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FACILITATING THE EMERGENCE OF LOCAL INSTITUTIONS

Reflections from the experience of
the Community IPM Programme in Indonesia

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FACILITATING THE EMERGENCE OF LOCAL INSTITUTIONS:

Reflections from the experience of the Community IPM Programme in Indonesia

This brief paper will try to provide an overview analysis of recent experience in the promotion and facilitation of local institutions for sustainable IPM (Integrated Pest Management) in Indonesia.. By nature, this topic is very broad. This paper will not attempt to be encyclopedic in scope, but rather will attempt to examine the issue from several key perspectives while relating to concrete experience in the field.

Outline of Issues addressed:

1. Which 'Local Institutions' are we talking about with reference to Community IPM?
2. The Training Perspective: From Extension to Education: what knowledge/capacity building interventions can lead to the emergence of local institutions?
3. Organizing in Community IPM: from Expert Farmers to Empowered Communities. What concrete steps can be taken to build local institutional strength?
4. Impact Assessment:: how do we know if facilitating local institutions makes a difference?

I. WHICH LOCAL INSTITUTIONS? A BRIEF TAXONOMY

When we discuss 'local institutions', a broad range of human affiliation structures come to mind depending upon our experience, our positions, and our programs. These can range from 'de-centralized' credit schemes run by the central government banking system all the way to the family unit as the basic 'institution' charged with maintaining the welfare of its members. Some of the broad categories of 'local institution' can be outlined as follows:

- Governmental and Quasi-governmental institutions: including the whole range of government supported service provision structures for healthcare, education, credit, marketing, etc. to 'quasi' governmental organizations such as farmers groups created by government extension, boy/girl scouts or youth organizations linked to local government, various kinds of government sponsored cooperatives, various 'women's auxilliary' organizations, and so on.

- LSM/LPSM “Self-reliance Organizations” (NGO’s/PVO’s?): a wide range of organizations operating at local levels but having a variety of ‘roots’ in political organizations, professional aid organizations, student activism, ‘parallel development’ organizations (for example: undertaking work similar to government agencies but with either differing target groups of differing approach methodologies, different sources of funds), credit/consumer unions, environmental activist groups, issue advocacy organizations, ‘welfare wings’ of religious organizations, etc. In Indonesia, as in many Asian countries, literally thousands of these organizations exist varying from ‘single person charismatic’ foundations to organizations with thousands of fulltime professional fieldworkers.
- Traditional/indigenous institutions including local religious groupings, traditional water-user societies, traditional credit mechanisms, customary traditional forums encompassing everything from traditional law to neighborhood security to traditional medical care to traditional performance art and media. In other words, the indigenous institutions that development programs often try to ‘use’ as delivery vehicles or support systems for government/NGO programs (sometimes coopting or killing the traditional organizations in the process)
- Emergent, Popular, or “Community-Based” organizations. The topic of this paper. Groups, associations, and networks of people that grow out of purposive/intentional activities developed (often initiated or ‘facilitated’ from the outside at the outset) to address specific issues facing communities. Leadership and initiative is dispersed and generated anew from within the organization membership (not relying solely on existing ‘formal and informal leaders’), and the organization remains accountable to its grassroots constituency. Organizational forms vary according to location and wishes of each particular group with no formal ‘model’ or set format.

These emergent, community-based organizations are of specific interest since they represent an evolution in development thinking. As central government resources, and hence roles, in development shrink the burden of ‘sustainability’ is increasingly shifting to the so-called ‘beneficiary community’ itself. Conventionally, many efforts were geared toward maintaining activities (‘institutions’) though ‘participation’ wherein beneficiaries carried an increasingly larger share of the ‘costs’ of development. Emergent institutions instead begin to place demands upon the larger system for more control of the basic design of institutions and programs, while demanding greater access to the process of resource allocation.

Community-based institutions are also of immediate interest in that they demand new roles and relationships with conventional government and NGO service agencies. More interesting, when government takes the role of ‘facilitator’ in supporting emerging institutions fieldworkers must undergo a fundamental change of perspective accompanied by learning new skills and approaches. The interface between outside facilitators and emerging

institutions is crucial. There are more than a few contradictions and conflicts embodied herein.

In particular, this analysis relates to experience in Indonesia and several other countries in the Asia Region that have embarked upon Integrated Pest Management programs based upon the Farmer Field School approach. Hence this case begins with rice farmers trying to make a living through rice cultivation; the largest single form of livelihood on the planet. As these programs progress beyond 'bugs' into ecological agriculture ('living soils', nutrient management, water resource management, plant/seed development, local action research) and beyond training and education toward the development of local institutions; fundamental changes in roles and activity structures occur.

