

## **Conversion of Kampong Ewa rice fields in Langkawi, Malaysia, into organic rice farming.**

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### **Abstract**

A single crop rice area covering 8.6 ha in Kampong Ewa, Langkawi, Malaysia, is currently being progressively converted into organic rice farming, commencing last main season rice crop in 2003. Among initial steps taken were to fence-up the area to disallow any interference of chemical usage from outside, reconsolidated small plots into bigger area, used independent unpolluted water source, improved land leveling and water management, practiced transplanting method and introduced rice-fish culture. Future plans for the area and issues and challenges in organic rice farming in Malaysia are also discussed in this paper.

### **Media summary**

A single crop rice area covering 8.6 ha in Kampong Ewa, Langkawi, Malaysia, is currently being converted into organic rice farming.

### **Key Words**

Organic rice, Kampong Ewa, Langkawi, single crop rice

### **Introduction**

Malaysia has more than 0.5million ha of rice fields, out of which more than 0.2million ha are double-cropped in the 8 granary areas. Outside the granary areas, and in areas where rice fields are still rainfed, much of those areas are single cropped. Farmers in those areas grow conventional rice with low chemical usage. However yields and income are low. Kampong Ewa in Langkawi is one such rainfed rice area. The government is looking into other alternatives to help these farmers increase their income. One possibility is to go into organic rice cultivation where padi and rice prices are higher. However organic rice cultivation in Malaysia is still new and there is lack of research information on it. Organic rice farming is the holistic production management system which favours the use of cultural, biological and mechanical management practices over off-farm synthetic chemical inputs, to optimize the health and productivity of ecologically sustainable agroecosystems (Tawee, 2003).

*Current status of organic rice cultivation in Malaysia*

In the past there has been small trials on organic rice cultivation in Peninsular Malaysia but some of these trials did use minimal chemical inputs. None were later tried on large scale. Until recently in 2002 in Kahang, Johor an entrepreneur converted some of his conventional rice fields into 100 ha of organic rice, without usage of chemicals (Tam et al. 2003). Much of the rice grown in the single crop rice areas and in the mountains of Sabah and Sarawak are cultivated organically but not certified as organic yet. Most popular among them is the Bario rice from the Bario village in the mountains of Sarawak. Much of the organic rice sold in Peninsular Malaysia is imported from India (Ponni organic rice), Cambodia (Somaly organic rice), Thailand, Australia and the USA.

#### *Objective of the project*

The objective of the project is to convert the once idle paddy land in Kampong Ewa, Langkawi, into a profitable organic rice farming venture. No chemical inputs will be used in the rice cultivation and in other agricultural activities in the village, in order to create an organic rice farming environment leading to the setting-up of an organic rice village in Kampong Ewa. Efforts will be made to establish a market for the organic rice and to promote consumers preference for it.

#### *Site selection*

The 8.6 ha of rice field in Kampong Ewa, Langkawi was selected based on the following criteria:

- The paddy field is a single crop rice area. During the previous season conventional rice was grown but with minimal chemical inputs. Prior to that the rice field was abandoned for 4 years.
- The water for the paddy field comes from the adjacent hill and was not shared by other farmers. The water was not polluted before entering the paddy field.
- The air at the site and the surrounding fields was not polluted.
- There was no interference from the field operation of conventional rice farming nearby.
- The rice field plots can be consolidated and improved to suit the different activities in the organic rice cropping system.
- The Kampong Ewa site is in the north western part of Langkawi island and far away from conventional rice areas that practices heavy usage of chemical fertilizers and pesticides.

#### *Project initiation*

The Kampong Ewa Organic rice project began in June 2003, with clearing of the 8.6 ha site, fencing the boundary (to prevent disturbances from animals, and disallow any interference of chemical usage from outside), building a workshed at the site, widening of some small plots into larger fields, repairing of bunds, land leveling and initial rotovation. Widening of in-field paths and repair of in-field drains were also undertaken. Basal incorporation of chicken dung (at a rate of 1.5 ton/ha) was made before the 2<sup>nd</sup> rotovation. The rice nursery was prepared in August and the crop was manually transplanted in September 2003. Manual harvesting was done in January 2004.

#### *Weed management*

Direct seeding of rice was not adopted to avoid problems in controlling weedy rice infestation. No weedicide, pesticide and chemical fertilizers were used in this organic rice farming. Manual transplanting into flooded rice fields minimized weed infestation. Another approach in tackling the weed problem in organic rice was to propagate azolla and let it cover the water surface in the field and suppress the weeds underneath. Weed infestation is a major problem in organic rice cultivation in Malaysia since no weedicide will be used.

