



## FOOD SMART VILAGE "Managing Land And Water Resources For Better Livelihoods Through Agriculture Development"

Driest climate upland area in Indonesia such as part of South Sulawesi, East and West Nusa Tenggara where low yields, may become even less-suited for agriculture as a result of water scarcity and land degradation. These conditions become more severe during the climate change that occurring more rapidly than anticipated and the increase in extreme weather events threatens more disruptive effects to agriculture.

Program to improve productivity of dry land in dry climates have been done since before 1980. The results are still not optimal with farmers welfare level very low. Various technologies and innovations for the management of dryland agriculture has been available , however, these technologies are still not utilized effectively and still need to be integrated , and packed in a practical review of the field on a scale sufficient effort so that it is technically feasible, socially and economically will be easy and profitable.

Integrated agricultural development model based on innovative and sustainable approach, supporting by community base is needed to solve the driest climate upland area through the Food Smart Village models.

**Food Smart Village** is a rural livelihood that pursue food self-sufficiency by applying innovative agriculture on marginal land. These model developed by 5 pillars interconnected innovative technologies coping with climate change to enhance food security and food quality.

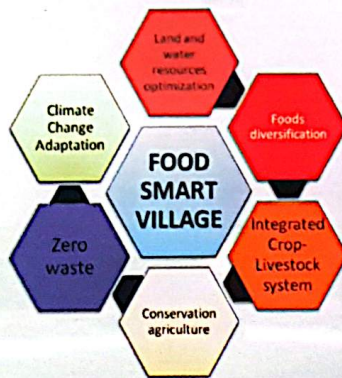


Figure 1. FSV Five Pillars for Climate Change Adaptation

The relation of each FSV pillars for climate change adaptation i.e: The Optimum utilization of land and water resources through surface and ground water management, soil fertility enhancement, and micro-climate modification will give the opportunity to spread out food crops options and enhancing food sovereignty based on agro ecological zone through development variety of food product. The biomas product of food crops and poly culture will allocate the livestock feeds and providing energy and manure for the crops. The animal waste be input in biogas generation before being applied as high quality fertilizer. The minimum tillage practices will be take an advantage year-round preservation of soil cover with crops or crops residues, crop rotations including nitrogen fixing crops. Finally the utilization of easily decomposed agriculture residue as feed, fuel and fertilizer to enhance land productivity.

Slow decomposed residue can be utilized as mulch to preserve soil moisture particularly in dry areas. On the other hand the zero waste model will be successfully adapted through three applicable "R" approaches namely minimizing the loss of waste out of the system of agricultural production (reduce), by reusing as much as possible of agricultural and livestock waste (reuse), thus the entire agricultural and livestock waste generated is always in the process of recycling (recycle) in agricultural production systems

### Food Smart Village for Climate Change Adaptation.

Climate dynamic and vagary becoming more frequent and severe. Climate change and food security can be addressed together by transforming agriculture and adopting practices that are "food and climate smart". Adaptive technologies to cope with the adverse events namely cropping system adjustment, cropping calendar, adaptive high-yielding crops variety, and appropriate water and climate management to be applied accordingly. The success story of first year implementation of FSV in Oebola, Kupang, East Nusa Tenggara Timur showed by the increasing of food crops cropping index especially during the dry season from zero to two time cultivation of various food crops, creating of the food diversification and providing the livestock feeds. In other words, the implementation of FSV at this location have changed the agriculture performance "from nothing to something"



Figure 2. Optimized land-water resources in Coping Climate Change (FSV Implementation at Oebola, Kupang, East Nusa Tenggara "from nothing to something").

The other excellent examples of successful implementation of FSV was adapted at Limampoeoe, Maros, South Sulawesi by way of the dryland productivity enhancement through rainfall and runoff harvesting. The approach was done with a series of brilliant concepts identification of potential land resources, water, climate and social and economic configuration of the local community as summarized in the following flow chart.

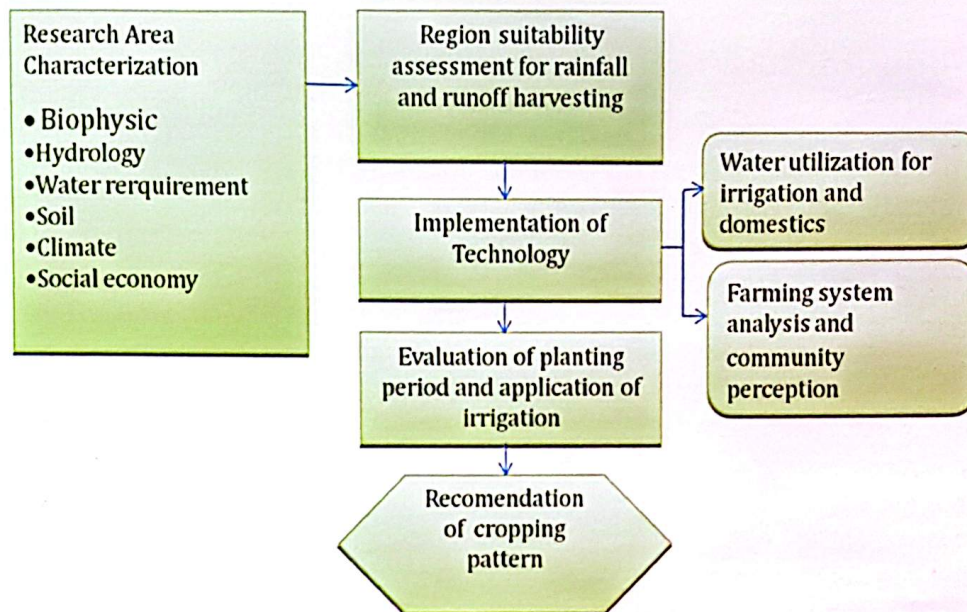


Figure 3. Identification of potential land resources, water, climate and social and economic configuration of the local community at Limampoecoe, Maros, South Sulawesi.

Fundamental changes that occurred after the implementation of FSV for the farmer at Limampoecoe, Maros, South Sulawesi were increase of the cropping index and crops diversification and directly jack up farmers' income significantly "from something to many things". The original agriculture landscape during the dry the season and changes over FSV implementation presented in the following figures.



Figure 4. Agriculture landscape during the dry season and changes over FSV implementation in Limampoecoe, Maros, South Sulawesi.

Based on financial analysis of FSV implementation in Limampoecoe, Maros, South Sulawesi show that the comparison farmer income in hectare between the original cropping pattern and innovating FSV model was very significant. The most valuable Paddy-Water Melon – Bare cropping pattern were able to increase the income of farmers reached more than 100 percent. Changes in cropping pattern and cropping index and its impact on farmers' income are presented in the following table.

Table 1. Financial Analysis of FSV Implementation in Limampoecoe, Maros, South Sulawesi

Cropping Pattern	Cost (IDR/ha)	Revenue (IDR/ha)	Benefit (IDR/ha)	BCR
Paddy-Bare-Bare	18,692,679	21,342,857	2,650,179	0,14
Paddy-Ground Nut-Bare	19,144,500	23,750,000	4,605,500	0,24
Paddy-Water Melon-Bare	38,824,074	67,613,169	28,789,095	0,74

No	Suitable Criteria	Suitable Limitation	Value	Conclusion
1	IRR	> 6%	> 50%	Suitable
2	NPV	> 0	132,573,988	Suitable
3	Net BCR	> 1	25.37	Suitable
4	Payback Period	-	4 Years	Rapid

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