PART II:

Case Studies

Part II of III from:

Behavior Change Interventions in Practice:

A synthesis of criteria, approaches, case studies & indicators

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Introduction

Many cases of behavior change, whether presented as verbal stories or research articles, focus specifically on interventions and their results. Yet, these lack the full picture of why and how a particular behavioral intervention works or the steps that implementers took to achieve a given behavior change result. In this section, we provide eight in-depth case studies that demonstrate the kinds of journeys that lead to successful (and sometimes unsuccessful) behavioral interventions. Case studies are instructive because of their detailed description of an intervention's effect but also because of what we can learn from the 'behind the scenes' of intervention development.

We chose the case studies in this section based on the following criteria:

- Real-world applicability: Cases feature field studies in real-world contexts

- Intervention-focus: Cases present solutions to a behavioral problem, not (just) to demonstrate behavioral insights

- Clarity: Cases demonstrate behavior change outcomes and why those outcomes did or did not occur is clear (ideally through a theory of change)

- Narrative journey: Cases tell a story about how the solution was developed

- Topic relevance: Cases are from one of the five GEF topic areas

- Strategy diversity: Cases feature interventions using a variety of behavioral principles

- Durability: Cases show the importance of monitoring effects over time (even if they lack that measurement in the results)

- Scalability: Cases show behavioral interventions across different actors and scales

- Replication: Cases have generalizable insights that could replicate in other contexts

For each case study, we present a short summary, the behavioral challenge and case background, the research and design of the intervention, the behavioral solution, the results, and the key lessons learned. After all of the case studies, we offer an analysis of what made them successful as well as where there is still room for improvement in behavior change work.
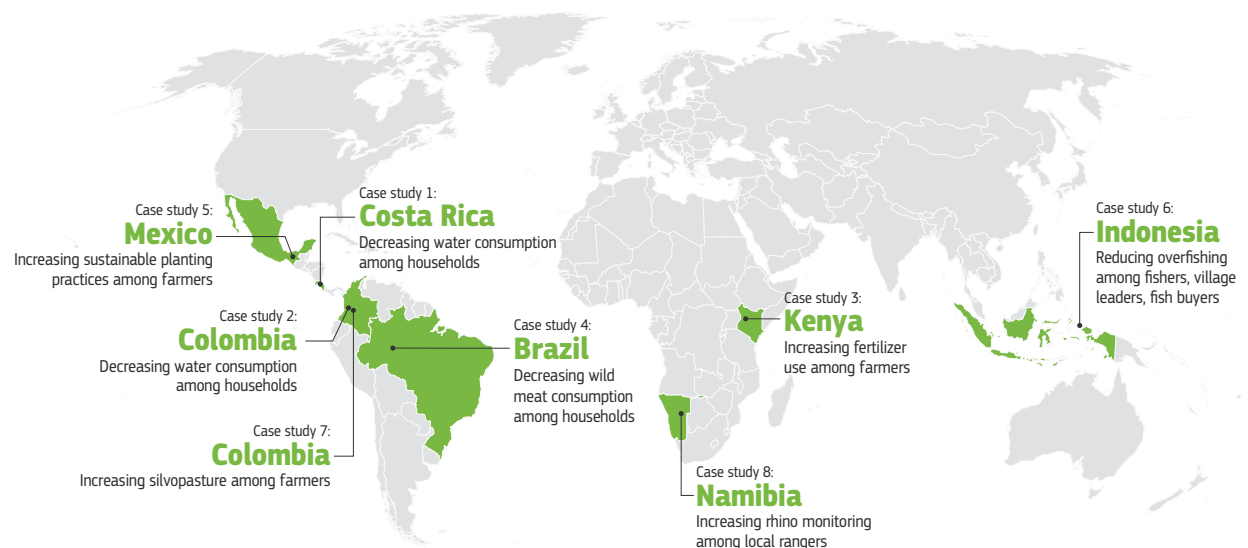

Figure 2: A map showing the eight case study locations, target behaviors, and target actors

Case Study 1: Water Consumption in Costa Rica

Summary

High rates of household water consumption were starting to deplete local water supplies in Belén, Costa Rica. To reduce water usage, the municipal government sent postcards to households comparing their water consumption to that of nearby neighbors. Postcards also provided tips for how residents could reduce their water usage and prompted them to plan how they would meet lower consumption levels. As a result, households reduced monthly water consumption by 4.5% (1.3 cubic meters) more than households that received the standard utility bill.

Challenge

Water consumption in Belén, Costa Rica (a town of about 21,000 residents) was 25% greater than the national average in 2010. It was estimated that if consumption stayed at that level, Belén could face significant water shortages by 2030. Reducing water consumption was thus a key policy priority for the Belén municipal administration.

Other interventions had not worked previously in Belén. A price increase in November 2012 had but limited impact even though water prices had increased by more than 100% (given the level of consumption of the average household). Fixed charges—for water use up to 20 cubic meters—increased by 70%. Despite these disincentives, by December 2012, the results showed that household water consumption had only decreased by 15% and rebounded to 5% higher than the November baseline by February 2013.

Meanwhile, the scope for price increases was limited by legal provisions stipulating that governments could not increase prices beyond what is needed to recover costs. Consequently, it was important to come with a simple and budget-light intervention to respond to the water urgency in Belén.

Research & Design

The team at Ideas42 developed their intervention using literature on behavioral interventions deployed in similar contexts, and from the findings of four focus groups run with diverse sets of Belén residents.

First, they found that residents generally believed in the importance of water conservation, but few of them believed that they individually should use less water. Residents justified their own water use based on Belén's climate, stating that it felt like a 'necessary evil.' As a result, the design team found that greater awareness may not be what was needed, but rather that personal appeals could be useful.

Second, residents were unaware of how much water they used. They focused on the cost of water instead of the amount of water used when talking about the information that they recalled from their water bills. Moreover, the water bills were hard to read and included information for both water and sanitation services, obscuring how much water individuals were actually using. Because of this, the team determined that making water use information more salient could be important.

Third, the water bills did not provide any comparison relative what reasonable or high amounts of water use were. Residents did not have an intuitive sense of what a small or large amount of water would be, and they did not know how to interpret cubic meters as a unit of measurement. As a result, the designers wanted to offer a relevant comparison for water usage—one in understandable units.

Finally, few participants were able to state concrete actions that would reduce their water usage. They could describe actions that used water but were unable to evaluate which of these used less or more water than others. The design team saw this as an opportunity to provide more guidance about specific water conservation behaviors.

Solution

The interventions were delivered as a one-time nudge through the mail. Households were selected according to postal routes, neighborhood, and average monthly water consumption; they were then randomized into three treatment groups and one control group. The first one, the "Neighborhood Comparison" treatment, took the form of a colored sticker pasted onto the monthly water bill. It communicated how a household's water use compared to the median household's water use in their neighborhood, including a smiley/frowny face to provide feedback about the household's water use and water-saving tips. The second one, or "City Comparison" treatment, used similar stickers, the key difference being the use of city-wide, rather than neighborhood-wide, average water consumption as the reference point for the social comparison. The third treatment, a "Plan-making" intervention, consisted of a postcard that prompted people to record their water use, record a personal goal for water use, and check off specific actions that they could take to reduce their water consumption. This intervention applied salience, goal-setting, and implementation intentions to change behavior. The control group received a standard water bill with no additional information. Each treatment in this intervention took place in July 2014. The design team then looked at the August and September billing cycles to evaluate if any changes in water consumption had taken place.

Results

Overall, the residents who received the interventions conserved more water than those in the control group, but some treatments were better than others. The neighborhood comparison intervention reduced monthly water consumption 3.7-5.6%, while the city comparison intervention had no effect. The plan-making intervention was also effective at reducing water consumption between 3.4 and 5.6%. Overall, these interventions marked an average water reduction of 4.6%. The plan-making intervention appeared to be most effective for low consumption households, whereas the neighborhood comparison intervention appeared more effective for high consumption households. If all households in Belén received these interventions, they could save about 6,720 cubic meters of water each month. This translates to conserving 94,080 washing machine loads, 188,000 showers, or 222,000 dishwasher loads each month. Household savings were estimated to be between US$2,600 and US$5,200. The costs of the intervention materials themselves were also minimal, increasing the feasibility and impact of scaling the campaign to the whole municipality.

