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CONFERENCE ON AGRICULTURAL SUSTAINABILITY, GROWTH, AND POVERTY ALLEVIATION IN EAST AND SOUTHEAST ASIA

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EPTD Workshop Summary Papers provide an overview of the discussions and findings of workshops and conferences that the Division has helped organize or sponsor. It is generally expected that a proceedings volume of papers will be published at a later date.

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CONFERENCE ON AGRICULTURAL SUSTAINABILITY, GROWTH, AND POVERTY ALLEVIATION IN EAST AND SOUTHEAST ASIA*

Julie Witcover and Mark W. Rosegrant**

1. INTRODUCTION

This first in a series of regional conferences on this subject[1] brought together more than fifty agricultural scientists and policymakers from China, Indonesia, Malaysia, the Philippines, Thailand, Vietnam, and from international agricultural research centers and the Asian Development Bank to discuss how best to promote "sustainable agricultural intensification"—natural resource management that safeguards productivity of the natural resource base while meeting economic growth and poverty alleviation objectives. The regional conference series began in East and Southeast Asia partly because of the area's already broad experience with intensified farming systems on high potential lands alongside shifting cultivation, or upland or hillside cultivation, on more marginal, fragile lands. The

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* The conference held October 3-6, 1994 in Kuala Lumpur, Malaysia, was sponsored by the International Food Policy Research Institute (IFPRI), the German Foundation for International Development (Deutsche Stiftung für internationale Entwicklung, or DSE), and the Institute of Strategic and International Studies (ISIS) Malaysia. A proceedings volume is currently being prepared.

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[1] This series of regional conferences was preceded by an international conference on the same themes sponsored by IFPRI and DSE and held in Feldafing, Germany, in 1991; its proceedings published as Agricultural Sustainability, Growth, and Poverty Alleviation: Issues and Policies (Stephen A. Vosti, Thomas Reardon, Winfried von Urff, eds.), DSE, Feldafing, Germany, 1991.

group could thus reflect not only on these two contrasting agroecological zones, but on the links between them.

Conference participants were optimistic that the region's countries would find their way out of the "environmental dilemma" many developing countries face: a choice between continuing along the path of agricultural intensification, which has sometimes led to environmental problems associated with the misuse of modern inputs, or, in failing to intensify, driving growing populations of the poor onto new, often more environmentally fragile lands to seek subsistence. Both scenarios threaten not only biodiversity and natural habitats, but the very productivity of natural resources, and ultimately, human livelihoods.

The pressures of rising demand due to population growth and growing incomes, participants agreed, preclude any strategy that turns its back on higher productivity of available resources—natural and human. Agricultural intensification specifically, and national development strategies more generally, need not entail irreversible degradation of the natural resource base. Still, there is no guarantee that sustainable intensification will occur in the region unless policymakers and researchers revamp current, often-distorted incentives for natural resource use. At the same time, they must take a hard look at reforming incentives inside government agencies and research institutions for the planning, design, and implementation of policies to promote sustainable intensification.

The group traced many of the region's environmental problems back to government and policy failure. In some instances, this was a failure to act—as in failure to set clear, secure property rights that would provide incentives for efficient use of, and investment in, land and water; or intervene where market failure (for example, to account for externalities) led to

degradation. In other instances, it was failure to consider incentives created by policy actions—as in failure to account for environmental consequences from overuse of publicly subsidized inputs such as land, water, pesticides, and fertilizers. In still other instances, the failure was institutional—as in failure to structure public irrigation agencies with incentives built in to encourage efficient water allocation.

Some steps recommended by the group for government policy to improve incentives for sustainable development follow directly from the failures cited above: setting well-defined, secure, and enforceable farmer property rights to land and water, noting that, where strong traditional rights to land and water exist, governments may be better off supporting existing mechanisms to enforce recognized property rights than imposing new titling schemes; eliminating subsidies on water, fertilizer, and pesticides; and strengthening the incentives for public irrigation agencies to allocate water more efficiently.

