

4.1 ENDOGENOUS DEVELOPMENT THROUGH EXPERIMENTING FARMERS

Dr Upendra Shenoy, V. K Aruna Kumara and A.S. Anand, KPP, India

Krishi Prayoga Pariwara (KPP) is an organised group of around 5000 farmers practicing ecological farming in Karnataka State, southern India. The objective of KPP is to understand how indigenous knowledge can enhance endogenous development to meet today's challenges. To this end, experiments are carried out on topics like indigenous cattle breeds, fruit trees, cash crops, and traditional food dishes.

Shimoga district is blessed with rich biodiversity, and the people of this district are relatively well off in terms of food and income, though 30% of them still live below the poverty line. The main crops are paddy, arecanut, coconut and spices; the marginal farmers mainly grow the staple food crop, paddy, while the medium and big farmers have arecanut (Areca catechu) and, recently, vanilla as cash crops. There are numerous medicinal herbs, shrubs, trees, vines and fruit yielding trees, like mango, amla, garcinia, jamun and jak. The area receives an average rainfall of 1,800-2,000 mm, the soils are laterite in nature and shallow. Many indigenous practices and technologies are still practiced by a number of people in the field of agriculture, health and education. Some farmers consult astrological timing for sowing, transplanting, intercropping, and harvesting. They base their practices on organic manure, traditional seed treatment and mixed cropping, and manufacture their own bio-pesticides. Some consider these practices as a fashion of the times, as many modern products in the markets come as ayurvedic herbs or natural eco-friendly products. But KPP also looks at these indigenous or local chemical-free practices as a heritage, which has the potential to support increased self-reliance and sustenance of the local people.

The ancient Indian scripts: the Vedas. It is interesting to note that the ancient Hindu scripts called Vedas, consider agriculture as the most honourable of human activities: agriculture is the one area where humans and the divine co-operate with each other to sustain creation. A hymn in the Rig-Veda says: *“don't play the games of dice; get involved in agriculture. You will acquire plenty and prosperity. This will bring you fame and recognition. Thereby you will lead a happy life.”* The Bhagavad Githa, another honoured script based on the Vedas says: *“If you respect and co-operate with the Gods, they will also respect and co-operate with you. By this mutual respect and co-operation you derive prosperity - both material and spiritual.”*

There are two famous collections of hymns in the Vedas. In the *Bhoomi Sukta*, or earth hymns, the human relationship with Mother Earth is equated to that of a son with his mother. She expects us to worship her devoutly because she bestows us with food, water and air, the three essential requisites for our life. In the *Anna Sukta*, or food hymns, food is equated to God, as it gives us vigour to achieve our ends - both material and spiritual. Thus, according to traditional Hindu thought in India, not only the earth, but also mountains, rivers, lakes, oceans, forests, birds and animals are sacred and should be worshipped. Therefore, in traditional Indian agriculture human needs can be met, but human greed is

condemned. In recent decades these norms in Indian agriculture have increasingly given way to more westernised norms and methods. The sustained propaganda in the media, the policies of the government, the teaching in agricultural universities, as well as national and international economic pressure, have all contributed to the present situation where traditional practices and values are seriously threatened.

Krishi Prayoga Pariwara

Shimoga district, where KPP's major activities are carried out, is well influenced by free market and globalisation programmes. Modern goods and comforts have changed the life style of rural and urban people. For example, branded products, such as tooth paste, soap, towels, toothbrush, oil, cosmetics, baby foods and beverages, are now common in the rural areas, whereas in the old days neem tooth sticks, local tooth and bathing powders made out of herbs, cotton towels of local mills, herbal local cosmetics, home prepared baby foods and local natural, herbal drinks were used. Meanwhile, the knowledge behind these local products is rapidly disappearing. This is also true in the case of agriculture. Farmers who aspire to maximise their economic benefits and yields depend on markets for seeds, equipment and chemical inputs. Yet, the effects of these modern inputs on their environment, soil, water and air, and their increased dependency on markets, are not given the same consideration.