Lessons Learned

- Some behaviorally informed design strategies can translate across different settings and cultures. It is well-documented that the use of social comparisons is effective in changing energy consumption in a developed-country context. However, these interventions had not previously been shown to work in other contexts, particularly in low-income countries.

- This intervention was purposefully simple (two sets of stickers) because of resource constraints within the local government in Belén. This makes an intervention like this much more adaptable to other low-income country contexts, where complicated, software-reliant interventions may not prove a feasible solution.

- It is important to tailor behavioral interventions to the specific population and circumstance. As demonstrated in this case, focus groups with target users can help uncover key behavioral insights and guide the intervention's final design.

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Case study 2: Water consumption in Colombia

Summary

Managing water availability in urban spaces is a major challenge facing city governments and local councils. To address the potential water shortage in the city of Bogotá, Colombia, the municipal government implemented an awareness-raising strategy that initially backfired, increasing water consumption. After refining their approach, they discovered that leveraging principles of saliency, social rewards, social punishment, and education could more effectively change behavior and reduced water use by an astounding 13.8%. Moreover, the interventions established a new social norm of water conservation in the city that persisted ten years after the initial set of interventions ceased.

Challenge

In the 1970s, officials in Bogotá, Colombia, decided they needed to take action and address the city's almost-exponential increase in water demand in order to secure water for their growing population's future. Their first solution was infrastructural: a system called Chingaza that would involve a series of tunnels connecting nearby high-Andean water reservoirs to a water treatment plant and an emergency water reservoir in the city. They predicted this would satisfy water demand through to the early 2000s. But in 1997, a section of the tunnel that provided water to the water treatment plant partially collapsed. It was unclear how long it would take to repair the tunnel, and so it meant that only the emergency water reservoir, named San Raphael, was a viable water source. Experts recommended water rationing as the best short-term solution, yet the mayor, Antanas Mockus, was reluctant due to the political optics of such a decision. Instead, he wanted to build on his popular Citizenship Culture policy program.

The city declared a public emergency and started a communication campaign around a voluntary water savings program where everyone could cooperate to avoid a water crisis. The danger was that 70% of the city would be left without water if current water consumption was not reduced because water cuts would then be the city's only option. In the week after the campaign's launch, overall water consumption increased. The campaign had backfired. Some people even started stockpiling water to prepare for what they thought would be an imminent shortage. Even so, the city administration did not change their strategy until the lead academic of the administration's Citizenship Culture program, Paul Bromberg, investigated the problem.

Research & Design

Six days after the campaign launch, Bromberg conducted a quick, large-scale survey with residents to learn about why water consumption levels were increasing. They discovered that 96% of residents knew about the public emergency and why it had occurred. The results also showed that while 90% of people claimed to be trying to reduce water consumption, people were also mostly using strategies that were unlikely to make a difference, such as turning off the faucet while brushing their teeth. While the mayor, Mockus, did not have a clearly outlined theory of change, he followed social science closely, was open to trying things differently, and had a strong understanding of what could work for his city based on his Citizenship Culture program. This program emphasized building both moral and social norms for people to self-govern themselves and one another. Mockus further recognized

that Bogotans wanted something to be proud of after many years of war and violence in their city. He was two years into his administration when the crisis occurred and had already gained popularity and authority among the people, which would come to be one of his campaign's biggest strengths. There were also several shared cultural symbols and beliefs that were important to citizens, based on Bogotá being a largely conservative and religious population. The administration was further familiar with the importance of publicly recognizing local heroes in water conservation efforts, and with the fact that transparency from the government would be a key part of the efforts moving forward.

Solution

The city government launched an intensive three-month campaign. Part of it involved reminding people to conserve water at times when they were most likely to overuse it. To do so, the city distributed stickers that featured a picture of a statue of San Rafael, which was also the name of the emergency water reservoir that supported the city after the tunnel collapsed. Citizens were advised to place the stickers by the faucet that they used most frequently in the household, office, or at school. The stickers made the urgency to save water salient exactly when people needed to hear it most: when and where they habitually used water.

The city government also started entertainment campaigns that educated citizens about the most effective techniques of water conservation. Four thousand youth volunteers roamed the streets of Bogotá to inform people about the emergency and to teach them effective strategies to reduce water consumption. Catchy and memorable slogans carried the key messages of the campaign. The mayor appeared on TV showering with his wife and explaining that residents could save water by turning off the tap while soaping or by showering in pairs. Catholic priests were asked to invite their communities to join the cooperative effort. Newly-implemented technology-enabled daily reports of the city's water consumption were prominently published in the country's major newspapers. These sections were called Reloj de San Rafael (The San Rafael Clock) and were perceived as reliable and trustworthy sources of information that got cited on the radio and TV stations as well.

A third component of the intervention had the government publish information about who was cooperating and who was not. The CEO of the water company personally awarded households with outstanding water savings a poster of San Rafael and a title, "Here we follow a rational plan for using the precious liquid." These awards were visible in the media, and the government further spotlighted individuals' unique stories and water conservation strategies. The technicians working on the tunnel were also labeled as heroes in the city. On the day celebrating the completion of the tunnel's reconstruction, a second tunnel collapsed in the reservoir. At this time, Paul Bromberg had become mayor of the city, and Mockus, the previous mayor, had begun a formal presidential campaign. The city was concerned about ongoing cooperation and oversaturation from several months of media campaigns. Therefore, Bromberg added a new component to the intervention by creating city-imposed sanctions for "despilfarradores" (squanderers), those with the highest levels of overconsumption. While the sanctions were minor-squanderers had to participate in a water-saving workshop and had an extra day of water cuts—they were nevertheless effective because they targeted highly visible actors. Car-washing businesses, although collectively not a major source of water consumption, were the primary targets for this reason.

Results

The change in strategy helped to create a social norm of water conservation. By the eighth week of the campaign, citywide water savings had significantly exceeded the expectations and peaked at a reduction of 13.8%. Cooperation remained strong throughout the 290 days of the public emergency. Moreover, the reductions in water use persisted long after both tunnels were repaired. Per capita water usage remained lower than before the crisis for more than ten years. This suggests that the new social norm around conservation was established and persisted over time.

Lessons Learned

- Making the assumption that providing information is enough to change behavior can lead to unintended or even counterproductive effects.

- Combining multiple behavioral change principles like social rewards and punishments, salience, and messenger effects can be a useful approach to achieving substantial behavioral change.

- Building a community and making appeals to reciprocity can establish a social norm that results in a long-term change in behavior.

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Case Study 3: Increasing Farm Productivity in Kenya

Summary

Encouraging the adoption of new technologies to boost agricultural productivity and food security remains a challenge. To increase agricultural yields in Africa by the uptake of fertilizer, researchers developed a behaviorally informed program that addressed the issues of timing and impatience of the farmers. The Savings and Fertilizer Initiative (SAFI) program increased the fertilizer adoption by 13–14 percentage points.

Challenge

There have been consistently low agricultural yields in Africa, even as other regions (notably South Asia) have enjoyed dramatic increases in farm productivity. This is a vexing problem in agricultural development given the large number of people who directly depend on agriculture for both subsistence and income. One possible explanation for this discrepancy is the low adoption of inorganic fertilizer. If used correctly, fertilizer has the potential to dramatically increase yields and be a highly profitable investment. Moreover, in some ecosystems, the lack of available nutrients in the soil are unable to produce the yields needed to feed growing populations—this makes fertilizer a necessity.

The more conventional way to address this issue via economic policy has been to offer farmers a price subsidy on fertilizer. This strategy has been widely adopted in some African and South Asian governments, but large subsidies are financially demanding, typically regressive (benefiting the wealthiest farmers most), and often necessitate that the government's involvement in fertilizer distribution. Relying solely on price subsidies also assumes that the main barrier to increasing adoption is affordability. In other words, that the reason behind the low adoption of fertilizer is that farmers may not have the cash or credit readily available to buy it.

