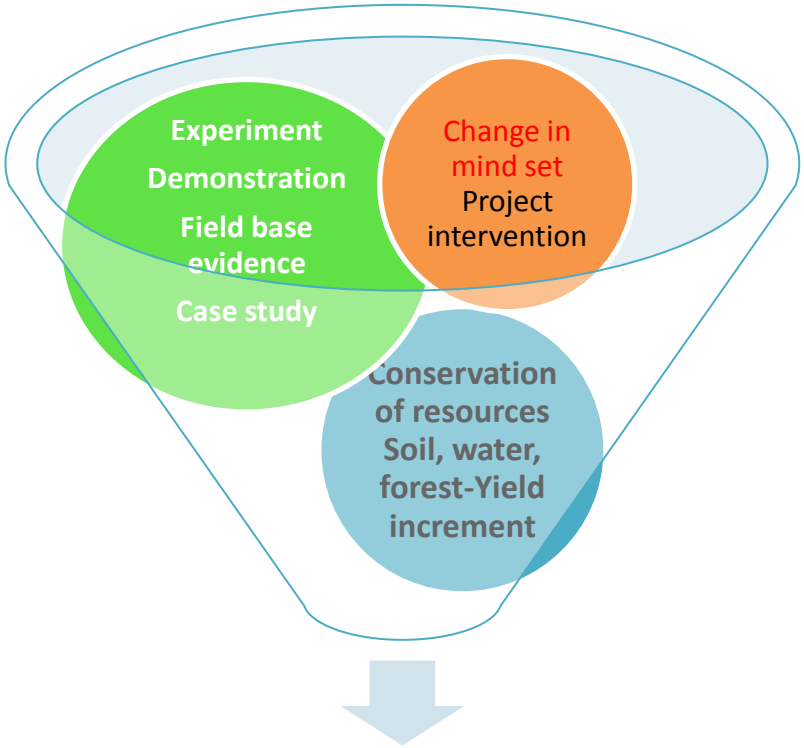
Pressure on water resource

- Decrease water recharge
- Springs and rivulets drying out early

Depletion of resources -Bottle neck

Not sustainable

Alternative to Shifting- Slash and Mulch



Mountainous farming system

Sustainability

Shifting cultivation/Slash and burn
The issues

The issue with the present state of the soil on shifting plots:

Recurrent annual burning have depleted soil organic matter.

Soil structure are increasingly compact.

No or less organic matter induce poor water retention capacity, soil are increasingly dry.

High rate of soil erosion during rainfall

Soil unprotected

Compact soil

Lack of organic matter

No humidity retention

- Observation of **soil condition** just before burning
- after 2 to 3 months **under slashed mulch**

(farmers slash and wait for the bio mass to dry before burning)

Soil is **better structured**

Soil **humidity retention** is high

Soil is **abundant with organic** matter

Good **humus smell**, soil easily workable

Facts:

If we **can keep the soil cover**…

- ➢ it will increase fertility, water retention, prevent erosion and possibly increase yield and/or add one or two additional years in the rotation system.

Open the mulch

Dig and plant

Option 1:

Permanent soil cover and thick much

- **Not burning** the slashed mulch, open the mulch and plant seeds, tubers, directly into the open mulch in a similar fashion as DSM or conservation agriculture

Weed easy to pull, comes with roots and no effort

No weeds are growing under shade

- ➢ <u>Some argument</u> against that method was that it will be difficult for farmer to control weeds
- ✓ It is expected that the mulch will have a weed suppressing effect
- ✓ Weeds can be a resources and turned into the soil

Option 2 : Keep the **branches on contour line** and the soil cover minimal.

- Use small branches as **contour bund to prevent soil erosion**
- Keep the soil with enough mulch and bio mass residues to break and absorb rain, control temperature and continue to nourish the soil

❑ Next year the mulch kept on the contour is **decomposed and can be re-used as compost fertilizer** !

