

## **Agresearch – farmers’ experiments and experiences**

---

### **Background**

The history of agriculture is also the history of the interaction between peoples, plants and animals, which is still true today, even though modern day agriculture has become more of a structured science and a commercial enterprise. Its chronology is marked with an ever shorter time frame, as it has progressed from the chemical-intensive “Green Revolution” to the now biotech-centric “Gene Revolution”. As agricultural sciences and the application of “scientific” theories and techniques to agriculture has moved from the land to the lab, they have increasingly become more distant from the realities of small farm agriculture. Correspondingly, the term “agriculturalist” has become reserved for the “expert” in the field. Farming has come to be associated more with scientists, inventors and entrepreneurs, rather than farmers! What was once the production of food, seed, feed and fibre to satisfy basic human needs through crop-growing and animal-rearing has now become a specialised business. Agribusiness – the entire operation of supplying farm produce to the market -- determines the how and what of agricultural research. It brings with it both technological imposition and resource privatisation.

Meanwhile, international and national agricultural research institutions have done very little to improve their agricultural research processes and orientation. Their research priorities still focus on improving monoculture high-yielding crops instead of emphasising the quality of life for farmers and rural communities. The real experts on the field – the farmers and their communities -- find their interests either addressed only in rhetoric or not at all. Thus the attainment of farmer stewardship, ecological safety, livelihood security and food sovereignty remains a constant struggle. Until relatively recently agricultural research was the domain of farmers. Over generations, they built up an impressive base of agrobiodiversity, technology, and knowledge adapted to their local conditions and cultural preferences. Live research was carried out by farmers, with farmers and for farmers. Today there is a growing disjuncture between the industrial agriculture research agenda and the movement for people-centred sustainable agricultural research. Farmers’ on-farm experiments and experiences are not recognised as formal “science”, whilst it is their knowledge that constitutes the agricultural heritage of the world.

Today, however, this top-down model of agricultural development is increasingly being questioned. Throughout the world there are initiatives and efforts to take agricultural research back to the farm and to reassert farmer control over research, through such things as seed security programmes, farmer exchange networks and community-based breeding. Also in academic circles, it is increasingly understood that research should take the role and input of local farming, fishing, pastoral and forest communities as a central starting point. Likewise, the legal community needs to respond creatively to secure and safeguard the processes and products of farmer-led and farmer-oriented agreseach.

### **International Pressures**

Among the key players in international agricultural research are the UN Food and Agriculture Organisation (FAO) and the Consultative Group on International Agricultural Research (CGIAR) created by the World Bank in 1971 with the FAO, IFAD and UNDP as co-sponsors. CGIAR now has 15 international centres called Future Harvest Centres, some of which are situated in different parts of Asia: IRRI – Philippines, ICRISAT – India, ICLARM – Malaysia, IWMI – Sri Lanka, ICARDA – Syria and CIFOR – Indonesia. Over three decades of agricultural research and development promoted by the International Agriculture Research Centres (IARCs) have offered little to the Asian farmers. Instead of improving their agriculture, the modern farming that took the place of traditional agriculture has ruined

their self-sufficiency, brought on indebtedness and destroyed the ecosystem and natural resources, thereby putting at risk the life and livelihoods of farming communities. The CGIAR system only encourages an agricultural model that favours industrial agriculture and ignores the needs of small farmers, indigenous peoples and women. The irrelevance of the IARCs can also be judged in disaster or conflict situations by their lack of responsiveness to the pressing need to rebuild the farm activities of those worst affected.

Many agricultural research institutes are collaborating with multinational biotechnology corporations in promoting research on genetically engineered (GE) crops. Such effort has been denounced as a means to make farmers and the Third world increasingly dependent on external production inputs. At the same time both aid and trade pressures contribute to creating a pro-GE environment in Indonesia as in other parts of Asia, be it USAID's Agricultural Biotechnology Support Project (ABSP) for biosafety regulation or its Collaborative Agricultural Biotechnology Initiative (CABIO) that funds research on GE crops.

