



Benguet State University

RESEARCH JOURNAL

CHED Accredited

Level B

CMO No. 23 S. 2014

ISSN 0117-5297

Vol. 73

January-June 2015



All communications should be addressed to:

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BSU Research Journal

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Website: www.bsu.edu.ph

This multidisciplinary scientific journal publishes selected papers but not limited to those presented during the annual Benguet State University Agency In-House Review (Agriculture, Forestry and Natural Resources, Social and Education Sectors).



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**SPECIES PROFILE AND ASSOCIATED INDIGENOUS
KNOWLEDGE OF TREES AND SHRUBS
USED AS TEA IN BENGUET**

John G. Tacloy

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Benguet State University

ABSTRACT

To conserve indigenous shrubs and trees used as tea for environmental and socio-economic development, profiling of these species was conducted. The research focused in identifying and in obtaining initial information as to the nature of the habitat, flowering/fruiting periods, and respondents' indigenous knowledge of the shrubs and trees used as tea.

Data were gathered through interviews with community folks using structured questionnaire, augmented by field observations. There were 79 respondents who contributed information; almost all are farmers and the great majority are elders and women.

Eighteen indigenous trees/shrubs were identified by the respondents being used as tea. The most popular being known to more than one third of the respondents is 'Beltik' (*Syzygium sub-caudatum*), followed by 'Dael' (*Cipadessa baccifera*), and 'Amututin' (*Drimys/Tasmannia piperata*).

Among these species, only 'Beltik', 'Talugtug' (*Gaultheria leucocarpa*), and 'Tsa-ang gubat' (*Carmona retusa*) are used as tea; the rest are chiefly used as medicinal plants but being prepared as tea.

Mostly used are the leaves, followed by the bark, rarely both the leaves and the bark or the fruits/seeds. These parts are used fresh, air-dried, or sun-dried, and prepared mainly by boiling. All species were reported to provide health benefits. As cited by the respondents, propagation of the species is mainly through the use of wildlings, seeds, cuttings, and flowering/fruiting usually varies with locations.

The species are found in mossy forest, except 'Bangkoro' (*Morinda citrifolia* L.), 'Dita' (*Alstonia scholaris*), 'Tuai' (*Bischofia javanica*), 'Narra' (*Pterocarpus indicus*) and 'Tsa-ang gubat' which are found in lower elevations.

Keywords: *Indigenous Knowledge, Tree Species, Profiling, Tea*

ARTIFACTS SPEAK: DIVERSIONS OF BENGUET MATERIAL CULTURE

Stanley F. Anongos Jr.

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ABSTRACT

The paper is part of the bigger endeavor to validate appellations, meanings, and histories of artifacts displayed at the Benguet State University museum. There were 70 distinct artifacts “brought back” in digital form to four communities in Benguet; Kabayan, Atok, Kibungan, and Bakun. This paper reflects on the current state of Benguet material culture from a perspective of social history of things, borrowing ArjunAppadurai’s concept of divergence and to a certain extent, Igor Kopytoff’s commoditization.

Diversions in the value of Benguet’s material culture were preceded by the transformed meaning of the materials brought about by a combination of trade, commercial vegetable farming, and other forces of modernity such as education and transportation developments. The alteration in the value and meaning of things has also changed the manner in which Benguet people themselves use these materials. Aside from non-use, some of these implements are now being displayed in private homes or used in other ways. Diversions of things, therefore, are not always manifested outside and only by other people but also within and from the people themselves.

Antique collection is a most common medium of artifact diversion in Benguet. It is in this practice that many of the Benguet implements were commodified, that is, developing a different value from its original value. As a commodified object, these implements extend their history from actual tools in the place of origin to an object of art and exoticism in another culture and country.

A more recent trend in the commoditization of these material cultures is in the context of cultural tourism and its accompanying craving for souvenirs. This shift demanded cultural symbols as souvenirs for tourists, which induced business minded persons to produce replica of traditional implements for souvenir seeking tourists.

Museums have also defined diversion in the history of things. It is another context where the value and meaning of things also change because they are transformed simply as displays for people to view. This way, their decontextualization alters the value of the tools into artifacts. The transfer of objects from origin to the museum translates the tool/ implement/instrument into artifacts, the latter use being closely associated to objects of display, antiquity, and the museum.

Key words: *Benguet material culture, diversion, artifacts, museum, antique, tourism*

**TIME USE ANALYSIS: WOMEN AND THEIR HOUSEHOLDS
AS SITES FOR EVERYDAY NEGOTIATIONS
AND ORGANIZING COMMUNITY LIFE**

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ABSTRACT

Time use studies puts values to work that are outside the cash nexus and are not counted in national accounts. This exploratory research conducted between August to December 2012, aimed to provide a comprehensive presentation of work along paid and unpaid dimension across gender. It also explored the use of qualitative methodology as an adjunct to quantitative measurements in capturing time use data in agricultural farming communities. Using time use survey, individual interviews, and focus group discussion, time use specifically on paid and unpaid work were drawn from two municipalities in the province of Benguet.

Results show that women's multiple roles remain undervalued and unrecognized. There is a large disparity of time utilization across genders especially on unpaid work. Both genders spend their day in farm work but findings show that it is the women who perform paid and unpaid work simultaneously. While men spend more in 'paid work,' women spent three times more than men in performing unpaid work while spending a time in 'paid work.' Time poverty has been expressed as true more for women than men. Care for teenagers is the dominant care role undertaken by both parents where fathers usually provide for financial support while the mothers provide not only financial but also emotional, psychological, and social support.

