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Sustainable rice production by indigenous women

1. GENERAL INFORMATION

1.1 Title of practice or experience

Sustainable rice production by indigenous women

1.2 Category of practice/experience and brief description

Rice production in the Cordillera Region in northern Philippines has long been a woman's domain. From selecting the seeds to storing the grains in the granary, women play the major role. The significance of this role in maintaining the high status of women in the society has been undermined by the introduction of cash crops, which has shifted the major role in production to males. This also means the loss of practices that have ensured that generations of indigenous peoples have remained self-reliant and self-sustaining in meeting their basic food needs. This study looks into the particular farming practice of the Kankanaey women of the Mountain Province, one of the provinces in the Cordillera.

Irrigated rice production is the main livelihood of many villages in the Cordillera and particularly for the people of the Mountain Province. The sustained production yields of rice in Bontoc, Mountain Province through hundreds of years (Scott, as cited by Omengan and Sajise, 1981) have aroused interest in the study of the practice. Much literature has already been produced regarding this kind of production and this paper will attempt to collate the available information. The interplay of technical and socio-cultural practices seems to have made this kind of farming sustainable. The combination of green and animal manure, the availability of water, the correct reading of the biophysical signs for proper planting times and the socio-cultural regulations of the indigenous village leadership help to produce food for a significant portion of the population on a sustained basis.

1.3 Name of person or institution responsible for the practice or experience

Subsistence farming villages in the Mountain Province, Philippines

1.4 Name and position of key or relevant persons or officials involved

Village officials and women farmers

1.5 Details of institution

Not applicable

1.6 Name of person and/or institution conducting the research

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2. THE PROBLEM OR SITUATION BEING ADDRESSED BY THE PRACTICE/INNOVATIVE EXPERIENCE

Chemical farming was introduced in the Cordillera in the 1960s. However, in upland areas, the use of chemical fertilizers, mainly urea and complete fertilizer (NPK), was concentrated largely in vegetable and sweet-potato production. Then, chemical pesticides were not used in rice production in subsistence farming in indigenous communities. Rice production was still done the traditional way. The Green Revolution in the 1970s converted prime agricultural lands in so many plain areas of the Philippines to chemical farming. The Green Revolution system resulted in the poisoning of the soils, water and people from the use of agrochemicals. Farmers and their communities are still mired in poverty, and it has become apparent that this was not the answer to

the lack of food and poverty. The search continues for ecologically sound and productive ways of farming.

Traditional rice production in almost all parts of the Cordillera is still at the subsistence level. Chemical fertilizers and pesticides are extensively used in the plains where commercial production of rice is practiced, and in the vegetable belt. Wet rice production is done in terraced fields with areas ranging from a few square meters to about half a hectare. The latter is rare. The rice fields are constructed where there is an assured water source. With the high cost of rice-farming inputs, the degradation of farms brought about by chemical farming and the failure of monocropping, it is relevant now to look at small-scale production practices which have been tested through time. These may seem irreplicable because of changed situations. But with sincere efforts to create the conditions for their practice, there is still hope.

3. DESCRIPTION OF THE PRACTICE/INNOVATIVE EXPERIENCE AND ITS MAIN FEATURES

THE AGRICULTURE CYCLE

Irrigated rice farming in the Cordillera follows a calendar that originally was used for a single rice crop. The start of this agricultural calendar is determined by the climate in the particular place. This calendar is an oral one and depends on the elders' reading of biophysical, meteorological and hydrological factors. It also contains the different rituals that must be done at certain stages in the life of the rice plant. The series of activities in the agricultural cycle that is generally followed in the Mountain Province is as follows:

Seedbed preparation
Irrigation-canal cleaning
Seeding/sowing
Rice-field preparation
Transplanting
Weeding
Watering
Bird/pest control
Harvesting

A village holiday is declared at the start of the agricultural cycle in order to coordinate the activities that will come afterwards and to synchronize the planting season. The start of this season is often signaled by the appearance of a migratory bird, known by different names by the various ethnolinguistic

groups'. The first activity for the season may be the cleaning of irrigation canals or the rice fields.

