

## THE BEACHCARE PROGRAM: COMMUNITY PARTICIPATION IN COASTAL DUNE RESTORATION

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**Abstract:** Coastal management through community involvement has significant advantages over non-participatory approaches as involving the community allows for consideration of multiple interests, resources, and skills that may expand the capacity for action and enhances local stewardship. Participation can help increase project efficiency as it avoids duplication of efforts. Collaborative strategies have been adopted in environmental management in the state of Queensland, Australia. Local governments have been responsible for integrating local instruments with state-level policies in coastal management. This paper analyses a community engagement program for the restoration of coastal environments in Gold Coast. One arm of the program is the BeachCare program, which involves volunteers from local communities in the restoration of coastal dunes. The program involved ten areas of coastal dunes on the Gold Coast. The study analyses the role of community participation in dune restoration by examining the following questions: 1) How do BeachCare volunteers engage with the restoration project? 2) Has community participation in dune restoration been consistent since the program was established in 2005? 3) What types of advantages, if any, did participation bring to the BeachCare program? Data on participants were analysed and a profile of participating volunteers was established over an eleven-year period (2005-2016). Results indicate that the number of participants increased during the period studied. The number of hours of volunteer work has also increased over the years. BeachCare volunteers have provided a number of reasons why they have chosen to volunteer including benefitting from some kind of social interaction, helping the community, and due to their concern for the environment. Attracting volunteers for environmental projects can enhance the community's ability to organise and create stable collaborative networks that will act more effectively in other situations of responding to disasters and extreme weather events.

**Keywords:** Governance, Coastal Management, Collaborative Strategies, Coastal Erosion, Extreme Weather Events.

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## PROJETO BEACHCARE: PARTICIPAÇÃO DA COMUNIDADE NA RESTAURAÇÃO DE DUNAS COSTEIRAS

**Resumo:** Gestão costeira com o envolvimento da comunidade tem vantagens significativas sobre abordagens não participativas, porque o envolvimento da comunidade permite a consideração de múltiplos interesses, recursos e habilidades, que podem expandir a capacidade de ação e melhorar a gestão local. Assim, a participação da comunidade pode contribuir para que projetos sejam mais democrático e mais eficientes e evitar a duplicação de esforços. Estratégias de colaboração têm sido adotadas na gestão ambiental no estado de Queensland, Austrália. Os governos locais têm sido responsáveis pela integração de instrumentos locais às políticas de nível estadual na gestão costeira. Este artigo analisa um programa de envolvimento da comunidade para a restauração de ambientes costeiros na cidade de Gold Coast, Austrália. Um braço do programa é o projeto BeachCare, que promove atividades envolvendo voluntários da comunidade local na restauração de dunas costeiras. Nós analisamos o papel da participação da comunidade na restauração das dunas, examinando as seguintes perguntas: 1) Como os voluntários se envolvem com o projeto de restauração? 2) Será que a participação da comunidade na restauração tem sido consistente durante o período de existência do programa? 3) Que tipos de vantagens, se houver, que a participação pode trazer para o projeto de restauração? Os dados sobre os participantes foram analisados para um período de onze anos (2011-2015). O estudo envolveu dez áreas de dunas costeiras. Os resultados indicam que o número de participantes aumentou ao longo do período estudado. Os entrevistados apresentaram diferentes razões para tornarem-se voluntários, incluindo algum tipo de interação social, ajudar a comunidade e

contribuir com o meio ambiente. Atrair voluntários para projetos ambientais pode melhorar a capacidade de organização da comunidade e criar redes de colaboração estáveis que poderão atuar de forma mais eficaz em resposta a desastres ambientais e eventos climáticos extremos.

