

# A Symposium on Land & Water Use in the Eastern Himalayans - Focus on Mizoram, India

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**Sloping Agriculture Changkham Technology:  
A transformation of Shifting Cultivation in Mizoram**

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# Mizoram Changkham Technology

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# The Excerpts

**“*SALT-LIKE* OR ANY OTHER APPROPRIATE AGRO-FORESTRY SYSTEM IS TO BE DEvised TAKING THE INDIGENOUS KNOWLEDGE AND LOCAL PARTICIPATION INTO ACCOUNT FOR MODERNIZATION OF SHIFTING CULTIVATION FOR A SUSTAINABLE ECOSYSTEM WITH A PROMISE FOR SELF-RELIANCE TO THE HIGHLANDERS OF THE CONCERNED REGION.”**

(Dr.S.Mokhopadhyay,2000)

*“Shifting from Traditional Farming Practices to Permanent Cultivation adopting latest technology to maximize the quality and production is the only option to uplift the economy of the farmers and market surplus production.”*

(Dr.E.Saipari,2012)

*“Soil and water conservation is first and foremost importance since without Soil & Water nothing will grow or survive.”*(Dr.Jerome Rokima, 2013).

*“Systematic land use allocation within the watershed is one of the most important criteria in land use planning. The whole watershed is divided into : (a) Catchment area (b) Cultivation zone (c) Riparian zone.*

(Er.Chawngnuna @ CFANRS,UNM,USA,2011)



# Shifting Cultivation(Jhum) Cycle in Mizoram



December-January



(Burning within 1<sup>st</sup> to 15<sup>th</sup> March)



Fig.2.Slashing of a jhum/vegetation



Fig.3. Jhum is left to ashes





Fig.4  
Removal of debris/preparation of jhum  
(Vegetable seeds sown in March)



Fig.5.Jhum terraced



Fig.6.Changkham rows prepared (March)



Fig.7. Hill-terraces developed (April)



Fig.8.Women carrying vegetables  
(June-August )



Fig.9.Calendar of weeding

- 1<sup>st</sup> weeding-May
- 2<sup>nd</sup> weeding-Jun-July
- 3<sup>rd</sup> weeding July-August
- 4<sup>th</sup> weeding -September



Fig.10.Paddy Fields  
ripened in November

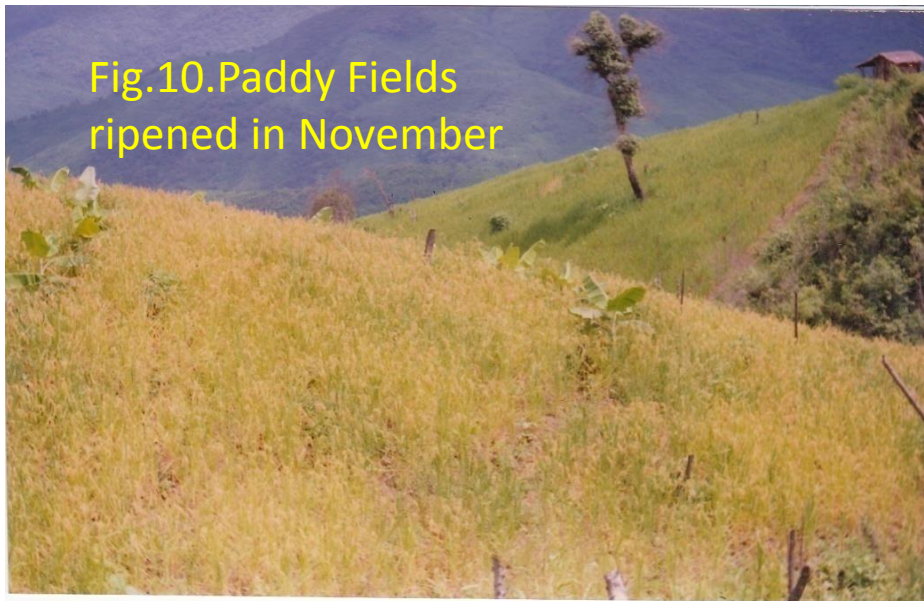


Fig.11. Harvesting Paddy  
in November



# Problems Identified in Shifting Cultivation

1. Jhum lands are in very steeply sloped gradient.
2. Slash-and-burn kills soil microbes, decreases field capacity and water holding capacity.
3. Jhum lands exposed to rapid soil run-off when heavy rain falls in May-Sept./up to October.
4. Decreases soil organic carbon and soil nutrients.
5. Affects siltation, loss of biodiversity and flora and fauna.
6. Water scarcity occurs from November-April.
7. So far, no suitable SLM technology is provided.
8. Lack of HYV seeds/quality planting materials.