Rice production starts with seedbed preparation at the end of the rainy season. The seedbed may be a small plot near the rice fields or home (the latter location makes for easier monitoring). It may also be a portion of the rice field itself. Still others may use their mountain garden. Sowing immediately follows, either by broadcasting the seeds or by laying them in panicles. This is done by the women. Scott (1969, **p.** 225) mentions that some women in the community are known to be "experts in broadcasting and give their services free to those who request them"2. In some villages, the start of the sowing season calls for the declaration of a village holiday. In one particular village, at the start of a two-day holiday, a woman of prestige is assigned the task of opening this phase by sowing the first seeds in her seedbed after which she will confine herself to her house and fast for a day (Sagmayao, p. 33). After the holiday, the others start sowing.

Inspection of irrigation canals and dams is also done during this period in order to assess any damage and thus prepare for the materials, labor and tools needed (Brett, p. 130). The different irrigators' associations will have to participate in the repairs and cleaning of the canals and dams.

As the seeds are germinating, and the conveyance of water is assured, land preparation starts. At this time, which is the end of the rainy season, the field is flooded. In water-rich areas, the field would have been left flooded **since** the end of the last harvest season.

This is rare nowadays. The field may have been planted to a second non-rice crop, like sweet camote, and so the soil is upturned and dry. In this case, the water is directed to flood it. The surrounding areas are cleaned to ward off rats. Weeds are removed and mixed into the soil. Sunflowers are also commonly added in. All these, together with the rice stubble, are plowed in. If a carabao can be used and is available, the turning of the soil becomes easier and faster[3]. But for most, the feet are used to trample down these materials so

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[1] The migratory bird is known **as** kiling or kiwing and appears at the end of the rainy season in many parts of the Cordillera. In Omengan and Sajise (1981), it is cited that: "From the description of Oakes (1947) and Wilson (1953), Professor Rabor identified the 'kiling' as Erythrura hyperthia brunneiventris (Grant, 1894) which is an endemic species from Northern Luzon and Mondoro and possibly **a** local migratory bird which seeks cool places" **(p.** 17).

[2] The woman to initiate the sowing season is selected on the basis of "skill in distributing **a** small supply of seed evenly over **a** whole plot, a history of not having had such calamities as poor crops, local deaths, or the outbreak of World **War II** follow **a sowing, and descent from** somebody with a similar reputation" (Scott, 1969, p. 225).

[3] The terrain in many communities is very steep and the fields too narrow to allow for the use of **a** carabao. Aside from that, many of the farmers cannot afford the investment in **a** carabao or even to hire one for this laborious activity.

that they are fully integrated into the soil for proper decomposition. This process may actually be repeated as often as possible until there are no protrusions. A common practice is to allow a standing period after the first plowing and allow any vegetation to regrow in the field. A second plowing is then done in order to finally fold in the new growths and complete the process. Those who have a harrow use it to refine the soil. About a week before transplanting, the field must be smooth, without any growth appearing.

This land-preparation phase, including the repair and cleaning of canals, often takes two months. By this time, the seedlings would be ready for transplanting.

The transplanting of seedlings from the seedbed to the prepared field is a very important event. A village holiday is usually declared for the ceremonial opening of the planting season. In many villages, the Central Council of Elders identifies a woman of prestige who will wake up early on the appointed date and go to her rice field to plant gabi (taro) to signal the start of the planting season. This marks the start of, usually, a three-day holiday. Nobody is allowed to work in the rice fields yet, nor go out of or get into the village.

Men and women may do the uprooting of seedlings, but more often than not, this is done by the women. Transplanting is a woman'sjob too. Seedlings are often shared when some farmers run out of planting materials. It would be unthinkable to refuse to share extra seedling materials with those in need.

