

WORLDVIEWS ON BIODIVERSITY FROM SELECTED VILLAGES AROUND IFUGAO RICE TERRACES IN THE PHILIPPINES

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ABSTRACT – This paper aims to assess the respondents’ prior knowledge on biodiversity and suggest some action plans for biodiversity awareness campaign among the locals. A total of 18 respondents from Banaue, Hungduan and Mayoyao participated in the survey. The web tool was adopted from <http://biodiversity.wviews.org/> (2012) but with some modifications. The results show a great concern over the loss of biodiversity (83% of the respondents) and is clearly reflected in their support of protective measures at the expense of economic constraints. Around 56% of the respondents are familiar about biodiversity and understood that most people in the world including the Ifugao residents, are affected by biodiversity loss. Sixty-seven percent (67%) of the respondents said that both industrialized and developing countries should be obliged to pay for biodiversity protection and when needed, 78% of them think that a global fee should be paid for their utilization. There is a general remarkable support for expanding international biodiversity regulation and therefore the extent to which burdens and benefits are shared. The local scenario of Ifugao was briefly analyzed and an action plan on biodiversity awareness campaign through policy and education was suggested.

Keywords: Worldviews, Biodiversity, Ifugao Rice Terraces

INTRODUCTION

The concept of worldview has been described as mental lenses that are entrenched ways of perceiving the world (Olsen et al., 1992). We use a particular lens to see things. According to Wise (2009), our particular “slant” on life can be the result of our cultural history, political views, economic status or level of education. Our individual or collective way on perceiving things also drives us to initiate moves or actions in finding potential solutions to some problems. This paper specifically would like to look into the worldviews of local people about biodiversity. Biodiversity is the “variety of life” or “variety of living things” in a locality or in an ecosystem (Gomez and Pacardo 2005, Buot and Osumi 2004).

The extinction crisis of world biodiversity calls for a worldwide effort in saving the valuable remnants. Scientists estimate that we are now losing species at 1,000 to 10,000 times the background rate, with literally dozens going extinct every day (Chivian and Berstein. 2008). In response to this, many countries took urgent actions to prevent the loss of biodiversity. Thus, in 2010 in Nagoya Japan, an agreement was signed by over 190 countries around the world recognizing the importance of our wildlife and ecosystems in sustaining a healthy planet and for delivering essential benefits for people. Furthermore, the United Nations declared 2011– 2020 as the UN Decade on Biodiversity. This serves to support and promote implementation of the objectives of the Strategic Plan for Biodiversity and the Aichi Biodiversity Targets.

Aichi Biodiversity Target 1 of the Strategic Plan for Biodiversity 2011-2020 aims to ensure that by 2020 people are aware of the values of biodiversity and the steps they can take to conserve it and use it sustainably. The need to increase the awareness on biodiversity to all the sectors of the society is a growing cause.

However, any awareness campaign would be futile if the values and attitudes of a group of people negate the cause. The substantial relevance of world views should be thoroughly grasped. Hart (2010) explained that worldviews are encompassing and pervasive in adherence and influence. Yet they are usually unconsciously and uncritically taken for granted as the way things are.

In 2012, a global initiative known as World Wide Views (WWViews) on Biodiversity gathered citizen views on international biodiversity policy issues and disseminated them to policymakers involved in the UN Convention on Biological Diversity (CBD). According to Bedsted (2012) this is a part of the ambition and effort to close a widening gap between citizens and policymakers as policy development grows increasingly global in scale. The world views of the people therefore, are a key determinant in this aspect.

Biodiversity is indeed important to farmers and non farmers alike. Agricultural productivity depends on biodiversity. In the Philippines, the Ifugao Rice Terraces (IRT) has been a sustainable system for several years on account of its agricultural diversity. It has been declared a UNESCO (United Nations Educational, Scientific and Cultural Organization) World Cultural Heritage site and a GIAHS (Globally Important Agricultural Heritage Systems) site (Koochafkan and Dela Cruz, 2011), as well. At present, however, there are plenty of challenges facing the Ifugao Rice Terraces system, (Wilson 2010, Bantayan et al., 2005). These are challenges most common to communities experiencing transition from subsistence agriculture to market economy and modern intensive agriculture.

Hence, this paper seeks to determine the worldviews of the locals that may have contributed to this degradation. This specifically (a) assesses the respondents' prior knowledge on biodiversity and (b) analyzes and suggests some action plans for biodiversity awareness campaign.

MATERIALS AND METHODS

Study Area

The Ifugao province is located along the eastern border of the Luzon Central Cordillera mountain ranges. It is bounded on the north by Mountain Province, on the west by Benguet, on the south by Nueva Vizcaya and on the east and southeast by Isabela. Eleven municipalities comprise the province with a combined land area of 251,778 hectares. Of the total land area, 198,246 hectares (79%) is occupied by nine upland municipalities containing the rice terraces clusters and the remaining 53,532

hectares (21%) is occupied by the two lowland municipalities of Lamut and Alfonso Lista (DENR, 2008). Of these nine areas, the municipalities of Banaue, Hungduan and Mayoyao were designated as GIAHS sites. The Ifugao Satoyama Meister Training Program is a human capacity building program which mainstreams the principles of GIAHS. The respondents of this study were from the said program.