# Alternative Attempts to Shifting Cultivation

- 1). **Terraces**: Introduced in the 1880's in small plots.
- 2). **Land Use Planning (LUP)**: Introduced in 1970-1980. Not successful.
- 3). **New Land Use Policy-I**. Introduced in 1981-'82;1988-'89. Not successful.
- 4). **Garden Colony**: Teak plantation(1974-'80).Successful, not Eco-friendly.
- 5). **Aibawk jhum Control (1990's)**. Not successful.
- 6). **Pit system** : Introduced by AMFU in 2004-2005.No success.
- 7). **Tree-green hedge cropping system (1995-1996)**. No success.
- 8) **Contour trenches & ICAR 3-tier method (2005-2006)**. Not successful.
- 9). **Sloping Agriculture Land Technology (SALT)**:Introduced in 2004. Partly successful and still maintained in Southern part of Mizoram.
- 10). **Self Support Project (2007-2009)** **Bamboo plantation, Oil palm plantation and Grape cultivation are successful.**
- 11). **New Land Use Policy-II (2010-2018 )**: Facilitated >130,000 individuals @Rs.100,000/family. **Broom grass cultivation is most successful.**
- 12). **JICO** Irrigation Plant (2010-'15) & **GoM-UNO** Agencies starts.. 2015...?.
- 13). **Policy of Changkham Technology** (H.Lalramnghinglova,2014, 2015).

# Changkham Technology Emerges

**The Concept:** “Changkham” is a Mizo vocabulary that denotes traditional way of farming system in Mizoram. It is laying of wood pieces after burning of a jhum across the jhum land in support of cut-trunks or by pegs to prevent from breakdown or collapse, and act as soil erosion barrier or reduce soil run-off.

Traditional changkham practice is modernized by supplementing/replaced with hill-terrace or by planting nitrogen fixing legumes to control soil run-off, retain soil moisture, enrich nutrients and increase productivity on the principle of SLM under Changkham Policies and Models developed (Lalramnghinglova,2014).



Fig.12. Mizo Changkham Jhum land



# Changkham Policy & Models

- **Policy No.1.** All flat lands up to  $2^{\circ}$  (4%) slope should be plough for WRC under System of Rice Intensification (SRI) or under good irrigation system.
- **Policy No.2(Model-I):** All jhum lands having  $2^{\circ}$ - $22^{\circ}$  (4-40%) be made benched terrace/hill terrace (Zo-terrace).
- **Policy No.3(Model-II):** All jhum lands having  $22^{\circ}$ - $35^{\circ}$  (40-70%) should not at all be terraced, but apply Changkham (hedge-rows) technology.
- **Policy No.4(Model-III):** All jhum lands between  $35^{\circ}$  and  $45^{\circ}$  (70-100%) be utilized for mono- or mixed cropping with Changkham hedge-rows.
- **Policy No.5(Model-IV):** All lands above  $45^{\circ}$  (100%) should not be disturbed and left for natural regeneration and wildlife habitats.
- **Policy No.6: Rain Water Harvesting:** Every Changkham farmer shall have a 'Farm House' with GI sheet roof-cover to facilitate rain water harvesting for use in dry spell period (November to next April).
- **Policy No.7: Integrated Bio-Farming:** Rearing of animals with eco-links.

*Thus, CPM provides sustainable livelihood options on rice, vegetable, Agri.-Horti crops, cash crops & farm forestry in a Farmer's Farm for Family Farming Sustainability.*