**Palavras-chave:** governança, gerenciamento costeiro, erosão costeira, eventos climáticos extremos.

## 1 INTRODUCTION

Restoration projects of coastal dunes in urban areas have been implemented in some parts of the world (DAHM et al., 2005; MARTÍNEZ.; SILVA; MENDOZA.; ODÉRIZ AND PÉREZ-MAQUEO, 2014) aimed at restoring ecosystems and enhancing the resilience of beaches to erosion and loss of amenity. Although the number of projects has increased in recent decades, strategies to recover dunes are still fragmented. There are many gaps related to theoretical and methodological issues in the restoration of dune ecosystems (ZAMITH; SCARANO, 2006). Restoration techniques adopted for forests, for example, tend to be inefficient in environments with high environmental stress and severe ecological filters (MOURA; MENDES MALHADO; LADLE, 2013), as in the case of coastal sand dune ecosystems. Furthermore, it is necessary to control the impacts caused by human occupation and by inappropriate uses of the coastal zone, which are susceptible to strong urban pressure. Community engagement in dune restoration projects in urban areas under great pressure can be crucial to their success because it promotes within the community a perception about the importance of these ecosystems and their environmental services, attracting more allies for the conservation of green urban areas.

Coastal management with community involvement has significant advantages over non-participatory approaches because involving the community allows for consideration of multiple interests, resources, and skills that may expand the project's action capacity. Collaborative strategies have been adopted in environmental management in the state of Queensland, Australia. Local governments have been responsible for integrating local instruments with state-level policies in coastal management. Communitarian engagement also can contribute to urban resilience building (BENDT; BARTHEL; COLDING, 2013; BIHARI; RYAN, 2012; COLDING; BARTHEL, 2012), so that the organization for local actions can create collaborative networks that will act more permanently in other disaster

situations. Cities affected by environmental disasters can be viewed as 'socio-ecological systems' that will struggle to recover after the disaster if there is deficiency of resilience (COLDING; BARTHEL, 2012). Thus, policies that aim at developing tools and strategies in order to build resilience before calamity occurs is essential (KRASNY et al., 2014). Environmental education programs with volunteer engagement generally stimulate community organization and can make the community more resilient.

In this study, the potential benefits of participatory practices in the restoration of dune vegetation in urban areas is analysed. In order to achieve this, we use a case study of the BeachCare Program by examining the following questions: 1) How do the BeachCare volunteers engage with the restoration project? 2) Has community participation in coastal sand dune restoration been consistent since the program was established in 2005? 3) What types of advantages, if any, did participation bring to the BeachCare program?

## **2 BACKGROUND INFORMATION**

The Southeast region of the Australian state of Queensland is one of the most urbanized regions in this state and is experiencing higher population growth rates than other areas in Australia. It is also one of the most vulnerable areas to extreme climate events (SANO et al., 2015). On the Gold Coast, many problems have arisen from massive occupation and rapid development, including the degradation of coastal vegetation. Also, Gold Coast beaches are highly vulnerable to rising sea levels, so that coastal erosion is a problem of major proportions (SANO et al., 2015). This degradation gets worse during catastrophic climatic events. For example, cyclones have the power to remove dune vegetation in the initial ecological successional stages and ultimately cause dune destruction.

Cities in coastal regions of Queensland have implemented local management policies to adapt to climate events. For example, the City of Gold Coast Council has developed a Climate Change Adaptation Strategy funded by the Australian Government under the Local Adaptation Pathways Program (SANO et al., 2015). A key component of public policy is the community engagement in developing

strategies for coastal adaptation to change. The Coastal Community Engagement Program (CCEP), for example, is a partnership initiative between the City of Gold Coast and the Griffith Centre for Coastal Management to maximise community understanding of natural coastal processes and management strategies for the local beaches, foreshores and dunes. Through this initiative, government actions have been delegated to partner agencies, which in addition to performing the actions act as facilitators, promoting the involvement of organisations of the civil society. Thus, a network of action is formed to act in a coordinated way, avoiding duplication of efforts and providing greater adaptation and resilience in the face of rapid environmental changes.

BeachCare is one of the programs that form part of the CCEP, and it is facilitated by the Griffith Centre for Coastal Management. BeachCare aims to provide an opportunity for individual community members to participate in caring for their local coastal environments. One of BeachCare's objectives is to restore, with community participation, dunes affected by severe erosion in an area that is vulnerable to extreme climate events.

