

4.7 REVITALISING TRADITIONAL AGRICULTURE

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Traditional agriculture in Sri Lanka was an integrated system based on ecological principles that included trees, crops, livestock and fish. Astrology and beliefs about supernatural beings played an important role. Though under threat, many of these traditions are still practiced today. In this chapter we share how various organisations in Sri Lanka have established a system of field experimentation to understand, test and improve indigenous farming practices.

Sri Lanka is a small pear-shaped island to the south of the Indian sub-continent. Altitudes up to 3,500 meter above sea level give rise to a varied pattern of rainfall and several agro-ecological zones. In the dry land areas, the ancient peoples made constructions in the undulating topography to reduce erosion, control floods, and to improve water availability during the dry season. In the highlands and tropical lowlands forest-based swidden farming was practiced with supplementary irrigation from reservoirs.

In spite of the recent renovation of most of these ancient irrigation systems, and the construction of new ones, heavy imports of rice and wheat are needed to meet the national requirements. This contrasts sharply with the past when the country produced all its food, which consisted of a wide variety of grains, yams, vegetables and fruits.

Sri Lankan agricultural cosmovision

Most (70%) Sri Lankans are Buddhists and 15% are Hindus. These formal religions generally merge with a range of traditional beliefs and practices. Many rural people and farmers make decisions according to traditional cosmovision, and the different local spiritual leaders often play an important role in village-level agriculture and health practices. The *daiwatnya* deals with astrology, the *kattandirale* with yantras and mantras, the *kapua* with Gods and spirits, and the *vedemahataya* is the traditional healer, both for humans and animals.

Indigenous knowledge, and the traditional practices of agriculture and irrigation, survived for over 2000 years due to the unique institutional system that supported it. This institutional system was made up of many components and organised as a hierarchy. At the base was the village with a village council and a village chief. Villages were grouped in larger divisions, and at the apex of this pyramid was the king. Any problem that could not be resolved at local level was referred to the higher levels. While religion was taught by Buddhist priests, other sections of the indigenous knowledge system were taught by masters, or *gurus*. In passing down this knowledge from master to pupil, some important sections were deliberately withheld from the pupil, and only revealed when the master died. In many instances knowledge so retained by masters was lost. This knowledge system is written in *ola* scripts, using a writing surface made of palm leaves. These writings can be categorised into four main fields: medicine, *dhamma*, which includes agricultural practices, astrology, and the category dealing with spirits and the symbols related to it.

Traditionally, Sri Lankan people believe in Gods and deities, and it is customary to invoke their blessings. They believe that the help and blessings of the Gods protect them from danger, ill-health and hardship. The Gods inhabit trees, and the Bo tree (*Ficus religiosa*) is held in special regard, because Buddha attained Buddhahood under it. Therefore, people construct temples and make offerings alongside Bo trees. It is also believed that certain Gods and Goddesses guard rivers, forests and mountains. On the other hand, people believe in the existence of demons that haunt cemeteries, funeral houses, empty buildings and unclean places. Spirits that are neither Gods nor demons, *bahirawas*, are believed to live underground or within air space, and are able to appropriate part of the harvest and cause loss to the farmers.

Buddhism. There are three major sections to Buddha's teachings. One deals with the discipline of monks or priests; a second refers to the understanding of thoughts, and the process of thinking; and a third section is known as the *Suthara Pitakaya*, which describes 'good ways of living'. This section consists of many *suthras*, or sermons preached by Lord Buddha. Reciting *suthras*, which is done to get rid of evil spirits and to invoke blessings, is called *pirith*. Farmers often chant *pirith* to prevent or obtain relief from crop diseases, animal epidemics and evil effects. There is nothing secret about these methods. One important requirement is that the chanting has to be done by a devout person, who leads a pious and righteous life. Fortunately, such people are available in our villages today. They are familiar with traditional religious practices, such as charming sand and water for protection against pests. Many farmers in the villages obtain their services to protect their crops against pests and diseases.