Time use in qualitative terms defines the context as well as the meanings people give to this kind of work. Meanings therefore strongly influence what is seen and how situations are responded to. Care work for instance, has been traditionally associated with women, and is continuously being performed by the same women in the households who also maintain farming activities. In the absence of institutions of care, these are the areas that these women take on a negotiating attitude in relation to work: by simultaneously doing things together and many times by 'naturalizing' work traditionally associated to women.

With the competitive and market orientation of these communities, both men and women perform paid farm work, but women have to juggle time for housework and farm work, hence simultaneous work and increasing intensity of work are shouldered. Qualitative data reveal that these male-female divide with men focused on paid work and women negotiating paid and unpaid work, has been naturalized and essentialized. Yet when probed deeper, women expressed the desire to 'share' the work with other members of the household which can have implications to their well-being both in material and emotional-spiritual terms.

Once again, findings show that behind the seemingly accepted and stable paid and unpaid work performance in farming communities, time use framework is revealing in that what has been naturalized is actually more dramatic in terms of women performing gender-related household tasks. On the other hand there is expressed desire of sharing unpaid work with other members of the household.

Keywords: *time use, paid work, unpaid work, negotiations*

THE MATHEMATICS OF MAXIMIZING A PARALLELEPIPED BOX WITH SPHERICAL OBJECTS

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ABSTRACT

This study investigated a special case of packing problems involving identical and fixed sized spherical objects and rectangular parallelepiped box. It determined the possible patterns of piling spherical objects into a parallelepiped box so that the box attains its maximum content. The study explored on the different ways of piling and identified those that yield content greater than that in ordinary piling. The effects of the dimensions of a box on whether or not it is possible to obtain a new pile that tends to increase the population density of the box is determined. The results show that there are smooth and behaved piling patterns that tend to increase the population density of the box from its default piling pattern. It is found that if the box can contain at least 5 spheres along its length, at least 3 spheres along its width and at least 4 spheres along its height, then it is possible to modify the default pile pattern so that additional spheres can be fitted into the box. The mathematics of maximizing the content of the box, or by increasing its population density, is given in theorems and corollaries. Also, the proofs of the theorems are supplied to establish their mathematical viability. The results also show that it is possible to generate mathematical models that establish deterministic algorithms of maximizing content, or increasing population density of the parallelepiped box. The mathematical models developed are recommended for use in calculating the maximal content of a given parallelepiped container. Finally, it is recommended that further investigations on the same topic be conducted as the present study is in no way exhaustive.

Key words: *Parallelepiped box, maximizing space, spherical objects, and mathematical piling models.*

QUELLMALZ HIGHER ORDER THINKING SKILLS AND STUDENTS' ACADEMIC PERFORMANCE IN PHYSICS

Bretel B. Dolipas, Jennifer Lyn S. Ramos and Brenda V. Villamor

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ABSTRACT

The study intended to determine the level of Quellmalz higher order thinking skills (HOTS) in physics of college students and its relationship with their academic performance in physics.

Results show that most students have average level physics performance. However, BS Forestry (BSF) and BS Nutrition and Dietetics (BSND) students have below average performance while BS Agricultural Engineering (BSAE), BS Nursing (BSN) and BS Applied Statistics (BSAS) students have above average performance.

Overall, BS Forestry (BSF) and BS Nutrition and Dietetics (BSND) students have below average level of HOTS while BS Agricultural Engineering (BSAE), BS Nursing (BSN) and BS Applied Statistics (BSAS) students have above average level of HOTS. The rest of the students from the other degree programs have average level of HOTS.

The level of HOTS on evaluation has the greatest influence in the physics performance of students followed by comparison, inference and lastly analysis.

Keywords: *Quellmalz Higher Order Thinking Skills (HOTS), Physics Performance, Mathematics Performance*

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Eriksen, T. 2001. Small Places, Large Issues. An introduction to Social and Cultural Anthropology. 2nd ed. London: Pluto Press.

Two authors:

Hallauer, A. R. and F. O. Miranda. 1980. Quantitative Genetics in Maize Breeding. Iowa State University Press. Ames, Iowa. Pp. 49-52.

Carrasco, C. and M. Serrano. 2011. Lights and Shadows of Household Satellite Accounts: The Case of Catalonia, Spain. *Feminist Economics* 17 (2): 68-85. IAFPE: Routledge Taylor and Francis Group.

Crisologo, L. C. and L. Berlage. 2006. Bargaining in rural households: a study of decision on labor market participation in the Cordillera. *The Philippine Review of Economics*. 48 (2): 249- 537.

More than two authors:

Linsley, R., J. Franzini, D. Freyburg and G. Tchobanoglous. 1992. *Water Resources Engineering*. 4th ed. McGraw-Hill, Inc. New Jersey, USA. Pp. 510-532.

Aguilar, N. O., B. L. Cardenas and M. A. O. Cajano. 2000. Spore and Seed bearing Plants of Mount Pulag, Benguet, Philippines. Museum of Natural History. UPLB, College, Laguna, Philippines.

Braunstein, E. B., I. P. Van Staveren and D. Tavani. 2011. Embedding care and unpaid work in Macroeconomic Modelling. A structural Approach. *Feminist Economics*. 17, 4-31.

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