Indigenous intensification by Mangyan swiddeners

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Swidden agriculture is often seen as unsustainable and not adapted to present day needs. Whilst it is true that traditional swidden systems are vulnerable to pressures from contemporary society, it is surprising how little effort has been made to improve these systems by building on indigenous insights and initiatives in order to increase the economic and ecological sustainability of swidden agriculture. This article describes the innovativeness of the Mangyan swidden farmers, the indigenous inhabitants of the island of Mindoro in the Philippines, and demonstrates their ability to adapt their farming to changing needs and conditions.

The traditional swidden system

Mangyan swidden agriculture was one of the first swidden systems to be fully researched. Conklin (1957) classified it as an established integral system. In such a system few crops are raised outside the swiddens and farms are usually located in secondary forests, as the clearing of primary forest is avoided. A long fallow period during which the forest recovers, completes the swidden cycle. The fallow ensures the sustainability of swidden agriculture by regenerating soil fertility and preventing high levels of yield loss through weeds, pests and diseases. Such swidden farming systems allow an efficient and ecologically sound exploitation of the hilly, wet, tropical lowlands. The stability of swidden systems is partly due to the fact that crop production is in conformity with the natural regenerative processes that takes place on the cleared swidden. Crop choice, crop management and crop succession reflect the process of forest recovery. Competent swiddeners have a deep understanding of the dynamics of natural processes and use this knowledge to manage their swiddens. In this aspect swidden farming differs essentially from other agricultural systems where natural processes are usually controlled to allow crop growth.

No forests left

Since the late 1950s the population of Mindoro has increased sharply as thousands of immigrants settled on the island. Mangyan land was taken by the settlers and as a result the Mangyan had to retreat into the hills. More recently, commercial loggers devastated most of Mindoro’s extensive forest reserves. After logging kogun grass (Imperata cylindrica) took over the land in many areas and hampered forest recovery. The Mangyan continued their swidden–based life style but the lack of forest land meant they had to adapt their traditional farming system.

SALT not a feasible alternative
Under such conditions swiddeners are often advised to abandon their swiddens and take up plough agriculture. But in tropical, hilly, lowland conditions ploughing exposes the soil to degradation and erosion. The recent development of Sloping Agricultural Land Technology (SALT) in the Philippines is an attempt to overcome the disadvantages of plough agriculture. An upland agroforestry technology, SALT aims to prevent soil degradation and erosion by planting hedgerows of leguminous shrubs or trees along contour lines (IIRR/DENR/FF, 1991).

The merits of SALT farming are taken for granted here. In the Mangyan region, however, SALT, including the use of the plough, has been rigidly promoted as an alternative to swidden farming. Moreover, SALT has been presented as a sustainable blueprint for agriculture rather than a source of technologies that can be adjusted to local conditions and needs. The rigid promotion of SALT is likely to have little impact on the Mangyan for several reasons. First, if one or more of its elements are incorrectly implemented, ecological stability will be undermined and soil erosion will be increased rather than prevented. Second, as Schlege (1981) demonstrated in the Southern Philippines, plough agriculture demands more labour than swidden cultivation and SALT is particularly labour intensive. Three, the Mangyan are unlikely to abandon a system of agriculture that is an integral part of their culture and finally there is the problem of getting draught animals.

The cultural dimension is an important element in the swiddeners’ resistance to plough agriculture. The promotion of the plough is experienced as an attempt to undermine cultural identity. The Mangyan prefer to adjust their swidden systems to accommodate increasing pressures in such a way that the cultural dimension of their agricultural activities is maintained and strengthened.

**Contemporary Mangyan farming**

In recent years the Mangyan have developed a differentiated system of temporary and permanent fields, each with specific crops and specific usage. While the traditional integrated farming system included all the essential crops the Mangyan needed for subsistence, various farming sub–systems are now required to raise the necessary crops. Farmers initially avoided kogun–infested land was initially avoided mainly because the rhizomes of this grass survive burning. But as forest fallow land became increasingly scarce, new fields had to be opened on Kogun land. This type of land was abundant and, to prepare it, Mangyan farmers use fire, the plough and sometimes the hoe. Both plough and hoe have only recently been adopted by the Mangyan and plough agriculture has not replace swidden farming, but complements it by allowing the exploitation of otherwise unexploited areas. The various farming sub–systems found in the Mangyan crop production system today include:

- **Ploughed fields** are usually planted with a mixture of annual crops and some perennials. These fields are typically located on deforested, kogun–infested land. They are permanent with a relatively short fallow period.
- **Swidden fields** are planted with mixed annual crops and bananas. Perennials, if considered valuable, are left unburned. Compared with the traditional system, the swiddens have a strongly reduced fallow period, are used for shorter periods and the emphasis is on grain crops.
- **Fields with minimal clearing and tillage** are used for the extensive production of root crops such as cassava and yams.
- **Fields with no tillage and limited clearing** are used for fruit trees and bananas.
- **Forest reserve and fallowed land** with secondary forest vegetation.

Swidden fields are usually combined with fields that require minimal clearance and tillage, perennial crops are raised and there is also some extensive root crop production. Some farmers are wholly dependent on their swidden farms, the most, however, include many (sometimes all) sub–systems in
their individual farming system.

