

Merging Indigenous and Modern Knowledge in Agricultural Development

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Abstract: This paper highlights the importance of merging indigenous with modern knowledge in agricultural development. Development of indigenous knowledge within the farming community, as a primary livelihood is now quite urgent. Development of technological-based local knowledge by the general public farmers seemed to be much easier for adoption because the technology actually originated from the local community, customs and local culture. Several studies have emphasized the importance of merging together the available indigenous and modern knowledge. It can be concluded that the rapid development of agriculture in remote rural areas in South Sulawesi, Indonesia requires significant merger of both the indigenous knowledge and modern agricultural systems. However, in order to ensure that the farmers can produce suitable and more effective modern adopted technologies, it has to be based on local wisdom. This adoption of modern technological knowledge ranges from the acquisition, dissemination and utilization of such beneficial knowledge in the Indonesian agricultural system. It is expected that such hybrids of local knowledge and modern technological know-how will help to create a mutual cooperation and knowledge contribution that encourages the development of strategic innovations and appropriate policies in the current local agricultural systems.

Keywords: Hybridization; indigenous knowledge; modern; agriculture; development

1. Introduction

Production systems through the application of green revolution technologies in agricultural development for farmers have been the main objective of technological development. However, local farmers do not have the opportunity to develop their local knowledge systems that have been rooted in the tradition of local agriculture. In line with a survey of farmers conducted by Collinson (2000), he reported that the priority of the farmer's role is limited to providing the information required by the scientists. The farming systems research is a diagnostic process, in which a number of methods used to gain an understanding of farm household, family decision and the decision making process. In addition, Ardhian (2009) claimed that the development of any local agricultural systems must be equipped with advance modern and up-to-date knowledge far beyond the knowledge of farming practices by local farmers. Unfortunately, Sunaryo and Joshi (2003) reported that agricultural development in a local situation may be slowed down due to that engineering technology put in practice is not in accordance with the recommended local conditions, particularly the socio-economic and ecological farming community.

A research by Suhartini and Dwi Cahyono (2009) found that indigenous knowledge were applied by organic rice farmers with several improvements. The common practices of indigenous technologies were the use of variety of local plants and animal faces (mostly from cows) for the substances of organic fertilizers and pesticides. Farmers also use their indigenous knowledge by producing organic hormone to

boost plants growth, which were derived from specific local plants. Basically, farmers have already had their own knowledge originally came from their parents or grand parents to make biological-based composition to be applied to their paddy fields. However, we found that the current application of this indigenous technology was not mutual exclusive with modern technology.

Today, many scientists and policy makers are aware of the significant contribution of local knowledge for more sustainable development (Viergever, 1999). Local knowledge also seems to be relevant to the scientific world with a variety of reasons, including the protection of biodiversity (Iwanaga, 1998). Several facts suggest that local knowledge can be used as an alternative starting point in the development of agriculture (Flora, 1992; Kloppenburg, 1991). For this reason, research and development began to incorporate such policy implications for higher agricultural production from the local people. This has been agreed upon by Ali (2000) who emphasized that the farmer's local knowledge systems, especially in the social and cultural systems must be functional and to be developed contextually through experimentation (trial) which may be different from the one developed by the experts of modern science. In addition, he stressed that the development of local knowledge is not based on the principles of reductionism or positivistic-deterministic used by most scholars of modern science, but rather based on the practical needs, social and cultural systems (Ali, 2000).

In lieu of the above, local farmers with the assistance of several types of agricultural change agents (such as extension workers

and the member of nongovernmental organization) have integrated this indigenous knowledge with the modern ones of EM-4, a sort of biological agent to ferment the organic materials, in which this agent was claimed as environmentally friendly. This integration of indigenous and modern knowledge regarding the organic compositions for plants fertility and health was well perceived by the majority of farmers as very effective, with a much reduced formula to produce them and had more powerful effects on plant growth and health (Suhartini and Dwi Cahyono, 2009).

2. Definition of an Indigenous Knowledge

Local knowledge developed from a collection of knowledge and ways of thinking of local communities through the “trial” of the ecological system and is usually passed on orally, and usually cannot be explained in scientific terms. Wisdom is a lot containing an overview of the public perception is concerned about the things related with the structure, how the environment works, how natural reaction to the actions of human beings, as well as the relations (which should be created) among people with the natural environment (Zakaria, 1994). According to De Watt (1994), indigenous knowledge is based on experience and experiments repeated in accordance capabilities. People easily implement original technology because the input is relatively low; the risk is quite small and environmentally friendly, while the introduction of technologies generally uses high input, great risk and often unfriendly environment. There is such a gap between indigenous knowledge and modern knowledge, the ability of farmers are

limited and need high inputs of technology introduction.