Box 4e Buddhist interpretation of reality

Mabima, a Buddhist priest from Kataragama, explained his understanding of reality: "In classical knowledge, upon which both Hinduism and Buddhism are based, reality is understood to function through a multitude of powers and forces. Besides the powers of matter and energy, Sri Lankan Buddhism recognises at least eight other forces and powers: the power of the moment (each moment has its special quality, which explains the importance of astrology), the power of a certain location (sacred places), the power of sound (mantras), the power of symbols (yantras), the mental powers of certain persons (enhanced by training and a pious lifestyle), the power of plants (beyond the nutritional or pharmaceutical values), the power of place and space (induced by certain events that have taken place there), and supernatural powers, that have their origin in spirits or divine beings. It is important to understand all these powers, know how to relate to them and understand their balance and synergy. This understanding cannot be achieved through mental efforts only: spiritual perception, feelings, intuition, ordinary and extra-ordinary senses, dreams and visions are also necessary. Therefore, personal spiritual development that helps overcome personal prejudices and biases is required. A different language is necessary: the language of metaphors, art and rituals. The traditional practices related to health, construction and agriculture are firmly based on the existence of these forces.

Mantras, yantras and kems. In Sri Lankan Buddhism, it is considered evil to kill any form of life. Although in traditional practices related to hunting, farming and fishing this basic principle is not always observed, it implies that the use of chemical pesticides, which kills insects and other living organisms, is not approved. Instead, practices that relate to

the spirits of the different living organisms have been developed. A *mantra* is a certain type of verse, a combination of sounds that together create a nucleus of spiritual energy. According to the *Upanishads*, ancient writings from India, mantras have their origin in the eternal substrate of the creation. The words, the sounds, the rhythm and timing of the recitation is important. In agriculture, certain mantras are used for obtaining higher yields, others for protection of crops from pests and wild animals. The spiritual leaders know which mantras are required to achieve specific effects.

Yantras are specific symbols, which have been empowered by a sacred person through a mantra or pirth chanting. It can have the form of a drawing, an idol, or inscriptions on a thin strip of copper or palm leaf. Certain yantras are used for protection from enemies, from the anger of the Gods and evil spirits, or from the ill effects of forces of nature, envy and the evil eye. Other yantras are used for crop protection: against flies, rats, and for animal health. In Sri Lankan agriculture, the use of yantras is widespread. For example, a specific yantra is often placed in the centre of the rice threshing floor.. Moreover during the threshing operations no item is referred to by its real name. The idea is to mislead the spirits so they will not know that a threshing operation is going on.

The practice of *kems* is quite widespread in rural Sri Lanka: it is a kind of practice, technique or custom that is followed in order to obtain some favourable effect. This may include relief from a specific illness, damage or problem. For example, the following kem is used for protection against the paddy fly: “*Go to the paddy field early in the morning, catch a fly at the entrance of the field, chant a specific mantra seven times, and then release the fly.*” Some kems combine astrology with the use of certain plants. Other kems depend on the use of specific plants and mantras. These traditional practices have survived because they are believed to be effective. There are also kems that do not involve any belief in spiritual beings, as they are based on a careful observation of natural phenomena. For example, a kem practised to destroy the paddy caterpillar. In this kem, milk rice is prepared very early in the morning, before the crows leave their nests, and put on circular slices of banana leaves. These are placed on tree stumps located in those parts of the field where caterpillars have infested the crop. When the crows perch on the banana discs to eat the milk rice, the milk rice falls to the ground. When the crows pick up the fallen milk rice, they see the caterpillars and eat them instead of the milk rice.

It is believed that various conditions have to be met to make kems successful. For example, the farmer should not visit the treated field for a specific period. With other kems, women are prohibited from entering the field. The effectiveness of a kem can be nullified if the person is exposed to an impurity caused by eating certain foods, especially meat. Attending a funeral or women’s menstruation may also cause impurities. Other kems have to be performed by women only, or by pregnant women.

Astrology. Astrology plays a significant role in the cosmivision of Sri Lankan people, who often consult astrologers before embarking on any significant undertaking in their personal, educational or professional life. Astrology is also dominant in agricultural practices, especially in the cultivation of rice. Most farmers follow the astrological calendar to ensure success and avoid bad luck. This calendar provides information on ‘good’ and ‘bad’ days due to the position of the moon in relation to the earth. Twenty-seven such posi-

tions, or *nekathas*, are known of which twelve are believed to be appropriate for different undertakings. For example, usually a Sunday is chosen to initiate work related to paddy cultivation.

