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## **THE LINKS BETWEEN UPLAND AND LOWLAND AGRICULTURE IN THE 21<sup>ST</sup> CENTURY VIETNAM**

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### **I. The Links between Lowland and Upland Agriculture**

With water shortages as well as increased floods and droughts in Vietnam, growing attention is being devoted to the environmental services that the uplands provide to the lowlands. Appropriate land management in the uplands can produce public goods for the lowlands. Up to now, the provision of such services has largely been taken for granted. Critical watershed services, biodiversity levels, carbon storage, and other goods have been delivered to the lowlands without charge. But just as these services are needed more badly than ever, trends in the uplands threaten to continue to force profound changes in upland land management systems, especially in agriculture, that may lead upland farmers and others to shift to forms of land management that will endanger the provision of these environmental services.

Many current trends in upland agriculture, while economically profitable in the short run, are ecologically worrisome. In swidden agriculture, fallow periods have been getting shorter and shorter, leading to soil degradation and reduced yields. As one response to this, monocultural cultivation in permanent fields on sloping land has been expanding. One sees more and more pure plantations of plums or apricots, of coffee or rubber or some other cash crop. Planted forests are also often monocultural. While such systems are often profitable in the short run, market fluctuations, disease, and other dangers can make livelihoods vulnerable and their ecological sustainability is not assured. Obviously, as well, biological diversity is reduced.

The well-being of the entire country can be negatively affected by these changes in upland agriculture. Every effort must be made to help upland farmers to practice sustainable and economically viable livelihood strategies while maintaining the flow of public goods to the lowlands. It is in the best interests of the government and lowland populations to provide substantial assistance to assist upland farmers to make the changes necessary to maintain environmental services while making livelihoods more secure.

## **II. The challenges facing us**

Vietnamese culture and society are now undergoing a profound transformation. The scope and speed of this transformation are unprecedented in Vietnamese history. This transformation has economic and ecological and political and social and cultural dimensions. And agriculture in Vietnam is being transformed as a part of this process of change.

Both upland and lowland agriculture have on the whole been growing more intensive, more productive, more market-oriented. While some farming systems have been changing to expand monocultural production, there seems to be a growing diversity in types of farming systems. Confronted with a growing shortage of arable land, land degradation, in some cases falling yields, changing market opportunities, and other challenges and opportunities, different farmers are adapting different livelihood strategies. The great diversity in upland farming systems means that no single policy or practice or innovation can be successful everywhere. As transportation and communication improve and educational levels rise, as urbanization proceeds rapidly and Vietnam becomes more deeply embedded in the world economy, agro-ecosystems and rural livelihoods will continue to change rapidly as well. Diversity is a powerful resource in coping with change, but achieving greater diversity requires appropriate policies and programs as well as appropriate research and extension activities.

There is, of course, great variation in agriculture both within and between regions. The Mekong delta, with a tradition of producing for the market, exports a rice surplus. But the Northern Mountain Region is not able to meet its own basic food requirements. At least in the Northern Mountain area, most communes contain different farming systems and farming system types vary down to the hamlet level. Many upland farm households will be confronted with difficult livelihood decisions.

We have always thought of Vietnam as a country with almost unlimited potential in agriculture and forestry. But in fact the reality as we move into the 21<sup>st</sup> century is that Vietnam has a very limited land area and the per capita levels of both arable land and forest land are very low. The population of Vietnam has increased by about 400 percent in roughly the past sixty years. Although deforestation has been halted or even reversed in some places, the quality of existing forests has generally declined. Land shortages are already a problem in many areas, while population growth and conversion of agricultural land to other purposes continue to generate more pressure upon agricultural production in both the lowlands and the uplands.

But we must also always bear in mind that in the not too distant future things are probably going to get much worse. It is anticipated that the impacts of global climate change will hit Vietnam especially hard. As land is lost to rising sea levels in coming decades, as temperatures rise, and the threat of flood and drought and severe storms will probably increase, both lowland and upland agriculture will experience incredible stress. Vietnam will have even more people trying to make a living out of even less agricultural land. Many of the refugees from lost delta land will inevitably end up in the uplands. The remaining lowlands, much more crowded than before, will be even more dependent on the environmental services provided by the uplands just as the uplands themselves are coming under much greater pressure to increase production at the expense of such environmental considerations.

