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# Farmer Field School or Participatory Technology Development?
## - a comparison of principles and results of two participatory approaches –

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***by Rik Thijssen*[1]**

**Abstract**
Within the Sustainable Agriculture programme, jointly implemented in Indonesia by the international development organisation Vredeseilanden and its local partner organisations, both the Farmer Field School approach and Participatory Technology Development were introduced. In this short paper, objectives, principles, processes and results of both approaches are compared, to provide a basis for exploring their most appropriate use.
This comparison shows that several principles underlying the FFS and PTD initiatives are common to both approaches. Despite some trend towards convergence, it is argued that key differences remain. FFS and PTD initiatives are seen as complementary and synergistic. Both agricultural development approaches also have some specific key qualifications, which could serve as learning points for each other in strengthening the distinct development initiatives.

**Introduction**
Vredeseilanden Indonesia (VECO), in collaboration with more than 40 partner organisations spread over large part of the archipelago, is implementing a large programme on sustainable agriculture. The focus within this programme is on low external input agriculture (LEISA), inspired by the ILEIA publication *Farming for the Future* (Reijntjes et al., 1992). Participatory (or People-centred) Technology Development (PTD) is presented herein as a path to LEISA. It refers to approaches that aim at strengthening local capacities to experiment and innovate. The general methodology is:

- gaining a joint understanding of the main characteristics and changes of the particular agroecological system;
- defining priority problems;
- experimenting locally with a variety of options derived from indigenous knowledge, *i.e.* from local farmers and from farmers elsewhere, and from formal science;
- and enhancing farmers' experimental capacities and farmer-to-farmer communication.

Field staff of VECO's partner organisations are involved in the facilitation of PTD experimentation with farmers. Generally, first, simple experiments are done with a whole farmer group, what should lead to the formation of PTD-groups by farmers with a

[1] Advisor Sustainable Agriculture, VECO Indonesia, Email: fadori@denpasar.wasantara.net.id

specific research interest. Until now, government extension staff is only in few cases involved in the PTD processes, while a link with formal research seems to be even more difficult to establish. On Java, rare study visits to research stations have proven to be of great value (Ambarwati et al., 2002).

In line with general agricultural developments in Indonesia, the FFS approach was also introduced to most partner organisations of VECO. FFS are designed for groups of 20-25 participants from one community. This approach requires significant institutional commitment and support, usually provided by the national extension service, although other mechanisms are possible where this is lacking.

Although PTD and FFS share more or less the same age, the FFS approach can boast of success in several Asian and some African and South American countries, with followers in some 30,000 villages in Indonesia alone, while PTD practitioners seem to be still few, although reports come from all over the world.
Support for FFS is provided by major organisations such as FAO, the World Bank, UNDP and members of the CGIAR system (IRRI, CIP, CIAT), while PTD receives backing mostly from few international NGOs (SIDA, Novib, VECO).

Now that almost all partner organisations of VECO in Indonesia have been introduced to both FFS and PTD, staff of these partner organisations, farmers as well as other stakeholders (researchers and extensionists), by now, might be wondering how they relate to each other, and what are their comparative advantages. Some have even suggested that PTD initiatives could better give way for the obviously wider accepted and more successful FFS.

This paper attempts to compare their objectives, principles, processes and results as a basis for exploring their most appropriate use.

**Objectives of both approaches**
Originally the FFS were developed in Asia to address a major food security threat caused by severe losses in rice production by the brown plant hopper (Winarto, 1995; van de Fliert at al., 1995). The main objectives of FFS were to improve farmers' analytical and decision-making skills, develop expertise in IPM, and end dependency on pesticides as the main or exclusive pest-control measure. To accomplish this, farmers had to gain an understanding of the ecological principles and processes governing pest population dynamics. The FFS provide an opportunity for learning-by-doing, based on principles of non-formal education. Change agents (extensionists, NGO staff) or trained farmers facilitate the learning process, encouraging farmers to discover key agroecological concepts and develop IPM skills through self-discovery activities in the field (Ooi, 1996). This initial classical FFS for integrated pest management (IPM) on rice was subsequently broadened in a second generation of FFS to address also other crops and topics.