Research & Design

To develop the intervention, the researchers conducted a set of agricultural trials over six seasons in Busia District, Western Kenya. They began in July 2000, working in conjunction with International Child Support. The Savings and Fertilizer Initiative (SAFI) program was first piloted with minor variations over several seasons and at a very small scale with farmers participating in on-farm trials. The trials involved farmers working on their own farms in a region of Western Kenya where fertilizer use is low, and they revealed that when farmers use limited amounts of fertilizer, they can create profitable yields even without having to make other changes to their agricultural practices

Additionally, in November–December 2009, researchers asked 139 farmers in the same area about whether they had used fertilizer the past three seasons, and if so, when they had bought it. Despite the potential returns to applying limited quantities of fertilizer, only 40% of farmers in the sample reported ever having used fertilizer, and only 29% reported using it in at least one of the two growing seasons before the program. When asked why they did not use fertilizer, farmers rarely said fertilizer was unprofitable, unsuitable for their soil, or too risky; instead, they overwhelmingly replied that they wanted to use fertilizer but did not have the money to purchase it. At first this seemed difficult to take at face value, since fertilizer could be bought in small quantities (as small as one kilogram)

that offered annualized returns of at least 52%. Farmers could buy more fertilizer over time based on the profits from better harvests and eventually be able to fertilize a whole plot.

Apart from affordability, farmers also face issues of timing; there can be a mismatch between when fertilizers are typically offered, demanded, and needed for application, and when farmers have cash in hand to pay for it. At harvest time, when farmers have cash, they may not be motivated to buy fertilizer, and pre-purchasing it may be inconvenient. Later in the season, however, farmers may find that they do not have enough readily-available funds left to buy it, even though it is the right time to apply fertilizer. This mismatch suggests that just making fertilizers cheaper is insufficient. Instead, policies that encourage farmers to buy fertilizer when they have cash at their disposal (i.e., immediately after the harvest) could increase fertilizer adoption.

Some farmers may not have the money to buy fertilizer because they intend to save the funds but are unable to convert that intention to action later in the season. Depending on the season, 96-98% of those who used fertilizer had bought it just before applying it. Overall, depending on the season, only between 0.4% and 2% of farmers had bought fertilizer well in advance. There is also some anecdotal evidence that farmers do not follow through with their plans to buy fertilizer: 97.7% of farmers who participated in the demonstration plot program reported that they planned to use fertilizer in the following season, but only 36.4% of them actually followed through on their plans. This type of behavior can be explained by people's tendency towards being present-biased; people may plan to act rationally and in their interest in the future (e.g., intend to buy fertilizers), but when the future comes around, they behave impatiently (e.g., forgetting to buy fertilizer). As a result, even farmers who want to use fertilizer do not have the money to purchase it when the time comes to apply it later in the season.

Solution

In collaboration with the ICS, researchers designed an intervention to test if providing mechanisms to save harvest income for future fertilizer purchases could be effective in increasing usage. The researchers wanted to see how the SAFI program fared against other strategies to improve the uptake of fertilizer. Four different interventions were tested over two seasons with a set sample of farmers:

1. Basic SAFI: An ICS officer visited farmers immediately after the harvest and offered to sell them a voucher for fertilizer, at the regular price, with free delivery later in the season. In that moment, the farmer had to choose if they would participate in the program and how much fertilizer they wanted.

2. SAFI with ex-ante Choice of Timing: An ICS officer visited the farmers before the harvest and offered them the opportunity to decide when in the next season they wanted someone to ask them to participate in the SAFI program. An officer would then visit them and offer the fertilizer voucher as in the Basic SAFI.

3. Free Delivery Visit Later in the Season: Same as SAFI program, but ICS officers visited farmers 2-4 months after the harvest and offered to sell them fertilizer as a top dressing for the next crop.

4. Subsidy Later in Season: An ICS officer visited the farmers 2-4 months after the harvest and offered to sell them fertilizer, at a 50% subsidy, with free delivery.

Results

The SAFI program was very popular. In the two seasons that the basic SAFI was offered, the program increased fertilizer use by 14 and 18 percentage points, respectively (an increase of around 69%). The SAFI with ex-ante timing choice increased fertilizer use by 22 percentage points, and the subsidy intervention increased usage by 13 percentage points. These interventions were all more successful than the free delivery visit later in the season, which did not significantly affect usage. None of the interventions led to farmers using fertilizer in the following season—they were all only effective in the current season. This suggests that it was the lack of an available

commitment mechanism that was preventing farmers from purchasing and using fertilizer. Overall, the results suggest that offering farmers small, time-limited discounts on fertilizer may substantially increase usage without inducing overuse among farmers who are already using fertilizer.

Lessons Learned

- A cheap, small, and timely behavioral intervention via improved program design can be as powerful as a heavy subsidy.

- Designing an intervention based on the needs, preferences, and barriers of the farmers revealed through surveys and interviews was crucial for identifying the best components and options for the intervention. The SAFI program helped farmers overcome problems of mismatched timing and present bias, apart from affordability.

- Testing an intervention through pilots before launching at scale can provide important information about ways to make an intervention more effective

- Commitment devices can be powerful tools to help farmers make good investments.

- Behavioral interventions can be more effective if they simultaneously address the unintended negative effects of price subsidies, such as the environmental damage caused by fertilizer overuse.

- The effects of the intervention may disappear if the intervention is removed. Fertilizer adoption increased while advanced purchasing was offered, but once the program was removed, fertilizer usage went back to what it had been.

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Case Study 4: Wild Meat Consumption in Brazil

Summary

Growing populations around the world lead to increasing meat consumption, which can have an impact on local wildlife. A group of researchers aimed to reduce wild meat consumption among households in the Brazilian Amazon town of Tapauá. They tried three different interventions that combined economic incentives with community outreach strategies and found that the outreach interventions were more effective than economic incentives alone, reducing wild meat consumption by 62%.

Challenge

As human populations grow, so does the demand for meat. In the Brazilian Amazon, growing populations are increasingly urban and can deplete surrounding wildlife populations. The wildlife trade in the Amazon is uniquely local and regional rather than international (as is the case with species in Asia and Africa). While this is positive for reducing wildlife exports, it also means that there is a smaller supply of meat to meet growing demands. Wildlife at risk from the consumption of wild meat includes various types of mammals, birds, and turtles, and tortoises. Researchers aimed to understand and change meat consumption behavior in the Brazilian Amazon town of Tapauá, which has a population of approximately 10,600 people.

Research & Design

The researchers first identified that their target behavior was not to stop wild meat consumption but to instead reduce it in a way that preserves cultural traditions and sustains wildlife populations. They also wanted to increase the consumption of chicken, pork, and fish as substitutes. They started with four focus groups to learn more about the motivations behind, and barriers to, consuming less wild meat. Three of the focus groups were with women, because they are those who most often buy and prepare the meat in Tapauá, and one focus group was with fishers because they could affect the supply of fish in the area. The researchers also conducted ten in-depth interviews with people who currently supply or consume wild meat so they could learn about what drives those decisions.

The findings of this preliminary research revealed that the poor taste and high prices of domesticated meat were barriers to their consumption relative to wild meat. People also liked the diversity and lower cost of wild meat and fish. They tended to eat wild mammals and birds during everyday meals, but turtles were a symbol of status and saved only for special events. In addition, the research team learned that chicken was the most available domestic meat, as compared to lamb, goat, and pork, and that there were gaps in people's understandings of wildlife ecology and population growth. Given the importance of price, the researchers wanted to learn more about what discounts would be most effective in encouraging domesticated over wild meat consumption. They randomly assigned different coupon amounts to 30 households and found that $3-$5 discount coupons were the most optimal for their intervention.

Solution

The researchers developed a theory of change for their intervention based on the Theory of Planned Behavior: an increased knowledge about ecology, more positive attitudes about wildlife, greater feelings of control over purchasing domestic meat, and a higher preferences for domestic meat was predicted to lead to an increased intention and commitment to consume more domestic meat and less wild meat.