After transplanting, the maintenance work is left to the women. The next two months are a slack season. The work required consists of maintaining the water level necessary for plant growth, weeding and pest control. After this, irrigation water supply decreases "so community cooperation is required to divide the dwindling supply equitably, whether by careful division of streams, the narrowing of everybody's channels, or diverting the whole supply from field to field in rotation. Community cooperation is not, however, sufficient to guarantee such equity at the height of the dry season, and the terraces will then twinkle all night with the watchfires of farmers guarding their water against diversion by neighbors..." (Scott, 1969,p. **227).**

This two-month period also sees the growth of weeds. Weeding is done mainly by women. The weeds are pulled by hand as women carefully walk in between the plants. It may also be necessary to redistribute plants if there is crowding or to dispose of stunted plants or those which were eaten by insects. This is also the period when some farmers may apply ammonium sulfate as fertilizer. Before World War II, the people used "a kind of acid black deposit"

[4] Scott (1969, p. 235) believes "that rice is a crop which was introduced into Sagada, for many of the traditional fertility rites are directed toward the growth of root crops". This may be true for many other communities in the Mountain Province where the same rituals are observed.

(Scott, 1969) for fertilizer which has long been abandoned. In areas which use pig and other animal manure, there is no need for chemical fertilizers. When the heads of rice form, the surrounding walls, hillsides and the pathways are again cleaned in order to prevent rat infestation. The weeds are reintegrated into the field by manually pushing them into the soil, making sure that they are fully covered by muck. Tall weeds that are too bulky are left on the sides of the field to dry for incorporation later.

As the grains mature, they attract rice birds which now have to be constantly driven away. Scarecrows and other capturing or repelling devices are made. Children are often tasked with maintaining the scarecrows or watching the traps.

Harvesting comes about two months later, toward the end of the dry season. Both men and women are involved in harvesting. An indigenous harvesting knife which is made of steel mounted perpendicular to a wooden frame is used. The paddy stems are cut one by one. After a handful have been cut, the leaves are removed and then the stems bundled.

The size of the bundle varies by culture. The bundles are then dried and stored in piles in the granary. This style of harvesting, handling and storage calls for a rice variety with grains that do not break or shatter easily. While harvesting, the most experienced women segregate the best heads as seed materials for the next cropping.

THE NUTRIENT CYCLE

This kind of regimen has, for some villages, produced rice consistently over the years. The findings of one study show that the yield per hectare is comparable to that produced using Green Revolution technology (Chong, quoted by Omengan and Sajise, 1981, p. 15). A quantitative study was made by Omengan and Sajise in order to help explain this sustained production.

In the study, the researchers looked into the nutrient cycle in the rice field in an area which uses a combination of green and animal manure to determine where the nutrients come from that support this kind of production. Aside from that, they looked also into the indigenous socio-cultural practices related to the agricultural cycle.

In the Bontoc irrigated-rice-production model, the regular incorporation of animal manure may be what sets it apart from the other areas. The nutrient sources come from the combination of weeds, sunflowers, rice stubble and

[5] Elizabeth Omengan and Percy E. Sajise presented a paper entitled "Ecological Study of the Bontoc Rice Paddy System: **A** Case of Human-Environment Interaction", at the IRRI Thursday Seminar on March ***26,*** 1981, which is a portion of Omengan's masteral dissertation.

straw, with **decomposed pig** manure which incorporates household, garden and field waste, and this provides for the consistent yields in the rice fields of Bontoc.

In the study, the following findings were made (Omengan and Sajise, 1981, p. 15):

1. There is enough N and P for the next cropping season (wet cropping) which may be the reason why the soil nutrient status is under steady state condition;
2. Significant amounts of N and P in the system come from the added compost;
3. A closed nutrient cycling is maintained by allowing crop residue to be incorporated into the soil and the coupling of the household to the pig for compost production which is returned to the fields, and
4. The possible role of microbial N fixation is important in maintaining a steady state condition in the Bontoc rice paddy system. However, this condition should be further studied.

