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## ***Fishing for Families: Evidence From the Philippines on Integrating Population and Environment in Development Programs***

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***Edited Transcript – Leona D’Agnes***

Thank you, Geoff, for a very warm welcome, and to all of your staff who have really done so much over the past two years to work with us on this focus piece, as well as a number of other events where we’re trying to disseminate as much as we can the experience of this seven-year project, which is called the Integrated Population and Coastal Resource Management Project. We call it IPOPCORM.

And if it sounds like “popcorn,” it’s meant to sound like “popcorn,” because we have learned from working with Mr. Mechai Viravaidya, whom some of you know as the condom king in Thailand and the recent recipient of the Gates Foundation Global Health Award -- he is a member of our Board of Directors. My husband, Tom had the privilege of working with Mechai and his foundation in Thailand in 1978 to 1981, and Mechai always told us that you need to bring some fun into development work and particularly with family planning.

And the Filipinos are fun-loving people, and they love acronyms, and so we purposely chose this to sound like popcorn. And it went over really well in the villages. Later on we even found that it was a way that policymakers could show their support for family planning and reproductive health, which is extremely controversial in the Philippines. They could show their support by saying, “I support IPOPCORM,” without being attacked for supporting family planning. So that was something that we hadn’t envisioned. We thought this would be something that the communities would like and be interested. But it turned out to be an extremely important policy advocacy communication tool, as well.

Today I’m going to try to give you some information about the program itself. But I wanted to spend more time on the operations research component because there is a lot of interest in this, and we just now have the data. We’re preparing an article that could potentially be published in peer review journals, so I’m sort of pre-testing this out on you now.



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So, it's funny, the actual project started in the year 2000 when the David and Lucille Packard Foundation gave PATH Foundation Philippines -- which is an independent NGO that had an affiliation with PATH International for many years, but they were always establishing it as an independent foundation -- Packard gave a participatory planning grant that allowed PATH Philippines to bring together experts in the conservation field, in the population field to kind of brainstorm how we should do an integrated approach, and where we should do it, and what would be the elements of it. And so I want to give a lot of recognition here and thanks to the Packard Foundation because they started us in 2000, and they're still with us until this day, and not only in this study but in funding the scale-up.

This approach which I'm going to describe to you has been scaled up to over 1,000 fishing villages in the Philippines, and working with 33 local governments who have bought into this and co-financed those scale-ups. And they were instrumental in getting us started. And then USAID, Mr. Tom Outlaw, when he used to work for the Population Reproductive Health Office, saw the potential, and he also provided some very critical funding in 2002 which allowed us to go beyond the two ecosystems where we were working, and basically introduced this approach to half of all of the most critical marine conservation ecosystems in the Philippines. So there are 14 that are considered to be the top priority for conservation of marine biodiversity, and in a seven-year period we've been able to introduce this approach into half of them. And you played a big role in helping to finance the replication and scale-up.

Also, the USAID Philippines Office has a Fisheries Improvement Project, and they had followed early on the success of our pilot. And they put a component in their Fisheries Management Project that included population and family planning, and it was through that project also that we were able to scale up in several other important marine corridors in the Philippines. So I'd like to also give special recognition to USAID Philippines for having that vision.

Lastly, I mentioned Mechai's group in Thailand. He also has played a really important role in helping us because we realized, when we started doing research in fishing villages to design this project, that there was no way that we were going to be able to get family planning services into these remote areas where sometimes there's no roads, and you have to go by small boats, and the government health worker, midwife, might only get in there once a month. And when the high seas come, they can't get in there for months on end. So we realized that there was no way that we could provide access to not only family planning but



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conservation know-how and micro-credit, which is also an important component because these are the poorest of the poor. Fishermen are the poorest of the poor in the Philippines.