We must begin now to do what we can to mitigate the effects of global warming and to find ways to live with the changes that cannot be avoided. We need to study and debate the impact of various land management practices upon rural livelihoods, upon agricultural productivity and sustainability, upon biodiversity, and upon carbon sequestration. Clearly, at a minimum, land in the uplands must be managed so that as much as possible vegetation cover is preserved, soil fertility is maintained, and productivity is increased in sustainable ways. How can we best proceed to do this?

### **III. What is the best way to proceed?**

There is no single solution to current problems, let alone the host of other problems that will be emerging in the coming years. Many approaches have been tried in Vietnam and elsewhere. Although for the most part the results have so far been disappointing, there have been some successes and many of the existing approaches may well have a role to play in certain places. Each hamlet, each farm, will have to devise an appropriate mix of crops and technologies and other sources of income. What we must do now is improve our ability to identify and clarify just which combinations of approaches are most appropriate in which places and how every hamlet and every farmer can create and develop these preferred farm systems. And then we must find effective ways to help farm households find the resources to make necessary and desirable changes.

All too often in the past conservation efforts, national development priorities, poverty alleviation, and the maintenance of local livelihood systems have been in competition with each other. It need not be that way and it must not be that way. These efforts can and must be seen as being complementary. This will involve a continuing effort to “reframe” many issues, to adopt a more realistic and more systemic view that pays greater attention to the ways in which our

various goals are interrelated and are continually interacting in ways that sometimes produce unanticipated consequences.

While much more research and policy analysis is needed, there are in fact many things that we might do right now that can make an important contribution to building more prosperous and more sustainable futures in many farm communities, strengthening the livelihood practices of upland rural households, especially those of ethnic minorities, those headed by women, all those with special difficulties. With food security assured, all other programs can be more successful.

Taking our collective experience to date as a starting point, we need to begin moving much more forcefully toward building a new upland development strategy that emphasizes a step-by-step approach to development and conservation, a strategy that gives a bigger role to local communities, one that takes greater account of differences in local conditions and customs, incorporating local knowledge and experiences, and one that is more responsive to local problems.

Based upon the extensive field research in the uplands we have conducted at Hanoi University of Agriculture, supplemented by what we have learned from our colleagues at other institutions and in the literature, I would like to mention what I see as a few key elements in a new approach to sustainable upland development.

First of all, I would like to see a much deeper and much stronger process of decentralization. This is important because effective decentralization can have a significant positive impact on many other efforts. Closely related to decentralization, we should pay much more attention to strengthening community organizations in the uplands. For some groups in some places, such organizations already exist and play a vital role in resource management and perform various other useful functions at the local level. We have seen how such groups can promote greater equity in resource use and also give greater voice to local people. Community-based forest management (CBFM) has worked very well in some places. It will not work well everywhere, but it is often a very cost-effective way to manage resources and protect the environment. In other places, such organizations once existed but have been weakened or disappeared. The emergence and growth of such organizations should be encouraged wherever possible. We must continue to raise our understanding of why community-based forestry works well in some places but not in others.

I also think it is absolutely essential to maintain an intense focus on people's livelihoods. All too often well-intentioned big development programs,

conservation efforts, and a wide range of government policies and programs have deprived upland households of access to desperately needed resources. This is almost always counter-productive. If people cannot meet their subsistence needs, they will ignore policies and regulations and do whatever they have to do to feed their families. This often leads to unanticipated and unwanted consequences. To get people to provide the cooperation that is necessary for the success of many programs and policies, it is necessary to give priority to providing them with the resources they need to maintain their livelihoods. A very important part of this effort is recognizing the important fact that for millennia and up to the present day, the livelihood of most upland farmers has been and in most places remains closely linked to swidden agriculture. Many people will probably continue to practice swidden agriculture for many decades to come and most of them will have no other choice. I want to suggest that this need not be altogether a bad thing.

It is ironic that in Vietnam, just as we are at long last beginning to obtain a more realistic perspective on swidden agriculture, a trend has been emerging in some localities to replace rotating swidden cultivation with permanent field cultivation. But the long-term sustainability of permanent field cultivation at many upland sites is open to serious question. And the impact of this practice upon biodiversity, upon household livelihoods, and upon the provision of various environmental services to the lowlands is likely to be negative.

In the hamlet we studied intensively to understand composite swidden agriculture, vegetation cover remained fairly constant over the past fifty years, despite population growth. Although stands of secondary forest were fragmented, the effect of such fragmentation upon watershed functions is not yet well understood.