BeachCare undertakes activities at 10 different sites, namely: Paradise Point, Runaway Bay, Labrador, Surfers Paradise, Broadbeach, North Burleigh, Palm Beach, Currumbin, Tugun and Rainbow Bay (Figure 1). The activities typically take place on Saturdays, where the community is invited to participate in rubbish removal and audits, weed control and in planting new native dune plant seedlings or cuttings. Each week a new area is visited cyclically, so that events occur at each of the sites at intervals of three to four months. BeachCare volunteers are invited via social media networks and other local marketing media. On the program's web page, there is a fixed calendar of events which is published every 6-months.

**Figure 1:** Location of Gold Coast, Australia (left) and BeachCare sites (right). Image (right) from GoogleEarth.



### 3 METHODOLOGY

Data were collected from two sources, that is, from project reports and from structured questionnaires, which were sent to potential respondents by email in 2015. The data concerning the participating volunteers cover a eleven-year period (2005-2015). From this data, the frequency and the number of participants per event were analysed.

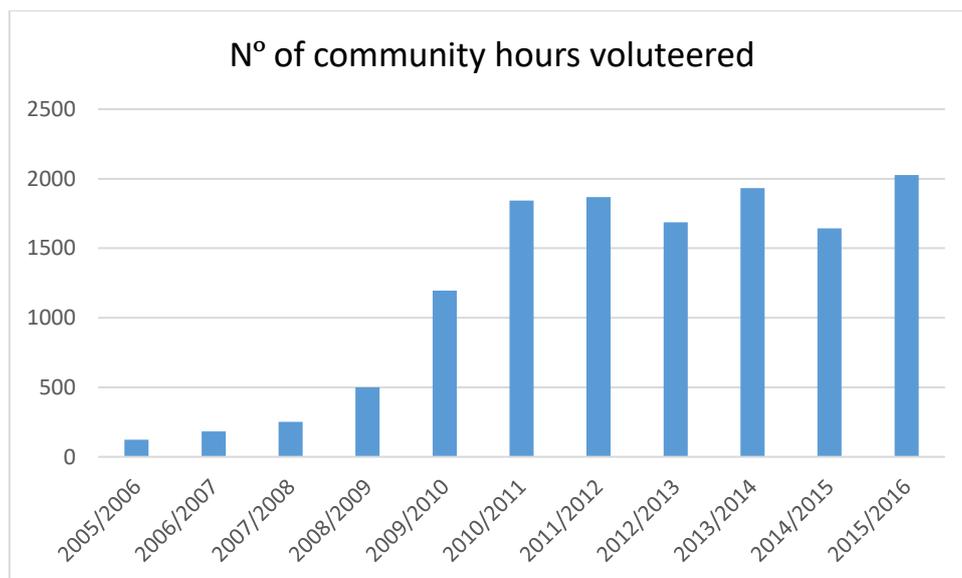
Questionnaires were sent by email to a sample of participants in order to identify the motivation for participation, frequency of participation, expected rewards, as well as a number of opinions about specific aspects that could help to improve the program's actions. Twenty participants responded to the questionnaire. The information about the age and the total number of participants was quantified based on the total number of participation in the last 11 years, while data on motivation for engagement are analysed based on the 20 questionnaires that were completed.

## 4 RESULTS AND DISCUSSION

The BeachCare program has been successful in attracting volunteers as well as in keeping them active and engaged. The average number of volunteers has grown over the years (2005 to 2016) since the program was initiated with an average of 17 participants per event in the first year (2005) and a current average of 23 participants in 2016. The volunteers range in age from four to 75 years of age, with a predominance of people in the range of 56-70 years.

The number of hours of volunteer work has also increased over the years, with 150 volunteer hours in the initial year and 1500 volunteer hours in recent years (Figure 2). The largest increase in hours worked by volunteers was associated with special events such as National Tree Day, World Environment Day and Clean Up Australia Day. Besides the increase of hours on special event days, there is a group of permanent volunteers who are dedicated to caring for each site between scheduled BeachCare events. For two of the sites - Runaway Bay and Tallebudgera - there are some “champion” volunteers who actively water recent plantings for a period that ranges from three to four weeks. These “champions” are highly motivated individuals that are committed to the program and have become local champions for each site.

**Figure 2:** Working hours donated by volunteers<sup>1</sup>



<sup>1</sup> In each pair of years, the data range from July of the first year to June of the second year.