They randomly selected and assigned 157 households to one of three treatments that included a combination of different behavioral strategies over three different periods of monitoring. These strategies were public information (e.g., visual media, mass media, giveaways, church visits, print media), community engagement strategies (e.g., door to door visits, commitments/pledges, cooking courses), and economic incentives (discount coupons for chicken in the intervention condition and coupons for cleaning products as the control condition). The treatments included: a community engagement group that received public information, community engagement strategies, and chicken discount coupons; a coupon group that received discount coupons for chicken and public information; and a control group that received public information and discount coupons for cleaning products.

Results

The researchers gathered self-report data during 15-20-minute visits they made to households 30 times over 60 days. During each visit, households reported the type and quantity of meat they consumed, how they got the meat, what the meat cost, and how many animals and which parts of the animals they consumed. Overall, households consumed fish and chicken the most as a result of the intervention. There was also an increase in knowledge about wildlife ecology across treatments, and those in the community engagement group increased their stated preference for fish, chicken, and beef. 92% of people in this group also made a public commitment to reduce wild meat consumption. The results showed that the $3-5 chicken coupons increased chicken consumption and decreased fish consumption for households already consuming those meats but did not reduce wild meat consumption. In contrast, the community engagement treatment without any price incentives reduced wild meat consumption by 62%. The designers attributed this change in consumption due to the shifting perceptions around wild meat consumption from community engagement strategies. The provision of concrete tips for cooking domestic meat also likely had an effect.

Lessons Learned

- Material incentives are sometimes not enough to change behavior on their own and can lead to unintended outcomes

- It is important to be very specific about the target behavior, such as decreasing but not preventing wild meat consumption, or not including turtles in the category of wild meat

- Conducting research with the target actor reveals important insights and validates the underlying motivations and barriers needed to design a successful intervention

- Culture context can be a critical consideration for interventions in terms of what the actors will find appropriate and is likely to adopt

- Piloting different aspects of the intervention prior to its launch can increase its effectiveness

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Case Study 5: Sustainable Farming in Mexico

Summary

The decline of indigenous agricultural systems has negatively affected Mexico's biodiversity, climate-resilience, nutrition, and public health. With the rise of commercial seeds, nitrogen fertilizers, and synthetic pesticides, many communities have abandoned ancestral farming methods such as Milpa, an inter-cropping system that enriches the soil, protects natural ecosystems, and produces high-nutrient foods. Rare and Centro de Investigación y Servicios Profesionales A.C. (CISPERP) developed a social marketing campaign to promote the re-uptake of traditional Milpa practices among farmers in the town of Tojtic in 2018. After a year of the campaign and ongoing support from the Center for Behavior & the Environment, there was a significant increase in sustainable Milpa planting practices and consumption of Milpa products, leading to improved ecological, social, and nutritional outcomes for the Tojtic community.

Challenge

Around the world, traditional agricultural systems and indigenous knowledge have been critical pillars of biodiversity conservation, as well as food and nutrition security for centuries. Milpa is an intercropping farming system consisting mainly of beans, maize, and squash, also known as "Las Tres Hermanas" or "The Three Sisters." These three crops form symbiotic relationships with each other and with other species, such as fruit trees and wild herbs. Traditionally, Mayans would preserve their native seeds to maintain the Milpa system alive. In this way, hundreds of variations of maize, squash, beans, and other crops would be preserved across generations.

However, with the recent rise in the use of commercial seeds and chemical fertilizers, many indigenous farming communities in Mexico have abandoned ancestral farming practices for new technologies promising higher yields at lower costs. Multinational corporations and government programs target and encourage farmers to adopt industrialized methods, guaranteeing higher profits with their use. They often do this by giving out free fertilizer and commercial crop seeds. Over the years, many Milpa farmers have started planting these commercial crops instead of their local seeds.

Replacing the Milpa system with industrialized agriculture further contributes to malnutrition and obesity, both of which are major public health challenges for Mexico. Along with this shift to commercialized foods, there has been a growing perception that Milpa is the food of the poor, or of the "Campesinos," casting a negative social image on the traditional dishes that use maize, beans, squash, chili, and wild herbs.

In the community of Tojtic, in the Mexican state of Chiapas, the Milpa system has long been a part of the community's cultural heritage. The people of Tojtic belong to the indigenous Mayan group, Tsotsil, and for centuries they have cultivated their own strands of maize, squash, beans, and other native crops. However, like many communities in the Mesoamerican region, Tojtic was hit with a wave of campaigns and marketing efforts by national government programs in the early 2000s that sought to industrialize agriculture and drive economic growth. While most farmers in Tojtic continued to value their native Milpa seeds, they began using commercial seeds and chemical fertilizers for their main production plots—moving their native seeds over to their smaller, household gardens. After adopting industrialized methods as their primary form of farming, the sustainable practices of intercropping and

natural nutrient management were increasingly lost or devalued. In response, the non-profit organization, Centro de Investigación y Servicios Profesionales A.C. (CISERP), began working with the Tsotsil farmers in Tojtic to revitalize their traditional Milpa systems and promote agroecological practices.

Research & Design

In partnership with Rare, CISERP designed and launched a year-long social marketing campaign to address the social and environmental challenges facing the community of Tojtic, with a focus on Milpa practices. Rare conducted capacity building training with local designers, developing a theory of behavior change, social marketing tactics, quantitative and qualitative research techniques, and a campaign designed to achieve social and ecological impacts that were community-led and human-centered.

In the first phase of the program, Rare helped CISERP develop a conceptual model that analyzed the systemic forces at play in Tojtic and to determine which behavior, if changed, could have the biggest impact on biodiversity, food security, and ecosystem health. CISERP identified target actors of 324 Milpa farmers in the town of Tojtic, and their campaign centered on promoting four target behaviors: compost organic waste (rather than burning it), reduce the use of chemical fertilizers, share and exchange native Milpa seeds with other farmers, and commit to a 5-year program throughout which these efforts would be sustained.

CISERP developed a theory of change based on a number of important insights from the results of 122 surveys and 20 in-depth interviews with farmers. First, farmers fondly remembered a time when their land was more biodiverse, and when they were not using as many chemicals. There is a strong connection to ancestral practices and ways of life, yet the introduction of chemicals made everything faster and easier, as well as creating a dependence on these products to get a consistently good harvest. There was little knowledge as to the effects of agrochemicals on farmers' health, their environment, and the community's economy, as well as on alternative options and support available for sustainable farming practices. There was also an opportunity to talk about the cost savings of planting Milpa, and to create conversation among farmers about the benefits of Milpa and share ideas about what was working. Farmers were very interested in participating in seed exchanges with others and already enjoyed spending their time doing a number of social activities. Finally, there was an interest and need for training and technical support, for celebrations of local seed varieties, and for long-term technical support to maintain new sustainable practices.

Solution

In collaboration with the community of Tojtic, CISERP developed materials and activities to promote the target behaviors. The materials included a slogan, a comic book, a puppet show, and a mural, all in the native Tsotsil language, and all conveying that ancestral Milpa practices are something to be proud of and protect. These campaign materials were designed to be digestible and accessible, weaving the campaign message into the culture of the community. The puppet shows and comics were especially geared towards children, who were believed to then carry the message of pride home to their parents. Engaging the children was also a way of helping them develop an early appreciation for local and sustainable agriculture, something that was found to be largely missing because many young people in the region migrated to cities.

To train the farmers in the targeted agroecological practices, CISERP hosted hands-on capacity-building training sessions, called Field Schools, where farmers could gather to learn about sustainable practices like composting, intercropping, and nutrient management. To promote the conservation of local seeds and use of the Milpa crops, CISERP organized a seed fair for farmers to exchange their native seeds. Simultaneously, they also hosted a nutritional fair in which the women in the community opted-in to prepare dishes using ingredients from the Milpa and shared recipes with each other. Coupled with the social marketing materials, these fairs offered the community

a space to celebrate their native Milpa crops, participate in peer-learning, and preserve the agroecological practices unique to their culture.

Throughout the year-long campaign, Rare staff provided ongoing mentorship and support to CISERP to carry out these various activities and monitor the results.