Other recommendations and insights emerged from debates during the four days over how to incorporate environmental concerns into existing planning and research structures. The group warned against assuming that policies designed for growth combined with improved natural resource management will necessarily always and everywhere alleviate poverty. Since not all degradation is caused by the poor, nor do all poor people degrade the environment, poverty alleviation deserves a high priority in both the research and policymaking agendas in its own right. Still, failure to carefully target poverty alleviating strategies can lead to leaks that distort incentives in food production and food consumption—with potentially deleterious effects on the poor, the environment, and the public purse.

The group also cautioned against repeating mistakes of the past while incorporating the new policy objective of "sustainable growth." A large, centralized bureaucracy charged with addressing sustainable intensification concerns might not have the incentive structure; the institutional links with other government departments, state and local governments, or researchers; or, perhaps most importantly, the ties with the targets of policies—farmers, community organizations, and other private sector actors—to meet with success.

What are the ingredients for success in bringing natural resource management into the set of objectives for policymakers and researchers? Conference participants brought a range of country experiences and policy and research perspectives—different economic development paths; different government roles in shaping those strategies; different institutions and mechanisms for government planning; different population densities, country sizes, natural resource richness, and level of food security—to the table for four days in grappling with this question. In the process of taking into consideration actors other than the government, levels other than the national, and mechanisms through which effective institutional links can be forged, the participants did not always reach consensus. Their debate, however, brought to light major issues to be researched and resolved along the way to "sustainable intensification."

In a format of morning plenary session papers and discussion followed by afternoon working groups, participants first reviewed regional trends in agricultural growth, poverty alleviation, and environmental degradation, examining the extent to which the three are linked in East and Southeast Asia (Day 1).

Next, the conference turned to the "nuts and bolts" of integrating natural resource management into policymaking and research agendas alongside objectives of growth and poverty alleviation. While one subset of participants wrestled with how to improve government planning regimes and implementation of policy with that goal in mind, a second subset wrangled with how such a new focus might shift national and international research priorities, project design, and dissemination of technology (Day 2).

The third day of plenary/working groups had two key resources—land and water—as its focus: "land" and "water" groups explored how to improve each resource's productivity, sustainability, and equitable use by altering the institutions, policies, and rights governing access to them. The plenary reconvened on the fourth day to sum up recommendations.

The different foci of the daily sessions are examined in turn in the sections below.

2. LINKS RE-EXAMINED AGRICULTURAL SUSTAINABILITY, GROWTH, AND POVERTY ALLEVIATION IN EAST AND SOUTHEAST ASIA

In plenary and working group discussions, the group spent at least as much time exploring how natural resource degradation, growth, and poverty are not linked in the region, as how they are. More specifically, the group reacted against the highly publicized notion that environmental degradation is mainly due to the actions of the poor. While poverty can cause environmental damage, they noted, many of the region's most pressing natural resource degradation problems have not been caused by poverty. In fact, whether growth or poverty has played a larger hand in environmental degradation varies with agricultural zone, level of development, and other country-specific factors.

In upland rainfed areas, and shifting cultivation areas, for example, poverty, together with inappropriate policies or technologies, does often drive people to use resource-degrading techniques (for example, deforestation leading to soil erosion). In turn, degradation in these areas is more likely to have an impact on the livelihoods of the poor, and constrain their decisions (for example, lower yields in the absence of external inputs, which leaves families with little option but to extend cultivation to another parcel of land). In lowland irrigated areas, though, land management techniques have environmental consequences (for example, improper use of modern inputs leading to a polluted water supply, siltation and salinization of irrigation systems, and, possibly, losses in soil fertility due to year-round monoculture) that differ less between rich and poor. There, the link between poverty and degradation may be more indirect and complicated—for example, poverty in lowland areas could spark migration to upland areas, feeding into the poverty-degradation cycle described above.

