The revival of sustainable (upland) rice cultivation in Reunion Island (France, Indian Ocean)

Reunion Rice Association

Reunion Island is a small semi-tropical volcanic island (2512 km2, 860 000 inhabitants) situated in the west of the Indian ocean, in the south hemisphere (latitude 55°30 east, longitude 21° south). The neighboring countries are Mauritius (170 km) and Madagascar (680 km). It is a French overseas territory. The island is very mountainous and very sharply sloped. The major part of the population is concentrated in the coastal fringe accounting for approximately one third of the total island surface area; consequently population density is very high. Agriculture is an important economic sector. Agricultural land covers 20% (40 000 ha) of the island surface area and agricultural products constitute the first exportation item. Sugar cane (for exportation of sugar) is the main crop, covering about two-third of the cultivated area. The production of tropical fruits, aromatic and medicinal plants (mango, pine-apple, vanilla…) and vegetables (temperate and tropical types) is a very dynamic sector oriented towards the domestic trade and it is the most concerned by organic agriculture development. Livestock farming is the third important sector (cattle, pigs, poultry, beekeeping). Organic agriculture is constantly increasing since the beginning of the century; nowadays it amounts to 400 farms and 1900 ha (about 5% of the total cultivated land).

The cultivation of cereals is very sparse in Reunion Island (small quantity of maize). Tubers (potato, sweet potato, yam, taro, cassava…) are much more grown. Yet, rice and bread are staple foodstuffs. Rice is almost consumed every day and it is unmissable in the local gastronomy. On average, rice consumption in reunion island approximates 65 kg/inhabitant/year. As a consequence, rice is dramatically imported, from India, China, Thailand and Madagascar (Reunion Island imports 43 000 t of rice per year). Reunion Island is highly dependent from outside for a lot of goods (including energy) and services (and strongly linked to the European community for a lot of regulation policies and subsidies). Today, due to recent crisis (Covid, Ukraine-Russia war), people from Reunion faced numerous problems of supply of provisions. This new situation drove them to raise awareness of the island self-sufficiency, especially for food.

Looking in the past, one may observe that rice had been planted since the early colonial settlement establishments (end of the 17th century). During the slavery period (18th-19th century), besides working in the commercial plantations (firstly coffee, cotton, spices and tinctorial plants and later on sugar cane), slaves (coming from west and east Africa, Madagascar and India) also managed fields of cereals and tubers and raised animals to (i) contribute to the food supply of the numerous people living in the plantation and (ii) resupply the boats making stopovers at Reunion island. If maize and cassava were the main planted species, upland rice was also cultivated. This organization disappeared with the generalization of the sugar cane agrarian system in the middle of the 19th century, the abolition of slavery and the economic modernization of the island in the middle of the twentieth century. Rice disappeared completely. Nonetheless, in the 1980s, a group of farmers (around 50) intended to revive rice cultivation throughout the island. Rice fields were created and machines were imported in order to be able to husk the paddy. The main motivation was to gain more independence in the agricultural sector. This experience failed because of various technical, commercial and political problems.

In 2019, an association of farmers (RRA: Reunion Rice Association) initiated a new revival project. Its ambition was to develop small scale sustainable (without chemicals) upland rice cropping systems, targeting local distribution networks for selling. For the promoters, it was essential that the nourishment of the population, even if it would be in small proportion, not be based only on imported food: “the landscape must reflect the content of the dishes”. The project has three main objectives: (i) to recover the knowledge and the know-how to master upland rice cultivation and transformation under the Reunion island conditions, (2) to set up agro-ecological management practices (no chemicals), ensuring no impact on the environment and a safe product for consumers (3) to reconnect people with the plant they consume the most, the population being ignorant of what rice is. In case of an acute food crisis, Reunion island should be able to spread out rice seeds and know-how to grow it.

The starting point was the re-discovering of the rice variety planted during the 1980s (“early Dourado”, originated from Brazil) and known to be adapted to Reunion ecological condition. Starting with a handful of seeds, RRA undertook a seed multiplication program. The next year (2020) started the experimental phase aiming at defining the best management practices (soil preparation, dates, density and mode of sowing, fertilization, hand weeding, irrigation, struggle against birds, straw management, crop rotations…). Very rapidly neighboring farmers were encouraged to join the project, cultivating for their own and with the help of the RRA association, a rice field inside their farm. At the same time, the ARR association took advantage of local public and private funds; they allowed: (i) to run the association, to boost the participation of farmers, to train them and to organize experiences exchange between them, (ii) to buy equipment for the transformation of the paddy rice, (iii) to realize educational actions oriented towards the general public and the young schoolchild and (iv) to promote the product and its origin on the whole island through different events (marketplaces, trade fairs…).

The poster will present the main field crop management practices: small fields of 250 m2 protected against birds with nets (birds eat the seeds after sowing and the grain after flowering), dry seeding in rows, irrigation with sprinklers, organic fertilization, hand-weeding and hand-harvesting. At that point, rice is considered as an alternative cereal specie to enrich crop rotations of market gardeners. Besides of the birds, the main constraints are storms and cyclones (rice is grown in summer during the wet season) that make rice plants to lodge and call for the use of short straw varieties.

In 2023, six farmers and several private individuals (non-farmers) have cultivated rice on their land; nearly 800 kg of paddy rice are expected, sold at a unit price of 15 €/kg (they are sold in small packets of 350g corresponding to the rice needed for one dish for 4 persons). At that time, there is a high demand for locally produced rice and the market is very far to be saturated. The current, still experimental, situation is temporary and the very unstable yields make non-sense to assess the performance in terms of tons per ha. What can be said is that the “Dourado” variety is expected to yield 3 tons/ha in favorable conditions. 31 farmers have been trained in 2022-23 and are waiting for the next season to sow rice.

First results, obtained in very few years are very promising. Nonetheless, a lot of challenges remain: (i) to train more farmers (ii) to extend the field size and to develop an adapted mechanization (iii) to continue the search for better management practices (seeding, organic fertilization, straw use and inter-cropping) (iv) to convince restaurant chef to cook and promote the Reunion rice and make individuals to use it at least once a month.

**Key words:** upland rice, small scale farming, self-sufficiency, empowerment, collective action.

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