II. THE TRAINING PERSPECTIVE: FROM EXTENSION TO EDUCATION

"IPM is an Ecological Approach where agriculture is viewed as a complex, living system in which humans interact with land, water, plants, and other organisms in an attempt to optimize existing resources. IPM promotes sustainability by applying ecological principles in the cultivation of fields and farmers learn how to optimize resource use by managing the ecosystem...."

FARMERS become experts, and the central focus of the agricultural system. Farmers become active, independent, competent 'subjects' within agricultural development. Farmers are the main owners, implementers, and developers of IPM. Farmers determine their own needs and create solutions and practices appropriate to specific local conditions"

- Decree of Indonesian Minister of Agriculture on IPM, May 1994

The IPM Farmer Field School program emerged out of a concrete, immediate problem. Farmers across Asia were (and in many if not most places still are) putting their crops, their health, and their environment at severe and immediate risk through massive abuse of highly toxic pesticides promoted aggressively by private industry and government. Pest species have become resistant and in some cases resurgent. As farmers applied more and stronger pesticides, pest problems become more, not less, severe as farm communities took their place on the 'pesticide treadmill'. Pest management problems, based on biological systems, are also ferociously local, defying attempts (even very costly ones) at control from the macro level.

What was called for was a large scale decentralized program of education for farmers wherein they would become 'experts' in managing the ecology of their field – bringing better yields, fewer pest problems, increased profits, and less risk to their health and environment. "Grow a Healthy Crop" is the first principle of the IPM program.

The IPM Farmer Field School program emerged out of failure. Numerous attempts at IPM training were undertaken across Asia utilizing an array of conventional methods. Strategic extension campaigns, 'mass guidance' programs, short courses, 'training and visit' extension systems. Most had little impact, or even back-fired resulting in increased pesticide use. At heart, IPM goes against the 'conventional wisdom' of green revolution agriculture that had to a great extent been internalized by a generation of farmers.; 'more inputs, better farming'. And perhaps against a basic tenet embossed in the human psyche since the biblical days of 'locust plagues', eg. "the only good bug is a dead bug". The task of re-educating farmers in field ecology and making them 'experts in their own fields' was indeed daunting. All the poster campaigns, technological packages, brochures, calendars, promotional lectures, and radio spots had failed. How were simple, uneducated farmers to master complex, local specific ecology? What was called for was a 'paradigm shift' in how we worked with farmers¹

From Extension to Education

The concept of the Farmer Field School grew from the roots of nonformal, participatory education and action research. Scientists involved postulated that since all agricultural knowledge originates from the field, that a return to the field to 'discover' the principles of ecological management was demanded.

The basic framework of the educational approach from which all methods and techniques were derived is based upon the taxonomy of learning put forward by sociologist Jurgen Habermas.² This learning framework does not break education down into the usual 'cognitive, affective, psychomotor'³ areas, but rather addresses three more fundamental human interests, which can be delineated in brief as follows:

1, The Technical Domain of Work: The identity of a farmer, anywhere in the world, is closely tied to his interaction with soil, plants, weeds, credit, fertilizer, seeds, and weather. How well he can analyze, predict, make use of available resources, react to changes in conditions, and understand the dynamics of his field determine his success as a farmer, and often his self-esteem and credibility within his family and community.

An axiom of community development states that good programs start with immediate, concrete activities that can be mastered and that are of immediate importance. This gives participants a taste of success, breeding confidence while they learn how to approach and solve problems. The task of the Farmer Field School was to build upon existing farmer knowledge by providing the methods and frameworks that would allow farmers to regain control of their fields. If one has ever seen the look on the face of a farmer who doesn't comprehend why he lost his crop, despite all his hard work, one can readily

¹ See appendix I: "Old Paradigm, New Paradigm". The Indonesian National IPM Program

² Jurgen Habermas, Knowledge and Human Interests, Boston, Beacon Press 1971.

³ Benjamin Bloom, Handbook on formative and summative evaluation of student learning, MacGrawHill, New York, 1971.

understand the empowerment that occurs when a farmer regains control based upon direct understanding.

