

PERSPECTIVES FOR THE FUTURE

Scenarios for the Future Development of the Ifugao Rice Terraces (N-Luzon, Philippines)

by

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1 Introduction

As already stated in the paper on the history and ecology of Ifugao (SETTELE & MARTIN, this volume, pp. 13-28), drastic changes may be expected in the terraced landscape of Ifugao Province, should the present development continue without alterations. Rice cultivation alone or in combination with swidden-culture increasingly seems not to meet the needs and expectations of the local people. Hard labour in the terraces, low rice yields, increasing population, and food imports are the major problems Ifugao people have to face. This for example leads to the search for alternatives in other areas (either in the lowlands, for example Quirino Province, or in the higher elevated regions with their mossy forests).

Among these preconditions we accepted rice shortage in the area as a given fact. However, the data available, as shown in BARTHELMES et al. (this volume, pp. 29-42), are not at all consistent. Depending on the sources used, we have a high variation in rice yields per hectare and the consumption per head. If we look at rice yields of irrigated systems in general, we dare to state, that the system in Ifugao - at least at higher elevations from about 800m upwards - surely can't yield as much rice as needed for the local population. To put this very important precondition on solid ground it would however be desirable to get more reliable data on rice production and consumption in Ifugao.

To deal with these problems and to derive options of future development, it is useful to apply scenarios. In this contribution we will concentrate on four scenarios which are somehow extreme versions of what could happen. Of course there are components in each scenario which could be exchanged with the respective components of others. Therefore we subdivided all scenarios into the following components: watershed, agriculture, tourism, and handicrafts (esp. wood carving). We summarize the medium-term effects of each scenario (including effects on biodiversity). The scenarios presented refer to the conditions we found around Banaue, as most of our experience (as a group) is derived from field work there.

2 Scenarios

2.1 Scenario 1: Continuation of the present state

2.1.1 Preconditions:

watershed:

Road construction (for example the Banaue-Bontoc road; see Pict. 17, p. 25) and foundation of human settlements in mossy forests (which can be found some kilometers from Banaue in higher elevations (see Pict. 19, p. 25); wood extraction for handicraft industry.

agriculture:

Local and partly new rice varieties are planted in traditional or slightly modified systems for a period of 6-8 months; additionally vegetables are grown; total area of agriculture decreases as young people leave from the region.

tourism:

Numbers of tourists increase slightly; average time a tourist spends in the area is 1 - 3 days, visits are concentrated around touristic spots (like Viewpoint, Batad, Bangaan).

handicrafts:

Cash income, especially for wood carvings, is based on decreasing natural resources (according to own observations, respectively interviews with wood carvers, wood is harvested in mossy forest or imported from the lowlands).

2.1.2 Medium-term effects:

watershed:

Mossy forests gradually vanish.

agriculture:

More water shortage especially in drier seasons, which would result in a loss of irrigated terraces (e.g. due to erosion after cracks, which resulted from drying of terraces) and problems in supply of drinking water, because mossy forests are the main factor for constant water supply; reduced maintainance of irrigated terraces because of emigration of young people; possibilities for agricultural innovations are limited due to watershed and erosion problems.

tourism:

More local people work for tourism industry, thus time invested for terrace and swidden cultivation decreases; majority of people, including most of the farmers, won't have access to the income created by tourism (compare MARGRAF & VOGGESBERGER, 1986); tourism will decrease as the scenery of the terraces gets worse (due to less maintainance, see below).

handicrafts:

Prices of natural resources (e.g. wood and rattan) will rise and cash income will decrease as these resources are more and more depleted and thus get rare (and expensive); less people will be able to make a living out of handicrafts.

biodiversity of agricultural areas:

Diversity of flora and fauna of irrigated rice fields will decrease, including the extinction of local rice varieties and some endemic species (e.g. caddis flies).