KPP was initiated in the early 1990s by a farmer peer group, in a remote village in the Malnad area of Karnataka. This group of experimenting farmers concentrated on the increasing problems experienced with chemical agriculture, and aimed at finding solutions to them. The group grew informally under the able leadership of Mr Purushothama Rao, a progressive organic farmer from Thirthahalli in the Shimoga district. Today the association counts over 5,000 members. By 1996 KPP became a registered body and its vision and objective were broadened, aimed at developing practical development strategies, which are not simply economic, but also based on moral, spiritual and ecological values. KPP has three major objectives. Firstly, KPP promotes indigenous, self-reliant and organic eco-friendly agriculture, which is thoroughly sustainable. Secondly, KPP revitalises local traditions, in which safe, non-chemical agriculture and diversified ecosystems play a central role. Thirdly, KPP provides development education to young people, empowering them to play a role in constructive, non-political development.



KPP grew under the leadership of Sri Purushothama Rao, an innovative organic farmer.

KPP has a farm developed by Sri Purushothama Rao at Thirthahalli as a model farm. It comprises of 10 acres of land; 50% of the area

is under local paddy varieties, while the remaining 50% is devoted to commercial crops, including arecanut, coconut, vanilla, pepper, elachi, coffee, banana and vegetables. The farm is fully organic since 1989. Nearly 50 farmers visit this farm on a daily basis, to learn about organic manure, bio-pesticide preparation, as well as sowing, planting, intercultivation, pest control, harvesting and post harvest technologies. KPP publications are available on the farm, which is also the registered office of KPP. The majority of the meetings of member-farmers and the Board of Trustees, as well as training and seminars are held here.

KPP has a Board of Trustees comprising of eight trustees. Seven of them are practicing organic farmers representing different parts of Karnataka state, and the other is a social worker who guides the whole body. This body, along with active local farmers, plans and executes the activities. Besides this, KPP presently works with two full-time staffers, who plan, advice, and direct the activities, based on good relationships with both the farmers and the academic community.

Methodology. Shimoga district has a diverse population. KPP is working with farmers of different ethnic communities, such as Idigas, Bovis, Havyka Brahmin, and Vokkaliga. These communities have their own customs, beliefs, norms and values, but all of them observe the Hindu festivals of *Ganesh Chaturthi*, *Dashera*, *Yugadi* and *Bhoomi Hunnime*, and use nature's diversity in different rituals. They worship different parts of nature, like water, soil, plants, animals, and air, in the name of Gods and Goddesses, as well as agricultural inputs like seeds, manure, farm implements and equipment. This concept of the sacredness of natural resources is still alive, even in this modern era, and this is the basis on which KPP works with the farmers on the relevance of traditional knowledge and practices in agriculture.

The objective of KPP within Compas is 'to understand how indigenous knowledge systems and techniques, as well as indigenous institutions, can enhance endogenous development'. To achieve this, various activities are executed.

- Documentation. The elders are consulted in documenting local knowledge and practices. Sometimes school children are involved, motivated through special prizes. The collected information is systematically compiled according to themes: crops, season, locality, farming operation, ethnic community, beliefs, faith and worship. To support this documentation, classical texts like *Vedas*, *Puranas*, and *Shastras*, as well as contemporary literature are collected. Persons, libraries, research institutes and institutions with similar interest are also identified.
- Working with research-minded farmers. KPP supports research-minded and knowledgeable farmers to find solutions to the problems that the KPP farmers face in their fields. All necessary information and expertise by way of resource persons are provided in facilitating the experimental process. KPP now works with more than 50 farmer-scientists of this kind. Their interests vary from seed selection to seed treatment, soil fertility improvement, plant protection, liquid manure, growth stimulation, fruit ripening, harvesting, storage, processing and value addition.
- Training and exchange workshops. For the last decade, apart from training workshops to the farmers, KPP has also organised meetings of farmer-experimenters in different

parts of Karnataka, in which they could highlight successful techniques and exchange their experiences.

- Organising village units. KPP has established ten village units, which consist of a minimum of five farmer families who practice organic farming. Key persons in each unit are identified and supported, to help in propagating the alternative philosophy in agriculture, which is eco-friendly, self-reliant and cost-effective. These units are supported through training to become the production centres of organic food products, and include a total of about 110 people, most of them women and subsistence farmers.
- Organising mass meetings. Mass meetings of farmers and community members are organised in the villages to present the outcomes of their activities related to organic agriculture. KPP has organised three mass meetings over the past three years: one to release the booklet on traditional recipes, another to release a pamphlet on the organic *kumkuma*, the red natural dye traditionally used on the forehead; and the third to release a booklet called *Kamadhenu*, which deals with indigenous cattle breeds.

