Background

Sri Lanka’s farming systems have evolved over thousands of years covering a rich array cultivated crops such as rice, grains, vegetables, fruits, spices, as well as the rearing of livestock. The long history of cultivation and a wide range of ecological landscapes have combined to result in a wide variety of farming practices in Sri Lanka.

According to documented history, as far back as 800 BC, there was rice cultivation in Sri Lanka. Since 390 BC, there was construction of irrigation structures, reservoirs, dams and diversions, many interconnected by canals.

Once, Sri Lanka boasted of more than 2,000 indigenous varieties of rice, and offered these as the granary of the East to the rest of the world. In the past, rice cultivation in Sri Lanka was well-planned: the methods of production and the sanctity associated with the process of production made it a truly sustainable process.

The advent of the Green Revolution in the mid-20th century, which brought western agricultural technology (high-input requiring crop varieties, soil damaging machinery, over-use of environmentally hazardous agro-chemicals and inorganic fertiliser), has posed a serious threat to the survival of the traditional agriculture systems of Sri Lanka.

At present, more than 95% of the paddy lands are cultivated with the so-called semi-dwarf, newly-improved rice varieties, which are grown using agro-chemicals, non-organic fertilisers and pesticides. However, with the current trend of global awareness of the benefits of consuming organic food and the hazards — both to human health and the environment — of using chemical
fertiliser and pesticides traditional farming of rice is gradually making a come-back.

The paddy sector is extremely vulnerable to the impacts of climate change. Over the years, on many occasions, farm lands have been heavily damaged by floods or droughts. Traditional agriculture practices that use local paddy varieties have proven to be more successful in withstanding such impacts.

The Kapiriggama Village Tank Cascade System rehabilitation programme set out to

- Popularise traditional rice cultivation in the project area;
- Promote agro-chemical free farming practices to decrease soil and water pollution;
- Promote the use of traditional rice varieties as a part of a strategy of adapting to climate variability;
- Promote good management of paddy fields to enhance the soil quality and productivity; and
- Improve economical and health benefits to the community. (Generating a mechanism for seed paddy production and seed exchange within the cascade.)

### Traditional Rice Varieties

Farmers had many rice varieties, which they developed using natural selection by observing the adaptive ability of tolerance to water scarcity, resistance to pest and disease, impact on soil fertility, as well as for various social needs such as health, cultural functions and religious needs. Among them, are many varieties found for specific purposes. The table in the next column provides some information of traditional rice varieties. There are many claims and beliefs related to the health benefits of consuming these rice varieties.

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<th>Name of the rice variety</th>
<th>Importance</th>
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| **Suwandel**             | - It is believed to promote fair and glowing skin; improve the functioning of the excretory system; improve vocal clarity; and help control diabetes. It is also said to support a balanced growth of body.  
- Its special milky taste makes it an ideal choice for festive occasions and ceremonies.  
- The nutrient composition of suwandel consists of 90% carbohydrate; 7% crude protein; 0.7% crude fat; and 0.1% crude fibre. It is also known to contain higher amounts of glutamic acid and higher concentrations of vitamins than more common rice varieties.  
- This is an exquisitely delicious white rice with a fragrant aroma. |
| **Kalu heenati**         | - Its name literally means dark, fine grain.  
- *Kaluheenati* is a highly nutritious red rice, perfect for daily consumption and is recommended traditionally for lactating mothers. It is believed that with its high fibre content it helps regulate bowel movement. It is also said to be effective in keeping diabetes under control, as well as controlling the toxic effects of snake bites and for treatment of hepatitis. |
| **Ma-wee**               | - *Ma-wee* is a reddish-brown rice variety with a unique texture that is low in carbohydrates, and rich in protein and fibre. It is also proven to have a 25% to 30% lower glycaemic index (GI) in comparison to other common rice varieties.  
- It has a nutrient makeup of 84.5% carbohydrates; 9.4% protein; 3.6% fat and 1.1% fibre.  
- *Ma wee* rice is best when soaked prior to boiling. It is also revered for its historical importance in religious ceremonies. According to folklore ma wee has been placed in caskets of sacred relics and the pinnacle of dagabas.  
- It is believed to be effective against a slew of ailments including diabetes, tuberculosis, constipation, haemorrhoids and cardiovascular disease. |
| **Pachchaperumal**      | - The word *pachchaperumal* means the Lord Buddha's colour and this rice variety is considered a divine rice in traditional Sinhalese culture. It was often used in alms-givings.  
- This is a wholesome red rice variety, which, when cooked, becomes a deep, rich burgundy colour.  
- It is rich in nutrients and in proteins, and is an excellent choice for daily meals.  
- *Pachchaperumal* is believed to be a perfect diet for those with diabetes and cardiovascular disease. |
| **Kuruluthuda**          | - This is a delectable and nutritious red rice variety, which is rich in proteins and fibre. It has a pleasant taste.  
- *Kuruluthuda* is said to improve bladder functioning. |
Traditional practices

