

Scoping Floating rice based agro-ecological farming system for a healthy society and adaptation to climate change in the lower Mekong Region and Myanmar: A case Study of Nyaungdon Township, Ayeyarwady Region.

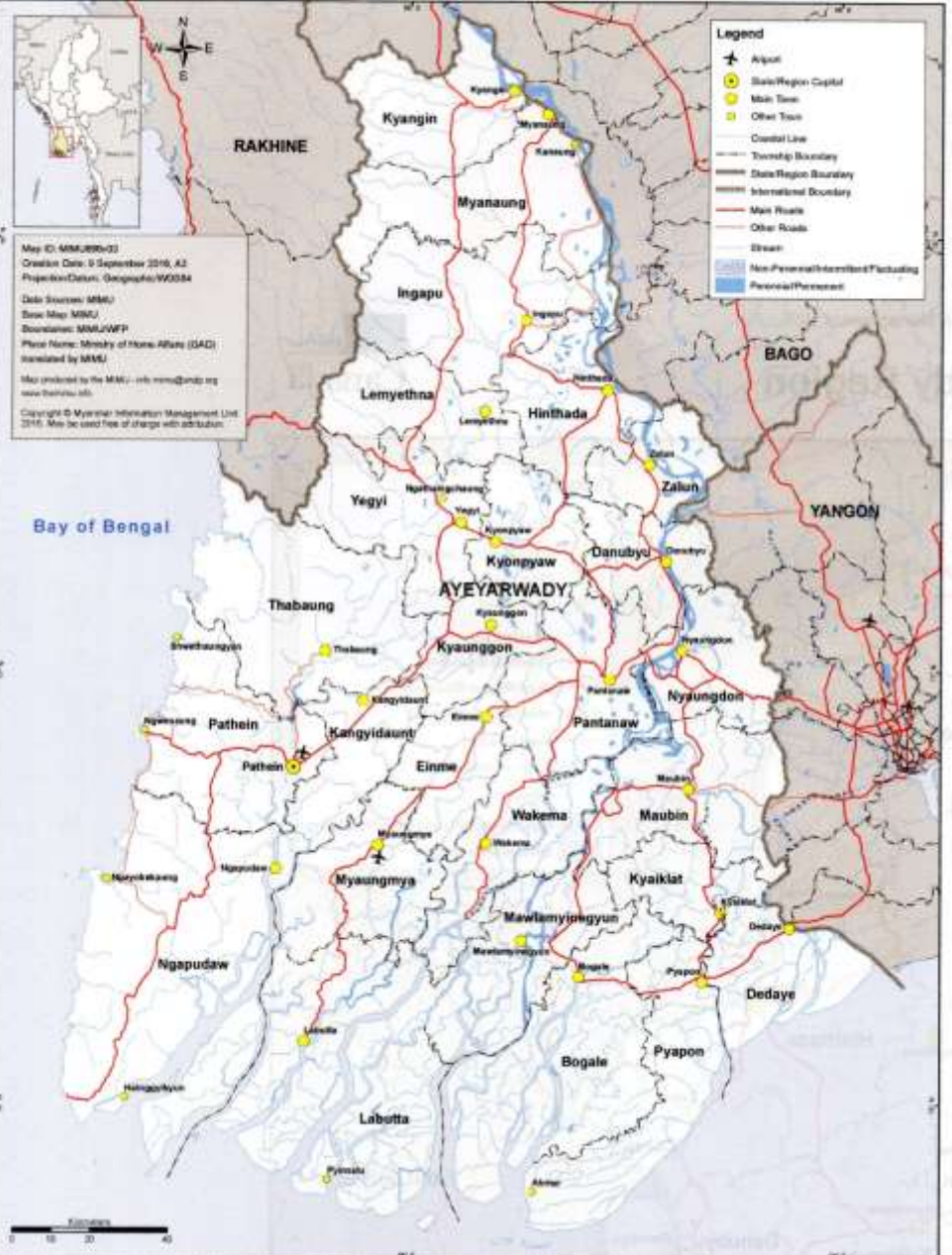
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Workshop on Scoping Floating rice based agro-ecological farming system for a healthy society and adaptation to climate change in the lower Mekong Region and Myanmar (10 June 2016)



Background

- The rice ecosystems of Myanmar include irrigated lowland, rain-fed lowland (including late-sown and Mayin area), deepwater, and upland.
- Late-sown rain-fed lowland is the area sown during the monsoon period; Mayin rice can be transplanted only after the monsoon when floodwater recedes.
- Rain-fed lowland (the largest ecosystems) and deepwater rice are confined to the delta region and coastal strip of Rakhine State.
- The Agriculture sector encompasses Crop production, Livestock breeding, Fisheries and Agro-Forestry.
- It is the main source of livelihood and income for the majority of the population in Myanmar.



