



Practice Brief

Increase Productivity in Paddy Rice Field: Integrating Cover Crop, Dry-Season Cropping, and Duck Raising

KEY TAKEAWAYS

Integrating paddy rice cultivation, duck raising, and dry-season cropping is an effective approach to sustainable farming. It increases rice yields through natural fertilization, boosts income with diversified production, and improves soil fertility using green manure, legume residues, and duck manure. This system also reduces labor as ducks control weeds and pests, decreases weed and pest problems, and minimizes the need for chemical inputs, fostering a healthier environment.

PADDY RICE PRODUCTION IN NORTHERN LAOS

Intensive agricultural production often requires significant investment in fertilizers, labor, and technology. In Northern Laos, paddy rice production is the main livelihood activity, followed by vegetable farming during the dry season after rice harvest. However, farmers face challenges such as insect infestations, soil degradation, and high weed pressure. These issues force them to rely on costly chemical inputs like herbicides, pesticides, fertilizers, as well as labor force for weeding. Despite these investments, rice yields remain low due to limited knowledge of sustainable farming practices and improper use of inputs.

Examples of these issues include the overuse or under-application of fertilizers and pesticides, leading to environmental damage and negative impacts on farmers' health and productivity.

To address these challenges, adopting sustainable and integrated farming technologies is crucial. Practices such as duck raising in paddy fields, legume cultivation, and vegetable production are promising solutions to improve productivity and resilience in the current context.

Rice is the main staple crop in Laos, with paddy rice covering the largest cultivated area compared to upland rice and other types. The primary paddy fields are located in flat plains along rivers in central and southern Laos, while upland rice fields dominate the sloping terrains in the north.

Traditionally, farmers have relied on practices such as plowing, harrowing, and transplanting 20 to 25-day-old seedlings. They initially used cattle manure and allowed livestock to graze in the fields post-harvest during the dry season (November to May). Over the past decade, chemical fertilizers and pesticides have been introduced to boost soil fertility and control pests like snails and insects.

A small number of farmers have diversified by cultivating dry-season crops such as vegetables, garlic, and groundnuts in the paddy fields.



Photo: *Crotalaria* legume on paddy rice field after rice harvested during dry season.

PRODUCE GREEN MANURE IN DRY SEASON

Planting ***Crotalaria beans***, as a cover crop after the rice harvest while soil moisture remains, is a highly recommended practice. This legume helps produce biomass, stimulates microbial activity, and enhances nitrogen levels in the soil for the next rice season. Through symbiosis with *Rhizobium* bacteria, *Crotalaria* beans fix atmospheric nitrogen, contributing to soil health and fertility.

PLANT GROUND NUT IN PADDY FIELD AFTER HARVEST

Groundnuts are an excellent alternative legume crop for the dry season after the rice harvest. Besides generating income due to strong market demand, groundnut residues left in the field enrich the soil, improving fertility for the subsequent rice crop.



Photo: Ground nut plantation in paddy rice field after rice harvested during dry season.

DUCK RAISING IN PADDY FIELD

Integrating duck farming into paddy fields offers multiple benefits, including increased rice yields, improved soil quality, and additional income. Ducks can be introduced into the fields 2-3 weeks after transplanting when rice stems are strong enough (e.g., late July to early August in Xiengkhouang, depending on transplanting dates).

Ducks feed on young weeds, insects, and snails, while their manure naturally fertilizes the soil. These activities reduce the need for herbicides, pesticides, and labor. After 3-4 months, ducks typically reach a marketable weight of 1-1.2 kg, providing farmers with an additional source of income.



CONCLUSION

Integrating three activities—paddy rice cultivation, duck raising, and dry-season cropping—on the same land within a year significantly improves productivity. These practices increase rice yields, enhance soil fertility, and boost farmers' incomes, paving the way for sustainable paddy field management.



Mrs. Sodsady Natavong

Mrs. Sodsady, a farmer from Khay village in Pek District, Xiengkhouang Province, illustrates successful paddy field improvement through innovative practices. Since early 2023, she has adopted integrated crop-animal production systems, incorporating duck raising and effective fertilizer management. Over two years of implementing these techniques, Mrs. Sodsady has observed significant improvements compared to traditional mono-cropping methods. She has achieved notable results, including increased rice yields, enhanced soil fertility, and higher income.

Credit:

This practice brief was prepared by the Department of Agricultural Land Management (DALaM) team, with key contributions from the Provincial and District Agriculture and Forestry Offices (PAFO and DAFO), who played a central role in implementation, monitoring, and data collection.

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