We had to use community-based approaches. And the Philippines does not do community-based family planning. They don't have a population policy, as many of you know. And this is partly why it's difficult to do work there. But unlike Thailand, where they've been doing community-based family planning for 30 years, and by that I mean training people from the community to use simple tools and methodologies, to be able to screen men and women who want to use contraceptives, and counsel them, and actually provide them with certain non-clinical methods. That's what we mean by "community-based family planning." There's also a similar community-based strategy in coastal resource management; the other side of this, the POPCORM side, is there are things that the community can do itself to restore a fisheries that's collapsing. And fish are so important in the Philippines -- and we'll get into some of these slides now -- because 80 percent of the protein requirements in these rural fishing villages are from fish that are just caught in small fisheries that are called "municipal fisheries."

The nation on a whole, 50 percent of the protein of the whole Philippines population comes from fish. So fish is an important staple product. And that's why we say it's IPOPCORM for food security. So the program is really focusing on food security. We're not just out there trying to promote family planning or conservation. We're saying that we are promoting an integrated approach that is to help improve food security.

As many of you know, it's an archipelago country. And it has over 7,000 islands. And they just finished the 2007 census data, and they've come out with some of the statistics. And there is now 88.6 million people in the Philippines. And in 1990 there was only 60 million. They have been able to reduce their growth rate somewhat, so it came down from 2.3 percent in 2000, when we first started doing our surveys. And it's now about 2.04 percent. That's still one of the highest growth rates in all of Southeast Asia, so it's still very high.

They don't have the most up-to-date statistic on what percentage of the population is under 15; this is where you get an idea of what is the youth bulge in a population. It was 37 percent in 2000. And I think it's probably going to be up to 40 percent when they finally release the 2007 data. This has an important implication because the demographers have actually looked at population projections and they can say what's going to drive future growth in the





Philippines population. And 65 percent of that is going to come from this age group, 15 years and younger. So that's what gives the momentum in a population.

And another 17 percent of future population growth will come from married couples who want to have more children, desired fertility, that's called. And then the other 18 percent will come from women who really don't want to have any more children, but they're not using family planning for one reason or another. They don't have access to methods, which is mostly the case in these rural coastal areas, and other reasons.

But 65 percent is going to come from this age group right now that's zero to 15. That's also where you're going to see the growth in the pressure on ecosystems, and coastal habitats, and terrestrial habitats. That's where you're going to have this driving pressure also by the youth bulge.

So when we did our analysis on this program, we realized from the beginning that we wanted to be ahead of the curve, we didn't want to just be in there providing services to adults. We knew now that we had to do something to engage this younger age group that's going to be the future stewards of the environment and the future parents of children. So we structured the program to have a large youth component, and you'll hear more about that.

I just wanted to show you kind of the comparisons of what the population is like when you focus on the coastal zone. Sixty percent of all Filipinos live in the coastal zone. And there you'll see a much higher rate of population growth, up to almost four percent. And most of the coastal zone is rural, although there are several cities that are also on the coastal zone. But the population density is much higher than the average population density in the Philippines. So you've got 286 persons per square kilometer on average in the coastal zone.

Now if we look at it, though, if you just go down to what I'm calling the marine hotspot areas, if you look further down to the areas where you have a high marine biodiversity, there's over 500 people per square kilometer. Population density is twice the national average in these areas. You have population growth rates of 5.6 percent. Tawi-Tawi is a province in Mindanao. It has 25 percent of the remaining coral reef in the country. It's also got the highest population growth rates, the highest population density, and the lowest rates of family planning practice, the lowest levels of knowledge about conservation. So when you take it down and really focus on critical ecosystems or -- we call them hotspots because they have two dynamics, this high population growth, high momentum in the population,





high biodiversity but also very high threats to the biodiversity -- and to go back over the environmental facts, as many of you know, the Philippines is one of 17 mega-diverse countries in the world.