Geographical Background of Myanmar

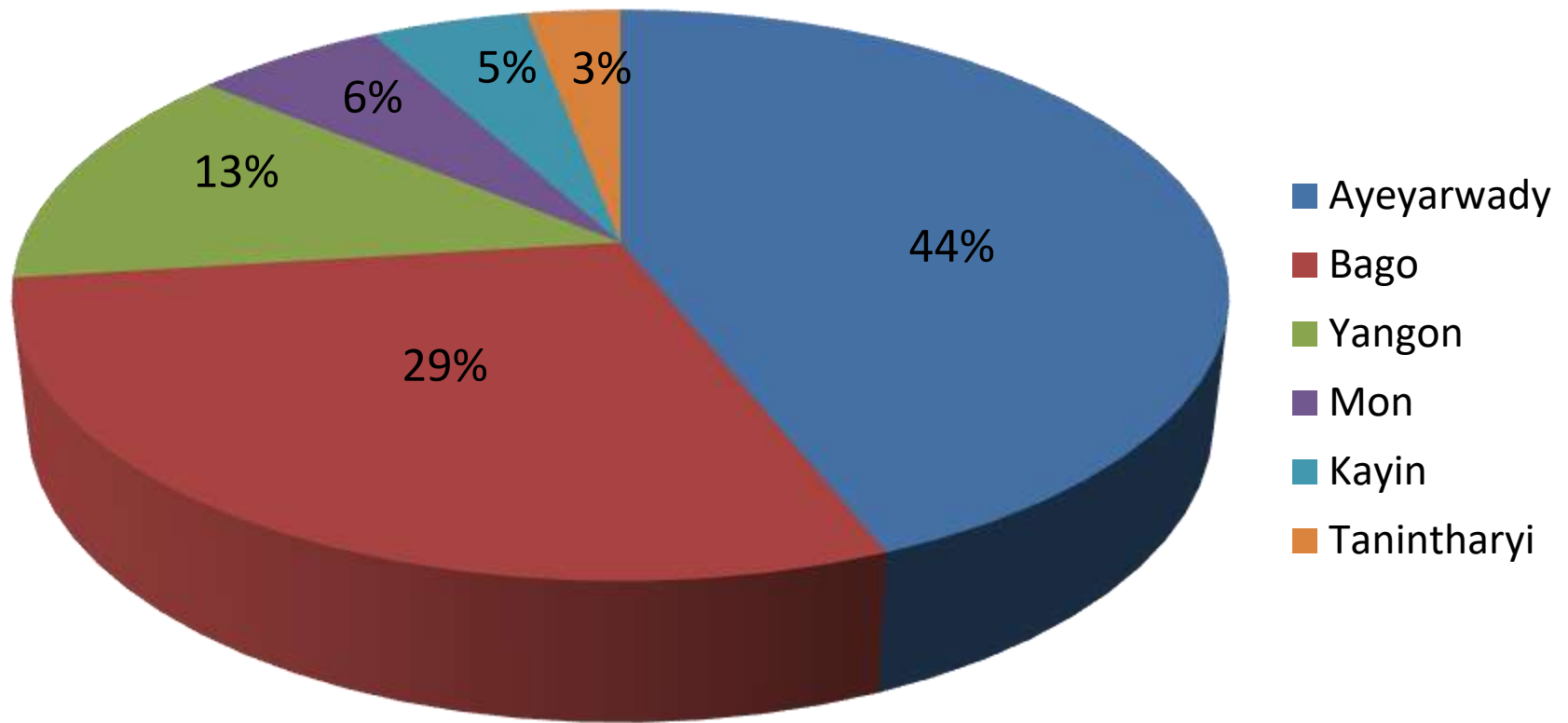
- Myanmar, in general, is said to be tropical monsoon. Rakhine, Tanintharyi and lower deltaic region experience tropical monsoon (Am) type of climate.
- In Ayeyarwady Region or delta, although there were the wetlands and lakes in which was cultivated the deep water rice and floating rice, some areas was transformed into fishery ponds.
- Due to climate change there was felt the unusual flood in Pre-monsoon Period such as 2016. Actually, the Ayeyarwady delta has the opportunities to grow the floating rice if we can support the seeds and methodologies for floating rice.