❑ Good fertile soil is retained by those structure

Create small retention structure with branches and mulch

… every few meters or according to slope

Use remaining trees stumps to anchor branch structure

Keep enough ground cover to protect the soil

30 years permanent farming under Slash and Mulch

Vomdhluk village – Farmer Mr Hoi Ling

Vomdhluk village – Permanent farm on slope under Slash &Mulch / Turn-in

- **Permanent farming** under **slash & mulch/ turn-in** since **30 years**
- No use of Chemical Fertilizer or pesticides
- High yield, excellent soil fertility, excellent P&D control
- Cultivation of Corn, garden pea, potatoes, beans
- No burning
- Very successful farmer managing perfectly well his system **without external input**
- **Farm fertility self- sustaining since 30 years**

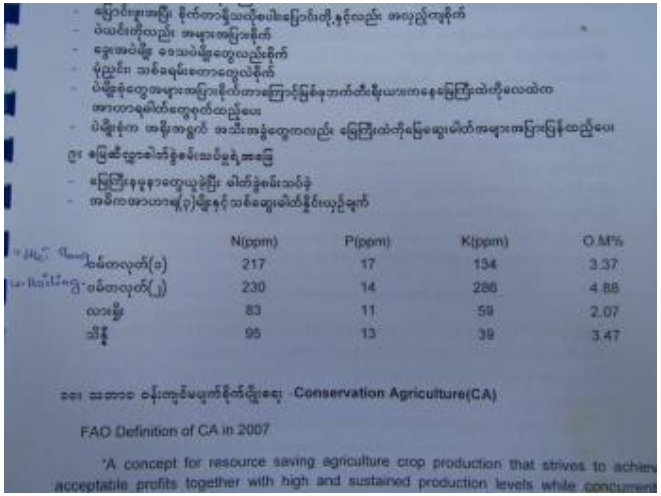
Mulched with weeds and previous corn crop residues

Soil highly fertile, black, well structure aerated, high level of organic matter, humus smell

Farming system practises:

The farmer practices a c**ombination of slash and mulch** and turning biomass into the soil (green manuring) during weeding operation.

Crops are sown (**direct seeding**) before mulching then covered with mulch. Garden pea, corn can sprout and **emerge trough the mulch**. For new plot weeds are slashed, sometimes uprooted and **turned into the soil.**



	N(ppm)	P(ppm)	K(ppm)	O.M%
ခဲမတလုတ်(၁)	217	17	134	3.37
ခဲမတလုတ်(၂)	230	14	286	4.88
လားမိုး	83	11	59	2.07
သိန့်	95	13	39	3.47

Conservation Agriculture(CA)

FAO Definition of CA in 2007

'A concept for resource saving agriculture crop production that strives to achiev

The farmer participated to a LIFT- UNOPS study on conservation agriculture (2012) and recorded the **highest level of soil N** (230 ppm) and Organic Matter – **OM 4.88%**

High population of **earthworms** are present everywhere under mulch at soil surface

Soil fertility indicator !

20 co- associate farmers experiment S&M in 5 townships across Chin State

- One of the most challenging agriculture task undertook by the organisation this year!
- it is challenging to change farmer mind- set and **decades old habit** of Slash and Burn

➢ **Steady progress ! ☺**

- All farmers **observe improve in soil quality and report less weed in S&M plot**, better soil texture, softer- lose soil, black colour like first year of shifting, easier to dig than control plot (S&B), **better plant growth**, better plant height and sometimes larger corn cob than in S&B plot

- Observation of a special interest:

- Farmer report that due to late rain, the plant under shifting died-off and suffered stunted growth while the **plant under S&M could endure the drought** because of better soil moisture content
- Weeds regrowth in control plot
- **Weeds are easily pull out** (soft soil) in S&M plot

When **less rain and delayed rain condition, S&M plot ensure better security against crop failure**

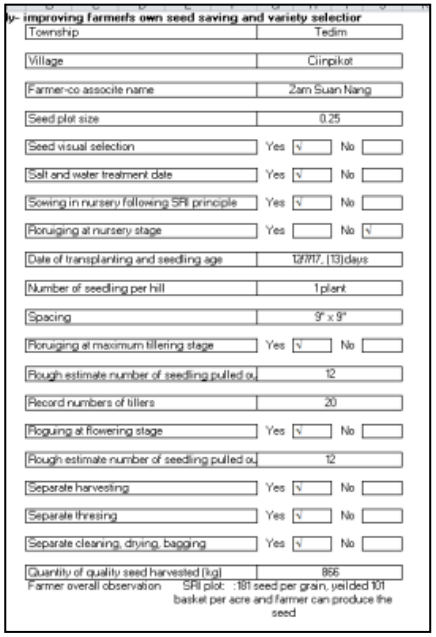
Slash and Mulch plot- Planting time in April