Results

A year after launching their campaign, CISERP achieved promising results in the community of Tojtic. The percentage of Milpa farmers using their own family's set of seeds and exchanging with other farmers jumped from 35 to 80%, meaning that 259 farmers were now participating in the practice of trading seeds and increasing the biodiversity of their farms. 65% of Milpa farmers committed to participating in a 5-year seed conservation program, supporting the durability of the behavioral shifts. CISERP utilized the campaign materials, such as the comic and puppet show, to reach other Tsotsil communities outside of Tojtic and to spread the important message of conserving the Milpa.

There were lasting impacts beyond the immediate ones. The percent of Milpa farmers in Tojtic who adopted the agroecological practices promoted in the campaign, such as composting organic waste, intercropping, and reducing the use of chemical fertilizers increased from 52% to 90%. There was a 95% decrease in the use of Glyphosate, the herbicide commonly used in Chiapas (the main ingredient in the "RoundUp" pesticide products). Additionally, 65% of the Milpa farmers had increased production and consumption of maize, beans, squash, and other crops associated with Milpa, thereby increasing the biodiversity of their farms and the nutritional value of their diets. An increase in the consumption of Milpa products also led to observable nutritional improvements. Over the course of the campaign, the average consumption of calories per day went from about 1900 to 1700—an effect attributed to a reduction in consumption of ultra-processed foods. For example, Pozol, which is a traditional refreshing drink made from fermented native corn, grew in popularity as a replacement to sugary drinks and sodas.

There was a complete eradication of the practice of burning residual Milpa waste, with 100% of the farmers transitioning to composting organic waste. Using the newly generated compost, CISERP trained a group of 16 farmers in Tojtic in harvesting mushrooms for both self-consumption and sales. A total of 36 families in the community took part in this effort across four mushroom harvesting sites, each producing an average of 220 kg (485 pounds) of mushrooms over the course of 8 months—60% of which was distributed to the community for household consumption and 40% for sales.

Lessons Learned

- Understanding ancestral and cultural practices and traditions can provide a meaningful starting point for change, especially when there is already a need to revive and celebrate them in everyday life

- An intervention can help address multiple, related target behaviors with similar motivations and barriers

- Building opportunities for peer learning, descriptive norming, and capacity building can help to overcome major barriers to change

- A good intervention can affect many different types of indicators, such as environmental, social, and health indicators

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Case Study 6: Reducing Overfishing in Indonesia

Summary

In the Dampier Strait of Indonesia, overfishing and the lack of rights to fishing areas were creating major challenges for coastal fishing communities. Leaders from 19 different fishing communities came together to co-create designated reserves and fishing areas (called Territorial Use Rights for Fishing, or TURFs) for each community and legalize their exclusive access and customary rights. These rights were also complemented by campaigns to adopt sustainable fishing behaviors, such as restricting the types of gear fishers used and fish they caught. As a result, the Dampier Strait network of 211,000 hectares is now the largest TURF + Reserve network in the world, and there has been a 44% increase in sustainable fishing behaviors.

Challenge

Overfishing is a challenge for many coastal fishing communities in some of the most biodiverse regions of the world. Having a reliable and abundant supply of fish underlies the livelihoods, economies, and food security of these communities. The Dampier Strait, a body of water between the Batanta and Salawati islands of Raja Ampat in West Papua, Indonesia, is one such place. There are 19 villages comprising ~6000 people along the strait that harvest fish there as well as small and large-scale fishers from other communities and countries. The challenge became to create a rights-based access system for fishing in Dampier Strait, coordinating this across villages, and to communicate the new rules to outsiders. While there was a history of customary rights for the Maya Tribe villages, there were no legal rights that allowed them to stop intruders from fishing in their waters and reduce the overfishing of limited resources for the communities that rely on them.

Research & Design

Rare's team sought to encourage behavior change from both local leaders, in creating this rights-based system, as well as fishers, to fish sustainability and manage the fishery through surveillance and reporting their catch. Fish buyers were also targeted to aid in documenting local catch. A number of relevant stakeholders were also involved in this solution, including religious leaders, media professionals, government units, and female leaders in the community.

The design team collected information from a representative sample of community members from 19 villages in Dampier Strait. They conducted interviews, surveys, and observations with village governments, customary leaders, and fishers as well as staff at the District Office for Fisheries and Marine Affairs and the District Technical Implementing Unit of Raja Ampat.

For local fishers, a number of key barriers and motivations emerged. Fishers knew that they were competing with other fishers, but they were hesitant to say anything to them for fear of creating conflict. Trust was a large barrier. Over 60% of fishers in Dampier Strait distrusted fishers from outside their village due to these interactions, and the average trust in fellow villagers was at an average of 55%. The trust in the local government was also about 50%.

Knowledge was also a major barrier. There were misperceptions and denial about the impacts of overfishing on fish stocks, where 40% of households perceived no link between human activity and fish populations. There was no prior knowledge about TURF systems, which also demonstrated to the campaign team that any print media they had provided on TURFs in the past was not working and that they needed to diversify their use of information platforms. There were also low levels of self-efficacy in making decisions that could make a difference as well as in social support for change.

Besides barriers, the campaign team identified a number of motivations for change. Formal and customary (adat) leaders were very influential in setting expectations, values, and norms for behavior. There was also a clear interest in having fish populations that could sustain for future generations. For village leaders, the campaign team found that there was a big motivation for them to be seen as responsible and wise in supporting the interests of their villagers. For buyers, the biggest motivation was to be able to predict future revenue from having a record of their transactions.

Solution

The design team launched a 12-month behavior change campaign targeting fishers, village leaders, and fish buyers. In order to design a rights-based system and appeal to village leaders, Rare and the provincial government hosted a series of workshops where the village, customary, and religious leaders of 19 communities drew maps of what they considered to be their fishing grounds—working together to resolve conflicts and identify the boundaries for each community's coastal waters. This resulted in a single map of 21 access areas, or Territorial Use Rights for Fishing (TURFs), one for each of the 19 villages as well as several common fishing areas that villages would share. This provided the foundation for the rights-based system that, beyond granting exclusive rights to local fishers, also outlined the types of gear that could be used and the fish that could be caught in the fishery. The final designations were no-take zones, or marine reserves, that would be off-limits to fishers and help the fish populations grow.

To maintain the sustainable fishing behaviors within the newly designated areas, the campaign also used several behavioral strategies designed in collaboration with the community: facilitating the registration of fishers' boats; highlighting key messengers in the community who supported the new rights-based system; organizing pledges in the community to uphold the fishing regulations; launching community surveillance of coastal waters and providing fuel for those doing the surveillance; controlling fishing inputs and outputs; offering training sessions on sustainable fishing; and integrating an app called OurFish into fishing operations to track fish catch and sales. There were a number of social marketing materials that complemented these activities, including calendars that reinforced fishing rules and campaign messages in each season, festivals to declare the TURF areas, puppet shows with children, a fish game that demonstrated the importance of cooperation and rights-based fishing on fish populations, and smaller giveaway items such as t-shirts, bags, and cushions that helped to create additional campaign visibility.

Results

The resulting network, officially designated a TURF + Reserve network at the national level, encompasses 211,000 hectares in Dampier Strait across 19 villages, making it the largest comprehensive TURF + Reserve network in the world. Between 2017-2019, there were large changes in beliefs and behavior. There was a 44.5% increase in compliance with fishing regulations, an 82% increase in knowledge of rights-based fishing areas, a 29% increase in trust in local villagers, 25% increase in trust in local governments, and a 15% increase in trust of other villagers to comply with regulations. There was also, on average, a 34% increase in participation for the development, management, and surveillance of the designated fishing areas. The environmental outcomes were also significant. Between 2016-2018, there was an 11% increase in coral cover and a 71% increase in fish biomass.