History of Floating Rice Cultivation

- Rain-fed lowland (the largest of the ecosystems) and deep-water rice are confined to the delta region and coastal strip of Rakhine State.
- Nearly 60% of the delta region, including the Ayeyarwady, Bago, and Yangon region of Lower Myanmar, is cultivated with rainfed rice.

Distribution of Deep water and Floating rice areas in Myanmar, 2015 (in hectare)

2015%



Source: Land Record Department, Nay Pyi Taw, 2015

- An average area of 762,716.77 hectare during six years period.
- 2010 and 2011 - more than the average area
- The floating rice area decreased gradually in the whole country.
- The floating - Kayin State, Mon State, Tanintheryi, Bago, Yangon and Ayeyarwady Regions.
- The Ayeyarwady Region in which it was cultivated an average area of 314,383.02 hectare.
- The second - Bago region - 222,771.35 hectares. - - 2010 - more than the average floating rice area
- The rest year- decreased.
- The least one - Tanintharyi Region - 26,988.71 hectare.

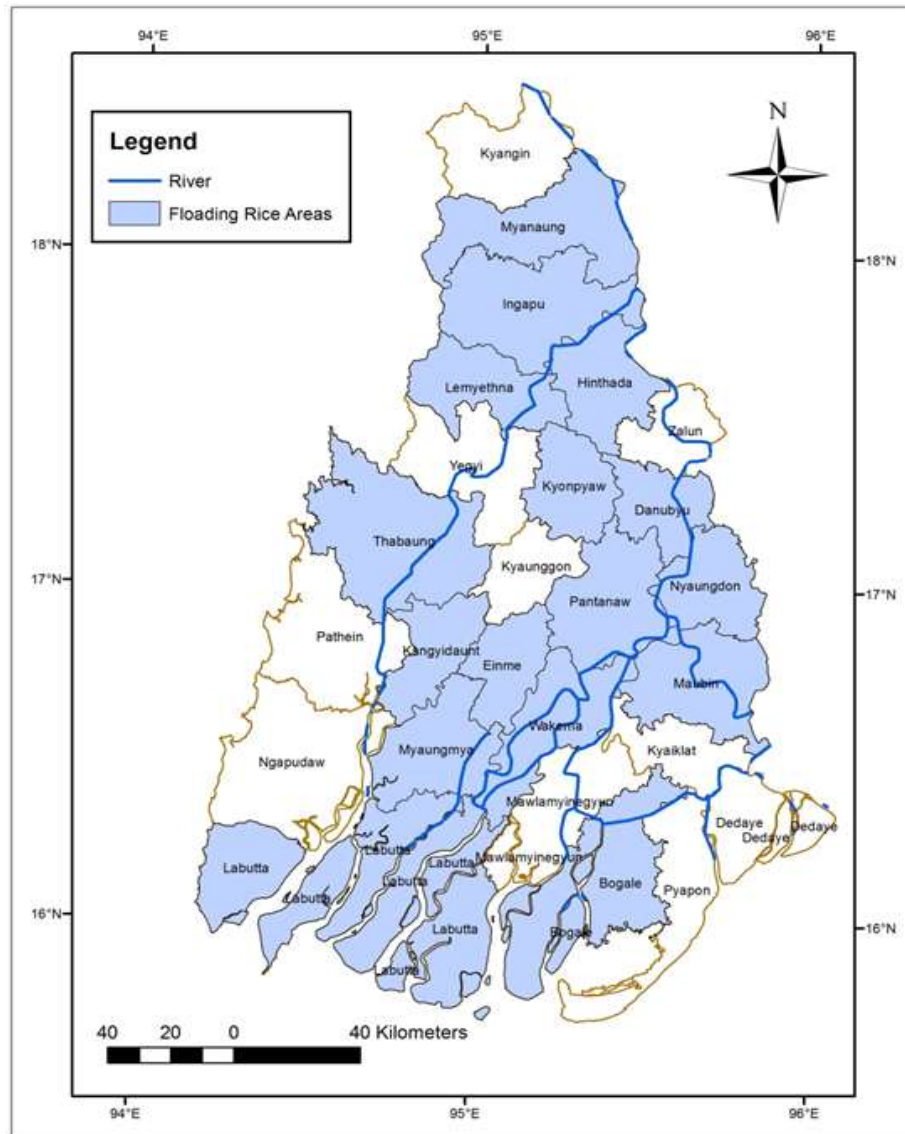
- The current and future threats on ecosystems due to being the weakness of government land policy and global climatic change.
- All of the farmers - such as Insufficient capital due to limited access to formal sources of credit forces farmers , less farm inputs, particularly fertilizer, and Inadequate infrastructure (e.g., irrigation, farm-to-market roads) and postproduction facilities (e.g., mills, storage).
- **Intervention:** (1) increase access to credit for farmers, traders, and millers; (2) increase the farm-gate price of paddy in order to encourage farmers to produce more paddy; and (3) provide finance for small-scale village infrastructure projects to increase demand for wage labor for the rural poor.