Because a significant part of the nutrients comes from added compost, it is interesting to look into what is in this compost. The compost pit here is the pig pen. The Bontoc pig pen, like others in the province, is a recycling center. The pens are constructed in such a way that there is a sloping portion which ends in a pit. This pit catches the pig manure and organic waste (weeds, banana waste, leaves, etc.) that is dropped into it.

The pigs are fed with mainly rice bran and sweet potato leaves and waste from the kitchen. When there were no threshers available, the dried straw and the husk were also added into the pile. In Bontoc in earlier times, the women usually collected the rice straw from the fields and brought it to the pit. Every day the pig wallows in this dump and mixes up the whole mass. After nearly a year, in time for the main cropping season, this compost will be allowed to dry by spreading it out on the top of the pen. Otherwise, the pig is removed and the manure is left to compost for sometime. In earlier times, these pens were also used as toilets, which may explain the rich nutrient content of the compost.

Another significant contributor to the nutrient pool may be sunflowers. Although no study has been made on the contribution of sunflower alone to the nutrient pool, it is possible that with manure, "their contribution is that significant to affect the continuity of the production system for centuries" (Pelegrina, 1992, p. 16).

Additionally, the source of water is also important. Creeks and streams which originate from the forests are the main sources of irrigation, aside from the rain. "Nitrogen fixation through symbiotic or asymbiotic means contributes to the nitrogen pool of the forest" (Pelegrina, 1992). Rains wash down

the "detritus and rich humus from decomposed leaves, lichens, and other materials" (Brett, p. 131) into the irrigation canals. "In essence, a 'nutrient leakage' from the forest contributes to the productivity and sustainability of the rice fields for centuries" (Pelegrina, 1992).

CULTURAL REGULATION

A significant component of the irrigated-rice-productions system is the indigenous socio-political system. In the clustered villages of the Mountain Province, there is a traditional leadership structure, which exercises power and authority within the community. This is the council of elders, which is composed of males. This council is based in a ward. There may be several wards in the community but there is a Central Council (hereafter referred to as the Council) which oversees community-wide affairs, particularly in the management of the agriculture-related activities/rituals. The Council determines the start of the agricultural calendar, and supervises the attendant rituals and subsequent activities through the cycle of production. In communities where these institutions are functional, the Council is consulted before and after each phase of the production process, and then rituals are performed as needed. These rituals signal the start or end of a production or agricultural phase.

An important function of the Council is the declaration of holidays to synchronize work during the important phases in the growth of the rice plant. This declaration is done after careful study of the combination of factors which the farmers deem important in the growth of the rice plants: water volume or level, temperature, appearance of the moon, stars, birds and rainbows, and the blooming of some plants. The use of such natural indicators is a product of long experience, which has some scientific basis. For instance, the presence of the bird (known as 'kiling' to some groups) that signals the end of the rainy season seems to indicate the onset of a certain temperature and radiation regime for favorable growth of dry-season rice crop (Omengan and Sajise, 1981, p. 19).

Different areas of the mountainous Cordillera have different cropping calendars. In a study of the patterns of production in all cases, it appears, though, that through time, the indigenous farmers were able to determine the optimal agroclimatological conditions for rice production. These are depend-

[6] These wards are referred to differently among the various ethnolinguistic groups which practice the system. The village is usually divided into several wards, which may be called ator/dap-ay/abong. These are the socio-political divisions in the village, each governed informally by a council **of** elders, who are all males. Decisions related to community concerns, disputes and rituals are made here. Decisions are arrived at by consensus and leadership is earned through practice, wisdom and commitment.

ent mainly on solar radiation and temperature. The agricultural cycle consistently "coincided with the hottest months and the month with the highest mean solar radiation" (Pelegrina, 1992, p. 12).

In pest-control management, the principle of risk distribution is important. Synchronized planting in one locality will ensure that the plants mature more or less at the same time. When pests attack, the risks will be spread over a bigger population and so everyone will be assured of some harvest. This minimizes risks and "promote[s] nutrient stability in the paddies" (Pelegrina, 1992, p. 16).