**Farming unsustainable**

This differentiation has not neutralised the negative effects of the increasing pressures on the farming system. The newly developed farming system compares unfavorable with the traditional swidden system. Almost all Mangyan in Tinis–an stated that yields have fallen considerably in recent decades. The yield/labour ratio has also dropped. Weed control is considered to have become more troublesome and many traditional crops have disappeared from the area. Soil erosion is no longer uncommon and landslides occur during typhoons. Mangyan farmers could no longer maintain their practice of fitting crop production harmoniously into natural processes on ploughed fields. However, the other types of fields still reflect the Mangyan’s profound understanding of the best way to fit crop production into the dynamics of natural processes.

**Ecological stability of the system**

The productivity and stability of agricultural production in hilly, tropical lowland conditions is enhanced by the continuous presence of plant cover. A permanent or perennial plant cover stimulates the build-up of organic matter in the soil and the presence of permanent root systems prevent erosion. Intensive tillage promotes the decomposition of organic matter in the soil and leaves it vulnerable to erosion. The risk of soil degradation is especially high on ploughed farms, often only a few (fruit) trees have been planted. Moreover, these farms are usually opened on kogun land, where there are very few trees. Swiddens are only unstable when they have just been opened. The presence of large and/or valuable trees, which are often left unburned, stabilises the swiddens and the rapid recovery of vegetation further increases stability.

**Table 1. An estimation of the ecological stability of the subsystems used in Mangyan agriculture**

<table>
<thead>
<tr>
<th>subsystem</th>
<th>presence of permanent plant cover</th>
<th>intensity of tillage</th>
<th>ecological stability</th>
</tr>
</thead>
<tbody>
<tr>
<td>ploughed farms</td>
<td>few (fruit) trees / bananas</td>
<td>intensive</td>
<td>very low</td>
</tr>
<tr>
<td>short-cycled swiddens</td>
<td>some (fruit) trees / (wild) bananas</td>
<td>extensive</td>
<td>low (during first year)</td>
</tr>
<tr>
<td>extensive farms</td>
<td>weeds/scattered trees</td>
<td>extensive</td>
<td>medium</td>
</tr>
<tr>
<td>perennial crop farms</td>
<td>many (fruit)trees / bananas</td>
<td>extensive</td>
<td>high</td>
</tr>
<tr>
<td>forest reserve</td>
<td>natural</td>
<td>none</td>
<td>very high</td>
</tr>
</tbody>
</table>

**Mangyan innovation**

The Mangyan of Tinis–an are acutely aware of the fragility of their agro–ecosystem and the need to increase food production. Further shortening of the fallow period in the ploughed and short–cycle swiddens systems is impossible without chemical fertiliser. However, as Mangyan farming is still essentially a subsistence agriculture, the use of chemical fertiliser is risky and not very profitable. Purchasing external inputs is also far from feasible. In fact, an increase in the level of food security can only come from further developing the remaining three subsystems: extensive farms, perennial crop farms and forest reserves. The Mangyan are, therefore, shifting crop production towards these more stable subsystems. The most recent development is a renewed interest in root crops such as yam and red tannia. Both yam and red tannia were important crops in the traditional swidden cycle, but their importance diminished as farming became more differentiated. Both yam and red tannia provide food during periods when other food is scare and are generally produced in the ecologically more stable extensive farm subsystem. In this way, the Mangyan raise their food security level and at the same time improve ecological stability.
Conclusion

It is not uncommon for outsiders to consider swidden agriculture as a static type of agriculture, dominated by tradition and doomed to extinction. The recent development of the Mangyan swidden system, however, shows that swiddeners are trying to sustain and improve their swidden agriculture. The trend towards ploughed fields and shortened fallow periods which lead to ecological degradation has been halted with an intensification of the ecologically more stable agroforestry sub-systems. To achieve this transformation swiddeners have fallen back on traditional practices. Based on the potential of traditional swidden agriculture to use land in a sustainable way and recent experiences with fallow intensification it is expected that these indigenous innovations will create opportunities for sustaining a growing population.

The recent adaptation of the Mangyan swidden system shows the importance of Mangyan traditions as a source of knowledge for innovation. Both yam and red tannia were traditionally important crops which have now been rehabilitated in order to overcome contemporary problems. Thus, even though the Mangyan no longer practice the original traditional swidden cycle, knowledge of this cycle is still very relevant as they develop new agricultural strategies. These adjustments, unlike introduced agricultural technologies such as plough farming and SALT, also strengthen the cultural identity of the swiddeners. Hopefully, the flexibility and the potentials of swidden agriculture will be recognized by the agriculturalists and policy-makers responsible for the uplands and forests inhabited by swiddeners.


References

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Yam (*Dioscorea* spp.) is particularly useful for developing the extensive production of food if grown like the forest yams of this area. It can give good yields and only requires the farmer to dig a planting hole and carry out some initial weeding. With its preference for stalking, yam is an excellent woodland (inter)crop and flourishes amongst fruit tree stands, reforested areas and secondary forest as well as on marginal and fallow land. Trees can be left undisturbed to develop into a yam/ bush agroforestry system. Although yam is usually raised as an annual crop, it is a perennial and can be left in the field during years of plentiful food supply to provide a reserve for years when food supplies are scarce.

Red tannia (*Xanthosoma violaceum*) is not a climbing crop, but is larger, sturdier and more perennial—like than the normal white tannia. Both types of tannia can be planted on swiddens and ploughed farms, but red tannia also produces well on extensive farms. It requires little attention apart from the digging of a planting hole and some ring weeding. Erni (1989) observed that red tannia, once established, yields continually for many years and needs only little additional care. Although not as flexible as yam, red tannia can also serve as a food reserve.