Traditional practices include

• *Bethma* cultivation, which is adopted during seasons of poor rainfall, where the limited tank water is used efficiently without causing crop losses. Farmers redivide temporarily the upper portion of the paddy tract, into areas mostly in equal size. Otherwise, there would be an abandonment of paddy cultivation for that season.

• *Pangu kariya*, where farmers divide maintenance work — such as cleaning the tank bund, clearing canals, repairing bunds, cleaning sluices — among themselves to prepare the irrigation system for seasonal cultivation. This reduces the cost and creates a sense of responsibility, ownership and accountability.

• *Kekulam gothena*: Dry sowing of paddy seeds early in the season is referred to as *kekulam gothena*. When dry sowing is carried out in tank upstream areas, it is called *vee hena* or *goda hena*. In the traditional kekulama method, the dry fields are ploughed to obtain a dispersed soil and to bury the weeds. At the inception of rains, dry seeds are sown anticipating more rains.

• There were many traditional practices designed to protect crops from the damage caused by wild animals, including astrology, the powers of the spirits and Gods, the chanting of verses (*mantra*) and the use of specific symbols (*yantra*).

• *Kem krama*: The practice of *kem* is very widespread in rural Sri Lanka. A *kem* is a kind of practice, technique or custom that is followed in order to obtain some favourable effect such as relief from a specific illness. Some *kem* combine the use of astrology with and the use of certain plants or herbs. Other *kem* depend on the use of specific plants and *mantras*.

Approach adopted

During the Project, the following strategies were adopted.

• Reducing the cost of production, especially by addressing the problems of weeds, pest and diseases.

• Adopting low cost practices to enhance soil fertility — such as the use of straw, green manure, cow dung, poultry manure, liquid fertiliser.

• Adopting methods to increase the profitability of rice farming by lowering the cost of input use and offering high market price for traditional rice varieties.

Because many of the traditional practices are now new to farmers, the following main components were recommended to bring back the practice of traditional rice farming.

• Cultivating traditional rice varieties;

• Preparing land and managing water taking cognizance from traditional farming;

• Applying fertilisers of organic origin (such as straw, green manure, cow dung, poultry manure, liquid fertiliser);

• Managing weeds through hand weeding, mechanical weeding and water management; and

• Managing pests and diseases by practising *kem krama* (rituals), maintaining biodiversity and using bio-pesticides.

Traditional rice varieties

It was recommended that farmers used various rice varieties available around them — such as *kurulu huda*, *pachchaperumal*, *suwandel*, *rathkanda*, and *kalu heenati*.

Land preparation

If ploughing the field manually is not possible, it was recommended that farmers use a two-wheel tractor with a rotary to plough fields. Partially burnt paddy husk and *Glicidium* leaves should be spread over the field two weeks after the first ploughing. Bunds are repaired before levelling the field.

Planting method

Broadcast sowing is preferable. A seed rate of 45–50 kg/acre with traditional varieties is sufficient. (For improved varieties, a rate of 60–70 kg/acre is used.)

Water management

In a month’s time, land preparation and sowing must be completed with irrigation water. Subsequently, irrigation water is supplied once in four days.