The region's serious environmental problems, moreover, are not confined to upland rainfed, or lowland irrigated agricultural areas—as pleasing as those two prototypes have been to commentators of developing world sustainability problems. In peri-urban areas, for example, environmental degradation "spills over" from agro-processing—another example of growth, not poverty, driving degradation. And, in many forested areas, eagerness for economic development has led to policies allowing overexploitation of timber resources.

If poverty and environmental degradation do not always go hand-in-hand, some participants feared that heightened awareness of environmental issues may drown out poverty alleviation efforts in areas where the two are <u>not</u> linked. To reach those poor left out of the broader growth process, then, policies to alleviate poverty can and should be at least partially

"delinked" from those designed to promote growth and proper natural resource management, and should be carefully targeted to the poor.

Other participants raised serious caveats to the plausibility of all countries—especially poor or politically unstable ones—being able to incorporate environmental concerns into development strategies to the same degree. Many believed that, for political and/or humanitarian reasons, countries still striving to meet food security needs may be willing to "trade off" environmental damage to achieve economic growth and poverty alleviation in the shorter term, only to return to confront environmental problems with greater human, capital, and political resources. (Such an argument parallels one commonly made to explain how poverty can lead to natural resource degradation at the household level: poor rural households may, to achieve food security, be in effect forced into damaging the environment.)[2]

Put simply, food security remains probably foremost among policymakers' goals. Participants recounted its primacy in the minds of policymakers throughout the region in the post-World War II period, despite striking differences in actual development strategies vis-a-vis role of government, sectoral focus, etc. As further confirmation, others cited the strongest emergence of environmental concerns in the region precisely where the greatest strides in achieving food security have been made. And, while participants' hindsight highlighted a new awareness of the environmental consequences of those early strategies, their questions

[2] Indeed, participants challenged the idea that, even if not constrained by food security needs, rural households would necessarily seek to enhance the natural resource base (even under a secure tenure regime)—the relative potential of those resources being defined against the household's other livelihood alternatives.

challenged the strategies more from an economic growth, than an environmental, point of view.

In Malaysia, for example, post-independence development programs targeted national food self-sufficiency via investments for lower income rice farmers on rainfed lowlands. Development strategy then shifted to promote non-food agriculture, and to use agricultural resources to develop other sectors, and economic growth accelerated. None criticized the first phase of the strategy, but some felt the shift was too long in coming. Some felt, moreover, that such a transition was facilitated in Malaysia by favorable conditions of relative richness in natural resources and relatively low population density. This combination led to levels of food security and political stability necessary to turn attention now to environmental concerns.

Part of the group, then, posed the question—even if development strategies for extremely poor countries could be made more "environmentally friendly," would policymakers there devote any of their scarce financial resources toward making this so? More broadly, the group challenged any implicit equality of priority under all circumstances among the three objectives—natural resource management, growth, and poverty alleviation—laid out in the conference title.

That said, it was agreed that economic growth in the longer term depends upon incorporation of environmental concerns. The group then turned to how to best implement such changes, given existing planning and institutional governmental and research structures, at a time when the region's development strategies are in flux.

3. BRINGING IDEAS "DOWN TO EARTH" POLICY AND RESEARCH PLANNING AND IMPLEMENTATION

After plenary paper presentations and discussion on policy and research planning and implementation, the conference broke into two sets of working groups to deal with policy and research topics separately. Despite their different foci, both sets of groups struggled to find mechanisms offering a balance of priorities defined at different levels (international, national, regional, village, farmer) through a balance of actors (public, private, and other non-governmental entities). To achieve proper balance, it was agreed, would require innovation and flexibility in the use of existing institutions, with careful construction of new institutions as a last resort. Above all, blueprints for change must, more than in the past, specify precisely how, where (that is, with what degree of centralization or decentralization), and by whom (within and outside the public sector) first planning, then implementation, should take place. Beyond this, blueprints need to make clear why the plan would succeed, demonstrating that incentives driving the workings within and across institutions are properly aligned.