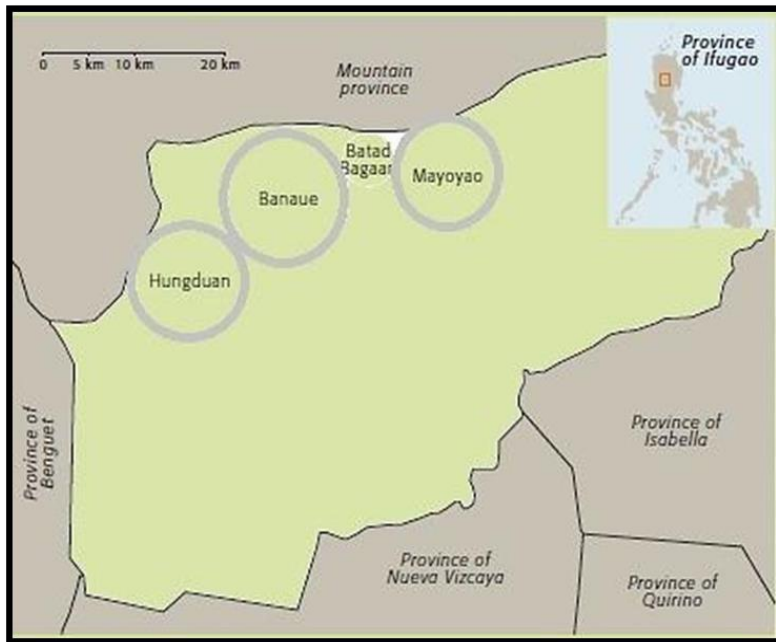


Figure 1. Map of the province of Ifugao showing the sites of the three municipalities of the respondents (Source: Calderon et al., 2008).

The web tool/material

In this study, the questionnaire from WWViews was adopted but with some modifications. This was accessed from <http://biodiversity.wwviews.org/> (Bedsted 2012). A printed material was answered by each trainee.

Essentially, the questions focused on how to stop the decline of biodiversity and with a view to provide decision makers with information about public opinion on different policy measures to do so. Questions chosen were clustered in 3 themes, namely, 1) Introduction to Biodiversity, 2) Biodiversity on Land, and 3) Burden and Benefit Sharing.

Unlike the consultation event, information booklets were not given to the respondents to test their “prior knowledge” about the values of biodiversity before they started in the program.

MATERIALS AND METHODS

Respondents' knowledge about biodiversity

The results from the local consultation on biodiversity with the respondents whose socio – demographic profile is shown on Fig. 2 are clear. In the first part of the survey, Introduction to Biodiversity, the respondents' familiarity about biodiversity was examined. Majority (56 %) of the respondents had some (as opposed to a no) knowledge about biodiversity while 28 % said they knew a little.

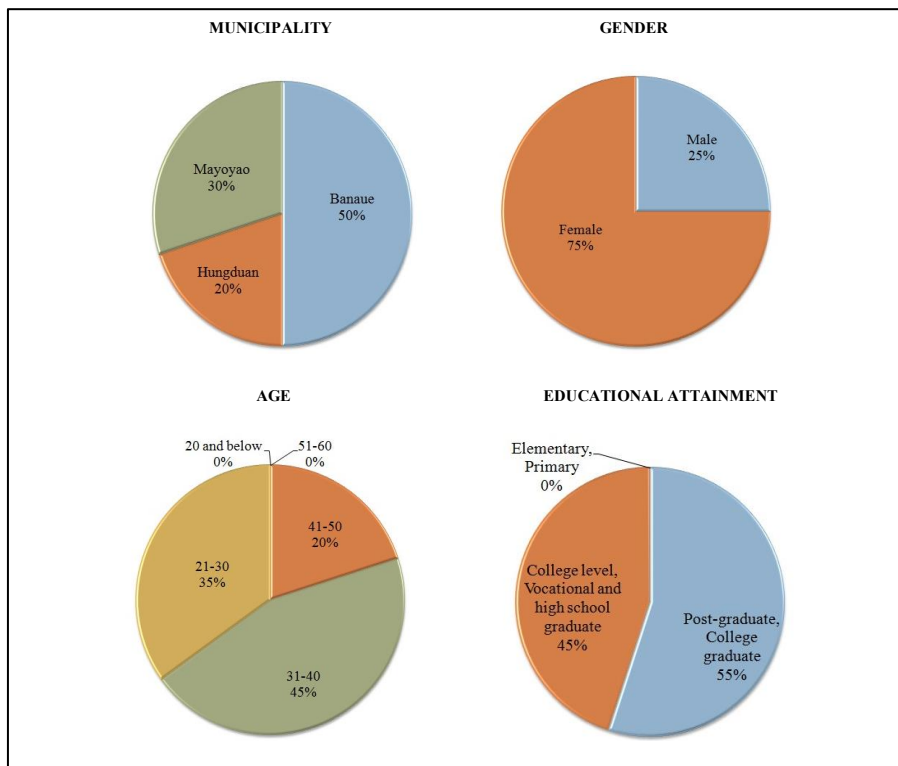


Figure 2. Socio – demographic profile of the respondents.