Plant stand in June- Dinlopa village

Slash and burn control plot

Slash and Mulch plot- Tedim township

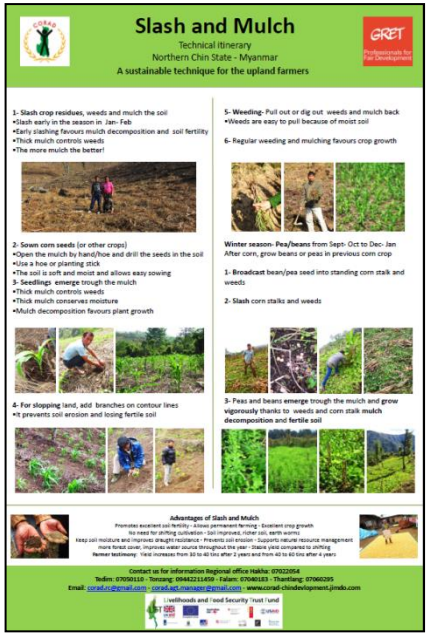
Data collection, compilation, analysis and restitution



y- improving farmers own seed saving and variety selection

Township	Tedim	
Village	Ciinpikot	
Farmer-co associte name	Zam Suan Nang	
Seed plot size	0.25	
Seed visual selection	Yes √	No
Salt and water treatment date	Yes √	No
Sowing in nursery following SRI principle	Yes √	No
Roruiging at nursery stage	Yes	No √
Date of transplanting and seedling age	12/7/17, [13] days	
Number of seedling per hill	1 plant	
Spacing	9" x 9"	
Roruiging at maximum tillering stage	Yes √	No
Rough estimate number of seedling pulled ou	12	
Record numbers of tillers	20	
Roguing at flowering stage	Yes √	No
Rough estimate number of seedling pulled ou	12	
Separate harvesting	Yes √	No
Separate thresing	Yes √	No
Separate cleaning, drying, bagging	Yes √	No
Quantity of quality seed harvested (kg)	865	

Farmer overall observation SRI plot: 181 seed per grain, yeilded 101 basket per acre and farmer can produce the seed



Data collection

- Biometry
- Technical itinerary
- Yield, work load
- Farmers observations

Farmer field books → *Data compilation* → *Technical sheet for extension*

Hakha Twp
Slash and Mulch

Sr. no	Village	Name	Acre	Experiment starting date	What Crops	Sowing date	Yield S&M	Yield control	Soil texture	S&M land	Design S&M	Design S&M	Control	S&M crop growth	Control crop growth	Soil test before S&M	S&M soil	S&M after crop
1	Dintopa	Tialkan	0.01	18-Mar-17	Corn (2.5'x2.5') and beans	04-Apr-17	1-2 earplant; less weeds	0-1 earplant; more weeds	S&M soil: dark color and aggregation formation while control soil: light color									
2	Hnaving Van	Pu Duhlian	0.01	08-Feb-17	corn	May-17												
3	Far Rawn	Tawkoung	0.01	12-Feb-17	Corn	07-May-17												
4	Sakta A			10-Feb-17														

Slash & Mulch *- Technical monitoring sheet-* ***Hakha*** *Township- Compilation by national consultant - U Ohn Tein*

Farmer testimony

Tedim township – Kaptell village

Women respondent, farmer group member : **Practise S&M since 2 years**. Observe better soil moisture and better soil fertility. Mention change in soil because of mulch decomposition. Report increase in corn crop yield from 50 tins to 60 tins after 2 years Planting by hoe, pull out weeds or dig out and mulch back. 20 % Yield increase after 2 years

Women respondent, farmer group member : **Practise S&M since 4 years** in permanent farming plot. Observe less work load, no difficulty for weeding or planting. Report increase in corn yield from 40 to 60 tins compare to shifting- Cultivate corn from April to September, then beans sown in September and harvested in December- 50% Yield increase after 4 years

Focus group interview - Falam township- Mangkheng village

Out of 28 farmers present 12 farmers practise by themselves since 1, 4, 7 and 10 years

Technique promoted by Myanmar Agriculture Service and FBA (church). Farmers are interested in permanent farming because of restriction/ limitation advocated by government

Most farmers practise permanent cultivation within 2 miles around the village. All farmers report **higher yield, better soil**, black, **more humid**, very good plant growth, easy to cultivate. Usual crop pattern consist in corn during rainy season followed by winter season pea cultivation.