On-going research is providing us with a basis for reevaluating swidden agriculture. We are seeing it in a new and more positive way. While this reassessment is not yet complete, nor completely accepted by everyone, I think we now know enough with a reasonable level of confidence to say that in Vietnam efforts to eliminate swidden agriculture and to blame it for so many problems in the uplands was based on a mistaken understanding of swidden agriculture. Far too little has been done to understand swidden agriculture or to improve it.

Although there is still much research that should be done, swidden agriculture can be made more productive and more sustainable based on what we already know. We can assist these land-use systems to continue to provide the downstream environmental benefits that are so urgently needed and which will become even more important in the future. Because time is limited, I want to

concentrate on just a few important elements that can contribute to more ecologically sustainable and economically viable upland development.

The improvement and spread of what I call, following Terry Rambo, composite swidden agriculture offers great hope for becoming an important part of developing agriculture in the uplands improving farmer livelihoods. Composite swidden agriculture is an agro-ecosystem in which permanent wet rice paddy fields are combined with rotating swidden cultivation in a single integrated farming system. Such a system already exists in quite a few places.

For fifteen years my colleagues and I have been studying a composite swidden farming system in Hoa Binh province. Our data and experience have led us to believe that swidden agriculture need not be incompatible with preserving the forests and maintaining biodiversity. Thus, we believe that a new and more effective strategy for upland development should include a program designed to help people, where appropriate, to create composite swidden agriculture systems in some places where they do not exist and/or improve composite swidden agricultural systems where they already exist in the uplands of the North Vietnam. It is not too early to establish a few pilot sites in the Northern Mountain Region of Vietnam where scientists could work with local farmers to create improved composite swidden systems.

There are places where conditions will make it very difficult to succeed in creating such a system, and places where such a system already exists. But there are also many places where composite swidden farming is not being practiced but could be carried out with a high likelihood of success. These places offer great potential for dramatic improvement. We have developed procedures for using GIS to identify with a reasonably high level of confidence places where composite swidden exists, places where it does not exist but where it would be likely to succeed, and places where it probably cannot be successful and other approaches should be tried.

Our research indicates that composite swidden system has the advantage of providing greater food security for upland farmers. Even relatively small paddy fields, if cultivated properly, can provide the bulk of a household's rice needs for a year. Once the intense pressure is relieved by the existence of wet rice paddy cultivation, rotating swidden fields can provide additional food and income, raising living standards, sometimes dramatically. Beyond that, run-off from fields above the paddies often seems to benefit the paddy crop. Run-off is often desired, but not with a high sediment load. This can be managed by limiting tillage, as we have seen in Thailand.

One key element in improving swidden agriculture is the way fallow fields are perceived and how they are managed. We have been badly misled in the past by looking at fallow swidden fields and seeing them as “barren” or “land not yet in use” when in fact that land is very much in use, providing many benefits while restoring soil fertility. Many upland farm households, especially poor ethnic minority households, already derive a large part of their income from fallow fields.

A scenario for achieving more profitable and more environmentally beneficial swidden farming, especially composite swidden agriculture, is all the more practical because fallow fields are much more productive than they are often seen to be and with improved management they can become considerably more productive and more sustainable. Fallow management can make a major contribution to improving swidden systems. A vast body of literature from within Vietnam and from around the world already exists, telling us many different ways to accomplish better fallow management.

With a growing shortage of arable land, and the need for an adequate fallow period to make the system sustainable, it is important to promote better fallow management to reduce the duration of the fallow period while simultaneously making it more productive and economically attractive. Whether a composite or regular rotational swidden system, better fallow management offers great hope for improved swidden farming. A great deal of experience in Vietnam and a vast body of literature provide a large number of alternative fallow management systems from which local people can be assisted to choose the mix of techniques and practices best suited to their particular conditions and preferences. There should, of course, be trials and assessments in cooperation with local farmers before any innovation is widely disseminated.

The range of options people have to choose from will help determine how well they can develop their farming systems and livelihood strategies. And the range of options people will have to choose from in carrying out this task and in making appropriate choices in other productive elements of their farming systems is heavily dependent on efforts to help them develop and exploit alternative markets. The economic viability of options that would be useful from the perspectives of productivity and environmental benefits is tremendously dependent on their access to markets. Identifying and improving access to appropriate market outlets is another of the key elements in improving swidden agriculture in the uplands.