Half of the respondents were from the municipality of Banaue and 75 % were females. Majority were college graduates with ages ranging from 21 – 44 years old. Most of the participants were inclined on agriculture and they wanted to know more about organic agriculture and on how to increase the productivity of their fields. Some were also interested on eco-tourism and conservation knowing the potentials of their majestic terraces (Fig. 3).



Figure 3. A portion of the Mayoyao Rice Terraces in Mayoyao, Ifugao showing serene rice fields with houses in traditional architecture sporadically distributed (photo by Dr Joane Serrano).

Aichi Biodiversity Target 1 aims to have a people that are “aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.” This measures the awareness of the public regarding biodiversity issues. The proportion of the participants that had some knowledge or knew a little about biodiversity is fairly high (Fig. 4). This is a manifestation of the efforts of various groups (whether government or non-government organizations) in conducting programs for the conservation of the terraces in their respective localities.

When asked about who are the most affected by biodiversity loss, interestingly, 39% and 28% of the respondents answered that most people in the world and in their hometowns are affected, respectively (Fig. 5). Most of the people are aware that biodiversity loss is happening, seriously affecting human communities. It is sad to note that some are not that aware. It is somehow a sign that biodiversity loss is a non-concrete construct for some. While there are a lot of programs about biodiversity, the manners by which these programs are delivered to the people may not be that effective. There should be an operative synergy in all levels to communicate the global consequences of biodiversity loss.

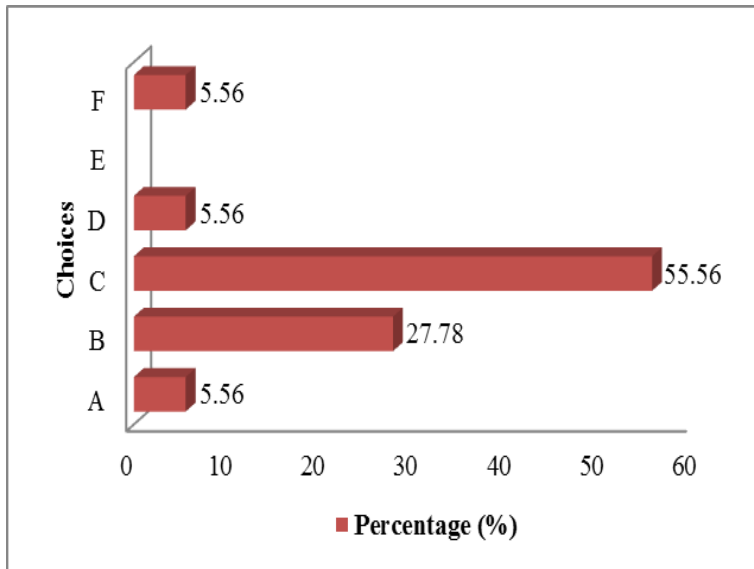


Figure 4. Familiarity of the locals with biodiversity issues. (Choices: A. I knew almost nothing, B. I knew very little, C. I knew some, D. I knew a lot, E. I was already an expert on the subject, F. Don't know/ Do not wish to answer).

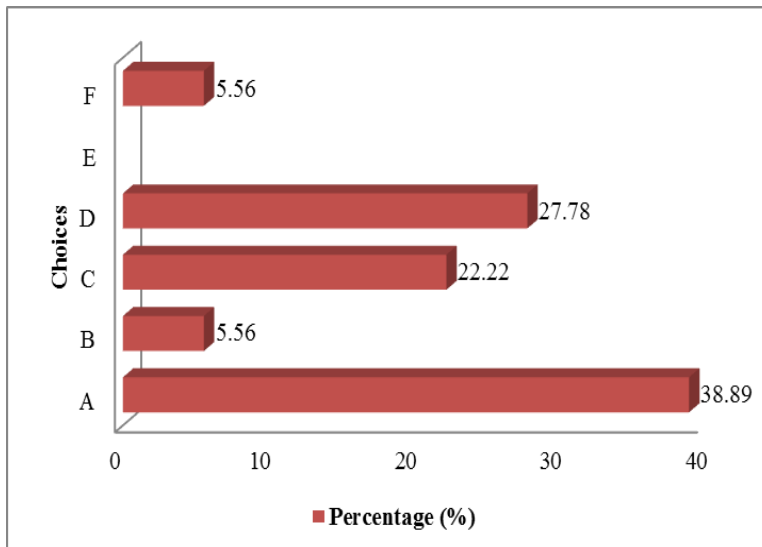


Figure 5. Perception of locals on affected communities over biodiversity loss. (Choices: A. Most people in the world, B. Few people in the world, C. My country in general, D. My hometown/village, E. Nobody, F. Don't know/ Do not wish to answer).

The results of the WWViews (2012) suggested that it is advisable that national action plans for implementing the Global Strategic Plan in national legislation and actions, address the concern that biodiversity is remote from people's everyday lives, for example by directing communication activities at the local and personal consequences of biodiversity loss.