SIDESTEPPING PAST MISTAKES? POLICY PLANNING AND IMPLEMENTATION FOR "SUSTAINABLE GROWTH"

As noted above, the group felt wary about schemes involving creation of a large, centralized government department to plan for sustainable growth: experience said that such an entity might not have the necessary links to either other central government units, or to information obtainable only at less aggregate levels, to succeed. By the same token, the group stressed that wholesale decentralization of all aspects of the policy planning and

implementation process could also spell disaster, creating unhealthy competition among regions for resources, and perhaps overriding national objectives. On balance, the group did express a preference for greater, but selective, decentralization of policy planning and implementation, but with much debate on the details of decentralization.

The debate centered around respective roles of national and provincial governments in general, and as regards natural resource planning in particular. Some felt that there was little wrong with national governments taking the lead in setting broad policy goals for the natural resource sector—the only problem was doing so without adequate information of various local conditions. In setting national parameters, then, central governments need to integrate information from regional and local levels more effectively and systematically as input into planning—via either "centralized" methods (for example, remote sensing), or more interaction between national planners and regional authorities.

National planning fills another need—that of balancing various sectors. In many countries, this function falls to a centralized planning unit (such as the Economic Planning Unit in Malaysia, the State Planning Commission in China, and the BAPPENAS in Indonesia), which maintains strong ties with departments and ministries of the national government to assure coherence in the development and implementation of an overall national plan. Environmental concerns are not yet fully integrated into all of these units. In China, for example, national planning regarding the environment goes on within each of several ministries (Ministry of Environmental Protection, and the separate ministries of Agriculture, Forestry, Water, and Energy), without an effective mechanism to iron out inconsistencies.

Others argued that regional governments should be more actively involved in planning themselves, especially where large variation in natural resource conditions from region to region[3] exists. They advocated an iterative process whereby national planners would consult regularly with regional planners, resulting in well-integrated national and regional plans (increasing incentives for implementation). As a model for intersectoral planning, it was argued, this would result in promotion of many "poles" of economic growth, alleviating poverty and reducing rural-urban migration on a national scale. For many countries in the region, jurisdiction over natural resources rests at the provincial level, in effect forcing more cooperation between national and local authorities regarding planning in this sector, at least.

Participants who were less optimistic about national-regional harmony argued that states' proprietary rights to minerals, land, water, and coastal fishing, could, instead, incite national-state conflict. These conflicts could be especially important in larger countries such as China and Indonesia, and where different political parties control national and state governments.

Which is more likely to accompany decentralization, then: tension or harmony? Will short-term local concerns win out over longer-term national priorities? And with decentralization in one sector, will the national government lose its power to influence local government altogether? These are the practical questions facing countries currently experimenting with greater decentralization of planning, in natural resources as well as other sectors.

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[3] While there was some discussion about defining "region" as agroclimatic zone, for most of this discussion it was taken to mean administrative unit.

Finally, part of the group felt that natural resource management was best decided at the village level, and not necessarily by the government. They summed up their view thus: government's role should be "big at the top" (that is, taking the lead in dealing with national and international issues—for example, externalities) and "small at the bottom" (that is, staying largely out of the day-to-day decisionmaking at local and farm levels).[4]

SHIFT IN PARADIGM OR EMPHASIS? IMPLICATIONS FOR RESEARCH OF "SUSTAINABLE GROWTH"

One group strongly voiced the opinion that "sustainable growth" should be not a topic of research in itself, but a concern to be incorporated into research projects across the board, with some serious implications for the way research is done. International and national research institutions previously interested primarily in increasing yields and productivity may have to broaden their list of "success indicators," lengthen their time horizon for evaluating impact, and pay more attention to not only landscape interactions (for example, commodity-commodity, land-water, commodity-resource), but the socioeconomic effects of proposed technological change.