Addition of organic matter


Pest management

Spreading ash over the field, *kem krama*, and placing crushed *Derris* spp. (Sinhala: *Kalawel*; Tamil: no name known) packed in bags, near the water inlet to the field, are good methods of pest management. The use of bio-pesticides is also recommended. For example, the leaves and tender stems of *Calotropis gigantea* (Sinhala: *Wara*; Tamil: *Erukka*; and *Azadirachta indica* (Sinhala: *Kohomba*; Tamil: *Arulundi*) are added to 10 litres of cattle urine and 10 litres of water, diluted after a week to a ratio of 1:20 and sprayed on the crop.

Farmers believe that use of inorganic fertiliser does not increase yield much in saline soils, but that a satisfactory yield can be obtained with organic fertiliser with low or no cost.
Project Interventions

• Two awareness raising programmes were conducted for 104 farmers on the importance, advantages, and the methodology of traditional rice cultivation. The seed paddy supplier, the Department of Agriculture, the Agriculture Instructor (AI) of the area, and IUCN Technical staff engaged in activities related to the programme, such as awareness raising, selection of suitable seed paddy, and distribution of seeds. Farmers were guided to select the suitable varieties depending on their requirement, interest, and the respective land characteristics.

• Awareness raising programmes included the introduction of methodology for preparing organic fertilisers and bio-pesticides that can be used in the paddy lands.

• It was arranged that 45 farmers and five officers from the Rambewa Divisional Secretariat visited two sites of traditional farming to gather knowledge on chemical-free agriculture, traditional rice farming and the preparation of bio-fertilisers.

• Four hundred and fifty kilogrammes of traditional seed paddy belonging to four varieties (pachchaperumal, kalu heenati, rath kanda, and kurulu thuda) were distributed among the farmers in the cascade area for cultivation during the 2013 maha season. The seeds were purchased from a certified traditional seed paddy supplier, who is also a traditional rice farmer, from Rambewa. The seeds were purchased with project funds.

• Two hundred and thirty kilogrammes from the above varieties of traditional rice paddy seeds were distributed among 104 individual farmers who cultivate in the command areas of six. Nearly two kilogrammes of seed paddy were given to each farmer under the condition that they return the same quantity of seed paddy, from their yield, free of charge, to another farmer in the project area for expanding the programme.

• The remaining 220 kg of traditional seed paddy (rath kanda and kurulu thuda) was given to a group of farmers in Konakumbukwewa for cultivating in a common field. This approach was taken because there was a limitation to the land that could be cultivated in the 2013 maha as a consequence of the limitation of water. As above, farmers are expected to return the amount of seed paddy they receive to another group of farmers in the next season.

• The total land area cultivated with traditional rice in 2013/14 maha season was 7.5 acres. The average yield is 1,300 kg/acre, which is close to the maximum yield that can be expected from traditional rice varieties.

• In 2014/15 maha season 11.5 acres of paddy land in six villages were cultivated with traditional rice. The seed paddy for these has been obtained from the previous season’s yield. In order to contribute to the spread of cultivation of rice via traditional methods in other parts of the dry zone and also to create a market opportunity for traditional rice in the Kapiriggama cascade, farmer organisations were directed to supply seed paddy for an FAO programme in 2015.

Recommendations for the future

• The programme should be continued in the cascade. Technical assistance should be provided continually through the Agriculture Instructor. Farmer to farmer technology transfer should be strengthened.

• The seed paddy obtained from the regular paddy fields has a tendency to be contaminated with other paddy varieties. Therefore, a continuous reliable supply of traditional seed paddy has to be arranged. This can be achieved either through Department of Agriculture seasonally or by providing the farmer the necessary resources for generating his own high quality seed paddy under standard procedures.

• Market opportunities have to be created for farmers to sell their produce at a reasonable price. Measures have to be taken to prevent adulteration of the produce during the supply chain from the farm gate to the customer.

• A quality assurance procedure should be introduced to certify good quality traditional rice produced without using agrochemicals. In this way both the farmer and the consumer benefit: the farmer obtains the highest price for his produce, while the customer receives a good quality product for the price he/she pays.

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Access technical note from here.

February 2016