There are also auspicious *horas*, or one-hour periods. Seven *horas* are identified and each *hora* is divided into five *panchamakala hora*, or 12 minutes. Each of the latter is divided into three *shookshama horas* of 4 minutes, and further sub-divided into periods of 36 seconds each. The astrological calendar also gives information on the evil period, also called *rahukalaya*, during which one should not start any important activities. It lasts for an hour and a half, and every day there are two such periods. It is also believed that one should face certain directions on certain days. For example it is believed to be inauspicious to begin any important enterprise while facing the north on a Sunday.

Changing agricultural practices. Traditional agriculture used to be a communal activity, in which individual decisions had to fall in line with communal decisions. The *gamarala*, or village chief, saw to it that all collective decisions were adhered to. Cultivation was initiated by the village leader in each area at an auspicious time, and started with a vow to the Gods to ensure the success of cultivation. These activities were followed by several agricultural practices, which we would now call eco-friendly, including minimal tillage of the land, mixed cropping, and fencing activities at auspicious times. Traditional crop protection included the cultivation of a small portion of land to attract birds, performing kems and rituals, supplemented when necessary by the use of certain plants or plant extracts as bio-pesticides. After threshing the harvest, a small portion was separated for the *Mangalya*, the first eating ceremony.

Despite the impact of the green revolution, many of these traditional practices exist in Sri Lanka even today, though their meaning is often not fully understood by the younger farmers. Frequently they are practiced away from the eyes and ears of outsiders. People have learned not to express their spiritual practices openly as they are often ridiculed by outsiders with a technical focus, who are looking for rational explanations.

The indigenous systems began to disappear with the advent of the British colonial regime. The *gamsabha*, or village council structure, was abolished in 1832. The *gamarala* was replaced by an officer called the *velvidane* in the 1860s, who dealt with the cultivation of paddy only, neglecting the other components of the farming system, such as highland and livestock farming. The Waste Lands Ordinance enabled buying up land at very low prices, to establish coffee plantations and later on tea and cocoa. This caused natives to lose access to the land, further destroying village agriculture. The institutional arrangements favoured individual activity rather than communal or co-operative efforts, and paid labour was introduced into village agriculture, which until then had depended on the mutual exchange of labour. Agriculture became an economic pursuit, and no longer a way of life. As a result, values such as respect for nature and cultural considerations began to disappear.

Moreover, Christian missionaries could not appreciate the value of indigenous practices and often deliberately suppressed and ridiculed them to introduce their own beliefs and practices.

The introduction of science-based education accelerated this process further. Modern



Different age groups take part in rituals to prevent or remedy field problems.

science has not seriously studied indigenous knowledge, and, instead of subjecting it to scientific study to test its validity, most scientists tend to dismiss it as a backwardness. Almost all farmers use fertilisers and agro-chemicals, though often in combination with traditional methods such as making a vow to the Gods when starting cultivation. At present, one can observe an increased interest of agricultural scientists in traditional practices, however, including their spiritual aspects.

ECO and the Compas Network Sri Lanka

The activities related to ecological agriculture were initiated in 1990 by ECO the Ecological Conservation centre, who joined Compas in 1997. ECO is experimenting with farmers on eco-friendly practices, including the use of kems, rituals and offering or *poojas*.

Eco works with volunteer farmers who carry out tests on their own fields, to verify the effectiveness of cosmovision-based methods and techniques, and those found to be effective are introduced by them to other interested farmers. During seminars and workshops for farmers, NGO officials and government officials, the experiences are discussed. Successful case studies are given publicity through the mass media. The small plots selected for testing traditional practices include Buddhist temples, as priests carry out indigenous practices such as charming of water and sand. The close relationship that exists between the rural people and the Buddhist temples are a great help in popularising indigenous knowledge. Buddhist priests have close contact with farmers and moreover they command respect in the farming community.

In 1999, four NGOs decided to join ECO, to jointly establish the Compas Network Sri Lanka: Negampaha Agro-producers Society, Dambulla Community Resources Development Centre, Janodaya, and Future in Our Hands. The objective of this network is to increase the effectiveness of their activities related to agriculture with the farmers.

