



Diversification:

Reducing risks,
increasing incomes
while enhancing
adaptive capacities in
the Ayeyarwady Delta



With support from the International Development Research Centre (IDRC) and the CGIAR Research Program on Climate Change, Agriculture, and Food Security (CCAFS), the International Institute of Rural Reconstruction (IIRR) and its local NGO partners are implementing Climate-Smart Villages (CSVs) to demonstrate community-based adaptation in agriculture in different agroecological zones in Myanmar.

This primer is based on IIRR's baseline studies and desk research that IIRR has commissioned to develop profiles of each CSV in the project. The purpose of this primer is to provide background information on the agriculture, livelihoods, nutrition, gender, and climate change context of each CSV.



The Ma Sein Climate-Smart Village (CSV) is located in Bogale Township in Ayeyarwady Region in the southwest part of Myanmar. Situated at the base of the delta, Bogale is susceptible to effects of sea level rise, flooding, and saline water intrusion. Rainfall is higher than in other parts of the country and is increasingly erratic.



People in Bogale and Ma Sein rely heavily on rice farming. Due to limited livelihood diversification opportunities, many people depend on casual labor as their main source of income. There are also limited off-season livelihood opportunities. As a result, vulnerability to climate change and natural disasters is high.



Farm households that do not diversify their income sources (ie. sole reliance on rice-based agriculture) are more vulnerable. Diversification of alternative livelihoods is a key strategy to enhancing adaptive capacities of households in Ma Sein. This could include small livestock, aquaculture, and homestead intensification.



Women in Ma Sein have a limited engagement in alternative livelihoods, relying mainly on casual labor for their income. Climate-Smart Agriculture (CSA) provides new opportunities for women, especially those from landless families and women-headed households. CSA provides us an opportunity to be socially inclusive.



Majority of residents in Ma Sein are engaged in rice farming, either as growers or/and casual laborers. Rice is an important commercial crop. Longer duration (lower yielding) traditional rice varieties are grown in the monsoon season (rainfed) while modern short duration, higher yielding varieties are raised in summer (irrigated).



Farmers in Ma Sein are also engaged in clean seed production with the support of the Radanar Ayar Development Association, a reputed NGO, which has worked in the village and is also engaged in CSV implementation. Rice production systems in Bogale are intensive, relying heavily on external inputs.



CSA options in rice-based systems could include quality rice seed production, rice-fish interventions (aimed at reducing reliance on pesticides), reduction in seed use through nursery management, direct seeding, and the efficient usage of chemical fertilizers in conjunction with residue management. The re-introduction of black gram (or other legumes) within the two-season rice system could also be considered.



Diversification opportunities are considerable due to the abundance of water. Duck raising is one such enterprise. Ducks in rice-based systems serve to recycle nutrients while controlling snails and other vectors in rice fields. Delta water is nutrient-rich, with abundant fauna for feeding fish and ducks using production systems with small carbon footprints.



Small-scale duck production systems in Ma Sein have demonstrated that CSA (ie. reliant on farm grown feeds and scavenging in natural surroundings) can help empower women economically and build social capital. Ma Sein CSV, for example, has engaged families in a start up effort that is primarily targetted to women.



Livestock is an important asset building approach for small farmers in Myanmar. These are important coping mechanisms in case of crop failure. Pigs and cattle are economic assets, which enhance resilience building and are sold for cash during difficult times (IIRR baseline study) .



Livestock are raised for meat. Most of the meat consumed by households are farm grown (ie. not purchased). Similarly, eggs and poultry, though consumed on a fairly regular basis, are rarely purchased from outside (IIRR baseline study).



Small-scale pig production can be undertaken in a climate-smart manner (native breeds, local sourced feeds, native housing materials that mitigates the impact of high temperatures). Effective waste management, recycling, and farm grown feeds can reduce the greenhouse gas (GHG) contributions of livestock production systems.



Tricanthera is an excellent pig feed shrub. Along with Taro and Banana trunks, they can greatly reduce the reliance on commercial feeds (used for the first 30 days). Production systems, which rely on farm grown feeds and by-products (eg. bran) have a small carbon foot print.



Cereal, grains, oil, fish, and exotic vegetables are purchased from the markets. Overall, farm households surprisingly have a moderate level of dietary diversity. These are good practices that should be conserved. Green leafy vegetables, roots and tubers, and legumes are eaten fairly regularly. These are farm grown or collected from the wild (IIRR baseline studies).