PTD is a complementary process which involves linking the power and capacities of agricultural science to the priorities and capacities of farming communities, in order to develop productive and sustainable farming systems. PTD is a process of purposeful and

creative interaction between local communities and outside facilitators but does not intend to be a substitute for station-based research or scientist-managed on-farm trials (Reijntjes et al., 1992). This approach to technology development is closely linked with a process of general community development on a self-reliant basis. The activities involved in PTD – critical analysis of community-managed changes in the agroecological system, identification and use of indigenous technical knowledge, reconstruction of successful local innovation, self-organisation and self-implementation of systematic experiments with selected options – all foster the awareness, self-respect and self-confidence as well as the diagnostic and experimenting skills of the farmers involved.

**Principles of both approaches**

Agroecological systems – even complex ones – are structured by a few key processes. When managing an agroecosystem, it is important to understand not only its components but also the patterns and processes defining the relationships among them. Another key concept of the FFS approach is the *indicator*. Because successful agroecosystem management depends upon system health, the FFS emphasise the importance of health indicators and develop the capacity to formulate them (Braun et al., 2000).
Although NGOs play an important complementary role within national extension strategies, it was felt that the limited scope of their projects prevented them from being the main channel for diffusing IPM extensively (Matteson et al., 1992). The only way to reach a significant number of farmers and ensure continuity and quality of IPM training and extension was to integrate these processes within a national programme agenda.

PTD does not attempt to generate results that can be generalised across wide areas, although it may well do so. The specific techniques and farming-system adaptations generated by the process are primarily of very localised validity.
PTD practitioners work with the rich store of local knowledge and information to describe and explain problems and relationships and to test possibilities. PTD is concerned mainly, though not exclusively, with extrapolating from local knowledge and experience (including locally available scientific knowledge and experience) to describe, explain and test technical options with local validity. This aspect necessitates facilitation by a change agent 'possessing good communication skills' (Hoang et al., 2001).
Another main principle of PTD is that its practitioners can be based in any rural and agricultural development service or project as well as among members of a local community. They may be experienced agricultural field staff from governmental or nongovernmental agencies, retired government extension or community development workers, or village leaders with agricultural training, but may also be research scientists.

Main contrasting elements between the two approaches can be clustered as follows:

- *perception of 'participation'*; while PTD promotes a bottom-up learning environment based on Indigenous Knowledge, FFS provide a more traditional teacher-student for learning about (agroecological) knowledge held by outsiders.
- *attitudinal changes*; where PTD seeks major changes in attitudes of researchers and extensionists, FFS could be seen as a more effective way to accommodate existing attitudes of these professionals;

- *the learning process*; although for both approaches based on self-discovery activities, FFS set their 'fixed' learning targets while PTD is an open-ended process.

**Processes within both approaches**

Although PTD-groups and FFS are organised differently, they share several processes such as facilitation, motivation, research and diagnosis. Nevertheless, some apparently similar processes have different objectives. Main contrasting elements between the two approaches can be clustered as follows:

- *project approach* in FFS contra *programmatic approach* in PTD;
- *objective of diagnostic meeting*; the village diagnosis meeting held during the preparation for FFS seeks to determine whether the community fulfils the criteria for establishing a field school and to help the facilitator orient activities towards the local agroecosystem. The diagnosis for a PTD-process aims to define the agricultural research topic that the community entrusts to the research group.
- *scope of activities*; all possible facets of farming systems depending on locally felt needs (PTD) or focus in FFS on certain components of farming systems (one crop, one problem, one agricultural practice) which is perceived as of great importance for large areas;
- *many aspects of the research process*: content, type of experimentation, data collection and analysis, participants, continuity, scale, etc.