Since 1999 considerable efforts were put into understanding the concepts of endogenous development and indigenous knowledge. During the initial discussions within the network it became clear that endogenous development is more than just a way of escaping from the economic crisis caused by passively submitting to market forces. The challenge is not just to resist these external forces, but to enhance development based on indigenous resources and knowledge. In this process, indigenous knowledge is not to be romanticised or proclaimed as the ultimate truth, neither is to be rejected as primitive or inferior.

Methodology for fieldwork. The network decided to start their activities by documenting the indigenous knowledge and practices in the field work areas of the respective organisations. First, the custodians of indigenous knowledge, who had been holding on to it despite powerful external pressure, had to be recognised. During village meetings with interested and experienced farmers the objectives of endogenous development were presented, and the field workers expressed their desire to learn about farmers' indigenous knowledge, the concepts behind them, and the cultural and spiritual aspects involved. After these discussions the process of sharing, discussing and analysing the indigenous practices and knowledge began. The findings were documented with the farmers' consent, and presented and clarified during follow-up meetings. This information was used to draw up a baseline document on indigenous knowledge in Sri Lanka. It indicated the extent of indigenous knowledge and practices, which included many ecological aspects, such as water management, landscape, climate, and seasonal differences. Traditional agricultural practices encountered included mixed cropping, the association between trees and crops, soil identification practices, game management, and the use of plants for crop protection, medicines and natural fertiliser. The findings also confirmed that indigenous knowledge systems in Sri Lanka have three main components: the ecological, the spiritual, and the astrological.

During one of our field visits we discussed the use of yantras with the farmers. One of the farmers remembered that his father made use of these, and that he should have a booklet with the designs of the yantras in the attic of his house. He found the book, which contained some 20 abstract geometric figures, each referring to a specific plague or pest. We copied the booklet and showed it to several other farmers. In many instances they were recognised by traditional leaders as consistent with their own knowledge. Other farmers were eager to copy the drawings to test them in their fields.

Testing indigenous knowledge. Subsequently, a novel methodology was needed to create opportunities for testing, revitalising, and improving the selected traditional practices. In the village meetings it had become clear that it would be impossible to select individual practices for testing, as most practices consist of a mixture of indigenous elements that are seemingly inseparable, and with varying degrees of interaction and synergy. One practice, for example, could include ecological concepts and materials, astrological timing, spiritual influences, and social norms. Moreover, farmers often apply a variety of indigenous practices, and these too are interrelated and complementary. Testing indigenous practices at field level with so many variables, some of which could not be quantified, would produce results that would be extremely difficult to interpret.



Mr Upawansa (left) meets with a spiritual leader and a Buddhist monk. The effect of yantras, or ancient symbolic drawings, to control pests in rice is tested in the farmers' fields.

Therefore, rather than focusing on testing individual indigenous practices, it was decided to compare farmers who were using indigenous knowledge (IK) practices with those following modern, or non-IK methods. Every network partner agreed to select 12 so-called IK farmers, and 12 non-IK farmers, who would be comparable in crops grown, social status, and economic standing. Arrangements were made to record their base-line status and to monitor their farming operations, costs, yields, and income. However at an early stage in the monitoring process it became clear that it was impossible to differentiate farmers into IK and non-IK categories. All farmers practiced a mixture of IK and non-IK applications, though in different proportions.

It was then decided to change the focus of the testing towards assessing the level and intensity of IK application of each farmer, and to express this in terms of the 'degree of indigenoussness'. Farm performance could then be compared in relation to the degree of indigenoussness of their farming practices. This idea was also discussed with agronomists at the Peradeniya University, who agreed that it might be a sound way of expressing the effect of indigenous practices on farming performance. After this endorsement each partner organisation reassessed the same 24 farmers according to their indigenoussness. In this assessment the number and type of the IK practices adopted by each farmer were determined. This was based on the farmers' own assessment, the opinion of neighbouring farmers and the impressions of the field worker. As the testing progressed, the farmers and partner organisations suggested that instead of giving negative marks for the use modern farming methods, the assessment could be based solely on the extent to which specific IK practices were followed. A provisional checklist of IK practices for this assess-

ment was proposed (see box 4f).