Figure 6 shows that most of the respondents (83 %) showed a heightened concern on the loss of biodiversity. On raising the level of awareness of the respondents, their concerns on the issue are also apparent. The rampant concern over the loss of biodiversity is notable. The result indicates that if there is proper education and also, significant time for discussion about the loss of biodiversity, the concerns of the respondents will be better felt. There is a dependency of most citizens in developing countries on the "direct use of natural resources and their greater vulnerability to the cultural and economic erosion that accompanies biodiversity loss in such circumstances". It should be noted that most of the respondents are farmers and rely on their farms for subsistence. Biodiversity loss affects agricultural productivity as well.

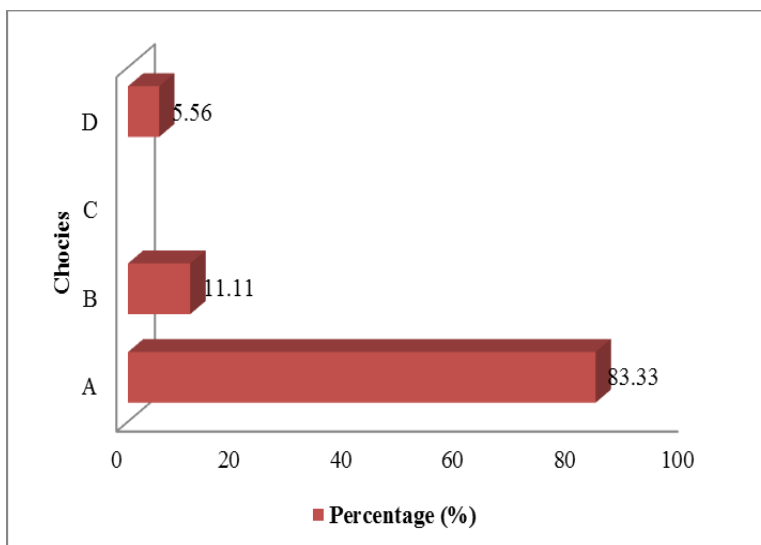


Figure. 6. Level of concern of the locals on biodiversity loss. (Choices: A. Very concerned, B. Somewhat concerned, C. Not concerned, D. Don't know/ Do not wish to answer).

Biodiversity on Land

In the second part of the survey about Biodiversity on Land, the first question was about which between existing economic interests and establishment of new protected areas should come first when conflict arises.

Figure 7 illustrates that 50 % of the respondents think that establishing new protected areas on land should have higher priority than economic aims unless they are very important. The results suggest that the respondents support the establishment of protected areas and should be "effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other

effective area-based conservation measures, and integrated into the wider landscapes and seascapes.” It should be noted that amidst the financial turmoil in the present times, economic concerns are not given higher priority compared to the establishment of new protected areas. On the other hand, some of the respondents also believed the importance of economic aims for their sustenance. Maybe, they are open to the idea that environmental and economic improvement goes hand in hand.

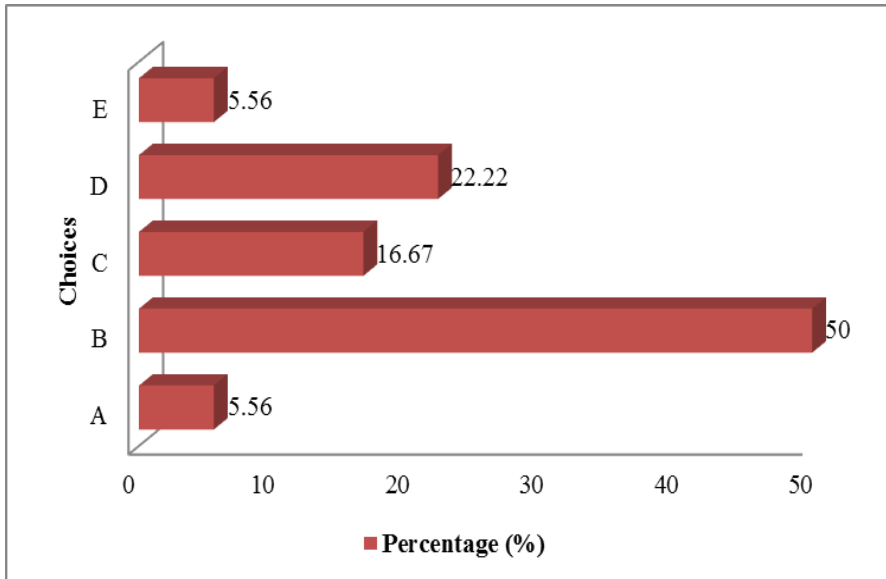


Figure 7. Priority when conflict arises between existing economic interest and establishment of new protected areas. (Choices: A. New Protected Areas, B. New Protected Areas unless very important economic aims are at stake, C. Economic aims unless the protected area is very important, D. Economic aims, E. Don't know/ Do not wish to answer).