Slash and Mulch practiced since 10- 15 years

Falam Township – L. Hmumpi village

- Farmer in L. Hmunpi village practise a **corn- pea/ cereal- legume rotation** since many years in permanent farming plot non-terraced

- Corn is sown in April- May and harvested by July- August
- After cob are harvested, pea are **broadcasted in standing weeds** and corn stalks
- The plot is then slashed and mulched to cover the sown seeds under 10 cm thick mulch
- Pea seeds sprout within one week 10 days and **emerge trough the mulch**/ rapid pea growth further control weeds which cant compete with the cultivated crop
- **Mulch continue to decompose and provide nutrient for the legume crop**
- Occasional **weeds growth are hand- pulled, turn-in or mulched back**
- Next corn crop follow the legume crop, hand drilled into pea residues

System in place since about 10 to 15 years, some farmer declare having heard about the technique years back from DoA staff and UNDP; other farmer declare having developed the system by themselves after observation of exceptional plant growth when seeds where sown in hedge rows made of weeds and crop residues

Field view previous to slashing: Dry corn stalk and vigorous weeds growth

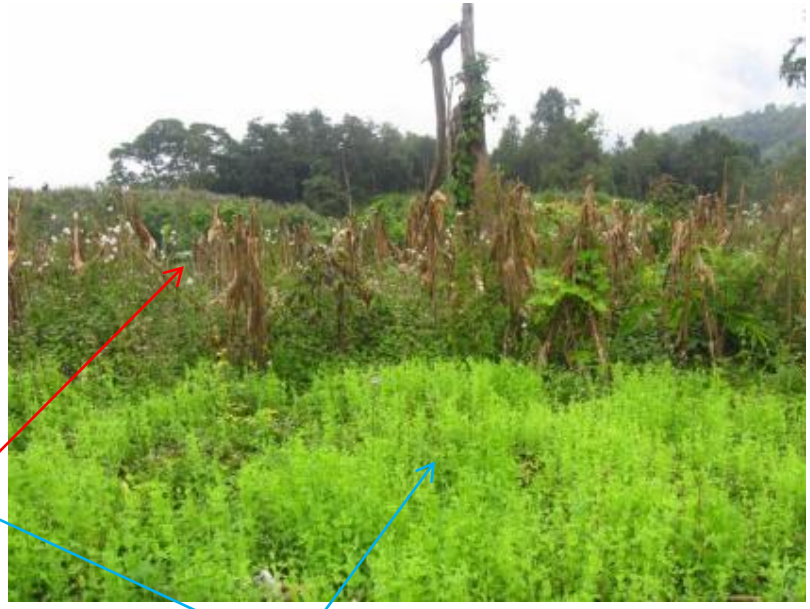
Seed broadcasted in weeds

Farmer slashing- Thick mulch

Winter pea emerge without difficulty trough the mulch

Weeds cant compete and are controlled by mulch then by the cultivated crop densely sown

Corn stalk and weed field



Winter pea field growing into slashed crop residues

Large area are cultivated under this system

Vigna and pea sown in previous crop residues

Slash and mulch has proven a viable solution adopted by some farming communities in permanent farming plot

Soil conservation- Soil fertility- High yield

Labour efficient !

Slash and Mulch- Main findings

- Slash and Mulch is becoming **more popular with co- associate farmers**
- More **farmers are attracted by permanent farming** and alternative to shifting
- Farmers are interested by the **simplicity of the approach** and of the technique
- **Initial implementation is often received with doubts** and hesitation but rapidly farmer notice the positive impact and continue eagerly and upscale to other plots

➢ Farmers overall report, observe and agreed upon:

- Better soil fertility, black soil, softer soil and better soil workability
- Better seed germination
- **Resistance to drought** during pre-monsoon onset due to **soil moisture conservation**
- Better plant growth, larger stem and leaves blade, heavier cobs
- Less **workload**
- Weeds are easily managed and **become a resource rather than an issue**
- Technique seen as resource saving and **conserving the family farm and soil** for future years and next generation

✓ Some minor barriers mentioned by first year farmers concern the novelty of the technique regarding planting seeds into mulch and weeding under mulch; **those barriers are rapidly overcome** with farmer practising and adapting the technique

Thank you for your attention and **have a good mulch** ☺

Presented by Stephane Fayon, consultant agro-ecology
on behalf of CORAD- GRET

Venue: Agroecology Futures- Regional Forum- Siem Reap , Cambodia
AFD- MAFF- CIRAD- GRET
6, 7, 8 November 2018

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