

120 - QUALITY OF IMMERSION WATER TO SCUBA DIVER WITH DEVELOPMENT AND SUSTAINABILITY

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INTRODUCTION:

Sports of nature developed normally in the wild with a lower level of environmental control than other more conventional sports. Known by various names, these activities are designated by ABNT (2005) as adventure tourism, by Betran (2003) as physical activities in nature and adventure cited by Munhoz (2004) as adventure sport, which is the most widely accepted nomenclature for the media to describe the activity.

The scuba diving, an adventure activity, is the individual's immersion in liquid medium without communication with the surface to fill the air using SCUBA equipment (Self Contained Breathing Underwater Apparatus) allowing total freedom of movement in time and immersion depth limited only by the available air intake and the physiological variables related to partial pressures of gases involved in respiration (Fontoura, 2006). Diving is enjoying nature and at the same time an adventure in a modern and complex hobby, are considered the pioneers Dr. Hans Hass and Captain Jacques-Yves Cousteau (BREDEBUSCH, 1998).

This activity is considered an adventure and harmony with nature where we can see a greater concern for the pleasure of being close to nature than the fight of the man with himself, with peers or with the environment (Parks, et al SHEWOKIS ., 1999). ABNT NBR 24801 through X-NBR 24802 NBR 24803-x regulates the standards for implementing each part of the activity.

The activity supports the idea that one should care for the environment so that it is available to visitors at its most preserved, it said, the same material all the time by combining economic development sustainable tourism with a very strong preservationist activity.

A basic scuba diver must be qualified to plan, conduct and log open water dives, confined or restricted due to decompression limits, time, depth or combine two or more of these factors, provided you have the proper equipment and training for that will hold diving, and is also accompanied by another diver certificate for the degree of difficulty of the dive being undertaken.

To obtain this qualification the diver must be oriented in a minimum amount of course properly regulated by a protocol certifier for teaching, this course is determined by a protocol regarding the extent to which the diver if you are comparing. This level can vary in general between the ratings dip basic, advanced, expert, rescue, dive master and instructor.

It is especially important that the diver knows the possible effects observed during the dive, the general and regional environmental diving, after all he will experience a new environment and should know how to live it for your own safety and security through. Water, temperature, thermocline, visibility, movement, action on the surface, currents, tides, density, salt or fresh water, and the types of fund and its topography, are important information for the diver.

Learn about the weather with the observe of the hills, the aquatic animal and plant life, pay attention to weather conditions, view on the approach to new environments especially diving and have full awareness of environmental conservation and education, stimulating the natural regeneration of marine ecosystems, the conservation of habitats, and survival of marine life in general, without distinction of any kind or species, endangered or not, emphasizing the obligation of the diver to remove, since this is not to compromise the safety of diving, trash or any object held on the polluter underwater environment.

They must also be other hazards related to fatigue and exhaustion, stress and panic, exposure to the environment, inadequate ventilation, injuries by animals and marine plants and drowning.

In Cabo Frio, this activity is developed in the Area of Environmental Conservation Pau Brazil, visiting a group of seven islands scattered along the coast, where there is concern about polluting processes arising from the mouth of the Channel Itajuru, only communication from the lagoon Araruama with the ocean. This meeting of the canal, coming from a disturbed area, with the sea, resulting in a unknown variable in the viewpoint of adventure tourism, causing a lack of knowledge about their ability to impact on the marine environment and activity of SCUBA diving correspondingly.

REVIEW

Although there are records of salinity and other characteristics of the Laguna de Araruama since the sixteenth century, and already in 1980 the Society for Research on Mineral Resources have already developed extensive research regarding the formation of the same, according to Garcia (2009) Araruama hypersaline lagoon eco system and is receiving a strong human influence due to the presence of five towns around it that magnify the risks from contaminated water mirror that is in the order of 220 km² in extent. His communication with the sea is through the channel Itajuru, which has its water movement dictated by the particular weather phenomena, astronomical and handling typical of the resurgence of the area.