Examples of KPP field activities

Revitalising traditional food dishes. Traditional Indian food is highly diversified; an ordinary lunch consists of many vegetables, grains and herbs. The Indian kitchen contains a wide variety of dishes, and any particular dish can be prepared in many different ways. KPP is interested in the relationship between the preparation of local dishes, human health and agriculture. In 1998, KPP invited schoolchildren to ask their mothers and grandmothers for recipes for *tambli*, traditional soup in which many local herbs are used. Nearly 160 different recipes were found! KPP listed the different types of *tambli*, described how they were prepared and recorded their ayurvedic background. It turned out that about 130 plant species are used in the preparation of the different *tambli*s. The parts used vary from tender leaves to flowers, fruits, seeds, bark and roots. The results of this research were presented during a mass meeting and in a booklet.

Home-made pickle and tender mango. Pickle is an indispensable side dish in traditional Indian food. There are many varieties, including tender mango pickle, lime pickle and vegetable pickle. The tender mango pickle is famous for its taste, the wood of the tender mango tree is used for construction and mango leaves in specific rituals. Leaves are tied around the house and in front of doors, to protect the house from the pollutants in the atmosphere. The tender leaves of mango and jak are also used in the *Kalasa*, a copper pot with water, where the leaves energise the holy water of the *Kalasa*. Two rather surprising facts about the use of tender mango led KPP to further study the use of this fruit tree. First, we found a large number of varieties of tender mango in the local vegetable markets: they differed in size, shape, flavour and sap content. This made us wonder about the mango varieties in the region and the quality parameters used by the local population. Second, it astonished us that local sellers harvest the tender mangoes by cutting down whole branches. The mangoes are then transported by lorry to big cities like Shimoga, Bangalore and Chennai, to be processed as industrial pickle. We wondered why people would indulge in such damaging harvesting practices. Moreover, due to industrial pick-

ling, the technology and know-how of local pickle preparation are being lost, and the younger generation no longer interacts with the older generation in the process of pickle making. People have lost the habit of offering a gift of homemade pickle, and even during community gatherings factory-made pickle is now commonly used.

Tender mango competition

The KPP team identified and prepared a small group of local people to conduct a survey on local mango varieties: the local name, the age of the tree, its fruiting pattern, yield and propagation. In April 1999, with the help of the Karnataka Forest Department, a tender mango competition was organised. During this competition nearly 100 entries were exhibited in classes like raw tender mango, tender mango in brine (saturated salt water) and ready pickle. The judges were two farmers and two housewives, experienced in pickle preparation and tender mango selection. They judged according to



During the tender mango competition the mangoes were judged by local criteria such as flavour, size, shape and sap content.

eight local criteria: size, shape, flavour, texture, stalk length and girth, sap content, thickness of skin and seed. Nearly ten local varieties of high quality mangoes were selected during the competition. The ceremony was attended by local leaders as well as representatives of the media, while Sri Vinaya Kumar, an official of the Government Forest Department expressed his department's interest in maintaining and propagating local mango trees.

For two years after this programme, a few grafters from the KPP farmer group supplied over 2,000 tender mango seedlings to nearby farmers. The local branch of the State Horticulture Department also took interest and supplied a good number of grafted tender mango plants to farmers. Meanwhile, home-scale pickle production has increased, and KPP is involved in selling these pickles directly to the consumers. The awareness about the tender mango tree has reduced the unsustainable harvesting practices.

Promoting organic kumkuma. Kumkuma is the name for the sacred red vermilion powder, which is used widely by the Indian Hindu population. It is applied on the forehead (*Agnya chakra*, or third eye) everyday, after performing morning rituals and worship of mother Goddess. It helps to develop purity in thoughts and feelings, improves *Satwik*, or the mental properties of silence, patience and self-control, and connects the person's inner and outer worlds. The particular spot is also a well-known accupressure point, which is used to promote health, calmness of mind and happiness. Medically speaking, turmeric, an ingredient in kumkuma preparation, is a good antiseptic against various bacteria and fungi, while it improves the colour and smoothness of skin as well as eyesight, sense of



Over 15,000 women and children have been trained by KPP in the organic preparation of kumkuma, the dye applied on the forehead after morning rituals.

taste, smell and hearing. KPP resolved to revive the traditional preparation of kumkuma and found an almost forgotten traditional method of producing it on the basis of turmeric, lemon juice, borax, alum and cow's ghee. To date nearly 15,000 women have been given a course related to the social, cultural, historical and spiritual background of kumkuma based on Indian science. They were trained in preparing the pure kumkuma, which has provided some of them

an added income. This, to our surprise, has spread autonomously throughout Karnataka State.

