

# BEST PRACTICES IN SUSTAINABLE LAND MANAGEMENT (SLM) THEME ON SUSTAINABLE AGRICULTURE



Two examples best practices in agriculture towards sustainable land management. First, planting legumes after wet season rice (left picture) is taking place in Takeo province as a part of "Model farm and home gardening" technology. It takes advantage of the remaining soil moisture and improves the soil fertility for the next rice crop aside from being an additional source of income to the farmer. In the 2<sup>nd</sup> picture, farmers breed traditional rice varieties in Kandal. This ensures them of better quality and higher yielding seeds, reduces the need for chemical inputs and increases the market value of rice. Farmers in 5 provinces have a high demand for the pure line of seeds produced by fellow farmers.

## BACKGROUND

The Ministry of Agriculture, Forestry and Fisheries (MAFF) through the Sustainable Land Management Project has identified one hundred potential best practices in sustainable land management (SLM). Best practices in SLM are defined as: "Measures, methods or activities; that perform best or achieve the highest impact (in SLM) according to pre-defined criteria assessed through a validation process." (UN Convention to Combat Desertification or UNCCD)

Technologies and practices that have been proven to have worked over several years and validated by third parties can be referred to as "Best Practices". They are not "perfect" but they are the "best as of the moment".

Information on Best Practices aims to guide policy makers and planners on what successful strategies may be promoted on a wider scale. At the same time, development workers can use them directly as "models" that may be adapted in somewhat similar situations.

There are 5 themes in Best Practices: (1) Sustainable Agriculture; (2) Community Forestry; (3) Community Fisheries (4) Community Protected Areas; and (5) Local authorities work in Natural resources management. Best Practices were identified in consultation with NGO partners. The key criteria used were relevance to issues on land degradation; the extent of adoption and current spread of the Best Practice.

There are two types of potential best practices: "technologies" and "approaches". Specific farming "techniques" (e.g. integrated farming systems etc) are examples of technologies. On the other hand, "approaches" can refer to "planning and facilitating tools" such as rapid appraisal tools, extension methods, efforts to improve security of tenure etc. These technologies and approaches were either developed by Government agencies, donor supported government projects or NGO assisted initiatives.

This specific article discusses the Best Practices under the Theme on Sustainable Agriculture

## BEST PRACTICES

MAFF and partners identified 20 technologies and approaches that are partly addressing land degradation issues. Within the twenty are SLM – oriented technologies that involve improving farming systems practices. These practices try to introduce beneficial types of plants (e.g. legumes and perennial tree crops) as well as simple agronomic practices that help improve organic matter and improve soil fertility.

At the same time, they diversify income sources for farmers so that there is income all year round. Examples of such technologies include:

- Integrated farming systems (also referred as multipurpose farms. This is now practiced in 6 provinces
- Use of Bio-digester and composting, now practiced by 6,400 users in 8 provinces
- Systems for Rice Intensification (SR1), practiced by some 100,000 farmers in at least 3000 villages
- Model farm and home garden system to diversify lowland rice farm productivity
- Farmer based breeding of important traditional rice varieties that adapt to climate change

SLM "approaches" in agriculture were also identified. These are perceived to improve the ability of government and NGO extension personnel and community leaders to:

- Understand the agro ecological situation of local communities (Agro-Ecosystem Analysis);
- Identify and understand the types of soils (e.g.: Soils Technology Information Package);
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- Improve extension through farmer to farmer exchange and farmer field schools ( FFS )
- support the role of livestock in SLM through village animal health workers (VAHW )
- Maintaining small irrigation systems through Farmer Water User Community ( FWUC )

*\*Table 1 is a summary of BP identified by MAFF and partners*

## OTHER SOURCES OF INFORMATION ON BP FOR SLM IN AGRICULTURE

Aside from the list of 20 in table 1, there are other sources of information on varying stages of best practices. Some of them are still "young" (newly developed but with strong potential), while some are mature and proven (undergone many years of testing). Some recommended sources are:

CARDI – This is Cambodia's main agricultural research agency. It continues to test and adapt many ground breaking technologies in agriculture. Please check: <http://www.cardi.org.kh>

RUA – The College of Forestry has started to document local knowledge on agro forestry. This is an ongoing process. <http://www.rua.edu.kh>

Cooperation Committee of Cambodia – This network of NGOs has an online resource center that links the reader to various agriculture oriented NGOs and their lists of "success stories" . Please see: [http://www.ccccambodia.org/index.php?option=com\\_ngosearch&controller=ngosearch&task=display&name=&acronym=&sector=Agriculture/Animal Health &Region=&from=10](http://www.ccccambodia.org/index.php?option=com_ngosearch&controller=ngosearch&task=display&name=&acronym=&sector=Agriculture/Animal Health &Region=&from=10)

### PROLINOVA

This is network of farmers, NGOS and Government agencies that aim to encourage farmer led action research to develop practical practices that improve farm income in an ecological way. Several farmer based innovations have been reported. <http://www.prolinnova.net/Cambodia/index.php>. The NGO CEDAC is major Cambodian partner: <http://www.cedac.org.kh>

## POLICY IMPLICATIONS

Most of the above Best Practices were developed over years of testing, observation and dialogue among stakeholders on the ground such as farmers, extension workers and local authorities.

Productivity can be technically achieved through low cost agronomic practices that rely on resources and inputs already in the farm or in the locality. Ability to add to food and cash are vital criteria. Apart from productivity increases, these technologies increase resilience to the effects of climate change. Programs that promote this type of technologies would be in the right direction.

Farmers who have access to clear and easy to understand information; as well as good quality planting materials would likely adopt technologies. Technologies can be spread more quickly when farmers were directly involved in testing them in

## KEY ISSUES

There are 3 closely related sets of challenges related to land degradation in Cambodia especially in agricultural lands. First, there is inherently low soil fertility in portions of agricultural lands; Low and medium soil fertility affects approximately 70% of the total land including agricultural lands. The sandy character of large land areas means that there is low organic matter and high susceptibility to drought.

The second factor would be the inappropriate land use practices in both forest lands and agricultural lands. These include forest conversion to agriculture and land preparation practices that induce soil erosion. The third would be the exacerbating effects of climate change. Approximately 700 communes have high vulnerability index to climate change particularly to intense floods and drought.

their communities. If provided with the opportunity, farming communities can implement complex tasks such as maintaining irrigation systems and animal health care systems or even breed rice varieties.

This implies that extension systems can be strengthened by developing networks of farmers who can test technologies and then share their learning's with other farmers. This information is vital in the light of the fact that Cambodia has very few extension workers in relation to the total number of farmers.