**Results of both approaches**

Outcomes common to both approaches include:

- increased farmers' capacity for research, innovation and informed decision making;
- development of farmers' capacity to define their own research agendas in the PTD-process and as part of possible FFS follow-up activities;
- stimulation of farmers to become facilitators of their own research and learning processes;
- increased responsiveness to farmer-clients' demands and needs by organisations in national research, extension and development systems.

There are, however, also impediments for effective implementation of both approaches. In Indonesia, practical bottlenecks experienced in PTD initiatives include:

- Attitude and interests of facilitators; if agricultural development professionals are to adopt participatory approaches, they must also be able and willing to do so.
- Commitment of facilitator during process; since PTD-processes are continuous and open-ended, farmers should be able to constant rely on their research-partners.
- Inclusion of local knowledge, means and practices; what often turns out to be mere intention, but in practice receiving very little attention (where are all the inventories of natural resources and indigenous knowledge?).
- Lacking knowledge/exposure hinders farmers to find appropriate solutions; an aspect where PTD-groups can still learn a lot from the FFS approach, but there is also a clear need for more information on LEISA.
- Experimental designs; farmers experiment normally in a completely different fashion compared to formal research designs. The gap between these different approaches has not yet been satisfactorily bridged by a kind of PTD experimental designs.

- Lack of involvement of research and extension services; partially because of non-availability of agricultural development professionals (especially in more remote areas) and for other part because the PTD-process is not appealing enough for these professionals.
- A policy environment that is far from enabling PTD-processes; again a field where FFS (for IPM) is accommodated in a much better way, with their approach being internalised in the national extension system.

There remain also several limitations for FFS initiatives in Indonesia:
- FFS-programs are resource intensive and hence suffer easily from the fact that they are project dependent (v.d. Fliert, 2002).
- The learning process is often interrupted when facilitators have to move on to the next village; sustained learning and collective action could possibly be encouraged by a broadened scope of interrelated farm management topics and skills in the FFS content, on one hand, and involvement of community-based organisations and farmer leaders in FFS implementation and follow-up, on the other hand (v.d. Fliert, 2002).
- Inadequate inclusion of local knowledge and practices; because of time limitation, relative narrow focus and general approach of FFS, only 'superficial', more easily recognisable local information is accessible. Conditions for accessing latent indigenous knowledge are not met (Thijssen, 1996).
- Questionable if FFS are also organised in more remote or isolated areas.

**Conclusions**

The question now should be if FFS and PTD-groups differ sufficiently to justify the application of both within the same area? Despite some trend towards convergence, such as the Integrated FFS initiative (Astuti et al., 2002), key differences remain. FFS are based on agroecological education; PTD-processes focus on establishing a community based agricultural research service with links to the formal agricultural research system. FFS are limited in time to one or two cropping seasons; a PTD-process is permanent. Experimentation in FFS is usually of a holistic type that requires integrated contextual analysis of agroecosystem pattern, structure and relations. PTD, in contrast, concentrate on experimentation through controlled comparison.
Therefore, although there might be many similarities in the two approaches as well as some convergence, it should be concluded that the FFS and PTD initiatives are complementary and synergistic.

In their endeavours to tackle the above mentioned bottlenecks, PTD-groups can borrow from the FFS principle on educating farmers on (agro)ecological components, patterns and processes. This is not reserved for (agro)ecological aspects of importance to IPM, but can also be applied on various other agricultural issues, such as soil fertility work, erosion processes and soil moisture storage, interactions between plants, as well as aspects of feeding farm animals. Furthermore, PTD initiatives could attempt to lean more towards the policy environment created in Indonesia to accommodate FFS.
On its turn, FFS should ascertain increased attention for reversing attitudes of agricultural development professionals, in order to facilitate increased involvement of these

professionals in PTD work. PTD groups can be instrumental in generating locally adapted technological options to strengthen FFS.

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