In many countries around the world, volunteers have played an increasing role in environmental planning and conservation (DAHME et al., 2005). A strong collaboration with local government has enabled the creation of successful environmental education programs on the Gold Coast (MUURMANS; LEAHY; RICHARDS, 2016). Volunteer participation in the BeachCare program is also growing which suggests that the community supports and acknowledges the success of this program. The increase in participation is represented mainly by the involvement of adult volunteers rather than by children or adolescents. Community participation in dune restoration projects has also been reported in New Zealand (COWIE et al, 2010) and other Australian states (e.g Merimbula Beach, NSW (OEH, 2013).

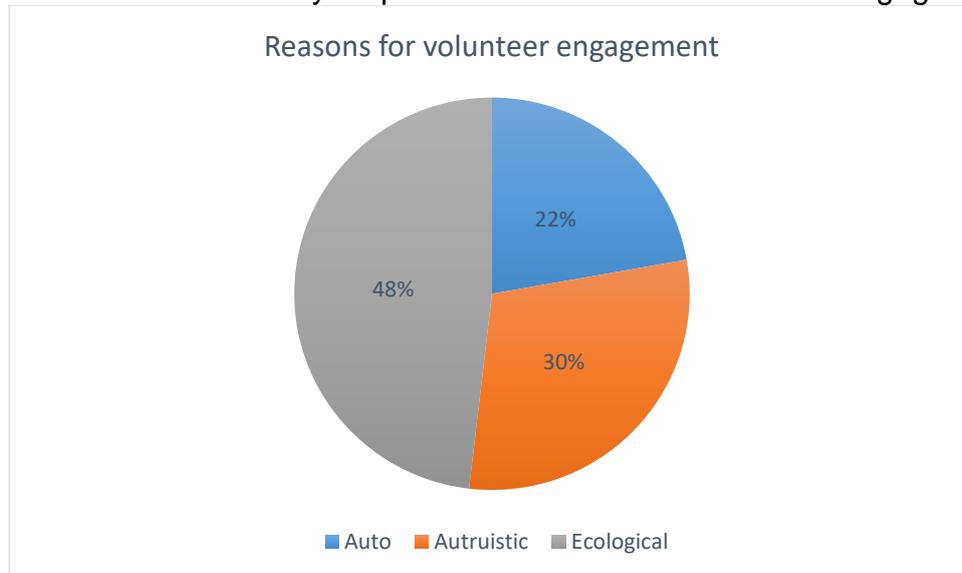
Areas with vegetation tend to be more resistant to natural disasters (MARTÍNEZ; SILVA; MENDOZA; ODÉRIZ AND PÉREZ-MAQUEO, 2014). Therefore, restoring dune vegetation may be used as a strategy to increase the resistance of these ecosystems to natural disasters, in addition to improving the diversification and visual amenity of beaches and also to contribute to the conservation of native diversification in particular. In addition to individual volunteers, 12 other coastal community groups have helped to increase the BeachCare footprint. These groups from the community help in a number of ways, for example providing support for the volunteers and by creating a network of support for the program.

The 20 BeachCare volunteers that participated in the survey have provided a number of reasons why they have chosen to volunteer including benefitting from some kind of social interaction, helping the community, and due to their concern for the environment. Their responses identified personal reasons (22%), for example, conducting a pleasurable activity, and for having fun with their grandchildren; altruistic concerns centred on collective interests (30%), for example to look after their neighbourhood, and to create a pleasant space. However, the predominant concerns mentioned were focussed on ecosystem/species (48%), for example, to help the environment, to improve the health of the dunes and beaches, and to help prevent erosion.

It is expected that the reasons for the involvement of volunteers with environmental projects vary greatly from one community to another and in relation to the nature of

the work conducted (KRASNY et al., 2014). Linda et al. (2003) grouped the motivations of volunteers as: centred on self (my health, family leisure), altruistic concerns centred on others (common good), and biocentric or ecocentric concerns focused on living things (species and ecosystems). We found a similar pattern of responses regarding the BeachCare program. Ecological concerns were the main reason for engagement with the program, followed by altruistic motivations (Figure 3). Although it has accounted for a smaller percentage of responses, the statement of personal reasons for engaging with the program (leisure, enjoyable family day) was mentioned by almost a quarter of respondents (22%). This appears to show that many people also look to the program as a way to expand their networks of social relations and to relax while working with the land, planting, watering, or removing weeds. Many volunteers claimed to want to know more about coastal ecosystems. Therefore, this interest should be met by way of talks, courses, publications, and other such environmental education activities.