Box 4f Indicators for 'degree of indigenoussness'

- Mixed cropping
- Crop rotation, including fallowing for long periods
- Indigenous methods of crop processing and storage
- Enterprise diversity and the degree of integration of crops, livestock and trees
- Adherence to auspicious times for performing farming operations
- Adherence to accepted seasons
- Minimum tillage, avoiding inversion of surface soil
- Application of organic manure
- Labour sharing and village level co-operation
- Farm-level breeding and seed improvement
- Weed management by indigenous means
- Measures for rain harvesting or for improving rainfall efficiency
- Making vows to spirits at the beginning of the season, and honouring the vows at the end of the season
- Repetitive chanting of Pirith (poetic Buddhist texts) against pests and evil forces
- Application of yantra/mantra to ward off pests, disease, evil effects, and to invite spiritual blessings
- Application of kem (customary action) to prevent or remedy field problems
- Application of Vrکشayurveda (traditional treatments) against plant pests and diseases

In the assessment all 17 practices had equal importance. Marks were allotted as follows: on a scale of zero to six the highest score - 6 - was awarded for maximum use; 4 signified moderate use; 2 low use and 0 no IK used at all. Each farmer's total degree of indigenoussness was determined by adding up the number of marks he or she had scored. After this more refined method was accepted, the level of indigenoussness was determined in consultation with the farmer while drawing on the results of their own field observations, and the farmer's own data.

Some results and constraints

Initially the idea was to collect accurate information on costs, labour, yields, and farm income, and compare this with the level of indigenoussness. This task proved difficult, however, because it was the first time the field workers and the farmers tried to monitor farming operations at some level of clarity and detail. Activities were also affected by a lack of literature on this subject. The following general conclusions emerged, however, after qualitative data was combined with the ideas and judgements provided by farmers and field workers. First of all, farmers with a high level of indigenoussness - with high IK rating - spend less cash on inputs. At the same time their returns per unit of cash invested were higher than those of farmers with low IK ratings. Also, according to the farmers, the quality and taste of the produce tended to be better with increasing levels of indigenoussness.

Another striking difference was the hardiness of crops under circumstances of envi-

ronmental constraint. When there were no constraints, the low-IK (modern) farmers obtained higher yields and higher monetary incomes than the farmers with higher IK levels. This did not always result in higher profits, however, because of the high cost of external inputs. Where the external environment was unstable, however, crops on high IK plots proved hardier and better able to withstand water scarcity than crops in low IK fields. This could be due to their deeper root system and the lower moisture content in body tissue. These elements are still to be studied and measured. The higher risk of the low IK farmers is not only due to the decreased hardiness of the crops they use, but also to poor input management, as farmers tend to concentrate on nitrogen fertiliser at the expense of other fertilisers. And, the application of insecticides is often after the damage has already been done. We must state here, though, that at this stage the results of the experiments are still preliminary and incomplete. During the next cropping seasons more accurate information on costs, labour, yields and farm income will be collected, and the results between different degrees of indigenoussness will be compared. Field staff and farmers will also receive more training in collecting accurate quantitative data.

When we took up this study of IK, the fieldworkers of the Compas Network Sri Lanka were unfamiliar with the concepts of endogenous development and indigenous knowledge. Moreover, they lacked field experience in testing agricultural practices, keeping relevant field records, and making reliable comparisons. During the first year of network operations they have grown to understand the concept of endogenous development and to grasp the relevance of indigenous knowledge. The field workers' capacity to make field observations and record them, and their ability to explore the effects of indigenous practices together with the farmers, have improved considerably. They have established good relationships with the IK resource persons and have been able to bring these otherwise isolated individuals closer to each other, so they are better able to interact, share and improve their knowledge and practices. In this way an informal 'forum for endogenous development' has been established at all four locations.

Improving traditional rice growing practices. The long tradition of irrigation in Sri Lanka has led to monocultures in paddy cultivation, in which insects, birds, rodents, as well as large animals and micro-organisms cause damage to the crop. Under mono-culture conditions, pests and diseases can be considered a natural reaction of nature to restore the biodiversity. Traditional Sri Lankan agriculture has developed solutions to these attacks, while still respecting the universal law of compassion and inner connection, combining insights in the natural processes with astrology and spiritual practices. ECO has worked on a mix of indigenous knowledge and new insights, which gives way to new practices. A good example is the *Nava-kekulama*, an adaptation of the traditional paddy cultivation system called *kekulama*, which includes minimum tillage and direct seeding. The adaptation is based on the use of rice straw as a mulch, and no weeding of the bunds. The mulch reduces the evaporation of water, protects the roots and reduces weed growth. Because of the high temperatures, the mulch decomposes easily, and when it rains, the nutrients of the mulch reach the ground water. The natural plants that grow on the bunds harbour a variety of insects and birds which act as the natural enemies of paddy pests.