Potential extension of floating rice based farming systems in the Ayeyarwady Delta

- Flooding conditions vary from submergence of 1 to 10 days to stagnant water of varying depth for up to 6 months.
- Daily submergence caused by tidal fluctuations is also another form of flooding that affects crop production.
- In general, flood-prone rice lands include rain-fed shallow submergence prone and medium-deep waterlogged lowlands, deepwater areas, and tidal wetlands (IRRI 1984).
- Crop productivity and income are usually very low vis-à-vis environments favorable to growing modern varieties of rice. Management intervention over the last decades have transformed much of the flood-prone ecosystem into areas favorable for growing irrigated rice during the whole year or at least during the dry season.

- The flood control mechanisms such as dikes, sluices, and polders; and irrigation and drainage facilities-have helped to bring about these changes in Ayeyarwady delta.
- This resulted in changed cropping patterns, biological diversity, and livelihood patterns within the flood-prone ecosystem.
- Ayeyarwady covers the fertile, low-lying and densely-populated areas also known as the Irrawaddy Delta.
- Regarded as the rice bowl of Myanmar, Ayeyarwady is the largest producer of rice among all the states and regions.

FLOATING RICE AREAS IN AYEYARWADY REGION



Source : Department of Agriculture, Ayeyarwady Region

Distribution of Floating rice areas in Ayeyarwady Region (in hectare)

Regions	2015-16 (ha)	%
Pathein District	5,042.39	4.79
Hinthata District	12,272.52	11.66
Myaungmya District	20,964.77	19.92
Laputta District	1,650.72	1.57
Maupin District	59,297.06	56.35
Phyapone District	5,997.05	5.70
Total	105,224.50	100

Source: Department of Agriculture, Ayeyarwady Region, 2015-16

Floating rice-based farming system (2015-16) (in hectare)

Rice Name	Net Sown (ha)	%
Deep water rice -1	60.00	0.3
Sitpwar	12800.00	59.8
Taunghti	7612.00	35.6
Thai deep water rice	929.00	4.3
Total	21401.00	100.0

Source: Department of Agriculture, Ayeyarwady Region, 2015-2016

Floating rice-based farming system after harvest rice (2016)

No	Rice Name	Net Sown (ha)	Harvest (ha)	Yield (tons/ha)	Yield (Total Tons)
1	Deep water rice-1	60.00	29.95	3.75	112.31
2	Sitpwar	12800.00	9506.00	1.63	15494.78
3	Taughtti	7612.00	5738.00	1.43	8205.34
4	Thai deep water rice	929.00	726.80	2.53	1838.80
	Total	21401.00	16000.75	1.60	25651.23

Source: Department of Agriculture, Ayeyarwady Region, 2016

Socio-Economic Condition of Nyaugdon

- Nyaungdon is a flooded area in Ayeyarwady delta.
- Although the highly dynamic estuarine ecosystems and their species are adapted to seasonal changes in freshwater flows, upstream activities that permanently change the total flow (such as dams, deforestation, climate change) may have significant consequences.
- Rice cultivation and fishing dominate economic activity is still largely in rural communities.
- Nyaungdon has those factors like Ayeyarwady Region but Nyaungdon was not severely impacted by Cyclone Nargis.