In short, the scientist (or team of scientists) needs to chart the impact of research on a variety of systems—for example, not only commodity yields, but also the natural ecosystem (including upland/lowland linkages, where appropriate) and the social system (for example,

[4] The discussion on policy planning and implementation segued into topics of user management of specific resources. Some aspects of decentralized planning and implementation will be taken up in the resource-specific section, below.

new technology could displace indigenous technology, before the latter is adequately understood). The group acknowledged that such changes in research institutions will not come quickly—they must be given time and incentive to gradually shift emphasis, building upon their research strengths. As a start, *ex ante* and *ex post* evaluations of research project areas should be instituted.

It was also stressed that research to boost and maintain increased yields must continue to receive the highest priority; however, the long-term capacity of the natural resource base to sustain those yields must also be taken into account. While declines in yield growth have been observed and studied for irrigated rice farming systems, improved long-term monitoring must cover other crops and farming systems (for example, wheat systems, wheat/rice systems, soybean systems) as well. Upland, rainfed farming systems must also receive greater resources, including more systematic monitoring. Yield growth in these areas, which are often cut off by poor infrastructure and/or low income levels (and not yet attractive to private investment), would contribute substantially to meeting inhabitants' food security needs in the short term (alleviating poverty and discouraging encroachment onto additional fragile lands). International research centers have to play a prominent role in setting up a comprehensive, long-term monitoring system for high and low potential areas. More generally, we need models that integrate future resource use patterns with demand and supply conditions. In addition, a standardized, cross-country database on natural resources, that can be easily integrated with socioeconomic data for use by decisionmakers, must be set up and managed.

At the same time as monitoring broad trends, research institutions must ensure relevance of research to a wide variety of local (environmental and other) conditions. To this

end, one group suggested methods of making sure that "user demand" drives research—from "localizing" national research institutions to "serve" a particular area, to spending more time linking research with successful "delivery systems"—to get research results to users.

First, the group cautioned that "users" can include not only farmers, but also NGOs, traders/financiers, etc. Clarity in this regard can be critical not only for research design, but successful "delivery" of results. One innovation proposed to encourage user-driven research demand was a voucher system, by which farmers (or other target group) would choose the research institutes from which they would like to receive research results—perhaps partly financing those research projects. The government would pay for the vouchers, but the relevance of the institute for practical problems would be reflected in farmers' choices. The group also discussed at length the feasibility of having research institutes physically closer to farmers, as a way of fostering greater interaction between researchers and "end users." "Users" might more easily participate in the research identification and implementation stages—even approaching the institute with problems; on-site research demonstrations would be more easily set up; and research would be more targeted towards questions appropriate to the agroeconomic system of the locality. This system was foreseen as a network of national, not international, research institutes, with an effective method of communication across institutes (and with other, less-localized national research entities). Indeed, alongside such highly location-specific research, some participants called for long-term comparative studies, with sites selected with enough combinations of biophysical and socioeconomic situations so as to help research identify what biophysical, and what socioeconomic, factors matter most for “sustainable intensification.”

Finally, successful delivery systems were seen as a prerequisite for success in making research relevant to users—and thus a deserved topic for research themselves. Suggestions for reform included contracting the delivery of research output to private agencies, and using farmers as consultants in the design of delivery systems, or in the training process itself. An Indonesian example was provided wherein farmer development centers, financed and run locally, introduced technology taught by farmers to farmers.

4. RESOURCE-SPECIFIC LESSONS ACCESS AND EQUITY QUESTIONS SURROUNDING USE OF WATER AND LAND

WATER

Participants in the water group began by delineating key water resource challenges facing their countries: rapidly growing demand pressure on water resources from agriculture, household use, and industry, accompanied in many regions by degradation of three important resource bases—the watershed supporting the water resource; the agricultural land base supporting the main consumptive user of water (irrigated agriculture); and the quality of delivered water itself for final demand.

These challenges translate into strong demands for the development of water resource policies that will: maintain growth in irrigated agricultural production; facilitate efficient allocation of water across sectors and final demands; and reverse the ongoing degradation of the water resource base, be it the watershed, the irrigated land base, or water quality itself.