Lessons Learned

- Co-creating solutions and engaging many actors to help scale interventions provide robust and durable solutions that will be supported and reinforced by many different people

- Incorporating customary, religious, or traditional values can help to legitimize solutions among a range of actors

- Addressing different motivations through a range of strategies and behavioral principles makes an intervention increasingly effective

- Being intentional about the benefits and barriers for each target actor leads to more effective messaging, such as boosting self-efficacy and perceptions of leadership

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Case Study 7: Silvopasture in Colombia

Summary

The adoption of silvopastoral systems (SPS) by Colombian cattle ranchers is necessary for both the sustainability of the country and the livelihoods of small and medium-scale farmers. Beliefs about the use of trees in grazing pastures and a lack of access to resources have limited the implementation of sustainable grazing methods. Project designers developed a multi-pronged approach to encourage SPS adoption in five regions of Colombia through improving access to financial and technical resources, increasing peer-to-peer knowledge transfers, enhancing the productivity and sustainability of ranches, and raising the standard of living for farmers and their families.

Challenge

The land area devoted to the cattle ranching in Colombia has increased dramatically, rising from 14.6 to 38 million hectares in the last 50 years. Currently, 38% of the total land surface and 89% of all agricultural land in the country are set aside for raising cattle. Not only is the cattle ranching process responsible for land degradation, it also employs methods that are both expensive and inefficient for small and medium-scale farmers.

Deforestation is a common practice among ranching communities in Colombia. As land becomes unsuitable for grazing, farmers clear the Andean and Amazon Basin forests and convert it into new pastures. This cycle continues, forcing farmers to expand into primary forests to make up for the degraded land. The clearing of land and the expansion of current cattle ranching practices both threaten tropical rainforests, biodiversity, and the carbon emissions pathway of the country.

As opposed to much larger, industrial, bovine farms, many of these local enterprises raise fewer than 50 cattle at a time. This limits a farmer's ability to adopt new technologies that would otherwise help their productivity and develop the sector. Regardless of a farm's size, the cattle ranching industry is an important facet of the Colombian economy, comprising 3.5% of the country's total GDP and at least 27% of the GDP for agricultural activities. However, these farms are typically located in communities suffering from high poverty levels, violence, extreme income disparities, and inequitable land ownership.

Silvopastoral systems (SPS) provide a more sustainable alternative to current ranching practices, one that would allow farmers to support the same number of cattle on less land. These systems involve combining a variety of vegetation, such as trees, shrubs, and herbaceous plants, for grazing. The benefits of this method of ranching also include increased local biodiversity, carbon sequestration, improved water quality, elevated productivity, and lower operational costs. Still, despite their benefits, silvopastoral systems have, historically, only had limited adoption rates among Colombian cattle ranchers.

Research & Design

This project was developed based on the lessons learned from previous silvopastoral programs in the region and from a variety of social and institutional assessments. Between 2002 and 2008, the GEF implemented a project to promote silvopastoral practices in Costa Rica, Nicaragua, and Colombia. Although this project indicated that the productivity and sustainability of cattle ranching in Colombia could be improved by silvopasture, its adoption within the program was limited by high costs, the complexity of methods, and a lack of knowledge by farmers. Furthermore, the program lacked the necessary incentives for adoption; many of the benefits of silvopasture were perceived by farmers as external to their operations. The coexistence of trees on grazing lands is also seen as problematic; farmers worry about the competition between the pasture for resources and the potential of falling branches that could injure cattle. This project illustrated that, despite comparable implementation across farms, silvopastoral practices did not always provide the same profitability to farmers nor contribute equally to conservation outcomes. Learning from this, planners chose certain strategies to improve the adoption of sustainable cattle ranching methods.

Program designers employed a variety of survey and assessment measures to better understand the social and political risks of the project, the socio-economic situation of ranchers, and the barriers to adoption for small and medium-sized farm participation. To further connect with the target actor, project partners completed surveys of sample farms, held workshops within the project regions, and conducted interviews with producer associations, environmental organizations, educational institutions, banks, and a variety of NGOs. In addition, assessments of larger social and institutional barriers to program participation were conducted to inform the strategy in different regions of Colombia. Once the project plan was designed, local partners led five regional workshops with farmers and extension agents to clarify the program components.

Solution

Using the lessons learned from past cattle ranching sustainability programs as well as the recent surveys and assessments, the project designers implemented a multipronged approach to increase the adoption of silvopastoral systems (SPS) by small to medium scale cattle farmers in five regions of Colombia. The solution included four distinct components: improving the productivity of farms through SPS, increasing connectivity in farms via payment for ecosystem services, strengthening monitoring and evaluation and related subsector institutions, and project management. Overall, the program could be broken into two parts: financial and technical assistance.

In providing financial assistance, cattle ranchers were given increased access to loans and microfinance investments, as well as adequate payment for the ecosystem services protected by SPS. These financial incentives also helped ranchers acquire new agricultural technologies and seeds that were previously unattainable in the regions.

Increased technical assistance was achieved through a variety of methods. One element was the use of project agents who provided SPS expertise via training sessions and local assistance centers for easy access by farmers. Another way this was facilitated was through peer-to-peer information exchanges between the farmers who were utilizing SPS on their land and those who were not utilizing SPS. This harnessed the power of social influence to encourage farmers to adopt these practices. Lastly, the program set up a silvopastoral certification process for farms, making it both accessible, valuable, and simple to achieve SPS designation.

More broadly, the program was advertised through radio stations, bulletins, and news sources, further increasing a normative shift towards SPS. To ensure community satisfaction, local participation was monitored, and feedback was collected through community complaint boxes set up in easily accessible locations.

Results

Prior to the implementation of the project components, a baseline assessment of productivity, environmental health, and socioeconomic level was conducted on each participating farm to determine the impact of the project post-intervention.

Since the project's inception, 4,100 family farms in five different regions of Colombia have adopted silvopastoral techniques in cattle ranching. Over 32,000 hectares of land were converted to silvopasture, and incomes increased by $523 per hectare, per year. The milk productivity of farms also increased by 36.2% since conversion. Overall, participating farmers have experienced increased pride and investment in their work as cattle ranchers.

In addition to the localized benefits of the program, the project led to ecosystem-level improvements. Participating farms planted over 2.6 million trees, of 80 distinct species, that captured more than 1.2 million tons of carbon. Moreover, 21,000 hectares of key habitats for biodiversity were conserved and improved through the adoption of silvopastoral techniques.

Lessons Learned

- Building on the experiences and results of prior projects can provide a starting point for intervention design

- The use of common language in disseminating information on different SPS schemes is necessary for adoption.

- Providing a baseline incentive for farmers to protect ecosystem services counteracts the need for farmers to clear the land for grazing.

- The technical assistance provided through experienced and trusted extension agents has proven to be the most effective component of the intervention

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Case study 8: Increasing Rhino Monitoring in Namibia

Summary

Despite numerous conservation efforts across Africa, black rhinos remain one of the most critically endangered species in the world, and traditional fortress models of conservation have resulted in a lack of engagement and investment in the people living near parks and reserves. Community leaders in Namibia identified opportunities to reduce poaching by introducing a Rhino Rangers program where local people were chosen by their communities to track, monitor, and protect rhinos in their conservancy, as well as to participate in a network of other rangers to help capacity-building efforts, training, and support. As a result, poaching declined 83% during the first five years of the program, with no further poaching incidents reported to date.

Challenge

Poaching has been a threat to black rhino populations for decades, with the loss of 97% of the population from 1970-1990. Rhino populations experienced a brief recovery, but growing demand for rhino horn threatens rhinos with extinction. The Illegal wildlife trade within and between Africa and Asia is a pervasive problem, and tracking and enforcement are difficult due to the illicit nature of poaching behavior and its complex trade networks. The highest numbers of rhino poachings have occurred in South Africa, Namibia, Zimbabwe, Botswana, and Kenya. Fortunately, Namibia has a record of successful community-based conservation practices. In 2011, local community leaders and guards felt a need to make a change to their practices to try and reduce poaching pressure on rhino populations. Historically, military-style law enforcement had been the most common strategy for protecting rhinos and has had little impact. Field conservationists from the existing Rhino Custodians Program in the area noticed that existing efforts tended to focus too narrowly on poaching and labeling poachers as criminals, rather than on the larger system that was causing people to poach rhinos in the first place. Additionally, models of fortress conservation in local parks were perceived as prioritizing the needs of wildlife over people—contributing to local communities' lack of interest in participating in conservation.