Local knowledge is the basis for the information society, which facilitates communication and decision-making (Flavier, 1995). While Rajasakeran *et al.* (1991) referred to the systematic knowledge acquired by local people through the accumulation of experiences, informal experiments and a deep understanding of the particular culture. Roling and Engel (1990) had shown that rural communities use and manage resources rationally based on local knowledge. According to Haverkort (1991), local knowledge is actual knowledge of a population that reflects the traditions and experiences including new experiences with modern technology. The local people, including farmers, landless laborers, women, rural artisans, farmers are the keepers of local knowledge systems. They truly recognize their own situation, their resources, what works and what does not work, and how one change affects other parts of their system (Butler and Waud, 1990).

Most local knowledge is the knowledge and skills passed on to the next generation, and will be adapted to their condition (Merrewij, 1998). Because each individual's knowledge is a consequence of the interaction with the local community, the system contains the concept of local knowledge, beliefs, attitudes and the storing and processing of knowledge transmission (Rajasekaran *et al.*, 1991). The use of local knowledge in innovative development shows such stunning success of research on soil and water resources management (Hambly and Angura, 1996; Mendoza and Luning, 1997; Stein *et al.*, 2001; Mapinduzi

et al., 2003; Marothia, 2002; Shrestha, Mc Donald and Sinclair, 2003; Cools *et al.*, 2003; Roth, 2000), conservation of genetic resources (Stein *et al.*, 2001; Bouguera *et al.*, 2003; Friis-Hansen, 1999; and Salas, 1996), and in medicinal plants (Vandebroek *et al.*, 2004; and Leonti, 2003). Further evidence of such critical importance of local knowledge can be seen from work done by Nanda (1999), Friis-Hansen (1999), Simpson (1999), Rosenblum *et al.* (2001), and Marschke and Nong (2003) who emphasized the importance of both scientific and local knowledge. While the results of other studies emphasize that both forms of knowledge are the ends of a continuum (Brodt, 2002). Some authors did claim that there is an irreconcilability of local knowledge with the formal scientific knowledge. This is due to too much refraction of political (Sumberg *et al.*, 2003) or commercial (Bouguera *et al.*, 2003) agendas in such agricultural development. Although local knowledge is currently commonly used in agricultural innovation, but some parties argued it as a counter-productive (Sumberg *et al.*, 2003). Kibwana *et al.* (2001) concluded that the participatory technology development approaches need to be modified to better fit the local problem-solving initiatives through the use of local knowledge in the early development of innovation, rather than at the end.

In the process of technological development, the livelihoods of local knowledge are an indispensable resource (Haverkort and Zeeuw, 1992). Local knowledge may not like abstract modern knowledge. It relies on intuition, direct

evidence, and accumulated historical experience (Farrington and Martin, 1987). Local knowledge reflects the dignity of the local community and put its members on an equal footing with outsiders who are involved in the process of technology development (Haverkort and Zeeuw, 1992). Local knowledge systems also provide mechanisms to facilitate understanding and communication between the outside (counselors, researchers) and those in the farmer. Improved understanding and communication enhance participatory approaches to identifying problems (Warren, 1993).

3. What is Modern Knowledge?

Modernization of society generally defined as the application of modern science to all activities, all areas of life or to all aspects of society (Schrool, 1981). Increasing the modern knowledge is an important factor in the process of modernization. More modern societies if they are to apply the knowledge in a way that can be justified in a modern, and vice versa for less modern societies. Suharsaputra (2004) stated that the development of modern science in particular technology as the application of science has undergone rapid changes where those changes have an impact on people's views about the nature and acquisition of knowledge, as well as beneficial to the community. Such knowledge tends to be considered as the only truth in underlie social life and has become an important basis that affect the determination of human behavior.

The above view is consistent with Suparlan (1994) which states that the modern

method is a framework for the creation of the foundation of modern science. It has to be done based on modern methods systematically and objectively. Thus, it is very clear that science is not a body of knowledge or set of empirical facts. This is because the empirical facts themselves in order to have meaning, these facts must be organized, classified, analyzed, generalized based method that applies and is associated with the fact that the one with the other.