Moreover, the current R&D paradigm is geared only towards the market. Often developmental aid denationalises decision-making and steers R&D towards the market. For example, ADB provides assistance to Indonesia for technology transfer in agriculture for agribusiness, thereby pushing farm production towards cash crops and shifting focus to mere yield increases. Such a limited vision does not take a holistic view of the farm, farming and the families around it.

### **Constitutional Reference**

Article 28 C of the Constitution of Indonesia mandates that (1) *Every person shall have the right to develop him/herself through the fulfilment of his/her basic needs, the right to get education and to benefit from science and technology, arts and culture, for the purpose of improving the quality of his/her life and for the welfare of the human race;* and that (2) *Every person shall have the right to improve him/herself through collective struggle for his/her rights to develop his/her society, nation and state.* According to Article 31(5) the government shall *advance science and technology with the highest respect for religious values and national unity for the advancement of civilisation and prosperity of humankind.*

### **Specific Law/Order**

The Law on Plant Variety Protection (No. 29 of 2000) based on the UPOV 1991 Act is designed to protect the research outputs of corporate plant breeders. Not specific to agriculture alone, there is also broader legislation entitled the National System of Research and Development and Application of Science and Technology (No. 18 of 2002). The national Law *Undang Undang* No.12 of 1992 on plant cultivation systems deals with certification and other requirements for releasing a new crop variety.

The Government Regulations (*Peraturan Pemerintah*) of 1995 on seed management and others dating 2004 deal with the procedures and conditions for use of a plant variety as a parental variety and the transfer of rights on the commercialisation of the "protected" variety. There is nothing specifically to protect and keep alive farmers' research, whether through positive directions to state agencies or by setting limits to public/private research enterprises.

### **Legal Actions, Court Judgments**

This case of the introduction of a new variety of orange tree in an island of Southeast Sulawesi shows how external research can actually counter and erode local farmers' resources. Orange farmers in five villages within *kecamatan* (sub-districts) Sampolawa and Batuga in the southern part of *kabupaten* (district) in the province of Buton lodged several complaints to government officials about problems with a so-called "improved" variety of orange provided by the government. Many villagers alleged the project, valued at

Rp 11 billion, did not match the promises as specified in the official project document. The project, entitled P2AH (*Proyek Pengembangan Agribisnis dan Hortikultura* or Agrobusiness and Horticulture development Project) and funded by the Japanese OECF/JBIC, also displaced five hundred hectares of land cultivated with the local orange variety. Unfortunately, no action has been taken to hold the project accountable or to punish non-performance. The farmers resorted to their traditional know-how and replanted the land with their local variety of orange trees.

Another oft-discussed case in Indonesian farmer circles is one that shows how farmers' creativity and access to planting material can be curtailed. In June 2005 small farmers who bred and used seeds of corn were prosecuted in at least two district-level courts in East Java province. They were accused of violating the 1992 law on crop cultivation, since they had supposedly sold certified seeds without permission from the certified holder. This case was brought to court by PT BISI, a subsidiary of a Thailand-based private company - Charoen Pokphand -- which had complained that the farmers were using seeds of BISI corn parental lines without permission. The same farmers, who had previously been contracted to work with PT BISI on a corn research project, found that, after their inputs into the research had been used, they had the law used against them! It seems that technology is not for sharing with farmers, though the research ideas and the know-how is the farmers themselves.

### Farmer Responses

Farmers want recognition of the contribution of their knowledge. So, even though they are not hopeful that any positive measure will come their way from either government or corporations, they want at least to be allowed to nurture their knowledge. Indonesian traditional agriculture is replete with examples of indigenous populations, peasant communities and small farmers with a history and a culture which needs to stay alive to stay relevant. For example, a Dayak leader explained that "correction techniques in our *Hitungan Bintang* [astronomic calculation system] need to be re-designed since the climate has changed and earlier reference points and pattern indicators no longer hold". Defense mechanisms and survival instincts have enabled the community of Dayak Pasir in *Kabupaten* (regency) Paser East Kalimantan to select drought-resistant varieties of local rice. Farmers lament that the experience with the tsunami was devastating, not only in terms of material loss but also because "relief" packages became an entry point for seeds and foods from outside and this did not in any way contribute to the recuperation of local farmer-led, farmer-centred and farmer-oriented research.