Cunha (2003) observes how factors of unplanned human intervention in regions like the study that affect the nature and quality of water: the launch of domestic and industrial effluents; interference in the flow of sediments and hydrodynamics, due to dredging and landfill and construction of jetties, wharfs and all sorts of foreign elements on the water surface, marginal areas and wetlands, the diversion channel of courses, and the construction of protective dikes and canals.

Pereira (2007) states that from the 60's there was an exponential increase of the occupation of soil around the area in 1991 was the identification of 365 points to dump sewage in the lagoon and within 197 Canal Itajuru, including eviction of hospital sewage, only in 2004 this problem was finally resolved with the implementation of sewage when the belt "was understood to be better to have something around 80% of sewage collected and treated for 95% of the year (the period without rain) than having about 10% of the sewage treated in 100% of the year, "since that sewage was piped along with the rainwater.

According to Dias (2005) research on the dynamic movement of water and sediment in estuaries are still quite scarce although they highlighted the work of Dobereiner (1983), Ayup (1986) and Barros (1984) in this area, being taken as raw materials for the current research.

MATERIAL AND METHODS:

This study falls within the pure science, using the inductive thought for continued observation and historical conditions determined by the perception that encourage scuba diving. According to Hochman (2005) this is a primary study, descriptive, observational, prospective, longitudinal, qualitative. Depending on the particularities of each region and population area delimitation of the research will occur in the region.

We performed a literature review to determine the health conditions acceptable to the individual's immersion in water, and search through longitudinal survey with an open question proposed for divers to determine which factors most influence on the water the decision to be scuba diving.

RESULTS AND DISCUSSIONS:

The activity of scuba diving through the X-NBR 24801, NBR 24802 NBR 24803-x regulates the minimum standards for performing the activity. However the practice of it needs besides the conditions described in the standards, the subjective conditions of perception as the weather, the visibility of water and its quality as for immersion, so one should take into account biological organisms referred to in resolution CONAMA 274, water turbidity, awareness of divers, water temperature, sea conditions on the Beaufort scale, are important factors in the analysis of water for scuba divers.

The Professional Divers Instructor Corporation PDIC - BRAZIL, certifier of quality teaching in the activity of scuba diving based on national territory, in 2007 reported the existence of 73.600 divers certificate, and only 10% of them are still in activity depending on various factors, among them the little structure available quality and the adverse conditions at sea, facts that increase the activity divers to leave and come back often to hypokinetic conditions that encourage the emergence of comorbidities.

Were reported by all 47 interviewees that the transparency of the water its color and light reflection are crucial for choosing the development of this activity. Also, they reported that the conditions occurring in the access to water, such as the infrastructure of vessels or piers or even the sea conditions and access to beaches, determined the choice of the places where the dumping would occur.

Illustration 1: Division of divers in the level of technical training. (Fontoura, 2007)

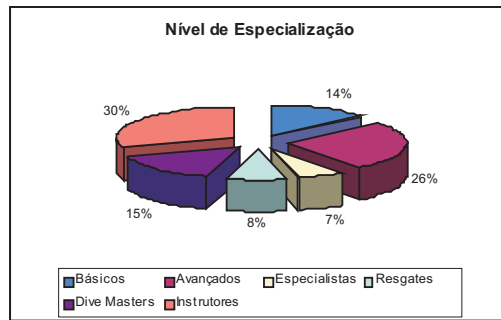


Table 1: Demographic data with scuba divers certification in Brazil. Source: Professional Divers Instructor Corporation (PDIC), 2007

Brasil Divers (2007)			
	PDIC	Total	
RJ	Divers	12.113	17.000
	Instructors	117	182
	Professional support	167	275
	Amateur Support	306	459
Brasil	Divers	45.948	73.600
	Instructors	410	700
	Professional support	524	890
	Amateur Support	1039	1800

CONCLUSION:

The investigation of factors that regulate the activity of scuba diving prepared by NBR's Brazilian Regulatory Standards, listed a series of security procedures that guide the activity but are only aimed at maintaining security in it. Maintaining the practice of this type of diving by people depends on creating an infrastructure that keeps them in pleasant conditions within the activity.