Advocating cow products. In India, the cow is greatly respected, worshipped and is believed to be the abode of all the Gods, particularly of *Laxmi*, the Goddess of wealth. In farmers' families, food is offered to the sacred cow every morning, before the day's activities begin. The cow is an inseparable part of the farming community. It is worshipped in particular during the festival of lights, *Deepavali*, in the month of October, when the cow is referred to as *Kamadhenu*, which means the animal with the power to provide whatever a person may ask for. All the products of the cow are used in agriculture. Gandhi once remarked: "*The cow was, in India, the best companion. She was the giver of plenty, the mother of life. Not only did she give milk, but she made agriculture possible.*" KPP has experimented with some ideas from ancient texts, by using cow's urine (both of pregnant and non-pregnant animals), dung, milk, curd, buttermilk, ghee and whey in agriculture. The texts also advocated the use of amniotic fluid to promote growth and induce flowering. Most of these cow products are now used by the KPP farmers in one or the other way: cow's urine as a foliar spray, manure for composting, milk as an antiviral spray, curd and buttermilk to increase the microbial activity in the soil, while ghee is used in traditional seed treatment.

Improving local cattle breeds. In India there are 26 descriptive indigenous breeds of cattle as well as numerous non-descriptive breeds. Unfortunately, Jersey and Holstein-Friesian breeds have been introduced for cross breeding programmes. The farmers in KPP are disturbed, however, by the fact that these crossbred cattle do not perform well in their area, as they require more concentrates and roughage than the indigenous breeds, and often suffer from diseases and disorders for which qualified veterinarians have to be

called in. Poor farmers are unable to cope with these increased costs of maintenance, and the dependency on external inputs such as antibiotics and other chemicals. The farmers associated with KPP concluded that except for a few incidental successes, crossbreeding at large is not an economically viable option. This made them decide to look at local cattle breeds afresh.



The cow in India is sacred and has multiple functions in agriculture.

A survey conducted by a KPP team concluded that the local breed, known as Malnad Gidda, can yield 3-5 litres of milk per day, comparable to 4-6 litres of milk yielded by cross bred animals in the KPP project area. Through selection and careful breeding, the yields of this indigenous breed can be improved. The National Dairy Research Institute in Bangalore has expressed its interest to support this programme. KPP has also collected relevant literature on ethno-veterinary medicine, documenting the role of indigenous cattle in family life, revitalising the local health traditions based on cow products, and disseminating all information to interested farmers. The findings of this KPP study is documented in a booklet titled 'Kamadhenu', which describes the characteristics of the four main local cattle breeds of Karnataka State. The booklet also presents several preparations from ayurvedic medicine based on cow products, and their effect on human health. Moreover, with the help of a local spiritual leader, Sri Raghaveshwara Bharathi Swamy, a centre for breeding and conservation of indigenous cattle has been established. The centre is playing a key role in the selection, breeding and distribution of local breeds, while also producing a variety of cow-based products for human health. It is supported by experienced ayurvedic doctors and by a research institute in Nagpur, Maharashtra State.

Arecanut experiment. The on-farm experiment on the yellow leaf complex of areca was started in October 2000. Arecanut is a perennial cash crop. Yellow leaf complex is a complex of diseases and disorders, first observed in early 1941 in Karnataka, which reduces the yield drastically. Within some 5 years the plot is unfit for the cultivation of arecanut. KPP has collected primary information regarding this problem, through local surveys and a review of literature. The KPP team discussed the matter with local farmers, agricultural scientists and ayurvedic doctors, and tried out treatment according to the principles of *Vrkshayurveda*, the ancient plant science. The treatment used was documented in a text published by Asian Agri History Foundation, Hyderabad: a decoction prepared of hog fat, horse hair, cow horn, cow ghee and hemp. This was applied to each plant every month on the tenth day of the ascending moon. The treated plants have shown some promising



KPP director (left) visits arecanut farmer in his garden to discuss experiments to reduce yellow leaf complex.

changes, like increased root growth, decreased nut shedding, and improved flowering and fruiting. KPP will continue these experiments in the coming 3-5 years.

