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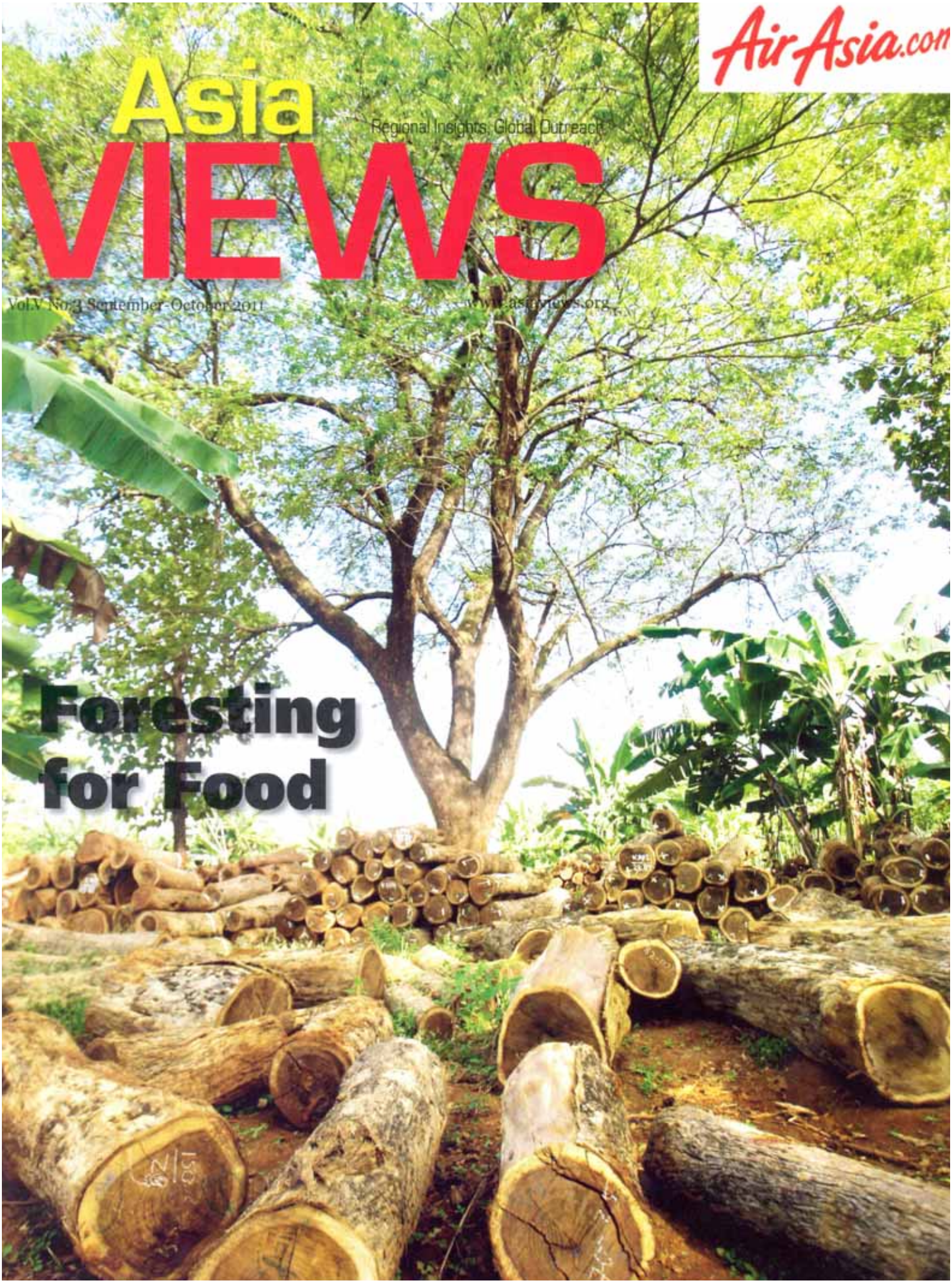