To meet these challenges, participants recommended moving forward more rapidly with institutional reform of public irrigation agencies, and with turnover or privatization of at least

parts of irrigation systems to user groups. Considerable debate was also held over the potential for introduction of market-based incentives through the establishment of tradable water rights vested in the water users.

Institutional reforms with promise include: shifting from a line department to a semi-independent or public utility mode; applying financial viability criteria to irrigation agencies; franchising rights to private companies to operate publicly constructed irrigation facilities; establishing performance-linked incentives for irrigation personnel; and strengthening accountability mechanisms such as providing for farmer oversight of operating agencies. Many of these reforms can be seen as introducing market-type incentives into the management of public irrigation systems.

The potential for involving farmers more directly in system management and system improvement also received considerable attention in the discussions. Turnover was considered desirable both as a means of directly improving tertiary level water management and maintenance of system facilities, and, in conjunction with activities aimed at main system managers, as a way of building a grass-roots structure linked with the irrigation bureaucracy to facilitate improved management of whole systems.

Concern was expressed, however, that, many times, turnover of irrigation systems has simply legitimized an empty transfer of the responsibilities for operations and management to farmers in order to reduce the burdens on public irrigation (lowering costs of financially strapped public bureaucracies) without truly devolving water control to the user groups. To have any real effect on water use efficiency, the group underscored, turnover must include firm rights to water, and control over allocation of that water.

The group also discussed in detail a possible, even more far-reaching extension of the turnover or privatization of irrigation systems: the reform of laws and institutions to establish well-defined, transferable water rights to water users or groups of water users. Participants identified some possible advantages of tradable water rights, including the requirement of user consent and compensation for any water transferred from the rights holder; and provision of incentives for water users to invest in water-saving technology, or use water-saving techniques, while gaining additional income through the sale of saved water (by considering the full opportunity cost of water, including its value in alternative uses). A properly managed system of tradable water rights could also provide incentives for water users to consider the external costs imposed by their water use, further easing the pressure to degrade resources.

While these benefits could be substantial, the participants also raised a number of serious issues that could make it difficult to establish equitable and efficient markets in tradable water rights. Laws, institutions, and contracts would have to be reformed or developed to deal with variability of water delivery, to protect the poor against the inequitable water sales, and to protect other water users against ill effects of water transfers. Given the complexities of these reforms, the group recommended a research and pilot testing program on tradable water rights before any large-scale implementation was attempted.

LAND

Behind the access and equity questions regarding land use lies scarcity of land and (land-based) resources, driven in part by population pressure, according to the two groups that met separately to discuss the issue. Such scarcity in a previously equitable and

sustainable system often provides the spark to ignite conflict. This underscores the need for policymakers and researchers to see land use changes as part of a dynamic, evolving framework (in which what constitutes "optimal" and equitable land use may change over time).

After stressing the need for clear indicators, measurements, and databases of land quality (and changes in land quality over time), both groups concentrated on how to resolve land use conflicts on scales both large and small (for example, zoning large tracts of land for "appropriate" land use—possibly agriculture or industry, neighboring villages' conflicts involving use of a watershed) so as to promote equity and sustainable natural resource management. Attack this problem, said one of the groups, by: a) influencing land use; b) improving conflict resolution; or c) doing both. Property rights regimes and technology are both central to the first approach; institutions (not only the government, but other, often local, social organizations as well) that manage and enforce property rights are central to the second. Echoing these sentiments in large part, the second group zeroed in on, as priorities for research, property rights regimes and liberalization of land markets, conflicts over land use and access claims, the role of technology in affecting land use, and the central role of institutions in mediating between government policies and locally recognized access rights.

Participants in both groups agreed that rural inhabitants require security of access to at least the use of land (that is, not necessarily ownership *per se*) before they are likely to invest in sustainable resource management. The appropriate property rights regime for particular conditions to ensure that security, however, is not well understood. In the Philippines, work is ongoing to contrast communal and private tenure in terms of equity and

preservation of the natural resource base. One group called for much more empirical work on the subject, including failure and success stories of various tenure regimes—for useful cross-site comparison.