From this emerged the entire 'Farmers As Experts' approach underlying the Farmer Field School. Needless to say, before the Farmer Field Schools could be undertaken a huge effort was needed to 're-educate' fieldworkers. In Indonesia, it was found that only 5% of agricultural extension workers had actually grown a rice crop themselves. Before they could work with farmers in fields, they had to undergo a season-long, intensive program (roughly 500 hours, with 3-6 hours per day in the field) before they were ready mentally, attitudinally, and even physically to work directly with farmers in ecological approaches. Fieldworkers need to be prepared for an evolutionary change in their roles as programs progress [See Appendix 1 'Metamorphoses of Farmers and Trainers'] The roles of these 'facilitators' has been greatly expanded as the program has progressed.⁴

The methods utilized in the Field School were designed to be congruent with the 'Farmers as Experts' principle. In Field Schools farmers themselves learn to conduct experiments independently, create learning materials on their own, manage a 'field laboratory', and plan for special sessions such as 'IPM Field Days' or "IPM Popular Theater'. Farmers do not master a specific set of contents or 'messages', rather they master a process of learning that can be applied continuously to a dynamic situation: the ecology of their field. (see appendix: The IPM Farmers' Field School)

2. The Domain of Interaction and Communicative Action: Farmers do not work in a vacuum. Their attitudes, decisions, perspectives, and practices are greatly influenced through their interaction with their peers and community. Sit in on any informal gathering of within a farm community: at the mosque, at the market, at the coffee stall, or on the front porch. Farmers talk about farming. They talk of seeds, fertilizers, credit, prices, weather, traditional beliefs, things they've heard from outsiders, new products, and all other kinds of hearsay that becomes common or consensual knowledge' within the community. Just as farmers are always experimenting, they are also always collecting and sorting and weaving new information into the fabric of their lives. Educator Jack Mezirow, drawing from Habermas states:

"Helping adults construe experience in a way in which they may more clearly understand the reasons for their problems and understand the options open to them so that they may assume responsibility for decision making is the essence of education"⁵

From the outset the Field School intentionally included processes and methods that would provide the 'tools' that farmers could use collectively and collaboratively to collect information, conduct analysis, draw conclusions, and

⁴ IPM trainers have also undergone metamorphoses. Increasingly, experience 'Field Leaders' are replacing international consultants across the region in the initiation of Asia Regional IPM Programs. To date, Indonesian Field Leader teams have conducted training in Vietnam, Cambodia, Bangladesh, and The Ivory Coast. Teams are currently conducting training in Cambodia, Thailand, and China. Cross-visits of IPM Farmer trainers across national boundaries is planned to start soon.

⁵ J. Mezirow, *A Critical Theory of Adult Education*, Adult Education, Vol. XXXI, no.3, 1980

make decisions. Often the results of these processes form a consensual reality, combining accumulated experience with new learnings and perspectives

From the beginning, participants in Field Schools work together in small groups to collect data from the field, generate analysis through discussion, present results, conduct experiments, and make group decisions for field management. For many farmers, unaccustomed to even speak in front of groups, this confidence building and process mastery is the most important outcome of their Field School experience.

Interaction skills are also addressed directly through exercises in communication, collaboration, group problem solving, and discussion/analysis techniques. The processes used for analyzing social reality are in essence the same as those employed in 'discovering' ecological realities in the field. For instance, the classic 'Agro-ecosystem analysis' process used by farmers across Asia is actually based upon Kurt Lewin's 'Force Field Analysis' technique developed for social psychology.⁶ These skills are applicable not only to IPM, but also to everyday life in the community. As with most programs, practice makes perfect. These skills do not come overnight, but must be practiced and reinforced, and elaborated upon over time. This is assisted by the length of the Field School which lasts across an entire season and is begun with preparatory meetings which also include participatory methods of problem analysis and participant selection such as labor analysis, mapping, and joint 'learning contract' formation.

3. The Domain of Emancipatory Action for Empowerment:. Emancipatory learning is the next step. In this domain people must examine their internal or group constraints and options as they relate to a larger social, political, economic, and ecological environment. Field Schools are only the first step in Emancipatory Learning since this requires concerted and intentional action over time based upon analysis of opportunities and constraints within a larger social universe. In this sense, the initial Farmer Field School, and even follow-up activities such as Farmer-to-Farmer training, farmer action research/field studies, etc. are just the 'primary school' for empowerment and local institution building.

From experience, we have found that while Field Schools may lay the groundwork for emancipatory learning; further efforts are needed to allow for the evolution of empowerment within the community. Gaining control of one's fields is a first step, but soon farmers run into forces and systems outside their immediate control that must be addressed through other kinds of action.

⁶ Kurt Lewin, *Social Equilibria and Social Change*, Human Relations, 1947, no. 1

III. COMMUNITY IPM: FROM EXPERT FARMERS TO EMPOWERED COMMUNITIES

The Community IPM Programme is not just about bugs.

The IPM Farmer Field School program has been a great success. To date, over 1,000,000 Indonesian farmers have graduated from season long Farmer Field Schools in rice, vegetables, and rotation crops. The training and education model has also proven to be durable and replicable across countries, cultures, and ecosystems with large-scale programs taking place in Vietnam, The Philippines, Bangladesh, and Cambodia and start-up programs are moving in other nations in the region. IPM Farmer Field School programs have also spread as far as Africa. The content of the program continues to expand to encompass general ecological agriculture. However, if our goal is sustainable farmer initiative and the 'institutionalization' of IPM at the farm community level; just running Farmer Field Schools is not enough.