In response to the preferred measures for protecting nature areas in the country, 39 % of the respondents, as shown in Fig. 8, believed that educating school children and the public by promoting biodiversity issues is the best move for them. Twenty two percent (22 %) of them also wanted to integrate the issues about biodiversity in planning future activities. A few (17%) of them also saw the legislation of stricter national laws as a means in protecting nature areas.

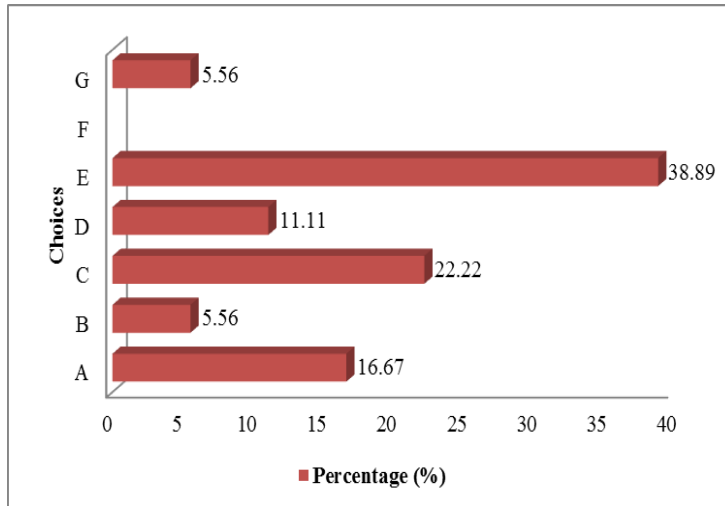


Figure 8. Locals' preferred measures to ensure the protection of nature areas in the country. (Choices: A. Enact stricter national laws, B. Better enforce existing laws, C. Incorporate biodiversity issues in all other planning activities, D. Provide incentives to stakeholders (industry, farmers, NGOs, etc.) engage in protection measures, E. Educate school children and the public by promoting biodiversity issues, F. Nothing, G. Don't know/ Do not wish to answer).

On the other hand, as shown in Fig. 9, most of the respondents (78%) wanted to intensify agricultural production in existing farmland to balance the future demand for food with the aim to protect biodiversity. As a people who are dependent on the provision of the forests and other natural resources, it is not surprising that most respondents would prefer the improvement of agricultural production to meet the demands for food. This provides a challenge for the agricultural sector to introduce novel agricultural practices and technologies that will reduce the conversion of nature areas into farmlands. The “kaingin” or slash and burn farming of the natives is an example of this. Consequently, the implementation of such practices and technologies should be managed accordingly.

Burden and Benefit Sharing

In the Burden and Benefit sharing part, the first question was on who should supply financial resources for biodiversity protection in developing countries. Based on the results in Fig. 10, 67 % of the respondents think that their country should be obliged to pay for biodiversity protection and interestingly, 33 % say that both industrialized and developing countries must be tasked to do so. Another 17 % also believe that commercial companies and consumers must do the obligation.

The willingness and readiness of the citizens to share the cost for better biodiversity policies must be considered by law makers. There is no discrimination whether the developed or developing countries should partake in protecting biodiversity. As peaceful natives, Ifugao residents want to be a part in actively accomplishing this task. They are more than willing to contribute in whatever way they can. Though as to monetary aspect, this is silent. It seems more feasible for developed countries to be mainly involved in this as they can be beneficiaries of the ecosystem services of a protected biodiversity.

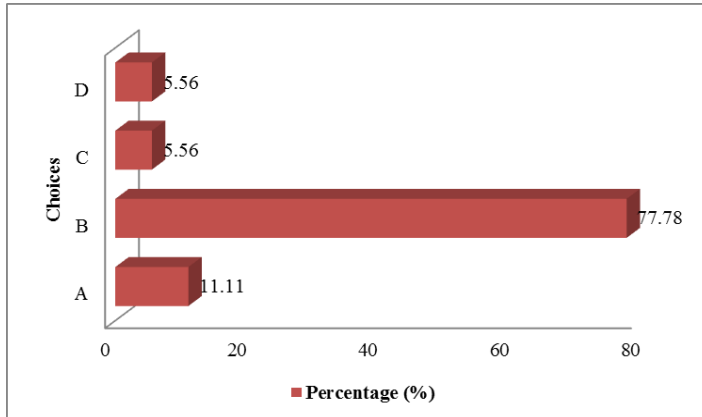


Figure 9. Locals' views as to the most promising strategy in matching the future demand for food with the aim to protect biodiversity. (Choices: A. Expand the farmland by converting nature areas to new agricultural farmland and thus avoid converting nature areas to new agricultural land, B. Intensify agricultural production in existing farmland and thus avoid converting nature areas to new agricultural land, C. Reduce the demand for more food, for example by eating more plants and less meat, D. Don't know/ Do not wish to answer).