Depending on the results reported in divers searched the area for defining the search, you can understand this result may be extrapolated to other areas of Brazil as these divers reported that they have a way to travel nationally and internationally for the development of activity.

To take place as part of a process of sustainable social development through tourism, it is necessary to control the quality and transparency of water immersion and care infrastructure to access it. This quality control has now been overlooked by agencies linked to the promotion of tourism due to the fact that it was not located any public information available to conduct the activity in them, which leads to the idea of not concern ourselves with the development of activity.

It is recommended that there be a study on water quality in areas where the activity is developed, taking into account the factors herein, that this activity generates sustainable development and environmental protection together with an active, contributing to the improvement of living conditions in areas most times of great need for environmental preservation.

REFERENCES:

- ABNT. **Projeto 54:003.01-001**. Associação Brasileira de Normas Técnicas. 2005.
- AYUP, R. N. **O Comportamento dos Sedimentos em Suspensão no Rio De la Plata Exterior e Proximidades**. Pesquisas, v.18, p.36 - 68. 1986.
- BARROS, A. N. S. S. **A Capacidade de Transporte nos Escoamentos de Maré no Estuário do Rio Potengi**. Engenharia, UFRJ - Universidade Federal do Rio de Janeiro, Rio de Janeiro, 1984.
- BETRÁN, J. **Rumo a um novo conceito de ócio ativo e turismo na Espanha: atividades físicas de aventura na natureza**. Barueri: Manole. 2003. 157-202 p.
- BREDEBUSCH, T. K. H. R. P. **Manual de Submarinismo**. Barcelona. 1998
- CUNHA, A. C. B. **Uma Análise do Sistema Lagunar de Araruama – RJ, com Enfoque Hidrodinâmico**. Engenharia, Universidade Federal do Rio de Janeiro, Rio de Janeiro, 2003.
- DIAS, C. B. **Dinâmica do Sistema Estuarino Timonha / Ubatuba (Ceará – Brasil): Considerações Ambientais**. Instituto de Ciências do Mar, Universidade Federal do Ceará, Fortaleza, 2005.
- DOBEREINER, C. E. **Importância do Comportamento de Suspensões no Assoreamento de Portos e Estuários**. Revista Brasileira de Engenharia, n.4, p.61 - 74. 1983.
- FIRJAN. **Manual de Gerenciamento de Resíduos - Guia de Procedimento Passo a Passo: GMA2004**.
- FONTOURA, F. **Estudo comparativo entre os praticantes do mergulho autônomo e da natação, nos níveis de ansiedade e autoconfiança FIEP**. 2006.
- GARCÍA, R. S., TRANNIN, M. C., et al. **Considerações Ambientais e Sociais do Ecossistema da Lagoa de Araruama**. Igual - Procesos de la interacción sociedad-naturaleza. 2009.
- GUIMARÃES, R. C. e CABRAL, J. A. S. **Estatística**. Lisboa: McGraw-Hill. 1999
- HOCHMAN B, NAHAS FX, et al. **Desenhos de pesquisa**. Acta Cir Bras, v.20. 2005.
- MUNHOZ, J. D. F. G. J., LUIZ. **Atividades físicas de aventura na natureza: trajetória na região de São Carlos**. III CONGRESSO CIENTÍFICO LATINO AMERICANO UNIMEP/FIEP. Piracicaba, 2004. p.
- PARKS, J. B., SHEWOKIS, P. A., et al. **Using statistical power analysis in sport management research**. Journal of Sport Management, v.13, n.2, Apr, p.139-147. 1999.
- PEREIRA, L. F. M. **A Gestão Participativa no Caso do Saneamento da Região dos Lagos, Rio de Janeiro**. Revista Discente Expressões Geográficas. 2007.
- SAMPIERI, R. H., COLLADO, C. F., et al. **Metodologia de Pesquisa**. São Paulo: McGraw Hill. 2006

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QUALITY OF IMMERSION WATER TO SCUBA DIVER WITH DEVELOPMENT AND SUSTAINABILITY.