Some results and conclusions

KPPs work is participatory in nature. As a farmers' organisation it is relatively easy to appreciate the cosmovision aspects of indigenous knowledge and practices of the rural people. Presently, KPP is an association of relatively well-to-do farmers, belonging to the upper castes. At the same time KPP is also supporting subsistence farmers, who have paddy as a staple crop, through training, meetings and direct distribution networks. In the next phase, more priority will be given to experiments with indigenous knowledge and practices related to paddy.

Over the past six years, the demand for the different training activities on the above-mentioned subjects in the different villages and communities has steadily increased.

Many families in the communities have started to include positive practices based on indigenous knowledge in their agriculture and life style. Though operating only with two full time workers, KPP is now considered one of the leading NGOs in the area in the field of organic agriculture. There has also been special interest in conserving local cattle breeds and the organic kumkuma production. The major constraint KPP has encountered is the challenge to understand the indigenous systems and knowledge in a holistic way. It proves difficult to give a scientific basis for certain indigenous practices and beliefs. For example, in the case of kumkuma, widely used in India for its sacredness, modern science does not explain what happens by applying it on the forehead. But Indian science, which looks inwards, indicates that it enhances the *satwik* properties of a person: the mental properties of silence, patience and inner control, which connect a person's inner and outer worlds. Satwik is considered very important for one's personal health, as well as the health of society as a whole. We intensively struggle to combine these two sciences - one which looks inwards and the other which looks outwards.

In the first years of the Compas programme, KPP had indicated that it would only work on organic agriculture. But over time we realised that the knowledge and practices documented were relevant not only to agriculture, but also to health and lifestyle in general. Therefore our vision was broadened, and we started to document knowledge and practices related to the different fields mentioned above, and conducted relevant training in the community.

In the next few years farmers and communities working with KPP will be strengthened further, and also be established in regional structures, called *taluks*. KPP will continue with the training programmes on various aspects of organic agriculture, health and rural development. Based on a syllabus developed between 1998 and 2002, training will be given to youth from different agro-climatic zones of Karnataka. The youth, selected according to their dedication to organic agriculture, will be trained for two years. They will involve themselves in the process of documentation, experimentation and dissemination. After the training period, they will return to their villages to facilitate endogenous development. Another activity will be the ongoing documentation of indigenous knowledge and practices. After collecting over 1,000 ancient texts, the next step in this process is to catalogue and analyse these texts. A group of Sanskrit scholars, ayurvedic doctors, agricultural scientists and farmers are prepared to support KPP in this effort.

Conclusion. KPP has made a small and modest attempt in the area of endogenous development. The process of building on the local resources in the area and supporting the farmers from different ethnic communities and socio-economic backgrounds, was started off with organic farming. Over the years, the local production, consumption and local marketing of organic foods have increased. Other activities have had impact on groups, especially rural women. For example, the production and use of organic kumkuma has reached over 15,000 women, which has stimulated them to think about their own cultural roots and how to build on it. The work on tender mango pickle production has also benefited women in terms of work, income and self-esteem.

KPP started with a charismatic local leader, the late Sri Purushothama Rao. His farm has become the central meeting place for the organisation as well as a demonstration farm for organic agriculture, where farmers from all around come to visit and see for themselves. The strength of KPP is that it builds on farmers' own capacities and initiatives for experimentation, in seeking answers to their practical problems. Making endogenous development a reality in a wider area requires, however, policies aimed at encouraging local communities to become more self reliant, while making better use of their own local resources.

Fortunately, and due to the positive results so far, different organisations, including research and government, as well as several reputed institutions and personalities at national and international level, have shown interest in the different programmes of KPP. Some of these are co-operating actively in spreading the results. This is a slow and ongoing process. As Sri Raghaveshwara Bharati Swamy, the local spiritual leaders who guides the cattle conservation and breeding centre, explains: *"Here we have several cattle breeds that are threatened by extinction, along with the local knowledge attached to them. Nature and people want evolution and not revolution. For us this is real development."*