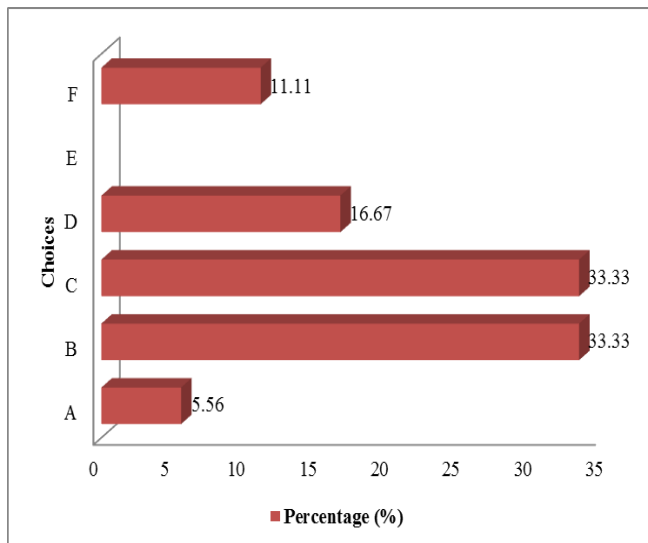


Figure 10. Locals' view on sources of financial resources for biodiversity protection in developing countries. (Choices: A. Payments from countries should be made in a voluntary basis as it is done now, which means that only industrialized countries provide money, B. Both industrialized and developing countries should be obliged to pay, but industrialized countries should pay the main part, C. Both industrialized and developing countries should be obliged to pay, but developing countries should pay the main part, D. Commercial companies and consumers should pay rather than countries, E. There is no need for financial resources).

According to the 50 % of the respondents as shown in Fig. 11, users of existing species collections of animals, plants and microorganisms should share the benefits with the countries of origin even if the species were collected before the Nagoya Protocol that requires benefit sharing into force. Another 50 % do not know or do not wish to answer.

The right of the country of origin to reap the benefits derived from them must be observed. New collections and discoveries made by developed countries from developing countries must be shared. Based from the result of the survey, this should be seriously considered by law makers. The issue of biopiracy could also be taken into account. The levels of support from the different levels of the government should cover the implementation of such action.

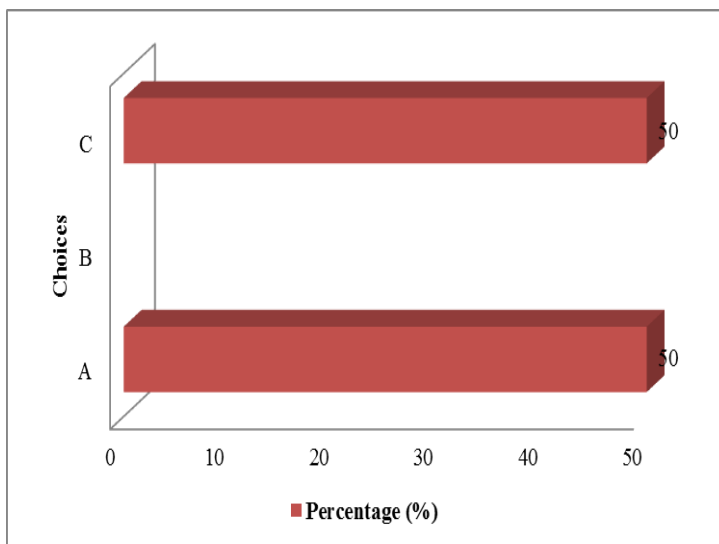


Figure 11. Locals' view whether users of existing species collections of animals, plants and microorganisms share benefits with the countries of origin if the species were collected before the Nagoya Protocol enters into force. (Choices: A. Yes, B. No, C. Don't know/ Do not wish to answer).

Figure 12 shows that 78 % of the respondents vote in favor of requiring users of genetic resources from the High Seas to pay a fee on global diversity in exchange for being allowed to use them.

Similar to the results of WWViews report in 2012, there is generally considerable support for stronger international regulation of the High Seas. There was a recommendation for a tax on the use of genetic resources collected before the Nagoya Protocol enters into force and there was also a strong support for benefit sharing schemes. This result echoes a strong message to law makers to reach a new international agreement on rules to be applied in the High Seas.

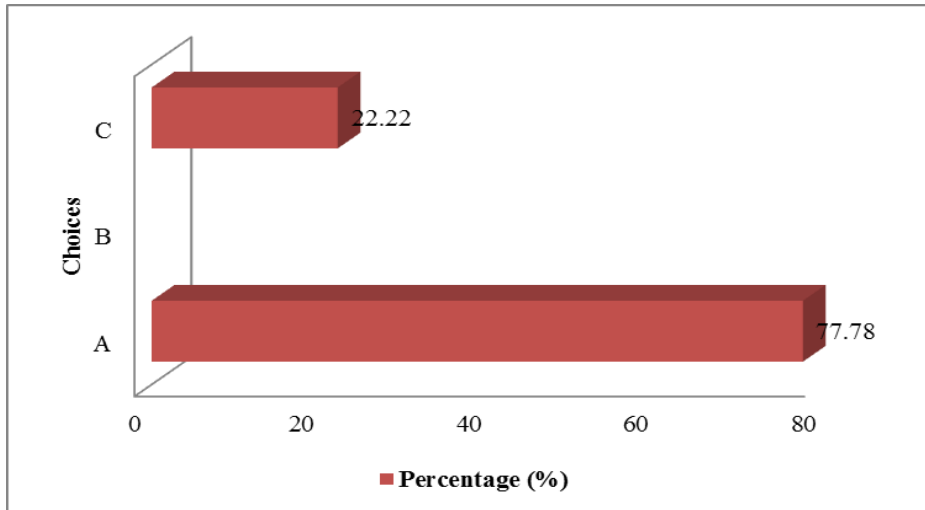


Figure 12. Locals' view whether users of genetic resources from the High Seas should pay a fee to global diversity for being allowed to use them. (Choices: A. Yes, B. No, C. Don't know/ Do not wish to answer).