Through evaluations and case studies we did indeed find villages where the cadre of trained farmers had 'captured' their entire community as they continued to spread and deepen IPM. However, in other locations we found that, even where good quality Field Schools had taken place, the program had vanished with little trace. Based upon this, early in the program a number of activities we started aimed at strengthening the roots of the program within the community.

Follow-up Programs and Further "IPM Heresies"

Former Bangladesh Minister and FAO Assistant Director General Mr. Obaidillah Khan once stated that "IPM is founded upon, and driven by, "Development Heresy". The first Heresy was Farmers as Experts. Soon, most of the dis-believers had seen with their own eyes that farmers could indeed master 'complex' agro-ecology.

The second heresy was 'Farmers as Trainers'. We postulated that if farmers could master the process of 'discovery learning' in their own fields, they could also facilitate other farmers in their learning. The first 'Farmer to Farmer' IPM field schools emerged spontaneously. They were then built in as an integral part of the program. Currently, nearly 50% of all IPM Farmer Field Schools are organized and run by IPM Farmer Trainers. Over 20,000 Field School graduates have gone on to be trained as Farmer Trainers and conduct field schools for other farmers.

The third heresy was 'Farmer Researchers'. Most believed that farmers would be limited to simple experiments and 'demplots'. However, in hundreds of locations farmers are currently engaged in field scientific investigations of complex local problems. Farmers are undertaking programs previously thought impossible, such as the rearing, breeding, spreading and maintaining of complexes of biocontrol agents (parasitoids, virus, bacteria) while training

other farmers in their use. Now, IPM 'farmer researchers' are often invited to national research meetings on IPM to present their findings and their programs. Needless to say, researchers unfamiliar with the independence, intelligence, and diligence of IPM farmers are initially shocked.

The Emergence of Community-based IPM

Again, we found that while this increasingly complex array of farmer-based activities was of great help in broadening and deepening IPM; the program still resembled a 'menu' of follow-up activities and dependency upon central and provincial project funds remained high.

The fourth heresy was 'Farmer as Strategic Planners and Organizers'. In many locations networks of active IPM farmers had been established, and many of the functions previously done by government or NGO fieldworkers had been taken over. However, the organizers of most activities, except at village level, remained with outsiders. Numerous activities had been done with farmers in the area of planning, but nothing had been done to pull together the networks of active IPM farmers doing science, training, and other activities into a coherent and viable organization.

Within **Community IPM**, activities were developed that would provide trained farmers with the skills and opportunities to build their own institutions. For this, a number of different types of Forums (fora?) were initiated, at first funded by the national program. These included seasonal Planning Meetings for IPM farmers from villages and sub-districts. Herein farmers were trained in participatory planning methods while making actual plans for their groups while allowing plans and planning skills to be honed through interaction with other farmers. Groups were linked across communities and across villages into networks where they could discuss their plans and share experience. Farmers were also trained in methods of 'lobbying' local government and applying effective demand through organizing. Once again, the farmers surprise people in their ability to develop thorough and detailed strategic plans incorporating problem and social analysis, 'Vision', 'Principles for action', Strategy, Tactics, and operational plans. Methods supposedly reserved for MBA programs and private sector management such as SWOT analysis or ZOP/Matrix Planning have worked easily and effectively with so-called 'uneducated' farmers. A wide range of other participatory methods drawn from NFE, action research, PRA, etc. are also employed.

Farmer Technical Meetings were also held to bring together networks of farmers involved in experimentation in their communities. These meetings involved sharing of results, cross-visits, and joint planning of activities to tackle common problems.

Farmer Trainer Networking: experienced farmer trainers with high personal investment in the program continued to be 'motors' both within and across communities. Training of new 'farmer trainers' was increasingly conducted and supported by experienced farmer trainers

Farmer Media: training and small amounts of initial funding were made available to IPM farmer networks interested in producing and disseminating their own bulletins, brochures, cases, posters, and even people's theater.

Community IPM, as shown in Appendix 3, made organizational activities one of the 'three corners' of the pyramid of farmer empowerment.

In recent seasons this has been taken further with experiments in further Heresy including Farmer Strategic Planning and Farmer Policy Making. As the 'Reformation' period in Indonesia has begun, so has IPM Farmer involvement in local politics since their networks represent one of the few organized institutions composed of true farmers.