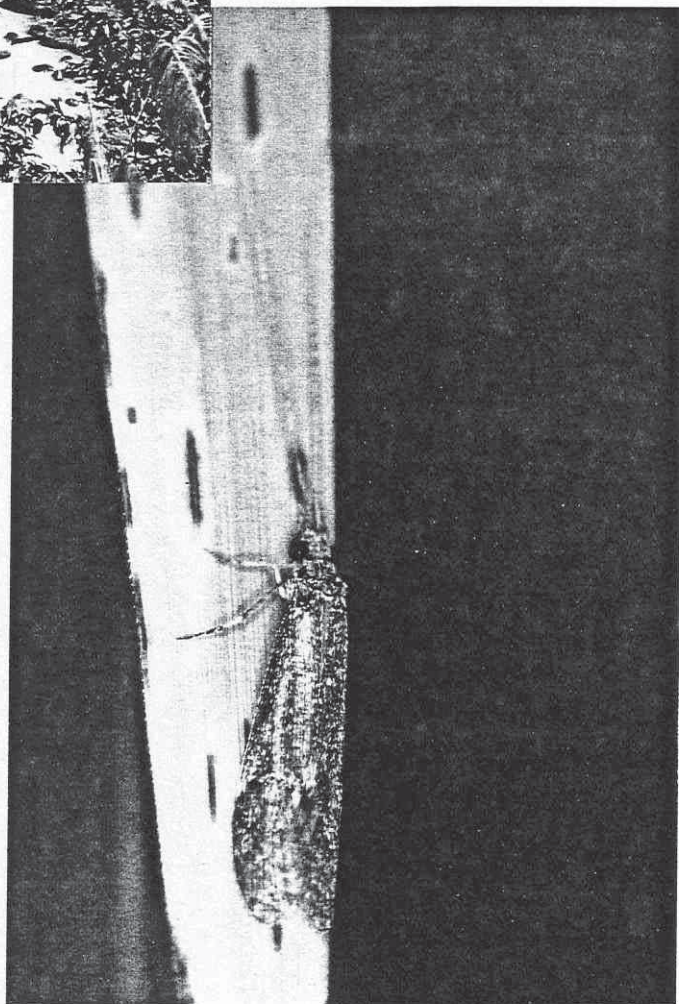
biodiversity of natural areas (mainly mossy forests):

Due to gradual destruction of forests the loss of many endemic species is to be expected (which means global extinction of a number of species)



Picture 43:
Erosion due to temporal
drought within rice fields
(Banaue, 1988)

Picture 44:
Caddis fly (Trichoptera)
from the Ifugao
Rice Terraces



2.2 Scenario 2: Short term mass tourism

2.2.1 Preconditions:

watershed:

In forested areas increased road construction and human settlements (tourists buy products along the roads); harvest of wood for handicraft industry (e.g. for carvings).

agriculture:

Continuation of irrigated rice terrace system (traditional or modified) concentrates around touristic spots (museum-type of rice production); rest of the region will be used in very different ways, e.g. for vegetables and fruit trees.

tourism:

Average time a tourist spends in the area is 1-3 days (like in scenario 1); number of tourists increases drastically; strong concentration of large parts of the population on tourism; more waste and garbage produced; construction of new hotel facilities and a nearby airport in Bagabag.

handicrafts:

Increase in production of wood carvings - especially locally sold ones.

2.2.2 Medium-term effects:

watershed:

Depletion of mossy forests even faster than in scenario 1: mainly due to 'improvements' of infrastructure (especially if not made in a technologically appropriate way, see extremely negative example of widening of Banaue-Bontoc road in 1997 in Pict. 17 and 19, p. 25), shifting cultivation (in combination with human settlements; Pict. 19, p. 25) and increasing wood demand for carvings.

agriculture:

Irrigated terraces in large parts of the region (except the ones directly at tourist spots) get lost due to reduced maintainance and the destruction of the watersheds; conditions for agriculture will hardly be suitable for any further development.

tourism:

Strong concentration on tourism of large parts of the population leads to a decrease in time invested in terraces and swiddens; major income will be created "out of the area" (e.g. large hotel entrepreneurs); waste and garbage problems will increase (see JAHN et al., this volume, especially Table 14 and pp. 53-54); drinking water supply will soon be problematic due to forest destruction; tourism might destroy its own basis and vanish in the longer term.