Rather than try to "match" appropriate property rights regime (private, communal, community, public ownership, etc.) to particular situations, participants debated the role of legal mechanisms, titling, land markets, and the government more generally in making land use secure so as to promote sustainable natural resource management.

Governments have the responsibility, it was felt, to: a) clearly define rights and their limits (even where legalizing rights already recognized locally) ; b) ensure those rights are protected from those who would infringe upon them (where the government lacks capacity for direct enforcement, this means investigating possibilities for local enforcement arrangements); c) ensure that exchange of rights is possible, via either political or regulatory measures; and d) improve accessibility and capability of the local holder of land rights to invest in the land.

Partial fulfillment of these objectives invites disaster: for example, conferring legal rights to land without ensuring that the necessary regulations and enforcement mechanisms are also in place could spark conflict; and, secure tenure without investment opportunities may lead to further degradation. Even this list, moreover, engendered debate—over exactly what the land rights and their limits should be, and over how intrusive of local norms the government needed to be to achieve these goals.

There was some debate in the group, for example, over the conditions under which completely free exchange of land rights (whether held by an individual or a community), while

possibly desirable for other reasons, was necessary for proper natural resource management. Indeed, governments often place conditions on tenure, with implications for sustainability, as cases from the Philippines, Malaysia, and China illustrate. In the Philippine highlands, the government gives only partial title to the land for a certain period of time, after which full title is earned based on the performance and commitment of the farmer. The intention is to guarantee that the farmers will not sell the land once the title is given (which could lead to concentrated land ownership), and move to other fragile areas (harming the environment there). In Malaysia, the Temporary Occupation License confers the right to use land for one year only. Even though the farmer can renew the license annually, this less-than-certain access to land use (and returns on any investments made to the land over the year), it was argued, biases the farmer against long-term stewardship, and toward activities yielding returns only in the shorter term. In China, the community owns the land, which it contracts out to individual farmers, who then have the right to manage it over a long period. This long-term security of use, it was felt, encourages sustainable management of the natural resource base, even where transactions in land are restricted. Others held that security of land use without titling (free exchange) would not be sufficient to ensure "sustainability" once economic development gathers steam, and investment choices proliferate: without a free land market, fewer would choose to make conservation investments on the land.

In general, the group was leery of prescribing an overly intrusive government role where local mechanisms for recognition and enforcement of property rights (including conflict resolution) function. Against arguments that legal ownership included such benefits as access to credit, ability to mortgage, and ability to trade, it was countered that these benefits may

also accrue (as in one Philippine example of a "traditional rights" system for an indigenous group) to locally recognized land rights systems, albeit only within the community. Under such conditions, some participants felt that governments ought to interfere as little as possible, perhaps legalizing (or otherwise bolstering) existing local property rights regimes, rather than generating new ones (and new, less reliable enforcement mechanisms).

More broadly, many in the group expressed a preference for the government to work with local institutions to fulfill its responsibilities (that is, a)-d) above) with regard to property rights. At the same time, they strongly expressed wariness about how little is currently known about why some property rights regimes and institutions successfully adapt or evolve to changing circumstances, while others do not—that is, how to build flexibility into property rights systems.

In short, both governments and communities come under pressures that place property regimes under strain, or make them obsolete. For example, a community may be content with its locally recognized property rights regime until an "outsider" makes a claim on the land, threatening the community's security of access, and enforcement of its own rules. At that point, the community may push for wider legal recognition of its claim. Or, increasing population pressure within a community may render a traditional rights regime, based on lower productivity needs, untenable. Or, rising population pressure outside the community may increase pressure on the government to change even a well-functioning (within its limits) property rights regime. Examples abound.

Nowhere do the strains of change emerge so clearly as where *de facto* rights to land diverge from legal ones. Should the government role in these cases be to rush in and legalize

the *de facto* situation, enforce the *de jure* scenario, or mediate conflict (if it exists) towards a new solution? Clear answers do not exist, but participants agreed that these areas raise a red flag—places where research may begin to uncover some answers.