The village holidays and rituals form part of the agricultural cycle. The prayers offered during these rituals ask for community blessings, like good health, fertility, abundance, protection from pestilence, etc. There are some rituals where the whole village is involved and there are others which are performed by specific families or individuals. Thanksgiving rituals after the harvest season usually involve the whole village.

The holidays declared before and/or after heavy farm work are a means of ensuring rest for the farmers, although this is not the stated reason. The prohibition on the movement of people into and out of the village during certain holidays, is to ensure the safety of everyone in order that the ensuing period will not be jeopardized. Any untoward incident will affect the agricultural cycle and may result in the cancellation of farming activities. Ensuring that everyone is at home in the village before the important activities will assure the success of the planting season.

The farmers cannot afford to take risks which will jeopardize their harvest because of the scarcity of arable land, which, in turn, produces only a limited amount of rice. This is the ultimate objective of the rituals: to ensure that risks are minimized so that there is food for all.

Water management is also looked into by the Council. It ensures that the irrigation system is in shape before the start of land preparations. In one village, a rice field located near or along a spring is considered sacred. Springs are considered living entities that harbor nature spirits who guard the water and the field (CDPC, 1997). Thus, these fields are considered the heritage of the community and it is taboo for them to be sold. The fields must be handed down within the same family. In order to show reverence and respect to the spirits that dwell in them, the owners are required by the village, through the Council, to perform a ritual every year by offering a chicken or pig sacrifice. The rationale here is that the spring **is** the source of water, the lifeblood of the rice fields. Thus, its maintenance is of supreme importance to the whole village. The ritual is a reminder to the custodian that effort must be made to preserve the resource for everyone. The taboo on the sale of the sacred fields is a form of control to prevent their appropriation for private use.

Council decisions and the taboos that go with the rituals and holidays are to be obeyed by all. Sanctions are always imposed on violators. The imposition of sanctions is to force everybody to "behave" because without community solidarity and cooperation, the food security of the community will be in peril. This is also a reflection of the premium placed on rice. The farmers know how difficult it is to produce rice. Compared to sweet potato, another staple food, rice can be stored for a longer period of time and its use can be stretched by mixing it with sweet potato itself.

4. DESCRIPTION OF THE INSTITUTION RESPONSIBLE AND ITS ORGANIZATIONAL ASPECTS

The ator/dap-ay (ward), in most cases, is the institution responsible for the coordination of the agricultural calendar and the regulation of practices which ensure the coordination/synchronization of agricultural activities in order to minimize production risks.

5. PROBLEMS OR OBSTACLES ENCOUNTERED AND HOW THEY WERE OVERCOME

DISRUPTION OF THE AGRICULTURAL CALENDAR

With the adoption of high-yielding varieties (HYVs) in indigenous communities, some of the socio-cultural practices, especially the observance of the compulsory village holiday which synchronized planting, have been abandoned. The HYVs mature early so they do not need to be planted at the same time as the indigenous varieties. If they are planted at the same time, they develop heads earlier, and thus are subject to pests and birds earlier. This desynchronizes the whole agricultural calendar, increasing risks for everyone as individual farmers will find themselves at different stages of the rice production cycle, and inconsistent with the traditional agricultural calendar.

Two villages in the Cordillera which until now cannot be reached by motor, have been known among the neighboring villages to be surplus rice-producing communities. Tamboan and Tubtuba, two interior mountain villages in the Mountain Province, would be visited by people from the lowlands who would exchange salt for rice. Until the 1960s, men from rice-deficient communities in the neighboring mountain villages would come during harvest time and help in the harvest. They would be paid with rice, which the men would happily bring home. With the introduction of HYVs in the 60s, rice production in the lowlands increased tremendously and people now did not have to go to surplus rice-producing villages to work for rice.