Several studies have also shown that the root cause of the failure of agriculture and rural development policies are less adaptive to the context of the development programs of social, economic, political, and ecosystems of a rural area (Green, 2006; Bieri, 2009; Namba, 2003; Samal *et al.*, 2003; Rosyadi and Tobirin, 2010). It has been recognized that modern science introduced the technocrats and scientists besides bringing some progress but also cause problems (Awang, 2008), but it cannot be denied that it is not sufficient to rely on local knowledge to bring the village to the expected level of progress.

Development of new techniques or perfecting an old practice to generate productivity without damaging practices and values that are conducive to the survival of local communities and the environment is very necessary to improve the competitiveness of rural areas. A context-specific rural area led to the solution of “one size fits all” is the wrong strategy development policy (Taylor, 2009). Therefore, modern science needs to be paired with local knowledge due to the ability of the community’s local knowledge in the use of rural resources are not strong

enough to face various external intervention (Rositah, 2005).

4. Merging of Indigenous and Modern Knowledge

Merging is the fusion of an old form which is separated from the place of origin, then combined with a new form in the application of a new one (Pieterse, 2004). It can be seen that globalization tries to meld the old stuff (in this case are specified culture) to be combined with new cultural forms that follow the developments that will emerge a new form of culture. Merging can also be supported by the migration of a people who will move into the new society that has a different culture. Merging itself is a concept that is not concerned about aspects of space and time because he thinks what happened previous era is not the bad stuff and still there are values that can be combined with the values that are now developing. The results formed by a merger alone are expected to establish a new form of culture that can be adopted by the entire community. Merging is also better known as the cultural mixing because of the mixing of cultures was performed in order to search for a new global culture.

Development of new techniques or improving the practice of local knowledge to generate productivity without damaging practices and values that are conducive for local or indigenous knowledge is one of the important components in the development process. Therefore, it needs to be juxtaposed with the modern knowledge of local wisdom as the ability of the community’s local knowledge in the use of rural resources are

not strong enough to face various external intervention (Rositah, 2005). The process of knowledge creation both local knowledge and modern knowledge according to Nonaka and Takeuchi (1995) includes acquisition, sharing and utilization of knowledge, all of whom are connected to form a cycle in the process of knowledge creation and learning. In agreement with Foucault (1980), he stated that knowledge is power to dominate others. According to the subjects that are created by the system and the power grid are usually not recognized at all by the subject. According to Foucault, power creates knowledge; knowledge and power interact directly with each other. He had a history of each era, description, classification, and understanding of the distinctive world. Way of thinking is determined not by the people, but is determined by the dominant discursive structures at that time. Discursive structure can be written text, oral verbal and nonverbal language, institutional practices, and others.

The knowledge gained from cognitive construction of the object, experience, or environment that is continuously forming and reorganized at any time due to the new insights that make up the result of social interaction patterns of thought and action. In line with Michel Foucault in *The Archaeology of Knowledge* (1972), said that the discourse shaping and constructing the specific event and the combination of these events form a narrative that can be recognized. In a society there is usually a wide range of discourses that differ from each other, but the power to select and support a particular discourse that has become the dominant discourse, while other discourses will be marginalized

(latent) and submerged (Beilhartz, 2005). Therefore, learning through interaction also occurs in the social structure so that the information contained in such knowledge to be productive. It continues to shape social structure in the form of rules and norms, but they are not last forever, so take renewed and transformed in line with the evolving knowledge. Transforming knowledge requires interaction between individuals, so that the necessary intensity, commitment and involvement of the people using the social interaction with each other, forming a social network. In the social network will be reflected roles and responsibilities of the acquisition, dissemination and utilization of knowledge in an ongoing dialogue constantly forging effective thinking. In maintaining useful knowledge as a stock, the knowledge needs to be transferred, stored in a format that is good and should be externalized and internalized by having the drawbacks, so that others can use and should review the relevance.

Dissemination of knowledge performed strongly influenced by the actors who take responsibility for distribution and how to find people with the knowledge needed to effectively and then transfer it to others in the transformation process to implement the action. However, because of the nature of knowledge that is not in a concrete form makes it very difficult indeed to be transformed and estimated financial context. Utilization of the knowledge contained in the dynamics of activity and its application by the user. The dynamics of the application of knowledge is a logical consequence of the complexity, diversity and environmental

turbulence, so it is necessary the development of strategy, process improvement, and technology implementation through setting goals with agricultural development policy.