#### *Maintaining soil fertility*

Four weeks after transplanting of rice seedlings, 0.5 ton/ha of chicken dung was applied. Some plots were applied with pure organic fertilizers such as Biokashi, Rapid X, Myco and Midori fertilizer at a rate of 2 ton/ha at 4 weeks after transplanting. A few plots were applied with fish meal at 150 kg/ha at tillering

stage. Maintaining soil fertility in organic rice fields over the years is the biggest challenge faced by organic rice growers in Malaysia. The dung from buffalo and cattle grazing in the paddy field during the dry off season months of January to March (when no crop can be grown) is expected to contribute towards maintaining soil fertility in organic rice fields.

#### *Crop care*

No pesticide was used in this organic rice cultivation. There was slight infestation of leaf folders at tillering stage but the plant recovered later. In organic rice environment there are a lot of natural enemies that helps in pest and disease management. The spraying of BTO (Biotech Ohira liquid) and the rearing of puyu fish or climbing perch (*Anabas testudineus*) as a pest control measure was tried and will be continued. Of importance too in organic rice is to select varieties that are resistant to major diseases like blast, bacterial leaf blight, sheath blight and others. In organic rice farming we always stress on having healthy plants. Healthy plants should have higher resistance against pest and diseases and good soil and nutrient management will produce healthy plants.

#### *Rice varieties and yield*

Eight rice varieties were planted during main season 2003 in Kg Ewa organic rice fields. The yields are shown in Table 1.

**Table 1. Yield of eight rice varieties cultivated organically in Kg Ewa, Langkawi during main season 2003.**

<b>Varieties</b>	<b>Yield (kg/ha)</b>
Y 1304	3231
MRQ 50	2565
MRQ 74	2707
Pulut Siding	4100
Pulut Hitam	3836
Mutant Jarum Mas	1765
MR 219	3768
MR 220	3675
Average yield	3206

The average rice yield for this first season organic rice crop was 3.2 t/ha. In organic rice it is suggested that the yield should be improved towards 5 t/ha. In conventional granary rice areas farmers are trying to achieve yields of 10 t/ha.

### *Future plans*

Manual transplanting of organic rice faces the problem of shortage of farm labour. Mechanical transplanting of organic rice will be pursued in the future. Additional weed control measures will be from the rearing of ducks. Ducks constantly pecking the soil and puddling the field by removing weed seeds and small weed seedling will suppress weeds infestation in early stage of rice growth. The timing of releasing the duck is crucial in controlling rice field weeds. Usage of mechanical weeder in transplanted organic rice will be explored.

These ducks will also help in pest management. If ducklings of the right age are introduced into the field at the right time, many of the pest will be under control. The most appropriate time to introduce the ducklings is two weeks after transplanting. Another approach in pest control will be the planting of pest repellent trees along the peripheral boundaries of the area. Setting-up crop trap barrier and the rearing of owl for rat control will be pursued.

Cultivation of green legumes such as *Sesbania* during the off season and application of straw compost is expected to maintain and improve soil fertility. This crop rotation will also help to break the sequence of common pest and diseases in the rice fields. Only specialty rice with low nutrient requirements will be transplanted in this organic rice area.

Efforts will be made to turn this Kampong Ewa village into an Organic Rice Village where there will be no usage of chemicals even in other agricultural activities in the village. This organic rice village will apply for accreditation from the Ministry of Agriculture and later from International bodies like IFOAM.

### *Issues and challenges*

#### *Organic rice market*

The organic rice market in Malaysia is still new compared to conventional rice. Organic rice is for the niche market. However farmers who would want to plant organic paddy is not sure who will buy it and at what price. The yield of paddy grown organically is still low. This will lead to low production volume. But premium prices at retail outlets are very high (generally 200 to 300% premium compared to conventional rice). If the premium price of organic rice over the conventional rice can be lowered to between 100-150% premium, then the cost of organic rice will be within the reach of more consumers. Also, estimate benefit: cost ratio for farmers who would grow organic rice. Only a favourable ratio would encourage farmers to grow organic rice.

#### *Availability of suitable rice land*

To plant organic rice the area must meet certain requirements, such as unpolluted irrigation water and non-interference from conventional rice farming. There must also be a buffer zone, before arriving at the organic rice area. Such areas are scarce. It is even more difficult to get such areas in large acreages for commercial organic rice farming.

The government is looking into other alternatives in the single crop rice areas, (where rice yields are not high), in the effort to increase the farmers income. Organic rice is suitable to be planted in these single crop rice areas and idle paddy land.

#### *Organic rice research and development*

In the past not much research was done on organic rice production technology, either by the universities or government research institutes. Linkages with research bodies in other countries was almost nil. This gap in research and development of organic rice farming needs to be rectified if organic rice farming is to be expanded in Malaysia.

### *Certification and accreditation*

To sell organic rice well, in the market, certification is necessary. Consumers prefer certified organic rice. However small individual farmers who would like to grow organic rice may not be much concerned about getting their rice land and organic rice certified and accredited. It is a complicated process for small farmers to go for certification and accreditation since it involves much documentation.

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