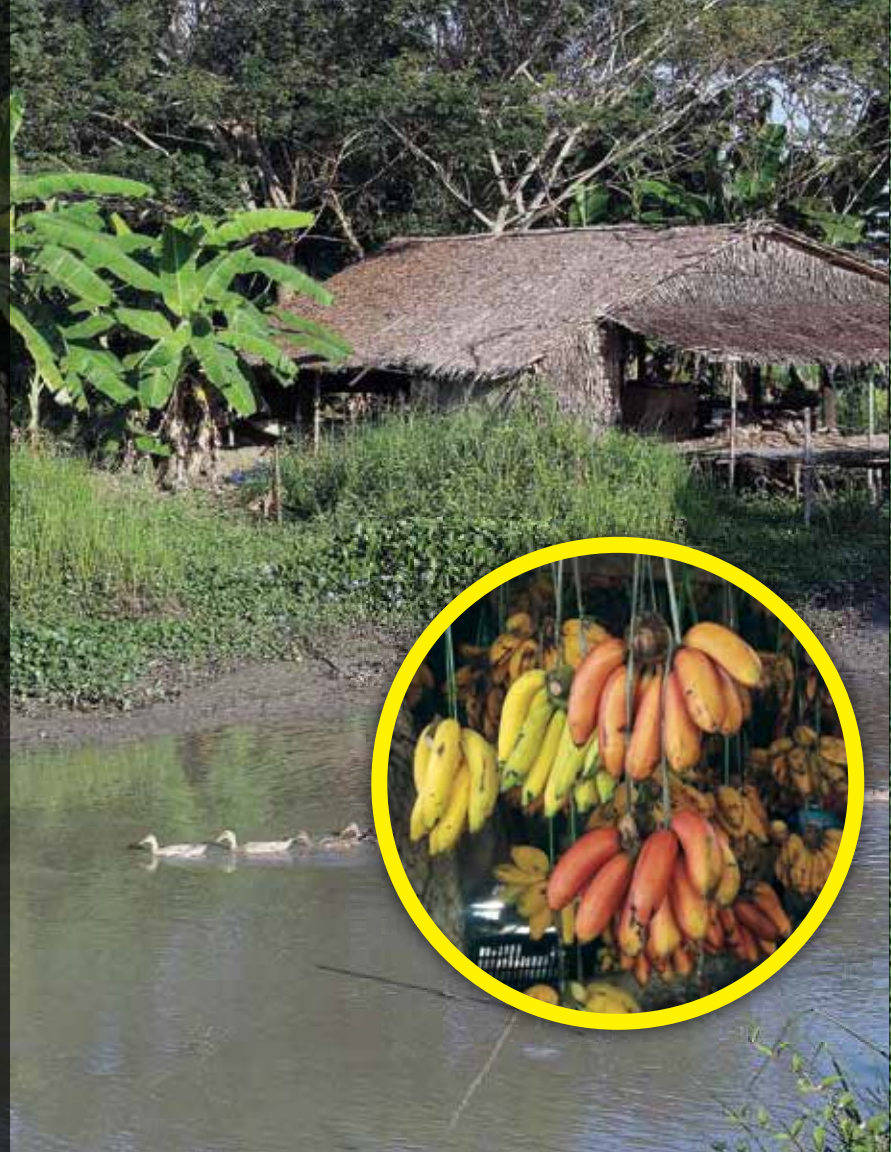
CSA program should consider distributing diversity kits of planting materials (intra-species, varietal diversity of beans, green leafy vegetables, roots and tubers and millets) as part of an effort to restore or strengthen local agro biodiversity. Planting materials can even be sourced from markets.



Homesteads in the delta typically already have important agroforestry components (coconut and betel nut palms). Their intensification with bananas, pineapple, and other understory crops can increase the absorption of GHGs. Carbon sequestration is enhanced by multi-story perennial cropping systems.



Taking full advantage of understory spaces, homesteads can also be used to conserve genetic resource of bananas, and root and tuber crops. With the further inclusion of ginger, black pepper, and betel vine, the mitigation (carbon sequestration) potential of homesteads can be maximized. The opportunities of understory crops as livestock feed and sources of family nutrition must also be explored (sweet potatoes, taro, and other similar crops).



Shade tolerant crops provide incomes and food to families and livestock. Local pineapple species, ginger, creeper beans, and leafy greens can help augment the daily staple of rice and fish. The distribution of diversity kits helps encourage experimentation and testing to find location-specific varietal options.



The delta is rich in fish diversity, providing nutrition and income opportunities. Well-managed use of chemicals in rice fields will help conserve this diversity of food sources.



Schools can serve as sources of planting materials and as location for teaching students about CSA. Schools are ideal locations for establishment of multiplication ponds of fish species for stocking backyard fish refuges and ponds. School spaces in Myanmar are generally under utilized.



Due to the mix of freshwater and brackish water in the river that flows by the side of Ma Sein village, there are opportunities for short cycle aquaculture. Existing drains in the village can be used for aquaculture.



Catfish, snakeheads, tilapia, and other naturally occurring fish species can be grown to supplement food for home use. These drains can also serve as refuges for conserving nutrient dense, small indigenous fishes commonly found in the delta.



CSA has three important trajectories in Myanmar: small farms, homesteads, and schools. In a typical CSV, all three offer new opportunities for demonstrating the value of diversification via a portfolio of CSA options.



CSA also provides new opportunities to address poverty - by better targeting of the bottom 40%, especially the women and the landless.



The delta provides numerous opportunities for reducing risks from natural hazards and extreme weather events. CSVs can serve as a model building effort to demonstrate how the adaptive capacities of people in the delta can be enhanced.



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