Most of these activities were focused at the sub-district level, which is seen as a 'strategic universe' for farmer organizing. In Indonesia, the sub-district is the interface between government and other services (banks, markets, etc.) and rural communities. Villages are often too small to provide the scope of institutions that farmer organizations need to interact with to improve their access to resources. But sub-districts are not so large as to be abstract: villagers all know the other villages in the sub-district and have probably been to them; villagers know the sub-district officers and the main town and its agencies; villages can travel from one end of the other without too much time or expense; and in general sub-districts in Indonesia are small enough to share similar agro-ecological features.

Institutional Diversity. An array of IPM Farmer institutions have sprung up across the country. These vary from single-village focused activities to Province-wide 'IPM Farmer Congresses' involving thousands of people. Some IPM Farmer institutions' have taken the form of networks, with meetings and leadership revolving across specific geographic areas. Others have formed more formal 'associations', some even with official legal body 'foundation' status. Some have made close links with local government at various levels and serve as training/service agency for government programs. Others have linked to local political or social forces, such as Islamic organizations. In the last 6 months, some have even begun to dabble in the heretofore forbidden realm of 'practical politics', organizing campaigns and getting IPM Farmers elected to village head positions (8 so far in West Java province alone).

As a point of principle within Community IPM, the training, education, funding, and other opportunities and resources provided DO NOT foresee or proscribe any specific institutional outcome. The job of outside organizers is to provide tools, methods, skills, experience, opportunity only. The countryside is already littered with thousands of hollow-shell organizations formed by projects, and abandoned after the 'project' was over. The hope is that emerging organizations will be as diverse as the cultural, ecological, and socio-political features of each area. It is up to the farmers themselves if they want to organize, for what, and how.

At present various forms of IPM Farmer Organizations are still emerging, growing, dying, evolving, stalling, prospering, disappearing. Current efforts from the ‘facilitators’ involves bringing Farmer Organizers into the analytical dialogue through programs geared to provide farmers themselves with the ability to document and analyze, to ‘map’, the progress of their institutional initiatives and to formulate ways to further strengthen their efforts.

Most challenges still lie ahead. We are not naïve concerning the inherent contradictions of having ‘agents of the state’ attempt to turn projects into *movements*. We also must admit that IPM is forced to travel ‘upstream’ against a very strong set of conventional policies, practices, and attitudes. And as in any large program, there is great variance in results. Some locations never cease to surprise, while others show their inherited genetic flaws as supposed ‘people’s organizations’ succumb to what Philipino activists term ‘Fasipulation’ (the hybrid of ‘facilitation’ and ‘maniupulation’). The aim of promoting Community IPM in its broad sense also puts a great burden of expectation on new programs in new countries, where just trying to make the change to more ecological agriculture is more than challenging enough. And currently across the region amidst the ‘economic crisis’, many governments are allowing IPM and Farmer supportive policy to ‘slip’ as the urge to return to more conventional approaches remains quite strong and ‘private interest’ pressure increases.

“Never in my Wildest Dreams did I think that a program about ‘bugs’ would bring the dawn of democracy and liberation to Indonesian villages”

- Journalist, Novelist, Environmental activist Mochtar Lubis in ‘The World Paper’

IV. ANALYZING THE IMPACT OF EMERGING LOCAL INSTITUTIONS

When we deal with the emergence of local institutions, with the empowerment of people and communities; the usual ‘impact indicators’ of development are not sufficient. In terms of IPM the usual indicators include farmer practice before/after, improved efficiency of input use, improved profitability, increased household income, decreased pesticide load on the environment, and less risk of illness or other negative effects of pesticides. However, as we have moved toward ‘institutionalization at the farm community level’, or ‘community IPM’, the frameworks used for analysis, and the approach to analysis has changed.

The more qualitative changes in the lives of farmers who have participated in IPM activities should be apparent and discernable in the evolution of:

- Farmers’ roles vis a vis IPM activities
- Farmers’ relationships to fundamental elements of their world

- Farmers' achievement of conditions/capabilities which allow them to realize their full potential

Within Community IPM a number of qualitative frameworks for analysis have been utilized. Importantly, the more that we move towards facilitating the emergence of local institutions, the greater the involvement of fieldworkers and farmers in the impact analysis process. As can be noted within the following frameworks, the 'indicators' are conceptual and require that participants be involved in defining the meaning of these concepts within their own social world.