And it has recently through studies been identified as the actual global epicenter of marine biodiversity. The center of speciation of coral has been identified now in the Philippines. And it's also one of the most imperiled environments in the world. And studies have shown this very high environmental stress, due to the population factor. And when I talk about population I just don't mean high fertility, that's one element, but there's also high migration. And these areas of high biodiversity are magnets. They attract people. And there's a lot of migrants that come there because they can glean from the fisheries, they can cut wood, mangrove forests, they can extract and get free goods, basically. So part of the population growth is because you have high immigration into these areas, as well.

So in 1998, when some studies had been done -- they found out now there's only five percent of the coral reef remaining in the Philippines that would be considered to be in very good or excellent condition. So they've lost a lot of biodiversity and species, both terrestrial and marine.

I mentioned to you how this is a fishing-dependent country. Not only is fish the primary source of protein, but about a million people are involved, either as small-scale fishers or commercial fishers, and that provides about five percent of the national labor force, and contributes about \$1.3 billion annually to the economy. Over the years there's been a tremendous increase and demand for fish from the population growth itself, but also from international markets in the Philippines. There's big tuna fishing industries there.

And just recently this chart was produced by the USAID Philippines Fish Project, it's called. They looked at the annual trends in marine fisheries harvests and population growth trends, and you can see from this chart that in 1995, basically, the population started to outgrow the annual fish harvest.

And there's a limit to how much technology or better extraction you can do to try to increase harvests. And the World Bank has said now that they've already reached the levels. They're 30 to 50 percent higher fishing extraction than the natural production capacity of fisheries. So they've pretty much now outgrown their fisheries, and this is the beginning of what you would call a crisis in food fish security. And the government has acknowledged that.





So not only do we have consumer demand putting pressure on the fisheries that brings about some degradation of the ecosystems, but then we have destructive fishing going on there. And that's because there's a lot of demand for live fish; there's a big live fish trade, there's an ornamental fish trade (the United States is the largest consumer of ornamental fish from the Philippines). And thank you for your "Finding Nemo" article. We try to discourage people from buying ornamental fish because they use destructive methods to capture those ornamental fish. And we'll talk about that a little bit later.

But one of the most popular methods is blast fishing or dynamite fishing, in that -- you can see the photo here where this small-scale fisher has thrown some explosives into the water. And it kills a lot of fish. And they come to the surface and he can harvest them very quickly. It also destroys the coral reef and other structures there. Dynamite fishing was actually introduced into the Philippines during World War II, and it was the Japanese soldiers who first started using the dynamite that they had access to, to harvest fish.

And this chart basically shows you something different from the other one. This is just focusing on what they call municipal fisheries. This is where the artisanal or the subsistence fishers fish. And it's 15 kilometers around an island are considered the municipal waters, and those are supposed to be reserved for small fishers.

So the fisheries code of the Philippines gives preferential access to small-scale fishers and subsistence fishers into these waters, but it's difficult to enforce, and the local governments don't enforce it. And you've got a lot of commercial boats coming in, poaching fish that's supposed to be for these small-scale fishers.

So destructive practices and illegal poaching have basically depleted the fish stocks in these waters that most of the fishing communities depend upon for their food and their livelihood. So this chart shows how the daily catch rate has declined since post World War II, and, at the same time, the population has expanded eight times while the catch rate has gone down five times. And this prompted the government, and through a USAID project, called "Coastal Resource Management for Food Security," to acknowledge -- and it wasn't the President that acknowledged this, but it was the Department of Environment and Natural Resources -- that, "If current trends of population growth and coastal resource exploitation continue," that, "the availability and affordability of fish to provide a crucial protein source for the Philippines will be lost." That was said in 1999.





At that point, there was also a very interesting fisheries expert, Dr. Daniel Pauly, who came up with a theory to, “How can we roll back over-fishing?” That’s what he called it, “rolling back over-fishing.” And he was a fishery scientist, and he identified three things. And he said, “One, We need to help the communities set up sanctuaries where the stock can regenerate, and they will promise not to fish in that area for three years until the stock regenerates, and then it will spill over, and they can fish around the perimeters of these sanctuaries.” And then he said, “Of course, we have to educate them about the value of coastal resources, and why they should protect them.” And the third thing he said is, “We need to strengthen family planning,” because even as a fishery scientist he saw that there were too many fishers and not enough fish. So he recommended that way back in 1995. And nobody really acted on that. And certainly the government agencies that could have made it happen didn’t get together to make it happen.