Action Plan

The continued dependence of human communities on nature's ecosystem services is undebatable. However, the low level of awareness (though majority) on the value of biodiversity (56% of the respondents as shown in Fig.3), the absence of policies, the commercialization trend and the increasing needs of the household are the factors putting extreme pressure on nature and biodiversity in the terraces and the surrounding muyong forest as is happening in many other places in the Philippines, ASEAN and the globe (Payawal and Markgraf 1981, Buot and Okitsu 1998, 1999, Buot and Osumi 2004, Hong et al 1995, Mittermeier et al. 1999; Myers et al. 2000, Buot and Osumi 2011). In response to these ground realities, two important actions are suggested: 1) intensifying local government's thrust on environmental policies and 2) incorporating a biodiversity curriculum in the local biodiversity action plan.

Intensifying local government's thrust on environmental policies

Several campaigns were conducted in the past years to save the Ifugao Rice Terraces system, an important agricultural heritage. According to the report of DENR (2008), several offices were created (and later abolished) during the terms of three presidents to address the concerns in the national level. President Fidel V. Ramos created the Ifugao Terraces Commission (ITC) in 1994, which was abolished by President Joseph E. Estrada in 1999 to give way to the Banaue Rice Terraces Task Force (BRTTF). In 2002, President Gloria Macapagal-Arroyo abolished the BRTTF and transferred the responsibilities of managing the agricultural heritage to the provincial government. The government initiatives towards the preservation of the terraces include the passage of two laws: the National Integrated Protected Areas System Act (NIPAS Law, Republic Act 7586) and the Indigenous Peoples Rights Act (IPRA Law, Republic Act 8731). Funds were also allocated on intensification of agricultural production.

However, some policies for sustainable agriculture, i.e. to promote integrative and holistic practices that focus on the conservation of resources (including genetic diversity), as well as productivity, have proved elusive (Swift et al., 2014). Sustainable and successful ecotourism is still not a reality in Ifugao. Land use planning and zoning seem not evident. At higher scales, the problem is exacerbated by population pressure and globalization of trade and economic trends. It is explicit that the respondents still believe on the roles of policy makers in upgrading environmental stance. The policy makers, though, need input from researchers and academics. The role of local universities cannot be overemphasized. Peer reviewed research results should be translated into policies and local government ordinances to enhance sustainable management of the Ifugao Rice Terraces system.

Incorporating a biodiversity curriculum in the local biodiversity action plan

A significant result of the survey showed a heightened concern of the respondents on the effects biodiversity loss (Fig. 5). Ironically, the level of awareness of the respondents on the genuine value of biodiversity is not sufficient. Even though most clamor for an “effective, participatory and updated national biodiversity strategy and action plan”, there is lack of communication on these measures to the locals. One way to bridge this gap is to utilize the greatest equalizer, that is, education. The fact that the strongest support goes to educational measures (39% of the respondents as shown in Fig.7) “indicates both a positive readiness and wish to learn about biodiversity and possibly a realization that education makes it easier for people to take biodiversity into consideration in their daily lives.”

The results of this survey should be submitted to the concerned local government units to uniquely design a biodiversity action plan appropriate for the location and situation. In this way, the rich cultural economy of the locality will be managed properly. A general curriculum for educating the locals could be drafted. This should be incorporated in the local and regional biodiversity action plan so as to protect the environment and natural resources surrounding the Ifugao Rice Terraces system.

Some of the topics that should be incorporated in the curriculum are; ecology and the dynamics of the environment, science of biodiversity and conservation theories and practices, and nature and local culture, among others.

CONCLUSION

The results of the locals’ consultation on biodiversity awareness were similar to the results of the global consultation event, showing strong public support in taking further political action in order to halt the decline of biodiversity. The respondents expressed great concern over the loss of biodiversity and this is clearly reflected in the support for protective measures at the expense of economic aims. There is widespread willingness to share the costs of biodiversity protection although citizens also believed that developed countries should make larger financial contributions. There is general support for expanding international biodiversity regulation and therefore the extent to which burdens and benefits are shared. Education has been identified as the main key.

Indeed, local public awareness on the value of biodiversity has strong implications on policy formulation for conservation of our biodiversity. The unique perspectives of the locals should be consulted to have a holistic and contextual approach in addressing biodiversity loss.

STATEMENT OF OWNERSHIP

The first author proposed and laid the concept of the study. He directed the appropriate methodologies used. Writing style and sequencing of the topics of the paper were that of the first author. The second author met the respondents and initiated the analyses following the instructions of the first author. He (second author) drafted the paper and was corrected several times and finalized by the main author.