Indigenous communication in extension

In promoting this nava-kekulama system in rural communities, we found that the processes used in conventional extension are not suitable. The common framework in conventional extension is: creating awareness of a problem; rousing interest for a new method; providing information and giving a demonstration; carrying out small-scale tests with interested farmers; and finally the adoption of the innovation. Experience has taught that in Sri Lanka, efforts to introduce innovations that build on indigenous knowledge cannot use demonstrations as an essential part of the extension methodology. This is due to the common notion of 'evil eye' and 'evil mouth' in folk stories. People who own demonstration plots do not want others to see them, because they feel that the comments of the observers could have a negative effect on their crops and families. Therefore, ECO had to find a suitable communication system to use in spreading innovative practices in these rural societies. Analysis of the situation in the past as well as in the present provided an answer: communication about testing of innovations takes place during village meetings and during ceremonies associated to the agricultural cycle. This indigenous form of communication is now an important methodological basis for ECO to enhance in situ IK conservation.

With modern agriculture taking over, the practice of ceremonies in the cropping season has diminished over the past decades in Sri Lanka. ECO has found however, that it is relatively easy to bring back these practices into the rural communities. Suggestions from ECO staff to revive these traditional ceremonies, as part of their extension work on organic cropping practices, were received positively by community members. They were quick in organising the events.

In the traditional societies, at least three stages of the cropping season are used to carry out special ceremonies. The first is undertaken before commencing work in the field, the second when the paddy is in full growth and vulnerable to pests, and the third ceremony takes place after the harvest. The village astrologers determine the auspicious times of these ceremonies. It was found that the discussions between farmers about specific agricultural practices during these ceremonial gatherings led to decisions at an individual level to engage in field experiments. Based on these insights we consider the village-based ceremonies as the most appropriate way to draw attention to possible innovations based on IK practices and to stimulate the villagers to experiment with them. Field staff of ECO work together with the spiritual leaders and participates in the rituals. ECO also supplies some financial support for the ceremonial activities.

During the one-day ceremony at the start of the cropping season, the community makes an offering to the Buddhist temple, and to the local and regional Gods. During this occasion the people share their plans about the work to be undertaken in agriculture. A case in point was the use of rice straw as a mulch in the paddy field: some people used thick layers, others thin ones; some covered the whole field while others left the channels open; some used an auspicious day and others used any day available. These individual variations led to a comparison of experiences. In subsequent village rituals these different experiences were compared and assessed.

The second village ritual takes place when the rice is full grown and vulnerable to pest attacks. A *pooja*, or offering, is carried out in the field. For example, in the south of Sri

Lanka a bowl of rice, of which the participants of the ritual have eaten some, is thrown over the field. This attracts predatory animals of paddy insects such as birds. This meeting also allows an exchange of observations about the differences in crop performance, as well as the incidence of pests and diseases, and to discuss the need for and effects of specific spiritual practices to counteract them. The third ceremony takes place after the harvest. In some villages there are certain taboos associated with harvest and it is common that no grain from the new crop is eaten unless this 'thanksgiving' ritual has taken place. All villagers are expected to take part in the ritual and everybody makes a contribution either in kind or cash. Even those who for good reasons cannot be present are taken into account during the ceremony, and are presented with some of the food that was ceremonially eaten by the community. This ceremony lasts between 6 - 12 hours, and it is obvious that during this time the process of reciprocal learning takes place.

Further probing into village-based experimentation indicates that the purpose of this activity is not limited to the rational interpretation of cause-effects in the biological and physical world. The aims of the experiments are not in the first place to maximise material gain through domination or manipulation of natural processes. The use of offerings, astrology and meditation techniques, in combination with an interpretation of the natural phenomena, indicates that these experiments are tied up with a comprehensive set of moral principles and inner knowledge. Therefore, the village-based agricultural experi-



Village based rituals can be an opportunity to discuss farming experiments.

ments include various social, ecological and spiritual aspects.