Framework No. 1: Participation

The word participation has a wide variety of potential meanings and is often used to describe a variety of situations. When looking at participation in terms of emerging local institutions, the most important definition describes power and power relationships. For instance, a 'participatory approach' to learning should describe learning processes in which at least some power is shared between facilitator and learners. Many, many frameworks for participation have been developed over the years. Within IPM impact analysis a simple '3 level' framework has been utilized⁷

- Presence or Form: an activity or situation in which participants/beneficiaries are physically present or contribute their time or other basic resources.
- Representation: the level of participation where some sharing of power exists between participants and the 'initiators' of the activity. Most often, there is some mechanism allowing for participants 'voice' in the course of activities.
- Control: occurring when participants make the decisions affecting planning, implementation, resource allocation, and direction of benefits. While the group/organization may still interact and benefit from interactions with people or agencies, they are not dependent upon outside resources or skills.

In analyzing levels of participation, a detailed analysis can be made with local organization participants concerning their role in specific decision making categories such as planning, budgeting, resource mobilization, benefit distribution, overall/specific management, and evaluation. In short, WHO determines what activity will be undertaken? Who facilitates the activity? Who maintains control of the activity? Who controls funds/resources and how?

⁷ drawn from They Know How, Interamerican Foundation, 1976 sections on "participation as a process", and 'Social Gains and Relationships'

Framework No.2: Relationships

Farmers live in a web of relationships which constitute their world. The emergence of local institutions will have a direct effect upon these relationships. These relationships can be categorized simply as follows:

- Farmers relationship to the agroecosystem: Farmers, whether aware of it or not, are in a relationship with their local agroecosystem. They may be bound by myth or habitual practice into a relationship that has little room for positive action. They can become free actors aware of the range of options that exist and their ability to create new options.
- Farmers relationship to the farming enterprise: Farmers are in a relationship with their work. Facets of this relationship include the access to and use of farming inputs, the capacity and right to manage production practices, and the control of technologies employed on their farms.
- Farmers relationship to finance and money: This includes access to and the terms of credit obtained, freedom from/dependence upon loan sharking, and level of access to funds to support development of their family or group enterprise.
- Farmers relationship to agricultural policy: Local government policy, including how government officials implement policy and activities as well as whether farmers can act to affect policy are important elements of this relationship.
- Farmers relationship to other farmers or the general community: Facets of this relationship include farmers interactions with other farmers and village officials; farmers attitudes towards those interactions, and the locus of control of these relationships.

Analysis of relationships should demonstrate whether and how these relationships have changed either on the individual or collective level. Further, if there has been a discernable change; who benefits and how?:

Framework No. 3: Social Gains

As stated earlier, the facilitation of the emergence of local institutions has implications broader than simple 'improvements' of physical conditions. Achievements of local institutions can also be measured in terms of qualitative social gains including:

- Access: access refers to the ability and capacity to obtain needed resources on favorable terms. Access is improved when groups/organizations either establish new means to obtain resources or enhance existing channels.

- Leverage: leverage means bargaining power. Poor community members seldom have much leverage on their own. One of the key outputs of local institutions is the ability of organized farmers to effectively influence outside powers and resources that previously were beyond their control.
- Choices: this refers to the ability to make decisions among available options. Positive benefits include both increased number of options as well as increased ability to take a reasoned decision regarding those options.
- Status: local institutions should provide their members with improved self-image, increased self-confidence, and a positive sense of identity. Enhanced status may be recognized in the new roles that farmers play. This status will not just be 'self-perceived', but will also be evinced by others within the community interacting with members of the local institution.
- Critical Thinking: the ability, and habit, to accurately and systematically assess competing options or newly encountered situations/conditions. Critical thinking ability provides a method, or a process, by which local institutions can rationally analyze problems and opportunities.

The above sample indicators, plus others such as Dependency Relationships, Momentum, Group Cohesion, etc. tend to be open and conceptual; demanding of processing within the group

Once again, the process of defining qualitative indicators of impact should and can be done most effectively directly with local institutions. In essence, this type of assessment is a further means of 'facilitating' the capacities of local institutions and broadening their perspectives on life while honing their abilities at analysis. Within the experience of Community IPM, the richest and most complex analyses have been generated by farmers themselves.

V. CONCLUSION

The promotion of Community-Based IPM with its emphasis on facilitating the emergence of local institutions remains a work in progress. An increasingly broad range of actors are testing, documenting, and analyzing approaches and methods across an increasingly diverse range of social settings and physical environments. The only conclusion that everyone so far agrees upon is simple: THE FARMERS ARE NOT THE PROBLEM. If anything, they discover, or elucidate, the answers. Just as then President Soekarno in the 1950's spoke of 'Newly Emerging Forces' with reference to emerging nations and their fight against the shadow of neo-colonialist domination; we hope that 'Newly Emergent Institutions' can transform the power relationships in rural areas.