**TABLE 1: LIST OF 20 BEST PRACTICES IN SLM – AGRICULTURE**

	<b>Title</b>	<b>Quick Description and Facilitating Organization</b>
<b>Technologies – Farming systems and agronomic practices</b>		
1	Integrated Farming Systems or Multi-Purpose Farm (MPF)  Site: Toul Khpous village, Chheur Kach commune, Baphnom district, Prey Veng province	A farming system that can be implemented in less than one hectare with the following outputs: 1-Crop production (Rice, vegetables, and legumes) including providing emergency food sources; 2-Fish and livestock productions for protein in the diet; 3-Fruit trees to provide soil conservation and fertility and better micro climate; and 4-On-farm ponding systems to help improve access to water for household-scale animal and crop productions. Facilitator : CARDI and CEDAC
2	Model farm and home gardening  Site: Takeo , Kampong Thom , Kamong Cham	This is also a farming system for less than one hectare that provides for an additional rice crop in the early wet season (Early wet season rice crop). It provides On-farm water harvesting with the use of pond for fish culture throughout the year. It also increases livestock production with increased availability of feed, and Legume and vegetable production after harvesting the wet season rice. Facilitator : CARDI and PDA
3	System of rice intensification ( SRI)  Site: Makak commune, Ang Snoul district, Kandal Province. Cheur Kach commune, Baphnom district, Prey Veng province.	This is a rice cropping system that involves alternative ways of transplanting and spacing of rice plants as well as water management to allow robust root growth and optimum photosynthesis. It reduces up to 80% of seed requirements and up to 50% of water. Facilitator : CEDAC
4	DMC – Direct Seeding & Mulching Cropping Systems  Site: Kampong Cham and Battambang pilot sites	This is a cropping system that involves minimum tillage and land disturbance while improving soil fertility. Most relevant to upland areas prone to soil erosion. The system involves planting cereals (rice and corn) with cover crops that eliminate the need for weeding and at the same time improve soil fertility. Facilitator : MAFF PADAC Project and AFD
5	Local Agroforestry initiatives  Site: Selected villages in Svay Reang	Forest trees and fruit trees are part of small farming systems initiated by villagers in selected villages in Svay Reang. Documentation is ongoing Facilitator: RUA College of Forestry
6	Climate resilient Rice varieties  Site:  in Bos Leav commune Kratie	This represents several emerging initiatives to promote rice varieties and production practices that better adapt to climate change impacts such as floods and droughts. In this site farmers with the guidance and support of the Provincial Office of MAFF, tried 6 improved varieties developed by CARDI and partners. Of these two to four were observed to better withstand floods and droughts. for at least 12 days.  Facilitator: MAFF – UNDP Promoting Climate-Resilient Water Management and

		Agricultural Practices in Rural Cambodia.
<b>Technologies – soil fertility amelioration</b>		
7	Biodigester and Composting**  Site: 6,400 units in 8 provinces	This is a system that converts agricultural waste to energy for the household. At the same time, a residue the bioslurry when combined with compost provides high quality organic fertilizer for the farm. Facilitator: National Biodigester program ( NBP)
8	Composting  site : Makak commune, Ang Snoul district, Kandal province (example of several sites)	This is an old technique that has been adapted to various small farm conditions in Cambodia. Organic materials from the farm are decomposed under controlled conditions using simple materials locally available and skills by the small farmer.  Facilitator( in the site cited ) CEDAC
9	Site-specific nutrient management  Site: (Chhouk, Tramkak, Bati, Ou Reang Ov, Svay Chhrum, and Kampong Liev districts of Takeo Kampot, Kampong Cham, Svay Rieng and Prey Veng provinces)	This is a fertilization strategy that enhances nutrient use efficiency by improving the effectiveness of applying fertilizers in different soil types and agro-ecosystems considering using the nutrient balance approach. Facilitator: CARDI
<b>SLM Approaches – water management and planting material and animal support systems</b>		
10	<b>Farmer Water User Community **</b>  Site:Trapeang Chheuteal village, Chresh commune, Chum Kiri district, Kampot province ( Note: here are 17 FWUC in Cambodia)	This is a community self help approach that ensure the sustainability of dam systems; manage water for dry season cropping, and intensify cropping and crop yield through effective water management. Facilitator : MOWARM in collaboration wiith community user groups
11	Traditional Rice Breeding by Farmers **  Site: Model farmer in Kraing Yov commune, Sa-ang district, Kandal province	This is a community based rice breeding approach that has been proven in Kandal province. Farmers were able to conserve traditional varieties through pure line selection. As a result, they reduce expenses on impure seed, chemical fertilizers, and pesticides, and raise market value of local varieties; This process has produced a new variety that is resistant to unfavorable weather and lodging, high yield, and uniform flowering. Facilitator : Provincial Department of Agriculture, and Srer Khmer (NGO)
12	Integrated Pest Management  Site: Location ( example)	A community based, cost effective pest management system that relies on farmer education and implementation of natural pest management systems. Pesticides are also used sparingly and based on an economic decision making process. Facilitator: Department of Agriculture and partner NGOs
13	Self Help Group Build Confidence of a VAHW  Site: Taan Commune, Kralanh	A self help group of farmers can incorporate and benefit from integration of livestock in their farming systems. Village based Animal Health Workers (VAHW) provide timely and sustained animal health services. Their services are sustained by small compensation provided by beneficiaries of the services. Facilitator : Heifer International- Cambodia