5. Conclusion

It can be concluded that in order for the agricultural sector to further progress and develop in the study area, it is very critical that there needs to be a merger between the indigenous or local and modern knowledge. It has been identified that this merger of knowledge ranges from its acquisition, dissemination and utilization in a system through mutual cooperation. This study implies that such merger of local and modern knowledge will encourage the development of innovations in agriculture that need strategy development, process improvement, and the application of technologies through the establishment of policies.

References

- Ali, M. Saleh S. 2000. Local knowledge and sustainable agricultural development: perspective of the marginalized. Speech of Inauguration Professor, Faculty of Agriculture and Forestry, Universitas Hasanuddin, Makassar, South Sulawesi, Indonesia
- Ardhian, D. 2009. Knowledge of agriculture: local knowledge and scientific dialogue. Available from: <http://ardhiandavid.wordpress.com/2009/05/14/pengetahuan-pertanian-dialog-pengetahuan-lokal-dan-ilmiah/>. Accessed on 10th May, 2011.
- Awang, S. 2008. Local wisdom. <http://www.unsoed.ac.id/node/local-wisdom>.
- Accessed on 29th July 2012.
- Bieri, S. 2009. Power and poverty: reducing gender inequality by ways of rural employment. Paper presented at the FAO-IFAD-ILO Workshop on Gaps, Trends and Current Research in Gender Dimensions of Agricultural and Rural Employment-Differentiated Pathways out of Poverty, Rome. Italy.
- Bouguera, A., Douma, A., Evina, H.E., Hamdouni, N., and Musubu, J. 2003. Valorisation de savoirs et savoir-faire: perspectives d'implication des acteurs, dont la femme, dans la conservation in-situ de la biodiversité du palmier dattier dans les oasis du djérid (Tunisie). Working Document Series ICRA (NI) No. 115.
- Brodt, S. 2002. Learning about tree management in rural central india: a local-global continuum. *human-organization (USA)*. 61(1):58-67.
- Butler, L., and J. Waud. 1990. Strengthening extension through the concepts of farming systems research and extension (fsr/e) and sustainability. *Journal of Farming Systems Research Extension*. 1(1): 77-98.
- Collinson, M. (Ed.) and FAO, 2000. A History of Farming Systems Research. CABI Publishing UK.
- Cools, N., De Pauw, E., and Deckers, J. 2003. Towards an integration of conventional land evaluation methods and farmers soil suitability assessment: A case study in Northwestern Syria. *Agriculture-Ecosystems and Environment (Netherlands)*. 95(1): 327-342.
- De Walt, B.R. 1994. Using indigenous

- knowledge to Improve Agriculture and Natural Resource Management. In: Human Organization Vol. 53. No. 2. Center for Latin American Studies.
- Farrington, J., and A. Martin. 1987. Farmer participatory research: a review of concepts and practices. ODI Agricultural Administration (Research and Extension) Network Discussion Paper No. 19. London: Overseas Development Institute.
- Flavier, J.M. 1995 The regional program for the promotion of indigenous knowledge in Asia. Warren, D. M., L. J. Brokensha (eds). The cultural dimension of development: indigenous knowledge systems. London: Intermediate Technology Production. pp: 479-487.
- Flora, C.B. 1992. Reconstructing agriculture: The case for local knowledge. *Rural Sociology*. 57 (1): 92- 97.
- Foucault, M. 1980. Power/knowledge (C. Gordon, Ed.). Hertfordshire: Simon & Schuster.
- Friis-Hansen, E. (1999). The socio-economic dynamics of farmers' management of local plant genetic resources: a framework for analysis with examples from a Tanzanian case study. CDR-Working-Paper-Centre-for-Development-Research (Denmark) 1999, No. 3.
- Green, M. 2006. Representing Poverty and Attacking Representations: Perspectives on Poverty from Social Anthropology. *Journal of Development Studies*, 42 (7): 1108–1129.
- Hambly, H.V., and T. O. Angura. 1996. Grassroots indicators for desertification: experience and perspectives from Eastern and Southern Africa. International Development Research Center, Ottawa. 68p.
- Haverkort, B. 1991. Farmers' experiments and participatory technology development. In: Haverkort B, van der Kamp J., and Waters Bayer A, (eds). *Joining farmers' experiments: Experiences in participatory technology development*. Intermediate Technology, UK.
- Haverkort, B. and H. de Zeeuw. 1992. Development of technologies towards sustainable agriculture: institutional implications. pp. 231-242. In: W.M. Rivera and D.J. Gustafson (eds). *Agricultural extension: worldwide institutional evolution and forces for change*. New York: Elsevier Science Publishing Company
- Iwanaga, M. 1998. In situ conservation and the development process. In: Jarvis, Debra I. and Toby Hodgkin (eds). *Strengthening the scientific basis of in situ conservation of agricultural biodiversity on-farm: options for data collecting and analysis*. Proceedings of a workshop to develop tools and procedures for in-situ conservation on-farm. 25- 29 August 1997, Rome, Italy. International Plant Genetic Resources Institute, Rome, Italy.
- Kibwana, O.T., Haile, M., Veldhuizen, L. van and Waters, B. A. (2001). Clapping with two hands: bringing together local and outside knowledge for innovation in land husbandry in Tanzania and Ethiopia: a comparative case study. *Journal of Agricultural Education and Extension*. 7(3):133-142.