Low interest, long-term credit is another indispensable condition for enabling upland households to take advantage of opportunities for achieving the transformation of land use practices. When farmers have access to credit, often

one of the first things they do is buy and raise more livestock. All too often, this has had an adverse effect on fallow management because free grazing cattle have destroyed vegetation in the fallow fields.

There is great potential to improve many upland farming systems by expanding livestock production as an integrated part of these systems. There seems to be sizable and growing market opportunities for livestock. This market should almost certainly continue to grow as incomes rise nationally and in the region. I would argue that helping farmers to fully exploiting this opportunity involves two main issues: integrating livestock production into fallow field management and decentralization of livestock production.

There are many ways to integrate the productive capacity of fallow fields with livestock production. Integrated management of livestock production and fallow management offers very promising possibilities for developing profitable and ecologically interesting farming systems.

What seems to be the current trend toward increasing centralization of livestock production in the uplands may be profitable for some people in the short run, but in the longer term it is driving environmental degradation in the uplands. A decentralized approach to livestock production can potentially strengthen farmer livelihoods while minimizing environmental damage.

The research we have done shows composite swidden agriculture systems to be very resilient and very flexible. They can adapt to current conditions and they can keep changing. Over time, such systems can evolve to become integral parts of larger agro-forestry systems. Appropriate participatory research and extension work along with infrastructure development and better access to credit and a wider range of markets can enable the step by step construction of farming systems—including a swidden component—that I think can be more profitable and more sustainable than most upland farming systems that now exist or are envisioned. To maintain the flexibility and provide the resilience these systems will need to adapt to changing circumstances in coming decades, a higher diversification of land-use systems is going to be necessary.

Here developments of market opportunities appear to be essential (e.g, for fruit trees, etc). Are new opportunities for energy crops emerging? Overall, I think a higher diversification of land-use systems is required to maintain flexibility and provide resilience. This means we must keep working to expand the options available for farmers in diversifying their farming systems. Appropriate diversification both within and between various land-use systems will help the capacity of upland communities to fill any number of other niches in land use practices in the future as upland farmers respond to greatly altered

circumstances decades from now, as the impacts of global warming population growth, and other factors transform both the lowlands and the uplands in many ways, some of them predictable and others unanticipated.

It is clear that top-down approaches are not capable of coping effectively with the great diversity of conditions and cultures that shape the many different production systems that exist in the uplands of Vietnam. The local people themselves will have to carry out the transformation of upland farming systems, but they will need a lot of help.

Rotating swidden agriculture, especially composite swidden agriculture, can play an important and very positive role in the process by which upland agriculture adapts to a rapidly changing world, maintaining upland livelihoods while providing environmental services to the lowlands, if:

If greater decentralization provides local people and their local leaders with the authority to take a more active role in development planning, decision-making, implementation, and monitoring, and to receive a larger and more secure share of the benefits,

If local organizations emerge to actively participate in all stages of the development processes in their localities,

If upland farm communities receive more information and better access to markets, more long-term low-interest credit, and appropriate levels and kinds of technical assistance.

Then:

In coming decades, rotating swidden farming, especially composite swidden agriculture, can play a vital role in maintaining rural livelihoods in the uplands, make a modest contribution to combating climate change and global warming, and help upland agriculture as part of a larger system of land management continue to provide public goods for the lowlands, especially environmental services.

To successfully transform their existing farming systems and livelihood strategies to cope with changing circumstances will require a very big investment of time, labor, and capital. And most upland farm households are very poor. Swidden farmers need practical government assistance, based on sound policies, that are suitable to the diverse local settings, traditions, and farming practices of different ethnic groups in the uplands.

To achieve in a timely manner the kind of transformation of upland agriculture that I have described will require a very big investment from the government and other sources, but over decades the benefits will exceed the costs many times over. Given the scope of current problems and the magnitude of emerging challenges, Vietnam should be putting much more money into agricultural research and extension activities. And I suggest that a bigger share of this funding should be devoted to improving swidden agriculture in the uplands. We should now be very seriously considering the proposition that under certain conditions, certain kinds of swidden cultivation can play a very useful role as part of a larger system of land management in the uplands of Vietnam and in other places in Southeast Asia.

I think this is the right thing to do in more ways than one. We should in any case try to help one of the poorest and most disadvantaged segments of society. But the entire nation can receive important benefits from this proposed transformation, including lowland agricultural communities. For lowland Vietnamese, and others, to generously assist poor upland farmers to create improved land-use systems in the uplands is not charity; it is very much an act of enlightened self-interest.