Foresting for Food

Climate Smart Rural Development

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IN the last century, the Southeast Asian region witnessed massive land use and land cover transformation. In many countries, natural forests were depleted to give way to agriculture, plantations and urban development. This has led to massive ecological and socio-economic problems. In 1992, the World Agroforestry Center (ICRAF) based in Bogor, Indonesia, started research and development work in the region, working closely with the Forest Research and Development Agency (FORDA) under the Forestry Ministry in Indonesia and other partners in the region. The following, written describes some of the key findings of ICRAF's research in Southeast Asia since 1992.

ICRAF's main mission is to promote more trees on farms and in landscapes. This is founded on many researches that have shown the varied beneficial effects of trees to farmers and the environment. With the onset of climate change, there is an even more urgent reason to incorporate trees on farms. Trees add resilience to farming systems as incomes diversify and the environment is conserved. Trees also sequester carbon which helps mitigate climate change. Agroforestry is now widely recognized in Southeast Asia as a land management approach that enhances the livelihoods of small holder farmers while promoting environmental conservation. The following article describes some of the key findings of ICRAF's research in Southeast Asia since 1992.

CIFOR / RAFIK ISTIQLAL

Small-scale mahogany plantation from below canopy

Tree Nurseries: Laying the Foundations

Tree nurseries are essential because they ensure that high quality planting materials are available to farmers. Planting poor quality seedlings will lead to trees of inferior quality which may become evident years later. Thus, it is critical to start right.

In Indonesia ICRAF researchers have surveyed more than 250 nurseries in four provinces. Our findings debunk the belief that there is high failure among smallholder tree nurseries. In Aceh, about one third of smallholder nurseries are still operating more than two years after project began. Spontaneous nurseries are in fact commercially oriented and long-term. The success factors include technical training, market orientation, and a business strategy.

With support from the Canadian International Development Agency (CIDA), ICRAF hopes to establish and study Farmer Nursery Field Schools (FNFS) in Indonesia. We believe that such farmers' schools are a good approach for awareness raising, capacity building, and experience and information sharing. Ideally, tree nurseries should evolve into enterprises that augment farmers' income. Through this project, we hope to identify what are the most effective and efficient extension approaches to smallholder nursery development.

Similar researches on tree nurseries are on-going in other countries such as Vietnam and the Philippines. ICRAF researchers are investigating how to facilitate access to quality germ-plasma through model nurseries, appropriate policies, investments, market intelligence, certification process and capacity building.

Farm Level: More Trees on Farms

ICRAF's main goal is to promote integration of more trees on farms. In Indonesia, there are numerous types of agroforestry systems such as jungle rubber systems, improved fallow systems, coffee agroforestry, coconut agroforestry just to name a few. In 2000, these sys-

tems cover about 20 million hectares. However, it is disturbing that five years later, this area has declined by 3.5 million hectares. Most of these agroforestry lands have been converted into plantations, mainly oil palm and monocrops.

ICRAF's researches point to a number of factors as imperative in promoting more trees on farms. First, local land use planning process and policy must promote the right trees in the right places that are integrated, inclusive and informed. Second, enabling conditions should be created, such as secure land tenure, germplasm and planting materials, capacities, market mechanism. In addition, agroforestry systems should be made an important part of climate change adaptation and mitigation strategies. Finally, rewards for environmental services such as REDD+ should explicitly incorporate agroforestry systems.

ICRAF's research has also studied rubber systems in SE Asia. In China, rubber has expanded tremendously. In Xishuangbanna, official data shows there are 200,000 hectares of rubber plantations but remote sensing analysis shows there could be as much 350,000 hectares of rubber. This has led to the decline of traditional farming systems in these areas. This trend could adversely affect biodiversity as well as other components of the natural ecosystem. In Thailand, we are investigating carbon stocks and level of biodiversity of rubber systems. In the Philippines, our researchers are evaluating various elite lines and the suitability of integrating rubber in upland farming systems.