Research & Design

Based on what they knew about the communities' perception of conservation, staff from the Rhino Custodians Program started by developing an understanding of how people valued rhinos as well as who got to make decisions about rhino conservation. Their goal was to shift conservation from a top-down model to a community-based approach, with local ownership and multi-stakeholder engagement at local, regional, and national levels.

Leading up to the launch of the Rhino Rangers program in 2012, there was a detailed 2-year planning process. In 2010, there was a multi-stakeholder rhino security workshop with rhino experts across several countries in Africa who shared their experiences. Save the Rhino Trust helped to organize NGO support for increased rhino monitoring and conducted a needs assessment for rhino patrolling with current guards. The Minnesota Zoo and The Nature Conservancy also helped by providing seed funding for the Rhino Ranger program. In the summer of 2012, nine conservancies selected the first rhino rangers that would become part of the first cohort.

The Rhino Ranger program was built upon Herold Lasswell's value concept to help bolster engagement in the Rhino Ranger program. These values include decision making power, knowledge, wealth, well-being, skill, affection, respect, and rectitude, and the Rhino Ranger program developed a theory of change based on how these values were perceived and experienced in local communities. They identified that people needed to be engaged and empowered to protect rhinos; have the tools, skills, and motivation to perform conservation actions that also improved their well-being; wanted to participate in efforts coordinated through a local institution with government endorsement; and had access to income-generating mechanisms and community benefits that were linked to this local institution. As a result, they expected that the community would protect and invest in rhino protection; the quality and quantity of rhino monitoring would increase; the relationship with people and rhinos would improve; the rangers would gain respect; poaching would be less tolerated; and ultimately, the rhino population would grow.

Solution

The resulting solution was a complex set of strategies and tactics involving a nested structure of different actors at different scales: local rhino custodians, regional community rhino custodianship, and the national ministry of environment and tourism. The first initiative was called the Conservancy Rhino Ranger Incentive Program. This involved a group of rhino rangers who were chosen by and accountable to their local communities to monitor and generate income from rhinos on their conservancy land. They also were a part of a support group where they received a comprehensive set of incentives, training, and tools to help them perform their work, and were part of a broader strategy to support rhino monitoring and, in turn, reduce poaching.

The campaign logo and uniforms helped to build and strengthen a sense of identity, belonging, and pride for rangers. Hero jackets were also awarded by respected figures in the community after five years of service, in addition to display pins, monitoring performance stars, and the ranger's local affiliation. There were even custom-made memorial tombstones for rangers who passed away that honored their life of service. A three-part training curriculum and team building sessions provided the information and peer support for doing the job effectively. During the basic training, rangers read, pledged, and signed the rhino ranger honor code in front of their peers and received a bracelet to signal their commitment. Ranger-selected patrol food, monitoring technology, notebooks, diaries, logbooks, and camping gear provided the essential equipment for rangers to perform their duties without having to purchase these themselves for the two to three weeks a month they were in the field. In the field, rangers also had laminated rhino identification cards to strengthen their relationships with the rhinos in their conservancy. There were additional extrinsic and intrinsic incentives: monthly performance bonus payments for exceptional quality and quantity of reporting as well as awards posted in public operations room for the best photo, best sighting, and best overall patrol. Each element contributes to the ongoing program's theory of change, and together, they serve to increase the rangers' dedication to their role as rhino custodians, make their jobs easier, as well as strengthen the relationship between people and rhinos.

Results

Results of a pre-post assessment from the program show that poaching declined by 83% from 2012–2017. There were no poaching incidents from August 2017 to May 2019. A survey with approximately 300 farmers in 2017 showed that there were positive attitudes towards the Rhino Rangers and interest in having more in the community. Additionally, where community members previously shared no prior information with the rhino rangers about potential poachers, between 2017 and 2018, there was an increase of public information given to the rangers that allowed local enforcement in 11 of 16 cases to prevent poaching in the area. Finally, the number of rhino sightings from when the rhino rangers started in 2014 until 2018 increased from 79 to 918.

Lessons Learned

- Decision making driven by local stakeholders creates both more durable behaviors over time as well as reinforcing ones supported by a range of actors

- Providing basic needs and requirements to do the target behaviors are important (gear, food, equipment, transport)

- Collaboration built through a shared identity and purpose can drive behavior change (reinforced by branding, logos, slogans)

- Open communication and engagement are key to achieving buy-in from a diverse set of stakeholders, and involving stakeholders at multiple scales reinforces target behaviors

- Developing a core set of outcomes that are selected, measured, and monitored is helpful for evaluating success

- Addressing a wide range of motivations and barriers can make an intervention more successful

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Conclusion: Case Study Recommendations

There are a number of recommendations and lessons learned that emerged from the eight case studies.

Base the intervention on the needs, experiences, and socio-ecological context of the target actors.

All of the case studies grounded their interventions in research conducted with the target actor. This essential step uncovers insights about their motivations and barriers that then guides which behavioral strategies will be most effective at changing behavior. For several target groups, boosting their sense of self-efficacy and celebrating natural resources created change. For others, there were significant financial, time, or social barriers that needed to be overcome. These cases further demonstrate how those designing interventions need to put aside their assumptions about what might work and instead use the information they have been given, even if it is surprising or something with which they disagree.

Moreover, this highlights the need to understand the broader socio-ecological context, structural barriers, and systems for designing behavioral interventions. Only about half of the cases here had strong processes for doing so. For example, in Indonesia, the role of customary leaders and the principles of adat were key in developing a locally-recognized and legitimate designated fishing areas. In Brazil, wild meat consumption was an important part of cultural traditions, and certain wild animals were consumed at certain times. Women were also the primary food buyers in the household and responsible for preparing meals. In Mexico, planting Milpa had a significant ancestral legacy and value in the community, and it was important to understand how this had been replaced by industrial agriculture. In Namibia, a legacy of fortress conservation tactics forced local conservationists to re-envision conservation by examining existing relationships between people, wildlife, and local decision-making powers to effectively protect rhinos. All of these insights were incorporated into the design of the behavior change interventions.

Combining multiple behavior change strategies can be more effective than a single strategy.

All case studies applied multiple types of behavior change strategies and appealed to three or more motivations and barriers. Indeed, the few cases where there was an intervention that only used one strategy, and particularly information and incentives, the intervention backfired. For example, launching an awareness-raising campaign on water consumption in Bogota initially increased water consumption. It is important to know the limits of any given strategy and once again base the intervention in what the data say about the target actors, rather than what designers think makes the most sense to implement. The most common strategies were informational and social and used together. These included providing tips, training sessions, media, or feedback as well as and changing social expectations, creating opportunities for peer learning, and making behavior more observable. These strategies were not random or interchangeable; instead, they were uniquely chosen due to their ability to address the target actors' motivations and barriers. At the same time, just because cases use multiple strategies does not mean they need to be overly complex or expensive. For example, in Costa Rica, postcards featuring a combination of stickers that conveyed social and how-to information were effective in changing behavior. In Kenya, the use of a small and well-timed incentive could make the difference between applying fertilizer or not in a given season.

It is crucial to have a robust monitoring and evaluation framework for assessing behavior change.

Most case studies had a theory of change that linked to core behavioral, social, and/or environmental outcomes, yet these could have been improved. The case in Mexico was one of the strongest examples of accounting for social, environmental, and health outcomes. None of the case studies identified a specific psycho-social theory of change. Very few use a robust evaluation framework such as randomized control trials, and most rely on pre-post measurements of change. Very few of these cases had controls in their intervention design, likely due to the nature of these cases being field studies. Additionally, a small minority of case studies had explicit plans to monitor behavior change beyond the end of the intervention, which puts into question their long-term durability. Overall, even for the strongest case studies in this set, there is room for improvement in their monitoring and evaluation framework.

Engaging a range of stakeholders who have different roles and operate at different scales can enhance the intervention.