Appendix 1. Metamorphoses of Farmers and Trainers in the Development of an IPM Program

Phase	Functions of Farmers	Functions of Extension Workers
TOT	Farmer	Trainer
FFS	IPM experts	IPM Trainer
Follow-up	Trainer/ Researcher	Facilitator
Consolidation	Organizer	Networker

Appendix 2: Old Paradigm/New Paradigm

Agriculture and agricultural development have undergone changes that have been far reaching. The following draws a comparison between older approaches to agriculture and agricultural development and approaches that are more recent and reflected in the Indonesian National IPM program. The following, it is hoped, will help the reader to more clearly understand some of the underpinnings of the Indonesian IPM program.

Topic	Old Paradigm	New Paradigm
Time and Social Context	The technological fix model: Post WWII approach made heavy use of industrial fertilizers and pesticides. In the 1960s this approach was intensified in reaction to increasing hunger, geopolitical, and pesticide producer competition, Green Revolution was a result of this intensification; people had to be fed. Pesticide producers were not opposed by entomologists or by environmentalists. Plant breeding was seen as the answer to being developed as the technological fix. Centralized planning approaches were put in place to develop and implement plans that would quickly fix the problem.	People-centered systems model: Began in late 1970s as environmental health came to be seen to be as important as economic health. People-centered development and educational approaches were worked out. People became the focus the development as a way of getting the economy and society moving ahead. The Green Revolution was successful in getting enough food produced, but questions such as sustainability, health, environmental quality and local responsibility for development pose questions that Green Revolution central planners seem unable to answer. The postwar saw nations became independent of colonizers; the post-cold war will see individuals gain independence from central planners.
Package Technologies	Seen as essential to development of 'modern' agriculture. Seen as quick fix to avoid heavy investment in human resource development. People manipulated to 'grow' the economy.	Packaged technologies not working. Human resource development becomes focus, 'modern' agriculture grows because farmers seen as the central focus for development activities. People must develop before economy can develop.
Pesticides	Use of pesticides was unquestioned, considered as essential element in increasing yields. Part of package that also uses high yielding varieties and chemical fertilizers.	Pesticides seen as problematic. They cause problems, must be used based on farmer's analysis of ecosystem and as last alternative.
Fertilizers	Necessary to increase yields. Use of fertilizers subsidized by governments to ensure application and thus maintain high	Necessary to increase yields but should be used on a need basis. P and K do not need to have continuous high

	yields.	application rates. N fertilizers are important for high yields. Use of organic fertilizers encouraged maintaining the high quality of soils and micro-nutrients.
High-Yielding Resistant Seeds	Necessary to increase yields and can be effective without training of farmers. Sufficient if used in a package that includes pesticides and fertilizers to give high yields.	High N response and high tillering varieties are useful for compensation against disease and insect damage. New varieties should be able to better compensate for insect damage. 'Resistance' is best limited to disease resistance and some insects. Most pests can be controlled biologically.
Pest and Natural Enemy Recognition	Too difficult for farmers: Farmers even if they could recognize pests and natural enemies are not capable of making complex decisions relating populations and their interactions.	Recognition requires only a little training since farmers have seen these insects for years. Farmers able to analyze agro-ecosystem as basis for making field management decisions.
Definition of IPM and Decision-making	IPM makes use of count and spray approach. Focused on pest populations in the field as they relate to a centrally determined Economic Threshold Level (ETL). ETL is based on conditions found at central research site. Mechanical instructions given to farmer: count, compare with ETL, and spray when pest numbers over ETL. ETL often artificially low because government researchers afraid of being challenged if outbreaks occur. ETL largely considers only pest populations and is based on partial budget calculations. Basic approach is that pesticides are a necessity.	IPM based on set of principles: <ul style="list-style-type: none"> ❑ Grow a healthy crop that is resistant to local disease and is able to compensate for pest attack. ❑ Conserve natural enemies of crop pests so that pest populations constrained. ❑ Weekly field observation and analysis leads to informed management decisions. ❑ Holistic analysis is made taking into consideration the plant, weeds, rats, variety performance, insects, and environmental conditions. Decision-making is based on the integration of plant health/compensation, pest populations, natural enemy populations, potential yield loss, cost of control, projected commodity price, farm level economics and previous farmer experience. Farmer's profit becomes focus.
Farmer as Optimizer	Impossible! Must be done with a highly technical centrally planned package.	Essential element. Farmers better able to optimize their own environment than a centrally planned package.
Farmers and	Must use extension system that markets centrally developed	Farmers are capable trainers. Approach is based on