- Kloppenborg, J. 1991. Social theory and the de/reconstruction of agricultural science: local knowledge for an alternative agriculture. *Rural Sociology* 56 (4): 519-548.
- Mapinduzi, A.L., Oba, G., Weladji, R.B., and Colman, J.E. 2003. Use of indigenous ecological knowledge of the Maasai pastoralists for assessing rangeland biodiversity in Tanzania. *African Journal of Ecology*. 41(4): 329-336.
- Marothia, D. K. 2002. Institutional arrangements for participatory irrigation management: initial feedback from central India. *ACIAR Proceedings (Australia)* 106 pp.75-105
- Marschke, M., and Nong, K. 2003. Adaptive co-management: lessons from coastal Cambodia. *Canadian Journal of Development Studies*. 24(3): 369-383.
- Mendoza, L. M. C., and Luning, H. 1997. Capturing resource user's knowledge in a geographic information system for land resource management: the case of the Kankanaey farmers in Benguet, Philippines. *Geographical-Studies-of-Development-and-Resource-Use (Netherlands)*. No. 2, 26 p.
- Merrewij, A.V. 1998. Three definitions of indigenous knowledge. *Indigenous Knowledge and Development Monitor*. 6(3):13-21
- Namba, A. 2003. Pendekatan ekosistem dalam penanggulangan kemiskinan: refleksi penanggulangan kemiskinan di Sulawesi Tengah. *Jurnal Ekonomi Kerakyatan*. Artikel Th. II No. 1 Maret 2003 (*In Indonesian*).
- Nanda, M. 1999. Who needs post development? Discourses of difference, green revolution and agrarian populism in India. *International Studies in Sociology and Social Anthropology*. 74: 5-31
- Nonaka, I., and Takeuchi, H. 1995. *The knowledge creating company: how japanese companies create the dynamics of innovation?* Oxford University Press. Inc. New York.
- Pieterse, J.N. 2004. *Globalization as Hybridization*. In: *Globalization and Culture: Global Manage*, Lanham. Rowman and Littlefield Publisher, Inc. pp. 59-83.
- Rajasekaran, B.D., M. Warren, and S.C. Babu. 1991. Indigenous natural-resource management systems for sustainable agricultural development - A global perspective. *Journal of International Development*. 3(4): 387-402.
- Roling N.G and Engel, P.G.H 1990. IT from knowledge system perspectives: Concepts and issues, knowledge in society. *The International Journal of Knowledge Transfer*. 3: 6-18
- Rosenblum, M.L., Jaffe, L., and Scheerens, J.C. 2001. Setting up farmers' research agendas in Lesotho. *Indigenous Knowledge and Development Monitor*. 9(1): 3-7.
- Rositah, E. 2005. *Kemiskinan masyarakat desa sekitar hutan dan penanggulangannya: studi kasus di Kabupaten Malinau, Provinsi Kalimantan Timur*. Journal Centre for Pacific and Asia Studies. Radboud University Nijmegen, The Netherlands (*In Indonesian*).
- Rosyadi dan Tobirin. 2010. Local wisdom. *Pidato ilmiah dalam dies natalis*