A number of these case studies consider several stakeholders either as part of the target actor group or as other influential actors in effecting behavior change. A single campaign can address the needs of multiple actors if there has been sufficient research and system mapping of their behaviors, motivations, and barriers. In the case of the Rhino Rangers program in Namibia and the sustainable fishing regulations in Indonesia, involving actors at multiple scales helped to reinforce the intervention and hold actors accountable to change. This also has implications for the durability of the intervention, since there are more individuals from local to national scales who are invested in the solutions over the long-term. Beyond working with actors at different scales, several cases were mindful of involving actors who held different roles in the community. For example, the Brazil case talked to women and fishers because of their impacts on the behavioral problem. In the Bogota water crisis and Tojtic cases, children were key messengers and educators of local citizens regarding the benefits of conserving water and farming sustainably.

It is necessary to have a very clear and specific target behavior and actor.

All of the cases demonstrate the importance of identifying a specific target behavior and actor (or several) when designing an intervention. For example, in Brazil, the researchers made it clear that they were aiming to decrease, not stop, meat consumption, all while increasing domestic meat consumption. They also specified that wild meat did not include turtles due to their unique cultural significance and rare consumption relative to other wild species. Their target actors were also narrowed to households, but particularly women who were the ones who bought and prepared meat for their family. Similarly, the case study in Indonesia had three different target actors (fishers, local leaders, fish buyers) and a number of different target behaviors for each that they addressed during the campaign. In Costa Rica, it was much simpler: households reducing water consumption. No matter the number of behaviors and actors, it is important that they are clearly specified in order to conduct the most accurate research and to design effective solutions.

Testing components of the intervention before going to scale can help designers create more effective solutions.

Several cases incorporated steps to test elements of their interventions and made revisions to their solution design. For example, in Kenya, the research team conducted trials over six seasons in order to learn more about the effects of offering incentives for fertilizer at different times. The results of these trials allowed them to design better-informed options for their intervention at scale. In Brazil, the research team did a small experiment about the level of incentive (i.e., a discount on chicken) that would be appropriate and increase the likelihood of purchasing

domestic meat. They used their findings in the design of their eventual intervention, and were then more confident that their findings were due to the incentive being offered and not the 'amount' of the incentive. In both Mexico and Indonesia, campaign materials were shared or even codesigned with local community members to incorporate their feedback on the brand and the type of messaging that would resonate best with the whole community. These instances show the importance of validating assumptions about the intervention before launching at scale and increase the likelihood of success.

Glossary

Actors: People whose behavior directly or indirectly affects program outcomes

Adaptive management: a process of updating and improving how a program is managed based on data and feedback about what is working or not working

Attitude: An evaluation of something, ranging from negative to positive

Barriers: Forces, attitudes, beliefs, or other reasons that prevent someone from doing a behavior

Behavior: An action that a person takes in response to something (a stimuli)

Behavior-actor pair: A grouping that identifies a behavior and who is doing it

Behavioral insights: The findings that result from analyzing patterns in how people tend to behave.

Behavioral system: A network of actors, mapping how each actor's behavior influences each other's capacity to act and their interest in doing so

Behavior change approach: A methodology for changing behavior, often drawing upon principles of behavioral design

Behavioral indicator: A measurement that signifies behavior (or something that approximates it) has changed

Behavior change intervention, programming: A set or sequence of activities that aim to influence actors to adopt target behaviors to achieve a certain outcome

Behavioral design: An approach that blends insights from the design and behavioral and social science fields

Belief: Something that someone accepts to be true

Bias/Cognitive bias: A way of thinking that systematically deviates from rational choice

Control: A level of an independent variable a person or group is assigned to in a study that receives no additional intervention

Counterfactual: A comparison for an intervention to assess its impact that shows what would have happened if no intervention had taken place

Cross-context generalizability: The degree to which something applies to other socio-ecological contexts

Design thinking: A creative and iterative process for developing, designing, and testing innovative solutions, often used in combination with human-centered design

Difference-in-difference: A quasi-experimental method that compares the pre-post change (difference) in outcomes for the treatment group with the change in outcomes of a comparison group

Direct observation: Type of behavior measurement based on directly observing behavior, rather than using a proxy or self-report measurement

Disaggregation: A data reporting process that shows how an intervention may have impacted different groups differently

Doer/non-doer analysis: A comparison of the motivations and barriers for people who are already doing the target behavior and those not doing the target behavior

Durability: The degree to which an intervention's effects persist during an intervention period and after the intervention has ended

Dynamic programming: Making live programmatic decisions about phase transitions, expansion, or termination based on real-time monitoring of psychological and social states of the target actors

Human-centered design: An approach or mindset to problem-solving that centers people's needs and goals in solution designs, often combined with design thinking

Matching: A quasi-experimental method that builds a comparison group by identifying units that are similar to each of the treatment units based on a relative set of observable characteristics

Motivations: Forces, attitudes, beliefs, or other reasons that encourage someone to do a behavior

Outcomes: The behavioral, social, or other goals or objectives a program is trying to achieve

Outputs: The components of a program that help to show how it achieved its outcomes and may serve as intermediary objectives

Pre-post comparison: A study where a treatment effect is estimated by subtracting the base-line value from the value after treatment

Program activities: The parts of an intervention that are implemented to change behavior, such as training sessions, pledges, incentive mechanisms, etc.

Prototype: A small-scale version of a behavioral solution that captures its essential features and can be tested with target actors

Proxy measures: Type of behavior measurement that uses outcomes assumed to be tightly related to the target behavior

Psychological indicator: A measurement that signifies a belief, attitude, or preference (or something that approximates it) has changed

Psycho-social state: Beliefs, values, expectations, and social relations that result from program activities, and other psycho-social states and also influence future behavior

Psycho-social theory of change: A theory of change that links intervention components to psychological or social changes, leading to behavioral outputs and environmental and social out-comes

Pulse monitoring: Assessing key psycho-social indicators on a frequent basis throughout pro-gram delivery

Quasi-experimental methods: Evaluation methods that infer the causal effect of an intervention without randomization when assigning individuals to treatment conditions

Randomized evaluations, Randomized Control Trials (RCTs): Evaluation methods where individuals are randomly assigned to treatment conditions

Self-report measures: Type of behavior measurement where the rate or intensity of a behavior is inferred through responses from instruments such as surveys

Social indicator: A measurement that signifies a social state, structure, or factor (or something that approximates it) has changed

Social marketing: The application of techniques from marketing to shift behavior to benefit individuals and society

Socio-ecological system: A system of interdependent linkages between ecological factors, social and cultural factors, and institutions at different scales that continually adapt over time

Stakeholders: Individuals or groups who have an interest in environmental outcomes or will be affected by a project and program

Study condition: A level of an independent variable a person or group is assigned to in a study

Study treatment: The intervention an individual or a group receives, based on the condition to which they were assigned

Systems thinking: An approach that synthesizes how parts of a system relate to, influence, and cause one another, often through feedback loops

Rare inspires change so people and nature thrive. Conservation ultimately comes down to people – their behaviors toward nature, their beliefs about its value, and their ability to protect it without sacrificing basic life needs. And so, conservationists must become as skilled in social change as in science; as committed to community-based solutions as national and international policymaking.

The Center for Behavior & the Environment at Rare is translating science into practice and leveraging the best behavioral insights and design thinking approaches to tackle some of the most challenging environmental issues. Through partnerships with leading academic and research institutions, they are bringing the research into the field to connect the next generation of behavioral scientists with practitioners on the front lines of our greatest environmental challenges.

To learn more, visit behavior.rare.org

The Global Environment Facility (GEF) was established on the eve of the 1992 Rio Earth Summit to help tackle our planet's most pressing environmental problems. Since then, the GEF has provided close to $20.5 billion in grants and mobilized an additional $112 billion in co-financing for more than 4,800 projects in 170 countries. Through its Small Grants Programme, the GEF has provided support to nearly 24,000 civil society and community initiatives in 133 countries.

The Scientific and Technical Advisory Panel (STAP) comprises seven expert advisers supported by a Secretariat, which are together responsible for connecting the GEF to the most up to date, authoritative, and globally representative science. The STAP Chair reports to every GEF Council meeting, briefing Council members on the Panel's work and emerging scientific and technical issues.