ABSTRACT:

Adventure sports developed normally in the wild, scuba diving, an adventure activity, is the individual's immersion in liquid without communication with the surface, this activity is considered an adventure in harmony with nature, where it is perceived a greater concern for the pleasure of being close to nature. Cunha observes human intervention as factors affecting the nature and quality of water, the release of domestic and industrial effluents; interference in the flow of sediments and hydrodynamics, due to dredging and landfill and construction of jetties, wharfs and all sorts of foreign elements on the water surface, marginal areas and mangroves; deviations courses channels, and the construction of protective dikes and canals. We performed a literature review to determine the health conditions acceptable to the individual's immersion in water, and search through longitudinal survey with an open question proposed for divers to determine which factors most influence on the water the decision to be scuba dive. We reported by all 47 interviewees that the transparency of the water its color and light reflection are crucial for choosing the development of this activity. Also, they reported that the conditions occurring in the access to water, such as the infrastructure of vessels or piers or even the sea conditions and access to beaches, determined the choice of the places where the dumping would occur. To take place as part of a process of sustainable social development through tourism, it is necessary to control the quality and transparency of water to immersion and care infrastructure to access it.

KEYWORDS: Diver, Development and Sustainability, Water Quality

QUALITÉ DE L'EAU D'IMMERSION À PLONGEUR AVEC LE DÉVELOPPEMENT ET LA SUSTENTABILITÉ.

RÉSUMÉ:

Sports de nature se développent normalement dans la plongée sous-marine, sauvage, une activité d'aventure, est l'immersion de l'individu dans un liquide sans communication avec la surface, cette activité est considérée comme une aventure et l'harmonie avec la nature où il est perçu une plus grande préoccupation pour le plaisir d'être proche de la nature. Cunha observe le intervention humaine en tant que facteurs affectant la nature et la qualité de l'eau, les rejets d'effluents domestiques et industriels; ingérence dans les flux de sédiments et de l'hydrodynamique, en raison de travaux de dragage et d'enfouissement et de la construction de jetées, quais et toutes sortes d'éléments étrangers sur le eaux de surface, les zones marginales et les mangroves; cours écarts canaux, et la construction de digues de protection et de canaux. Nous avons effectué une revue de la littérature pour déterminer l'état de santé acceptable à l'immersion de l'individu dans l'eau, et la recherche par enquête longitudinale par une question ouverte proposée pour les plongeurs à déterminer les facteurs qui influencent le plus sur l'eau de la décision à la plongée. Nous avons signalé par les 47 personnes interrogées que la transparence de l'eau sa couleur et sa réflexion de la lumière sont essentiels pour le choix du développement de cette activité. En outre, ils ont signalé que les conditions rencontrées dans l'accès à l'eau, tels que l'infrastructure des bâtiments ou des piles ou encore les conditions de mer et l'accès aux plages, a déterminé le choix des lieux où le dumping se produire. Donc, pour qu'elle ait lieu dans le cadre d'un processus de développement social durable par le tourisme, il est nécessaire de contrôler la qualité et la transparence de l'eau à l'infrastructure d'immersion et de soins pour y accéder.