### Customary Practices

Indonesia's tropical farming systems practised by its small farmers have more than enough know-how about seeds and soils. Farmers have several locally-conceived categories of ecological zones, in both lowland and upland areas. The ancient classical Javanese society has classified land into *sawah* (wet rice fields), *gaga* (*pegagan*, rainfed fields for rice), *tgal* (*tegalan*, dryland for horticulture), *kbuan* (*kebun*, or *talun* mixed garden) or *taungya* (in Myanmar). Likewise, there is folk innovation in seed broadcasting: for example, Java small farmers have been applying the *uritan* method through the "broadcasting of rice seed in the form of string" (*tebar-tangkai*). Just as significant for lowland farming systems is the folk innovation of *surjan*, which are raised and sunken crop beds. *Surjan* is composed of rice cultivation in sunken beds and non-rice crops grown in an intercropping system in raised beds, along with various other seasonal crops, fruits and trees. This system reflects an indigenous way of working with the local nature in Java: Javanese farmers maintain a harmony between the macro-cosmos (the universe) and the man-made micro-cosmos (specialised ecology). The ecology of the *sawah surjan* system also has an inbuilt strategy of maintaining gender balance with continuous labour inputs from both men and women throughout the season.

Their systems work with seed selection as well, with Sepan farmers of Daya Pasir in Balikpapan Bay of East Kalimantan always selecting the best rice grains, picking them last during the harvesting season, and placing them in the most respected part of the rice barn. These rice grains are called *mamak-padi* (the foundation seed). Most farmers in Sepan village grow rice varieties row by row without leaving empty space between the row. This leads to other innovations such as natural hybridization. Good seed selection is also found among farmers in Kalikotes Klaten Central Jawa, who use a different method called *nglanggori* (seed selection before harvesting so as to avoid natural pollination). In the past, there was an abundance of rice varieties as a result of the “not take all at once” principle: it was taboo to consume the whole of the harvest.

In the land of “*nasi goreng*”, the vast abundance of traditional rice varieties is evidence of the Indonesian farmers’ research abilities. In the southeast part of West Jawa, by tradition named *Periangan*, water used for house consumption, rice farming and fish raising with fish ponds are inter-linked. As Soemarwoto *et alii* observed, fish ponds often form part of the home garden system. The cycling and recycling process, together with the layered plant cover, protects the soil of the home garden from exhaustion, leaching, and soil erosion. The most popular rice farming system in Indonesia is *mina-padi* (rice and fish culture), which has several configurations. One such configuration is the containment of rice and fish within the same ponds, which are also used for the disposal of human waste which acts as nourishment for the fish and rice.

Traditional multi-cropping and home gardens – *pekarangan* (mixed gardening) etc. -- are also local and small examples of the ways in the which the farmers’ wisdom takes into account ecological, cultural and social factors. By and large, home gardening has been perceived as *apotik hidup* (live drugstore) or living healing so as to stress the close relationship between prevention and curing in combating human illness and disease. Kaili farmers, the indigenous people of Central Sulawesi, cultivate in hilly rainfed areas two rice varieties as their staple food, along with other crops such as maize and sweet potatoes. Communal villages in Bali, which had the highest per capita level of rice consumption in Indonesia from 1984-1989, cultivate rice of at least four different colour (black, yellow, red and white). In like fashion, until recently the farmers of Kalikotes used to grow at least five different varieties of rice. It is also important to point out that villagers use many so-called weeds, which may grow spontaneously but are also useful plant. So there is little space or need or time for research into the weedicides and herbicides that the corporate “life science” companies want to sponsor.

**THE WAY FORWARD** is to revitalise the sense of shared interests and shared experiences that have held communities together. It is clear that complicated techno-fixes can NOT provide peoples’ solutions for problems that the “outside” inflicts and that these collective agricultural solutions need to be studied and researched.

Conceived and developed by Biotani Indonesia Foundation ([www.biotani.org](http://www.biotani.org)), in collaboration with GRAIN, under an initiative on behalf of BASA-Asia (Biodiversity in Action for Sustainable Agriculture in Asia)