handicrafts:

For increased wood carving there will be an increasing demand on woods, which accelerates the depletion of natural resources; prices will increase and profits be reduced in the medium- and longer term due to lack of resources; quality of carvings might decrease, as locally sold products do not have to meet the same quality criteria as exported ones.

biodiversity of agricultural areas:

Especially species diversity of irrigated rice fields will get lost, including the extinction of many endemic species.

biodiversity of natural areas (mainly mossy forests):

Due to destruction of forests complete loss of many endemic species.

2.3 Scenario 3: Further agricultural intensification and technical modifications

2.3.1 Preconditions:

watershed:

Protected (to guarantee a continuous water supply throughout the year).

agriculture:

- a) Irrigated rice: introduction of a second rice crop (especially in areas of lower elevations like e.g. around Kiangnan, where it has been partly introduced already); synchronicity of crop cycles will be reduced;
- b) Introduction of rice-vegetable-intercropping (like in Bay-Yo, Mt. Province, see Pict. 46, p. 98):
- c) Exclusive growth of vegetables (or fruit trees) on terraces.

tourism:

Continued like in scenario 1 (maintenance of breathtaking views in central areas).

handicrafts:

Wood carving industry is improved; forests are intentionally planted for wood production.

2.3.2 Medium-term effects:

watershed:

Maintained if relation to agriculture is recognized, which leads to protection efforts of official and private people. However, certain danger for the watershed, as the dependence on the forests for water supply will decrease and it might still be possible to grow vegetables in rainy season.

agriculture:

- a) Reduced synchronicity of rice crop cycles most probably will not create problems in insect pests (WAY & HEONG, 1994; HEONG, 1996). Nutrient supply for two rice crops might not be sufficient (additional input of fertilizers!);
- b) In rice-vegetable-intercropping systems soil erosion is more likely to occur (due to temporarily dry conditions); terrace stability will severely be reduced due to cracks in dried up clay walls (unless stones replace the clay terrace walls, like e.g. in Bay-Yo or Batad); increased dependence on the market, especially for trading cash crops and for buying fertilizers and partly also pesticides (potential health problems); changes are to a certain extent reversible.
- c) Exclusive vegetable or fruit tree growth on terraces will result in the application of fertilizers and pesticides (like in Kiangnan); increased dependence on the market, especially for trading cash crops and for buying fertilizers and partly also pesticides (potential health problems); the rice system will be lost irreversibly to a considerable extent (e.g. due to nutrient loss, destruction of irrigation systems and erosion; see Pict. 45, p. 96).

tourism:

Depending on the intensity effects might be like in scenario 1 or scenario 2; a reduction in medium- to long-term tourism could result, if large portions of area are devoted to upland agriculture (e.g. vegetables)

handicrafts:

The chance for cash income will lessen the effects on natural resources.

biodiversity of agricultural areas:

- a) Diversity of local rice varieties most probably will be reduced, 'modern' varieties will be introduced; depending on the respective agricultural changes, species

composition especially of the aquatic fauna in rice fields might be affected, including a certain risk of extinction of endemic species like for example some caddis flies; terrestrial invertebrate fauna composition will remain more or less constant, as it basically seems to be the same all over the Philippines, irrespective of growing systems (SCHOENLY et al. 1996).

- b) Diversity of local rice varieties most probably will be reduced, further 'modern' varieties will be introduced; species compositions (esp. the aquatic fauna) will be totally different (including the extinction of endemic species).
- c) Local rice varieties will be lost completely (except some preserved seeds in germplasm centers); aquatic fauna will be completely lost and many endemic species will go extinct

biodiversity of natural areas (mainly mossy forests):

- a) Biodiversity will be preserved due to efforts of watershed protection, which is due to the dependence on water supply for the irrigated terraces.
- b) Same as a).
- c) Risk for loss of diversity larger than in a) and b), as vegetable system is more independent from continuous water supply and negative effects of forest destruction are not obvious as early as in irrigated rice systems.