5. CONCLUSIONS

The sense of the workshop was that ecosystem damage can stem from many types of agricultural growth as well as poverty, and that many factors condition the degree of degradation: level of development, resource endowment, availability of technology, policy, institutions, property rights, knowledge, and population growth.

The group cautioned against "blaming the poor" for degradation, for, while in some parts of the region poverty still constrains rural inhabitants to greater reliance on a more fragile natural resource base, in others, the lion's share of degradation has resulted from the growth process. In particular, as economic growth occurred, several types of failures contributed to degradation: institutional failures—especially failure to establish secure rights to water and land, which leads to overuse or overextraction as well as lack of investment in efficiency and conservation of the resource; market and pricing failures, including inappropriate subsidies that failed to take into account the external costs of different activities and decisions; and government failures, in terms of poorly managed bureaucracies, excessively extractive policies, and inability to regulate environmental damage. Lessons from these failures need to be applied to areas where growth has taken off, and to those where growth has languished until now.

For, despite the environmental consequences that have ensued to date from a growth strategy, participants first and foremost endorsed the goal of sustainable intensification—arguing that higher productivity with less ecosystem damage is within our collective reach, and is central to the food security and human welfare goals uppermost in the minds of policymakers and researchers. There was considerable agreement, moreover, on broad strategies to be followed, including elimination of subsidies to inputs such as water, fertilizer, and pesticides that, when overused, cause degradation of the resource base. Second, and closely related, well-defined and secure property rights should be established for the main resources used in agriculture, namely, land and water. The specific types of rights to be established may vary by type of resource (so tenure to land and water may be viewed as separable), and existing conditions governing the use of the resource. And, rights could be granted to individuals or to groups.

In water and irrigation policy, there was strong consensus that reforms were required to strengthen the incentives for public irrigation agencies to allocate water more efficiently (possibly by transforming them into regulated utilities); and that farmers' rights should be strengthened through turnover of existing systems, and vesting of stronger water use rights in farmers or farmer organizations.

Results from the sessions on land rights indicated that various forms of informal or traditional property rights, with appropriate government support, can provide nearly the same level of security as formal, registered property rights—thus informal tenure arrangements in the Philippine uplands gave sufficient security to non-land owners to encourage them to make conservation investments. Still, the group stressed that more needed to be known about the

dynamics and adaptability of such systems, and worried that such systems might impose limits on the optimal use of land that might ensue were property rights more broadly standardized.

Where government could take a more active role is in provision of public goods such as research, extension services, and rural infrastructure (particularly in rainfed areas), and in the fixing of subsidies or taxes to align private incentives with social objectives, to properly reflect environmental externalities. Poverty alleviation policy was considered to be in significant part separable from policies for growth and environmental sustainability (although the reforms suggested above were motivated by a concern that resource use be made more efficient and equitable). A careful targeting approach to poverty alleviation was the consensus of the group. Broad income supports that distort incentives in production and consumption, and leak to the not-so-poor and rich, were too costly (to public coffers, and in their effects on the economy and the environment).

And researchers need to broaden their perspective and tools, to not just add natural resources to a list of research topics, but integrate them into landscape-level interactions of commodities and resources, as well as human behaviors, with "user" input into research planning and implementation.

In all workshop discussions, a strong pragmatic streak prevailed: in recommendations for pilot programs to precede large-scale projects; in careful listing of often overlooked local and regional, public and private, actors as partners (whether they be in agreement or at odds) in research and policy; in precise delineation of incentives inherent in proposals. The pragmatism, born of a determination not to repeat past mistakes in research and policy planning and implementation, allowed for an exchange from which

participants—policymakers, planners, and researchers alike—could take away practical suggestions for incorporating this relatively new policy objective of natural resource conservation, into priorities for economic growth and poverty alleviation.

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