With the introduction of HYVs in the 1960s, farmers gradually switched from their traditional rice variety (TRV) seeds to the "miracle" seeds. "The first two years **[of]** growing HYVs were successful as yields greatly increased. After two years, yields decreased and most TRVs were lost in circulation" (CDPC, 1997). In the1970s, rice production dropped to low levels and in the 1980s, rice shortage was felt for the first time and villagers had to buy from outside, or resort to substitute staples. Pest infestation became a yearly problem. In 1986, rat infestation was so severe that a special ritual to drive away the rats had to be performed for the first time in a long while (CDPC, 1997)'.

EROSION OF THE INDIGENOUS SOCIO-POLITICAL SYSTEMS

Cordillera upland rice farming is characterized by rituals which are closely linked to animist practices. With Christian proselytization, these practices were considered pagan and/or satanic. Even the physical center of the Council, which is the dap-ay/ator/abong, is considered a taboo in Christianity. Thus, the decisions of the Council are also considered pagan, so these are not followed. The economic crisis has also made the offering of so many sacrifices in such rituals expensive. This has discouraged coordination of activities among the councils, leading to a breakdown in the agricultural cycle, especially in the observance of holidays. Many now do not observe the holidays. The erosion of the indigenous socio-political institutions is a factor which has contributed to the decline in rice production.

In one village, the villagers confidently say that "the surplus on rice production in the 1900s was credited to the dap-ay's effective management of the agricultural cycle. Synchronized planting and harvesting ensured minimal problems from pest infestation. When rats and birds would attack the rice plants, the dap-ay performed a ritual to counteract these and the ritual had been proven effective" (CDPC, 1997).

"Panagsanga-ili is a ritual performed when rice plants are infested with pests, and/or [a] community member gets ill, in order to control the pest and cure the sick. In this ritual, the entrance and exit of the community is closed. It is believed that the pest is brought by bad spirits, thus they close the entrance and exit points of the community. Before the ritual is performed, elders visit the members of the dap-ay and solicit food and drink for the spirits. These are brought to the dap-ay. A chicken or pig is butchered in the dap-ay.

When the meat is cooked, old men chant prayers and invite the malevolent spirits to a ritual food and wine offering. After the food and drinks are consumed, the old men get the gongs, red or white clothes, light a fire and proceed to the mountains calling on the spirits to move away from the community and go [in] the direction that these men ask them to go.

This ritual is also performed when there is news of pest infestation in nearby villages. Old men perform the ritual to block the entry of pests into the community" (CDPC, 1997).

Another factor that has eroded the importance of the indigenous socio-political institutions is the imposition of governance structures like the barangay which have supplanted the political authority of the dap-ay and other indigenous socio-political institutions. The power of the indigenous socio-political institutions is thus now perceived to be without basis and consequently, their decisions are not taken seriously. However, the non-political functions of the indigenous socio-political institutions have not been taken over by the government structures.

This resulting lack of venue for the discussion and resolution of problems related to agriculture has yet to be redressed by the government agencies and the government political system.

LACK OF WATER

The degradation of the environment, particularly the deforestation brought about by logging concessions, the increasing needs of an expanding population, government programs which support cash-cropping and thus more forest denudation, and climatic changes have translated into less irrigation water for the rice fields. This has led to the abandonment of rice fields, reduced production of rice, outmigration and a shift toward cash crops.

The climatic changes have also contributed to the disruption of the agricultural calendar because the arrival of rains has become unpredictable.

INCREASING INTEGRATION OF VILLAGES INTO THE CASH ECONOMY/COLONIZATION VZS-A-VZS THE RIGHTS OF INDIGENOUS PEOPLES

The increasing intrusion **of** the cash economy into the villages has brought about the deterioration of subsistence production in favor **of** cash-crop production and entry into the labor market. The temperate climate **of** the Cordillera made it attractive to the American colonial administration; the administration made the mountain village of Baguio their summer capital and later converted it into a city. They also saw the opportunity to commercially meet their food needs – by producing temperate-climate vegetables in particular. At the same time, American capitalists opened up the rich gold and copper veins in the villages around Baguio, attracting many able-bodied males from the subsistence farming areas all over the region to the mining camps as laborers. The abandonment **of** so many rice fields during the American colonial administration is directly traceable to the opening of mines. The entry into the labor market and into cash-crop production during this period started the breakdown of subsistence farming, including the erosion of practices related to it.