MOTS-CLÉS: Diver, le développement et la sustentabilité, qualité de l'eau

CALIDAD DE LA INMERSIÓN EN AGUA DE SCUBA DIVER EN DESARROLLO Y SOSTENIBILIDAD.**RESUMEN:**

Deportes de la naturaleza se desarrollaron normalmente en el buceo, una actividad de aventura, es la inmersión del individuo en un líquido sin comunicación con la superficie, esta actividad se considera una aventura y la armonía con la naturaleza, donde se percibe una mayor preocupación por el placer de ser cerca de la naturaleza. Cunha observa la intervención humana como factores que afectan a la naturaleza y calidad del agua, la liberación de efluentes domésticos e industriales; interferencias en el flujo de sedimentos y la hidrodinámica, debido al dragado y relleno sanitario y la construcción de embarcaderos, muelles y todo tipo de elementos extranjeros en el superficie del agua, las zonas marginales y los manglares, canales de desviación de cursos, y la construcción de diques de protección y canales. Se realizó una revisión bibliográfica para determinar las condiciones de salud aceptables a la inmersión del individuo en el agua, y buscar a través de encuesta longitudinal con una pregunta abierta propuesta para los buzos para determinar los factores que más influyen en el agua, la decisión que bucear. Estamos informados por los 47 entrevistados que la transparencia del agua su color y el reflejo de luz son cruciales para la elección del desarrollo de esta actividad. Asimismo, informó de que las condiciones que ocurren en el acceso al agua, tales como la infraestructura de los barcos o muelles, o incluso las condiciones del mar y el acceso a las playas, determinó la elección de los lugares donde se producen el dumping. Así que para que se llevará a cabo como parte de un proceso de desarrollo social sostenible a través del turismo, es necesario controlar la calidad y transparencia del agua a la infraestructura de inmersión y de atención para acceder a ella.

PALABRAS CLAVE: Diver, Desarrollo y Sostenibilidad, Calidad del Agua

CONCEITO DE BALNEABILIDADE PARA O DESENVOLVIMENTO COM SUSTENTABILIDADE DA ATIVIDADE DO MERGULHO AUTÔNOMO RECREATIVO TURÍSTICO E DE LAZER**RESUMO:**

Os esportes da natureza são esportes desenvolvidos normalmente em meio agreste, o mergulho autônomo, uma atividade de aventura, consiste na imersão do indivíduo em meio líquido sem comunicação com a superfície, esta atividade é considerada de aventura e integração com a natureza onde percebe-se uma maior preocupação com o prazer de estar junto à natureza. Cunha observa como fatores da intervenção humana que afetam a natureza e a qualidade da água, o lançamento de efluentes domésticos e industriais; a interferência no fluxo de sedimentos e na hidrodinâmica, em decorrência de dragagens e aterros, bem como construções de espigões, trapiches e toda sorte de elementos estranhos sobre o espelho de água, áreas marginais e mangues; os desvios de cursos de canais; e a construção de diques de proteção e de canais artificiais.

Foi realizada uma revisão de literatura para determinação das condições aceitáveis de saúde para imersão do indivíduo em meio aquático, e pesquisa através de survey longitudinal com uma questão aberta proposta a mergulhadores, para determinar quais fatores na água mais influenciam a decisão de estar mergulhando de forma recreativa, turística e de lazer.

Foram relatados por todos os 47 indivíduos entrevistados que a transparência da água sua coloração e reflexo luminoso são determinantes para a escolha do desenvolvimento desta atividade. Igualmente, os mesmos relataram que as condições em que ocorriam os acessos a água, tais como a infra-estrutura de embarcações ou de trapiches ou mesmo a condição de mar e de acesso a praias, determinavam a escolha dos lugares onde iriam ocorrer as imersões. Sendo assim para que esta atividade ocorra como parte integrante de um processo de gestão sustentável de desenvolvimento social através do turismo, se faz necessário controle da qualidade e transparência da água para imersão e cuidados com a infra-estrutura de acesso a mesma.

PALAVRAS CHAVE: Mergulho Autônomo, Desenvolvimento e Sustentabilidade, Qualidade de Água