REFERENCES

- Bantayan, N.C., Calderon, M.M., Dizon, J.T., Sajise, A.J.U., Salvador, M.G. 2012. Estimating the extent and damage of the UNESCO World Heritage Sites of the Ifugao Rice Terraces, Philippines. *Journal of Environmental Science and Management* 15:1-5.
- Bedsted, B. (ed). 2012. World Wide Views on Biodiversity: from the world's citizens to the biodiversity policymakers Results Report. Published by The Danish Board of Technology Foundation. Available at biodiversity.worldviews.org.
- Buot I.E. Jr. and Okitsu S. 1998. Vertical distribution and structure of the tree vegetation in the montane forest of Mount Pulog, Cordillera mountain range, the highest mountain in Luzon Is., Philippines. *Vegetation Science* 15: 19-32.
- Buot I.E. Jr. and Okitsu S. 1999. Leaf size zonation pattern of woody species along the altitudinal gradients of Mount Pulog, Philippines. *Plant Ecology* 145: 197-208.
- Buot IE Jr, Osumi K (2004) Satoyama landscapes in the Philippines. *J Nat Stud* 3:1-11
- Buot IE Jr, Osumi K (2011) Land use type pattern and woody species composition near human disturbed landscapes on Mount Makiling, Luzon Island. *Am J Environ Sci* 7:306-315
- Calderon M., Dizon, J., Sajise, A., Andrada, R., Bantayan, N. and M. Salvador. 2009. Towards the Development of a Sustainable Financing Mechanism for the Conservation of the Ifugao Rice Terraces in the Philippines (research report). Singapore: the Economy and Environment Programs for Southeast Asia (EPPSEA).
- Chivian, E. and A. Bernstein (eds.) 2008. *Sustaining life: How human health depends on biodiversity*. Center for Health and the Global Environment. Oxford University Press, New York
- Department of Environment and Natural Resources. 2008. Conservation and Adaptive Management of Globally Important Agricultural Heritage Systems (GIAHS): The Ifugao Rice Terraces Philippine Project. http://www.fao.org/fileadmin/templates/giahs/PDF/Ifugao_Rice_Terraces.pdf (Accessed on September 10, 2014).
- Gomez, R. A., and Pacardo, E. P. 2005 Landscape Change in the Ifugao Rice Terraces, Philippines with the Advent of Modern Agricultural Technologies. *Journal of Environmental Science and Management* 8:1-14.
- Hart, M.A. 2010. Indigenous Worldviews, Knowledge, and Research: The Development of an Indigenous Research Paradigm. *Journal of Indigenous Voices in Social Work* 1: 1-16.
- Jones, M. 1991. The Elusive Reality of Landscape. Concepts and Approaches in Landscape Research. – *Norwegian Journal of Geography* 45:229-244

- Koohafkan, P. and M.J. dela Cruz. 2011. Conservation and adaptive management of Globally Important Agricultural Heritage Systems (GIAHS). *Journal of Resources and Ecology* 2:22-28.
- Hong S., Nakagoshi N. and Kamada M. 1995. Human impacts on pine-dominated vegetation in landscapes in Korea and western Japan. *Vegetatio* 116: 161-172.
- Mittermeier RA, Mittermeier CG & Myers N (eds). 1999. Hotspots: Earth's Biologically Richest and Most Endangered Terrestrial Ecoregions. Conservation International and Cemex, Monterrey, Mexico. 501 pp.
- Myers N, Mittermeier RA, Mittermeier CG, da Fonseca GAB & Kents J. 2000. Biodiversity hotspots for conservation priorities. *Nature* 403:853-858.
- Olsen, M. E., Lodwick, D. G., & Dunlap, R. E. 1992. Viewing the world ecologically. San Francisco: Westview Press.
- Payawal, P.C. and Markgraf V. 1981. Vegetation and modern pollen rain of Mount Makiling, Philippines. 1. Vegetation analysis of the NE slope. *Kalikasan, Philippine Journal of Biology* 10: 255-267.
- Rossler, M. 2005. World Heritage Cultural Landscapes: A Global Perspective. In *The Protected Landscape Approach: Linking Nature, Culture and Community*. J. Brown, N. Mitchel and M. Beresford, (ed). The World Conservation Union (IUCN).
- SITMo, 2008. IMPACT: The Effects of Tourism on Culture and Environment in Asia and the Pacific. Sustainable Tourism and the Preservation of the World Heritage Site of the Ifugao Rice Terraces, Philippines. UNESCO Bangkok, Bangkok.
- Wildlife crisis worse than economic crisis. 2009. Press release. <http://www.iucn.org/?3460Wildlife-crisis-worse-than-economic-crisis--IUCN>. (Accessed on September 10, 2014)
- Wise, D. L. 2009. Identity Interplay: Real and Crafted Identity Among Virtually Performing Musicians (Unpublished doctoral dissertation).



JOURNAL OF NATURE STUDIES
(formerly Nature's Bulletin)
ISSN: 1655-3179