ICRAF has also helped develop different agroforestry systems and soil and water conservation strategies. For example, in the Philippines, we have studied and promoted the use of natural vegetative strips, as a cost-effective way to conserve the soil in sloping lands.

Landscapes: The Big Picture

At the landscape level, ICRAF has been working in the last ten years on how to effectively reward small holder farmers for the ecosystems services (ES) they provide. These services include watershed protection and carbon sequestration. With support from IFAD, we are exploring how small farmers in Indonesia, Philippines, Vietnam and China can best be incentivized to provide these services. In Indonesia, there is great interest in carbon finance through forest conservation activities. ICRAF is a leading provider of technical solutions to national partners. It has developed several tools to assist policy makers and development workers in designing a more appropriate mechanism for developing carbon forestry projects.

Table 1 Agroforestry tree farms in Indonesia

Islands	1990		2000		2005	
	Mha	%	Mha	%	Mha	%
Bali-Nusa	1.21	6%	0.86	4%	1.20	7%
Jawa	2.00	10%	1.23	6%	0.97	6%
Kalimantan	4.60	23%	5.43	27%	5.34	32%
Maluku	0.55	3%	0.58	3%	0.75	4%
Papua	0.64	3%	0.57	3%	0.73	4%
Sulawesi	2.23	11%	1.44	7%	1.54	9%
Sumatera	8.64	44%	9.84	49%	6.09	37%
Grand Total	**19.85**	100%	**20.00**	100%	**16.60**	100%

In Vietnam, ecosystems services payments can reach US$ 10-34 per hectare per year which is similar to what current reforestation programs pay. However, this is still low. Bundling ecosystems services is probably a more effective approach. In the Philippines, rewards and payments for ecosystems are on the way to being mainstreamed in government policies and programs. There has been a rise in projects-incorporating some aspects of ecosystems services compensation.

Another major output of ICRAF in the region is the landcare approach to land management, primarily in southern Philippines. Landcare can be viewed both as a development approach and a community-led movement. Operationally, Landcare can be looked at as an extension approach for rapid and inexpensive diffusion of conservation farming, agroforestry practices and other natural resource management systems among upland farmers. It is based on their innate interest in learning and sharing knowledge about new technologies that provide higher farm incomes and environmental benefits.

Landcare is a partnership triad composed of grassroots Landcare groups, local government units and technical service providers and facilitators (such as ICRAF). The success of Landcare as an approach is dependent on how these three key actors interact and work together. The total number of farmers adopting conservation farming technologies in the Philippines is estimated at more than 8,000, representing more than 3,000 hectares of cropped areas.

Governance: The Enabling Environment

ICRAF is actively engaged with local and national policy makers in promoting agroforestry for sustainable livelihoods as well for climate change adaptation and mitigation. In Indonesia, the Philippines and Vietnam, ICRAF has been providing technical assistance to national partners in preparing national Reducing Emissions from Deforestation and Forest Degradation Plus (REDD+) strategies. This work is part of the effort to assist small holders in accessing carbon finance.

In the Philippines, ICRAF helped organize two major conferences on climate change adaptation. ICRAF researchers are also assessing how to effectively adapt to climate change by promoting more trees on farms. ICRAF also assisted in the calculation of greenhouse gas emissions and sinks in the country.

Diagram 1: Simplified diagram of forest transition in Southeast Asia

In the past 30 years, agroforestry has become mainstreamed into rural development paradigms and programs in Southeast Asia. ICRAF is fortunate to be part of this process. However, major challenges still remain in uplifting the lives of poor small holder farmers. There are still millions of people living in extreme poverty amidst vast natural resources. Millions of hectares of fragile lands still need rehabilitation and stabilization. ICRAF and its national partners will not rest in finding sustainable solutions to these challenges.

For more information:
www.worldagroforestry.org