Related to colonization and to the breakdown of the indigenous socio-political institutions is the legislation which consolidated state control over national patrimony. The law which required show of proof of ownership of lands in order to get titles to lands is an alien concept to the indigenous peoples who had long cultivated the land based on the usufructuary principle. The "papering" of this right provided a negotiable instrument which easily alienated the land from the users/producers. Aside from this, many indigenous peoples were not aware of this law, or if they were, did not agree with it, and thus ignored it. The prescription period lapsed, making many parts of the Cordillera lands state-owned. The state is then in a position to simply hand out concessions, patents and other land instruments to other parties. At the same time, by invoking the national interest, it can easily displace communities.

This brings **us** to the issue of indigenous peoples' (many of whom are subsistence producers, be they on land or at sea) rights to their ancestral lands – an issue which is beyond the scope of this report.

6. EFFECTS OF THE PRACTICE/INNOVATIVE EXPERIENCE

Irrigated rice production has been a way of life for the indigenous peoples in the Cordillera for centuries. In the harsh and fragile environment of the Cordillera, the peoples have been able to muster the available resources for the development **of** a way of life that would ensure the survival of their tribes. That these peoples have survived in this harsh environment for centuries while still maintaining their physical environment in good condition and, as a matter of fact, even enhancing it, is testament to the sustainability of this kind of rice farming. Minimal external inputs are necessary.

The fertility of the rice fields is maintained with the use of organic fertilizer like sunflowers and animal manure. The overall effect has been that of preserving the environment and at the same time feeding communities.

7. SUITABILITY AND POSSIBILITY FOR UPSCALING

This kind of rice production had been the norm in the irrigated rice-producing areas of the Cordillera. However, the introduction of cash-cropping, including high-external-input rice production, and wage labor has seen the erosion of this kind **of** rice production. Unless the government gives substantial support for its revival and development, it may not be possible to shift back to this kind of rice production on a large scale. The back-breaking work, the increasing dependence of people on the market for their food needs, and the loss of irrigation sources have forced farmers to sell their labor or to shift

to other crops using high external inputs. Thus, in terms of upscaling, the principles of this tradition should be encouraged, upscaled and mainstreamed in government food programs.

This means that low cost and accessibility of inputs, maximum use of local resources, community ownership and management, and cultural practices that encourage communitarian involvement must be encouraged.

8. SIGNIFICANCE FOR (AND IMPACT ON) POLICY-MAKING

SUPPORT FOR SUBSISTENCE RICE PRODUCTION

Agricultural policy imposed on developing countries has always been geared toward high-impact programs like plantation-scale monocropping for export. These are instituted in the name of promoting "efficiency" in production under the principle of comparative advantage and economies of scale. Coupled with these, of course, are the use of environmentally-unfriendly products and the push for the conversion of wide areas of land into corporate farms. The globalization drive to have borderless trading, including in food, is weakening the societies, especially those of non-industrialized countries like the Philippines. This vulnerability, in terms of trade and ecology, will result in hunger and famine because nations will not have control anymore over their food production. With economic and ecological problems now cropping up in all parts of the globe because of the destructive agricultural development programs that have been foisted on agricultural societies, and trade globalization, communities now have to take steps to ensure food security.

Subsistence production has been neglected as a key component of food production in many countries. It has been shown that if farmers have "ownership" over their production processes and inputs, especially land, they can be productive. This means that support in terms of research and development, recognition of land rights (whether as farmers or as indigenous peoples), programs for irrigation, organizing and education, and others must be given by the government.

One of the crucial needs of subsistence food producers is water. **So** much has been poured into massive irrigation projects in the plains. The indigenous irrigation systems for the upland subsistence producers, however, have been left to be managed by the farmers themselves. And so they should. However, support should be given to develop these systems, especially the organizational and infrastructural components. The indigenous irrigators' associations and the Councils (the latter being regulatory bodies) must be strengthened for them to continue functioning. The corollary to this would be watershed management.