Picture 45: Former irrigated rice terraces converted into bean fields (near Kiangnan, 1985)

2.4 Scenario 4: Integrated Development

2.4.1 Preconditions:

watershed:

Mossy forests strictly protected; no wood is taken out of these forests; reestablishment of the woodlot system in areas of agricultural production (compare CONKLIN, 1980).

agriculture:

Traditional rice growing system maintained in major/some parts of Ifugao (rice production for own consumption as well as for sale of traditional rice varieties for a regional or even global market); modified rice system (e.g. two rice crops per year in lower elevations; SETTELE et al. 1993b, 1995) contributes to increased production of high yielding varieties; parts of imports of rice from the lowlands are replaced; vegetable growing introduced in restricted areas (percentage of land cover herefore orientated at the traditional swidden system; compare CONKLIN, 1980).

tourism:

Tourists are charged with certain entrance fees; tourism concentrates on certain areas for the majority (a reduced kind of mass tourism) - especially for short to medium term visitors; 'high quality tourism' (like for example ecotourism) is introduced for long term visitors; it includes a set of guided tours through the region, combined with central informations on the respective systems and their compartments or components; a 'tourist academy' promotes traditional handicrafts and skills, like e.g. weaving, carving, basketing, music and dances as well as cooking; it could also contribute to maintain the knowledge of the religious basis of the system.

handicrafts:

If industry-like enterprises are developed; as the local supply with wood is not at all sufficient, it shall be combined with forest plantations in lower elevations (e.g. within Ifugao Province around Lawig?).

[As an example we just could make very simple calculations: if such an industry would need 10,000 logs/year and we have 20 logs/ha one would require 500ha of forest/year. If we further calculate around 80 years for the regrowth, we would end up with an area of 40,000 ha as a basis for the wood supply for a wood carving industry.]

2.4.2 Medium-term effects:

watershed:

Mossy forests will survive and guarantee the long term stability of water supply for terraces and people (drinking water).

agriculture:

Sustainable development; traditional systems based on local rice varieties survive in certain areas; modified rice system contributes to increased production; dependence from imports of rice from the lowlands decreases; vegetable growing creates additional sources of food and cash income; maintenance of terraces possible because of economic feasibility due to production as well as tourism.

tourism:

Contributes more essentially to local improvements, as financial income from entrance fees goes back to people and especially farmers; sale of handicrafts creates some additional cash income (similar or higher than at present)

handicrafts:

The 'tourist academy' and industry-like enterprises contribute to maintenance of skills and create jobs, they guarantee cultural integrity; wood supply for carving in the longer term is save due to forest plantations

biodiversity of agricultural areas:

Species diversity of irrigated rice fields will be preserved, especially in areas of traditional rice production (including local rice varieties and many - partly endemic - species of the aquatic fauna).

biodiversity of natural areas (mainly mossy forests):

Mossy forests are preserved, including their large number of endangered and/or endemic species; thus an important contribution to the protection of global biodiversity results.

2.4.3 Possibilities for the implementation of an integrated development

Tool for the implementation of such an integrated development could be the declaration of protection and development zones, like the zones defined for Biosphere reserves in the *MAB-programme* of the UNESCO:

- Zone 1: core zone (here especially the mossy forests)
- Zone 2: traditonal land-use zone (areas of traditional rice/swidden culture, like e.g. around Banaue and Batad)
- Zone 3: development zone (landuse according to the principles of sustainability; areas with more intensive production of rice or vegetables, e.g. around Kiangan)

Such a scenario only will become true (in the suggested or somehow modified versions), if local people are the driving force for its implementation.

Picture 46:

Intercropping fields
(rice - sweet potato)
in the sweet potato stage
(Bay-Yo, Mt. Province,
March 1997)



Rice Terraces of Ifugao (Northern-Luzon, Philippines) Conflicts of Landuse and Environmental Conservation

- Report of a Scientific Students' Excursion -

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