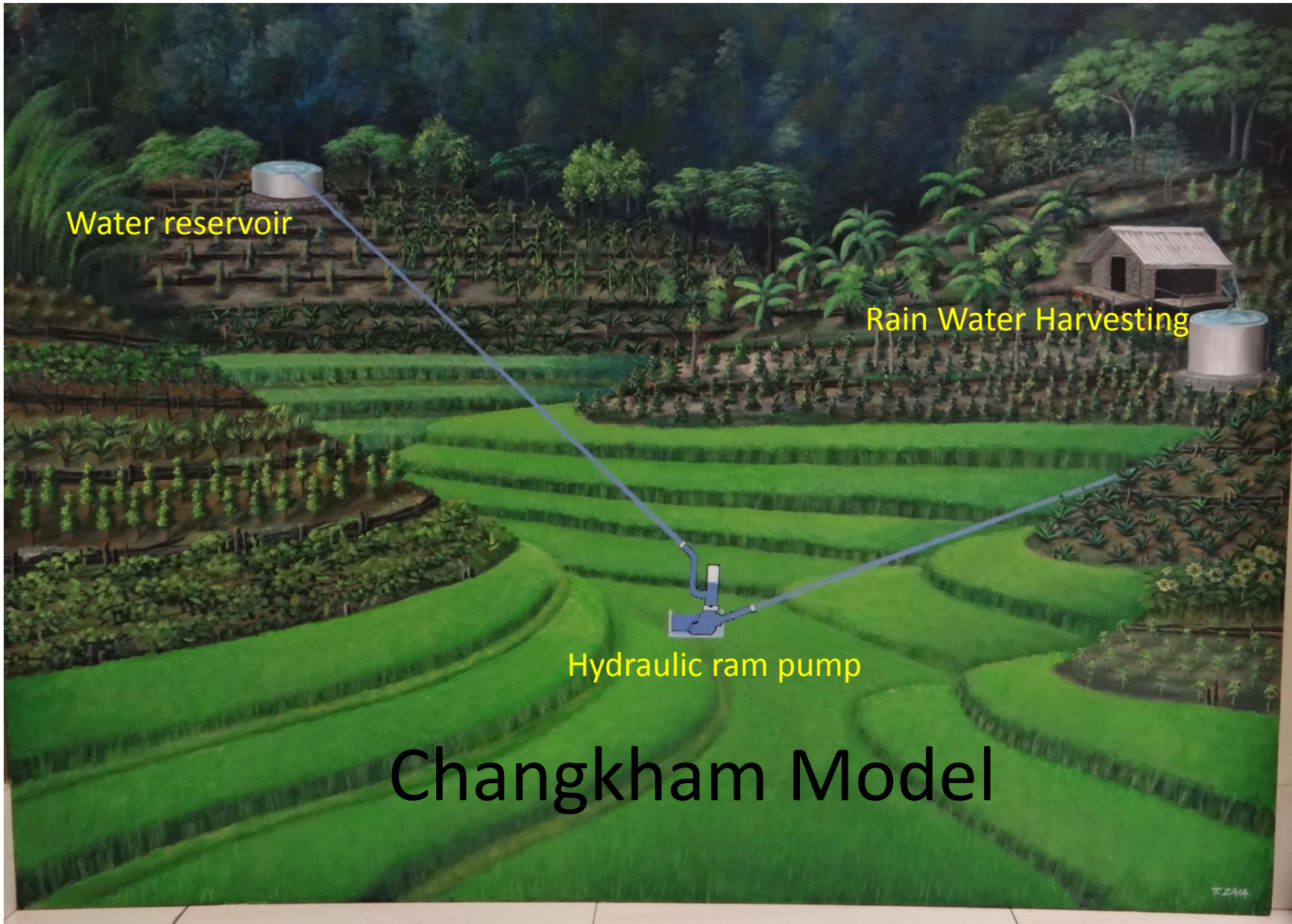
<b>Policy</b>	<b>Model</b>	<b>Slope p.c.</b>	<b>Area</b>	<b>Land Use Management Options</b>
No.1	Wet Rice Cultn.	0-4%	3% of GA	Wet Rice Cultivation
No.2	Zo-terrace	4-40%	30%	Rice/Pineapple/Chilli
No.3	Changkham hedge-rows	40-70%	30%	Banana,Citrus,Mango, Arecanut, NWFPS
No.4	Mono or mixed Crops. Tree bean ( <i>Parkia roxburghii</i> )	70-100%	17%	Plantation crops, Fruits, Tree bean, Bamboo etc.
No.5	Forests plus	>100%	20%	Natural regeneration
No.6	Bio-Farm	Ponds& Water- sheds	negligible	Poultry,Piggery,Cattle, Goatery+Fodder/Maize /Fruits/Vegetable etc.
No.7	RWH- Construction of Farm House.			Storage of water for use during dry spell period(Nov.-April).





Fig.13. Existing Model Farm in the Farmer's Farm





Water reservoir

Rain Water Harvesting

Hydraulic ram pump

# Changkham Model



# Expected Outcome of Changkham Technology

1. Adoption of Changkham Policy & Models in the Farmers' farm will transform of Shifting Cultivation to Settled cultivation.
2. Farmers' choice of crop combination for home consumption, and; domestic/local market supply with scientific intervention.
3. District-wise clustered area approach for market tie-up/ market-linked surplus production.
4. Enhancement of soil security, water security, ecological security, agro.-market-linked security, family farming security; after all, food security to the rural population.
5. Restoration of agriculture carbon sequestration & ecosystem services.
6. Mitigate the effects of global warming & climate change at the local level.

# Conclusions

Changkham technology provides an easily adaptable sustainable land use management in a farmer's farm. At each level of the models, it strengthens moisture retention capacity and nutrient status, thereby maintaining the ecological balance of biodiversity and food productivity for self-reliance on a sustainable basis in hilly terrain of EHR- MIZORAM.



# A Team of UNM-MZU visits Jhum Land at South Kanghmun Village on 20<sup>th</sup> March 2014



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