There is a need for retraining agricultural extension workers in the workings of indigenous subsistence farming. This entails field participatory studies on specific farming systems by the extension workers with the farmers for the two actors to learn from each other. Research and development is needed in order to provide a scientific explanation to farmers' practices and thus elevate the level **of** knowledge at the village level. This will disabuse the communities of their fears regarding the alleged paganism connected to their rituals and the declaration of holidays. Development is needed for the protection of indigenous varieties and for further improving the farming system itself.

Most agriculture-related curricula are presently geared toward the promotion of cash-cropping on a massive scale. There is a need to review these present curricula with a view to introducing revisions and even total reorientation to support a food-first policy and self-reliance food production programs. Indigenous farming systems are now being relegated to being mere research topics for students, while Western farming models are promoted instead.

PROTECTION AND PROPAGATION OF INDIGENOUS SEED VARIETIES

The technology used in the indigenous production system calls for certain qualities that can be found in the native varieties. Although there are **HYVs** that have been adopted, these have adapted to the colder areas because the indigenous farmers in the upland areas do not use the whole package of chemical farming. Thus, their native characteristics are becoming more developed, returning to their wild attributes.

However, there are also the indigenous varieties that are still being propagated. Seed exchange among farmers is already being practiced to revive these in areas where they have been lost. Community-based, farmer-managed seedbanks must be promoted. In situ conservation must also be encouraged and supported.

STRENGTHENING INDIGENOUS SOCIO-POLITICAL SYSTEMS/ INSTITUTIONS AS REGULATORY BODIES FOR AGRICULTURAL PRODUCTION

The erosion of the indigenous socio-political institutions, which has led to the deterioration of the peace and order situation in many villages, and also of rice production, must be studied. For one, the rituals that were imposed on the village were seen as pagan/satanic practices from a fundamentalist Christian perspective. However, if these were to be interpreted in a more objective

manner in order to bring out the ecological implications of such practices, then there would be a better appreciation of their role.

The rituals may not be followed by everyone, but at least the principles of pest management, village unity and cooperation must be emphasized in order to minimize risks to production. If the governmental structure can take on this role, then it should do so.

The problem is that it has not taken on this role or responsibility. Thus, there should be mutual accommodation between both systems if food security is to be ensured.

To further support the indigenous socio-political institutions, community organizing should be made a part of extension work. In the Philippine context, community organizing by government extension workers is limited to just getting the officers of an organization elected. Empowerment, not project implementation, must be the objective of organizing.

The rituals may be modified in order to do away with unnecessary expenses. The compulsory village holiday can be transformed into other activities which will help ensure synchronized planting and coordinated activities. It can also be used to hold fora for education and training, consultations and meetings, and other such activities. In the community which was severely infested with rats in 1986, both the government agriculture agency and the villagers saw the need to go back to the old agricultural calendar. The coordination was now done at the government village council level.

This brings to the fore the issue of the recognition of indigenous peoples' rights. The imposition of the government political system has eroded the traditional socio-political institutions in the village, which served as a comprehensive governing body. **As** many indigenous peoples are subsistence farmers who have a unique non-entrepreneurial relationship with their land and territories, their right to their land and territories must be recognized and promoted.

9. POSSIBILITY AND SCOPE OF TRANSFERRING TO OTHER COMMUNITIES OR COUNTRIES

This kind of rice farming is present in many Southeast Asian countries where the irrigated-rice-production culture has developed. The retention of centuries-old practices in irrigated rice production has produced the varieties of rice that have been coveted by the International Rice Research Institute and used as the base of its collections. The Thai farmers who developed the popular Jasmine rice use this kind of technology. However, the worldwide shift to cash-crop production, not necessarily food crops, is leading to the commercialization of rice production and the attempts to commercially patent rice

plant genes. This is removing community ownership of the process, materials and experience.

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