	district	
<b>Approaches – Extension Tools for Appraisal and planning</b>		
14	Agro Ecosystems Analysis ( AEA)  Site: 2 communes in Pursat ( examples only )	The MAFF has conducted AEA in a third of the communes in Cambodia. The AEA is a participatory appraisal tool for understanding the agricultural situation of a commune from an agro – ecological basis. It has been adapted to various programs including those for social land concessions, irrigation systems and inland fisheries. Facilitator : MAFF Dept of Agricultural Extension
15	Soil Technology Implementation Procedure ( TIP)  Site:	It is a simplified version of Soil Manual for Rice Crop which uses the Cambodian Agronomic Soil Classification System to identify soils and manage them for sustainable rice production). Facilitator : MAFF DAE
16	Land suitability classification for field crops  Site: Communes of Ou Reang Ov, Tramkak, Banan, Kong Pisey, and Ponhe Krek districts	It was developed to facilitate extension workers and farmers understand the main biophysical constraints that limit the production of field crops. Together with assessment of socio-economic conditions of the farmers, it identifies the most suitable crop for growing). Facilitator: CARDI
<b>Approaches – facilitation approaches for community based actions</b>		
17	Supporting Land rights and Livelihood Improvement (including Farmer field and life schools )  Site: Kampong Cham, Banteay Meanchey and Battambang	Farmer leaders are developed to become effective farmer trainers for other farmers. Familiar with adult learning principles and skills, they help other farmers learn new practices in cereal and vegetable crop production. Assisting external organizations (government or non government) who do not have sufficient extension personnel can use this approach reach out to large numbers of farmers. At the same time, farmer's organizations learn better negotiating skills for consolidating their land rights. Facilitator :Srer Khmer
18	Empowerment Ethnic Women in agriculture  Site: Romnea commune, Senmonorom district, Mondulkiri	A Self-Help Group of 20 families of the Phnong ethnic minorities are working together to improve their livelihoods and self-reliance by increasing their indigenous understanding of farming and animal production and developing the community's resource base, along with strengthening the women's capacity in leadership for their holistic community development. Activities include: gender awareness, group management, savings scheme, agricultural techniques and animal husbandry, and horticulture. Facilitator :Heifer, Cambodia
19	Building adaptive capacity and ecosystem resilience to floods and droughts in Indigenous and minority communities  Site: Ratanakiri and Stung Trang Province	This is a community research and planning tool that help the community assess and document local and indigenous perceptions on climate change (mainly floods and droughts) impacts. It builds on an ongoing social research process (known locally as Sala Phoum). The practical experience gained from the research is used alongside farmer to farmer exchanges, and other participatory approaches to the construction and communication of indigenous knowledge.  The above actions are derived from the vulnerability assessment, and aim to support 1) production enhancements, 2) information/knowledge improvements and 3) institutional strengthening. Local authorities work with communities to develop village adaptation strategies which are then discussed at commune council, district and higher administrative planning and policy levels. Facilitator : (NTPF and GEF SGP )

20	Integrated ecological farming- Sustainable Land Use and Management at Household Level  Site : Samroung District, Takeo province	This is an extension approach to support integrated commercial farming by small farmers. Thirty five farmers are being supported to become the model farmer in implementation of integrated ecological farming and sustainable land use and management at the householder level. The goal is to support those farmers to develop integrated commercial farm, sustainable in their agricultural production, compatible with climate change adaptation and support habitats of biodiversity. Dissemination mechanisms are enhanced through training 36 representatives of 14 CBOs/NGOs to transfer their knowledge and skills to more than 160 farmers  Facilitator: CEDAC and GEF SGP
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## KEY REFERENCES:

- MAFF and MOWARM. Strategy for Agriculture and Water. 2011-2013
- MAFF SLM Project 2009. Report on the Stakeholder Consultation Workshop on Best Practices in SLM – Agriculture Theme
- Seng Vang, 2009. Report On Policy Analysis For Agricultural Land Use. FAO
- Other References are found in the individual case studies

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