- Some areas of Nyaungdon remain prone to flooding, posing a significant risk to farmers and fisherman.
- The geographical and climatic vulnerability of Nyaungdon is a major development challenge for the Regional Government, and for the Region's rural residents farming in flood and storm-prone areas.
- The economic condition:- based on the agricultural and fishery sectors. Physical condition of study area is lowland, and most of the areas are flooded during the rainy season.
- Government constructed the sluice gates and embankments to develop the agriculture sector and to encourage the fish ponds development after 1988.
- The development of agriculture :-not only in terms of acreages but also in terms of cropping intensity. Moreover, the importance of fish ponds is also emphasized.

- Lay Nwe, Pro-Rector (Retd) Yezin Agriculture University, She discussed the cropping patterns based on the “lowland rice-based ecosystems in Nyaungdon Township of Ayeyarwady Region” (Garcia, et.al. 2010).
- Ayeyarwady Region had two cropping patterns such as rice-pulses and rice- oil seed in CY 1994-1995 and CY 2003-2004.
- In study of cropping patterns, rice was mainly cultivated in monsoon period and some area was left as fallow due to not sure to get the profit.

Major Cropping Patterns and Share of Cultivated Area

Cropping Patterns	CY 1994-95 (%)	CY 2003-04 (%)
Rice - Pulses	35	34
Rice - Fallow	13	18
Fallow – Rice	11	8
Fallow – Pulses	11	14
Rice – Rice	11	3
Rice – Oilseed	7	9
Fellow – Vegetable	1	7
2 Rice – Fallow	2	0
Others	9	7
Total	100	100

Sources: Garcia, et.al, 2010: “Lowland Rice-based Ecosystems in Nyaungdon Township of Ayeyarwady”, ASEAN Round Table, Myanmar.

Discussion

- Department of Agricultural Research (DAR) and Department of Agricultural (DoA) suggested that there is needed to test new crop combinations, e.g. floating rice-mungbean, floating rice-sunflower, floating rice-vegetable, etc. and cropping patterns, e.g. dry directed seeding method is practiced in May and harvested in November and December and second crop is grown in December without tillage.
- They committed : to survey necessities in current situation in deep water areas of Ayeyarwady Region.
- To be ware the advantages of these areas and to explain new cropping patterns.
- to do integrated approach collaboration with Gov. Policy makers, NGO, INGO, Private sectors, and Civil Service Organization.

Cost and Benefit of Deep Water Rice Cultivation In Nyaungdon Township

	Subjects	Price(\$)	Yield	Cost \$per ha	
	Seeds (0.15 ton) 3 bas*5000	12.60	0.15ton	31.50	
	Ploughing cost	25.20		63.00	
	Labour cost	1.30		3.25	
	Weeding cost	12.60		31.50	
	Harvested cost	37.80		94.50	
	Total cost	89.57		223.93	
	yield/acre 35 ba*5000	147.18	1.75	367.95	
	Net benefit			144.02	

Source : Cost and Benefit presenting in workshop at Yangon YMCA on 10-6-2016

- 10 farmers :- randomlyu from 3 villages in Nyaungdon Township with major Deep Water Rice areas in the Ayeyarwady Region.
- Farmers said that deep water rice costs and benefits per ha and total costs per ha is 223.93 USD (including seed cost value per ha (31.5 USD), the ploughed cost (63 USD), labor cost (3.25 USD), weeding cost (31.5 USD), and the harvested cost (94.5 USD) and the current production is grain yield of 1.75 t/ha amounted to 367.95USD. Therefore, the net benefit is 144.02 USD.
- Deep water rice is reducing in recent years, replaced by irrigated short term rice farming.

- The problem of Agricultural sector is being negative income elective.
- So it must change to positive income elective by diversifying to products (i.e. rice, fruits, flowers, agro-tourism, etc.).
- But farmers can grow only one crop because there have not water and soil moisture after harvested the first crop.

THANK YOU VERY MUCH
For
YOUR ATTENTION!