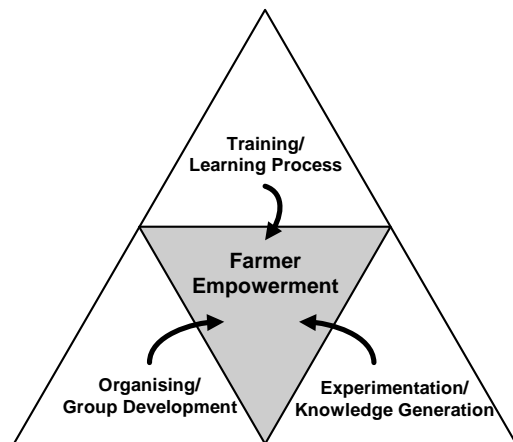
Training	message. Extension field workers bring message that farmers are supposed to implement. Farmers can carry, but they cannot train other farmers. Only elements of centrally organized extension system can conduct training. Dependence of farmers increased.	process of training not on a message to be conveyed. Farmers work in the field with assistance of local IPM expert to expand their field and analytical skills. Farmers can replicate this process with other farmers. Local situation defines topics and direction of training. Independence of farmers increased.
Research	Technology is developed in a central research institute and given to extension planners who then pass the technology down through trainers of extension workers and finally to farmers. Farmers and field extension worker are passive (sometimes forced) recipients of packages based on these technologies. On occasion, the research-based packages become 'menus' or 'options' from which to pick. Research fulfills centrally defined needs or needs of researchers for increased status. Research is not training driven, but driven training.	Research is carried out at all levels. Research centers continue do basic studies while developing process, which are employed to test research results locally. Local studies initiated with full farmer participation. Thus varietal trials, fertilizer trials, sampling methods, natural enemy exclusion, and other research are conducted locally in the field. Field extension workers and farmers are full partners in the process. Research fulfills farmers needs and responds to real field problems. Research is training driven.
Future Adaptation of New Technology	Requires centrally developed message to be passed down through extension system to field workers and than to farmers.	Farmers are both creating new technologies and processes as well as testing centrally developed packages.
Training Evaluation	Training results evaluated based on the extent of a package's adoption by farmers. Evaluation based on package and message planners' needs. Evaluation conducted by central staff. Results of evaluation are used to determine if farmers are 'modern', 'accepting', or 'capable'.	Training results evaluated based on extent of modification and integration of new ideas/methods being presented in training and their benefit to farmers. Evaluation used as decision-making tool to improve training so that farmers benefit from training and research. Field staff and farmers are involved in the development and implementation of evaluation. Results of evaluation used by researchers to determine future research agendas. Extension system staff evaluated by farmers.

Appendix 3: What is Community IPM all about?

σ **Community IPM** is about farmers organising and implementing their own IPM activities. It is about farmers becoming the instigators of IPM rather than just the recipients. It is about group action which uses the agro-ecological concepts of IPM to analyse problems, design field studies and carry out experiments. It is about farmers joining forces to promote and protect farming practices which they know are healthier and more efficient.

σ **Community IPM** has emerged from training programmes organised by Government agencies and NGOs in various parts of Asia. It is the graduates of Farmer Field Schools (FFS) who have decided to plan and manage their own IPM activities. Government and NGO trainers now have a new role to play in supporting farmers who are managing their own IPM activities.

σ The three basic elements of **Community IPM** are illustrated in the triangular diagram. Most **Community IPM** activities involve at least two of these elements, although different elements are prominent in different activities. Together, the three elements of **Community IPM** lead towards farmer empowerment. To use the words of one IPM farmer-trainer from Indonesia, this type of IPM helps farmers to *“stand on their own and think for themselves... to do their own field observations, make their own discoveries, make their own decisions, and take action on their own.”*



σ Examples of **Community IPM** activities where training is prominent are: FFS conducted by IPM farmers for other farmers; incorporation of IPM into the curriculum of local schools; IPM as part of functional literacy programmes.

σ Examples of activities where experimentation is prominent are: insect zoos and compensation studies, managed by farmers as part of FFS organised by the Government or NGOs; field studies which are organised and implemented by groups of FFS graduates; action research facilities, involving a number of studies carried out by IPM farmers over a number of cropping seasons.

σ Examples of activities where organising is prominent are: IPM farmer clubs, associations and congresses; planning and technical meetings organised by farmers; farmers' advocacy and efforts to mobilise funding from local government in support of community action.

σ **Community IPM** started among Asian rice farmers who wanted to solve pest management problems, but it has developed in a number of directions. Other crops, such as vegetables, maize, soybean, cotton and tea have also become the focus of training and experimentation managed by IPM farmers. And issues such soil fertility, water management and marketing have sometimes become just as important as solving pest problems, if not more so. Finally, it is not just in Asia where **Community IPM** is happening. As a result of international exchanges by IPM trainers and programme managers, Farmer Field Schools and Community-based IPM programmes have started in a number of African and Near East countries.