**Figure 3:** Distribution of survey responses to reasons for volunteer engagement



In an analysis of immediate benefits, the participation of volunteers extends the project capacity for action and project efficiency, enabling the existence of everyday project actions. In the case of vegetation restoration in sandy soil, irrigation and initial monitoring are essential activities for the survival of seedlings in the dry season (ZAMITH; SCARANO, 2006). The low rates of seedling survival after planting has been a major obstacle to restoration in sandy soils (HUANG; YIM, 2014). The participation of volunteers helps to achieve more efficient results in relation to the

initial survival of seedlings. Participation has also extended the potential of the program actions, as the involvement of volunteers has allowed the program to start a new restoration area every year, without abandoning the previous areas. Another important aspect of participation is that in some areas volunteers monitor continuously the areas in their respective neighbourhood, especially for the first month after planting. Volunteers can also warn of potential damage to the restoration actions and can constantly monitor the restored areas. After a planting event, volunteers can become long-term project partners. According to Cowie (2010), for dune restoration projects with community support in New Zealand, the participation of volunteers enabled the realization of the work, which would be totally impractical without the participation of dedicated volunteers. This multiplication of efforts and the formation of a permanent network of volunteers is an additional gain reported by several authors in relation to projects in developed countries (GROSS; HOFFMANN-RIEM, 2005; PETERS; HAMILTON; EAMES, 2015) and developing countries (FAO, 2010). In the case of the BeachCare program, with the increase in the number of volunteers, the number of man-hours was considerably expanded (Figure 1b) following an increase in the program's capacity for action. The volunteer work invested in the BeachCare program equates to 2026 hours / year. The effect of this engagement has potential to continue in the medium and long term, encouraging the volunteers to become more environmentally active and knowledgeable about local environmental issues. Community participation can also favour the building of stronger links and greater community organisation. The increase in the social capital through community engagement can also contribute to building urban resilience. In this sense, it is very positive to strengthen the role of the involvement of volunteers in the expansion of collaborative networks. The South East Queensland (SEQ) coastal region is intrinsically sensitive to climatic drivers (SANO et al., 2015). Therefore, attracting volunteers for environmental projects can enhance the community's ability to organise and create stable collaborative networks that will act more effectively in other situations of responding to disasters and extreme weather events.

Community engagement has also shown advantages over top-down methodologies, since volunteer participation favours a broader assemblage of various skills, included knowledge of community participants, and it also increases the working capacity of the project. These advantages have been observed for restoration projects with

community participation in various parts of the world (ASAH; LENENTINE; BLAHNA, 2014; BENDT et al., 2014; MILES; SULLIVAN; KUO, 1998). These authors have suggested that community involvement may be a key factor for project success, mainly in urban areas.

## 5 CONCLUSION

The BeachCare program has been successful in encouraging community participation in the restoration and conservation of urban coastal dunes. The capacity to mobilize volunteers may have major additional gains, since actions involving adult volunteers can attract allies to the environmental cause. As volunteers showed great expectations to know more about coastal ecosystems, maybe the program should promote more environmental education activities as they may help participants learn more about their environments thus raising their awareness about local coastal ecosystems.

It is suggested that additional research be undertaken, in order to: 1) examine if and how volunteer participation has contributed to increasing participants' knowledge about ecological processes, and if increased knowledge leads community members to attach greater value to coastal ecosystems; 2) evaluate if participation has contributed to improve dune ecological recovery; and 3) study if volunteer participation has reinforced the social capital of the communities involved.

In addition, it is also important to understand the reasons why volunteers decide to get involved with programs such as BeachCare in order to create strategies to support the long-term participation of volunteers. This is particularly important in the case of BeachCare, as well as in relation to other government programs that depend largely on the work of volunteers, both in Australia and other countries.

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