The results of this process are encouraging. Many organisations and farmers are now enthusiastically involved in the experiments with organic paddy production. The results of a comparative study between conventional farming and this kind of organic farming has greatly surprised the researchers involved. Yield-wise, the results are comparable. Other aspects show the greater advantage of the latter, especially the economic and ecological sustainability and the improved soil fertility. But the most striking accomplishments of introducing IK innovations in paddy farming has been the production of sufficient quantities of tasty food, that is of good quality and free of poisonous pesticide residues, as well as a noticeable increase in biodiversity - wild plants, insects, birds and other organisms - in the paddy fields.

Involving universities. In co-operation with universities in Sri Lanka, field tests have been carried out, in which conventional research methods are combined with the traditional ones. For example, the University of Peradeniya has studied the impact of ecological farming on the population of predators of paddy pests. These tests confirmed the effectivity of the *neva kukulam* method and appreciated the methods used. Yet, a theory to explain the possible effects of the astrological and spiritual practices in traditional Sri Lankan agriculture is hard to find in these scientific institutions. Therefore, a dialogue with traditional spiritual leaders has been initiated to learn from their interpretation of the life processes. Buddhist as well as shamanistic leaders are consulted and their knowledge is taken as complementary to that of the university scientists. Eventually the Peradeniya University will incorporate the lessons learned from these experiences in their research programme and the curriculum.

Lessons learned

Although often not openly shown, in Sri Lanka there is still a great wealth of traditional knowledge related to agriculture. The selection of indigenous practices to be experimented with is important: it must be advantageous in relation to conventional practices, in terms of income, environment, or taste, for example. The choice for improvement of paddy production responds to the felt needs of the farmers, as it is a major crop, while the economics and environmental issues related to it are problematic. The revived traditional practice of mulching and zero-weeding of the bunds proved positive, as it enhances biodiversity and reduces the need for costly external inputs, such as fertilisers and pesticides. Moreover, the quality and taste of the paddy food products was enhanced.

Over the years we have experienced that it is much easier to work on the basis of indigenous communication systems, than to adhere to conventional extension methodologies, such as the use of demonstration plots. Working with IK practices, in this sense, requires more than only promoting effective traditional practices such as mulching, minimal tillage, and no weeding on bunds to improve paddy production. It implies a combination of these practices with traditional communication systems, such as those taking place during the various ceremonies related to agriculture. Other important aspects of the traditional belief systems, such as auspicious timing of the agricultural practices, and spiritu-



Traditional crop protection combines the use of herbs with meditative practices.

al practices like mantra, yantra, pirith and kem, all need to find their place in this methodology. Building on these practices and involving the village shamans during rituals, ensures local ownership of the experimental processes and enhances the experimental capacity of the rural communities without breaking with the traditions. The theoretical background of the effect of these spiritual practices and astrology is a difficult aspect to grasp.

Therefore an agreement has been made with a consortium of universities in the country to do research, not only on the effectiveness of traditional practices, but also on their conceptual frameworks and spiritual background.

We believe that genuine traditional practices should stand up to testing, and their effectiveness should be explained by a theory. The NGOs in the Compas Network Sri Lanka want to avoid romanticising traditional practices, and distinguish between effective knowledge and superstition. Assessment of the degree of indigenusness of local farmers, and how this correlates with farm performance, appears to be a useful method for testing the relevance of indigenous practices. By involving farmers with a wide range of IK levels, and by keeping proper records on them, it may be possible to compare their performance and the effects of certain spiritual and astrological practices as well. In terms of institutional development, the NGOs have made considerable progress, while more and more farmers have expressed the desire to join the activities and improve their farming operations. Interest in astrology and spiritual practices is increasing, and government extension workers, who are now considering this methodology as a serious alternative, are keen to see further results.

Active networking has resulted in an increase interest of government agencies and scientists in the approach for endogenous development. A number of mass meeting have been held, agreements were established with government organisations, and articles and books on the subject have been distributed. The application of the approach is no longer limited to a few villages, but is spreading over the island, and is now welcomed by many in the mainstream. A point that requires constant priority is the training of field staff in the participatory methods of experimenting in the cultural context. By involving students in this work, and a future modification of the university curriculum, new professionals may become better equipped to enhance endogenous development in Sri Lanka.