- Universitas Jenderal Soedirman ke 47. <http://www.unsoed.ac.id/en/node/local-wisdom>. Accessed on 6th August, 2012 (*In Indonesian*).
- Roth, G. 2000. Lokales Wissen im Beratungskontext: Vernetzung von loka-lem bauerlichem Wissen mit dem landwirtschaftlichen Beratungsangebot in der Dominikanischen Republik (*In German*).
- Salas, M.A. 1996. Papas y cultura: acerca de la interaccion de sistemas de conocimiento en los Andes del Peru
- Samal, P.K., L. Man S. Palni, and D.K. Agrawal. 2003. Ecology, ecological poverty and sustainable development in Central Himalayan region of India. *International Journal of Sustainable Development and World Ecology*. 10: 157-168.
- Schoorl, J.W. 1981. Modernisasi Pengantar Sosiologi Pembangunan Negara-Negara Sedang Berkembang (diIndonesiakan oleh Soekadijo, R.G.) Cet. 2. PT. Gramedia. Jakarta (*In Indonesian*).
- Shrestha, P., McDonald, M., and Sinclair, F. 2003. Application of a knowledge-based systems approach in participatory technology development: developing soil and water management interventions for reducing nutrient losses in the middle hills of Nepal. *Mountain Agriculture in the Hindu Kush-Himalayan region. Proceedings of an International Symposium May 21-24, 2001, Kathmandu, Nepal*. pp. 61-67.
- Simpson, B.M. 1999. The Roots of Change: Human Behaviour and Agricultural Evolution. In: Mali. *IT-Studies-in-Indigenous-Knowledge-and-Development-Intermediate-Technology (UK)*. 1999, unnumbered, 182p.
- Stein, A., Goma, H.C., Rahim, K., Nangendo, G., and Riley, J. 2001. Participatory studies for agro-ecosystem evaluation. *Agriculture, -Ecosystems-and-Environment (Netherlands)*. 87(Special Issue 2): 179-190.
- Suharsaputra, U. 2004. Filsafat Ilmu. Universitas Kuningan: Jakarta (*In Indonesian*).
- Suhartini and Dwi Cahyono, E, 2009. *Kajian Sistem Pertanian Padi Organik: Dalam Perspektif Indigeneous Knowledge/Technology dan Ekonomi Lingkungan (Kasus di Sragen, Jawa Tengah dan Malang, Jawa Timur)*. Laporan Penelitian. Fakultas Teknologi Pertanian. Universitas Brawijaya. Malang (*In Indonesian*)
- Sumberg, J. Okali, C., and Reece, D. 2003. Agricultural research in the face of diversity, local knowledge and the participation imperative: theoretical considerations. *Agricultural-Systems*. 76(2): 739-754.
- Sunaryo dan L. Joshi. 2003. Peranan pengetahuan ekologi lokal dalam sistem agroforestri. World Agroforestry Centre (ICRAF) Southeast Asia Regional Office. Bogor, Indonesia (*In Indonesian*).
- Suparlan. P. 1994. *Metodologi Penelitian Kualitatif*. Jakarta: Program S-2 Kajian Wilayah Amerika Universitas Indonesia (*In Indonesian*).

- Taylor, L. 2009. Growth, Development Policy, Job Creation and Poverty Reduction. DESA Working Paper No. 90ST/ESA/2009/DWP/90, World Bank.
- Vandebroek, I., Van Damme, P., Van Puyvelde, L., Arrazola, S. and De Kimpe, N., 2004. A Comparison of Traditional Healers Medicinal Plant Knowledge In The Bolivian Andes And Amazon. *Social Science & Medicine*. August 59(4): 837-849.
- Viergever, M. 1999. "Indigenous Knowledge: an interpretation of views from indigenous peoples". Pp.333- 359 In: Semali, Ladislaus M. and Joe L. Kincheloe (Eds.). *What is indigenous knowledge? Voices from the academy*. New York and London. Falmer Press.
- Warren, 1993. Using IK for Agriculture and Rural Development. *Current Issues and Studies*. In: *Indigenous Knowledge and Development Monitor*. 1(1) CIKARD.
- Zakaria, Y. R. 1994. *Hutan dan Kesejahteraan Masyarakat*. Wahana Lingkungan Hidup. Jakarta (*In Indonesian*).