So those were the factors that we took into consideration when we designed our integrated approach. And this is a conceptual framework that tries to be a graphic presentation of, “What are the environment, and population dynamics, and the social dynamics that are going on in a given situation or area?” So these are the dynamics going on in the coastal zone. And the situation on the right is our vision. What we would want it to have is improved human and ecosystem health for better food security. And as you go to the left, the risks or the threats are identified in the box. And the further that you go to the left, you get into the indirect threats. The ones on the right are more the direct threats. So we tried to work it back. It’s kind of a root cause analysis.

And in the process then, we identified three of those factors or four of those factors that also represented opportunities for intervention. And those are the black boxes. And they were opportunities that an NGO working with communities and with local governments could possibly impact. And they were the lack of access of family planning in areas of high marine biodiversity, some traditional preferences, and beliefs. One was this desire for more children. And it’s because they have no other livelihood opportunities other than to fish. So the more children you have, the more hands you have to help with fishing. So there was this sort of built-in preference, and also, of course, there’s some preference also for males over females. You have that. So they may already have five children, but they still want that boy so they keep going on.





The lack of alternative livelihood is why there's also so much poverty there, because when the fisheries collapse, then they're driven further into poverty because they really don't have any other skills, and they don't have access to credit. So we saw that as something that perhaps we could intervene, and then very weak enforcement where the local governments were not enforcing laws that are already in place to protect the habitats.

So those were the opportunities then that we designed the integrated approach around. And just very briefly, we like to call it an approach rather than a project because it's an approach that once we introduce and communities pick it up, they carry it on, and they sustain it. So it's not like going back to see if every element of the project is there. If you go back, what you will see is this integrated approach still being carried on by the communities. It uses the symbiotic strategy to link the sectors. So the three sectors that we're linking are the population and health, the environment, and the economic development sector.

It focuses on food security from the sea. So this is a concept, food security from the sea. And it's going to be important later on when we talk about how we evaluate this. We didn't use traditional food security indicators. We used the ones that are used in the Philippines when they talk about the food security from the sea. The program targets, of course, fishers, which are both men and women living in coastal communities, because they are the ones that don't really have any access to alternative livelihood training or micro-credit, and then youth group -- and I explained before why we're giving emphasis on youth -- and, of course, living in what we call this high growth top priority marine conservation areas. So that's in a nutshell the focus of the project.

Very quickly, the goal was to improve the quality of life of fishing dependent communities while, at the same time, maintaining the diversity, the productivity, the integrity of those life-sustaining coastal habitats that they depend upon. So it had two goals, simultaneously trying to impact both of those.

And, by the way, we were trying to just maintain the status. We did not expect that we were really going to be able to improve it because it's hard enough just to maintain it with all of the loss of biodiversity that's going on, even with the best protective management interventions. We said, "We will be satisfied if we can maintain the conditions of these coral reefs and mangrove over a period of six or seven years." The specific objectives then were to improve reproductive health outcomes in these communities, and we selected that because







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our baseline surveys showed us that women here have six or seven children, high rates of infant mortality, and maternal mortality.

Most of those women did not want to have that many children, so there was a huge unmet demand for family planning. We wanted to build the community capacity to implement these coastal resource management interventions and approaches, not to just be dependent on the government. And this is what we also found, that they all thought that the government was supposed to be the one to go in there, and clean up the coast, and do the protection, and they didn't really even realize that there were things that they could do, so the whole idea of building their capacity. And then we wanted, also, to increase community and policymakers' awareness of the linkages between these population, health, and environment, and consumption factors, and garnish their support for integrated approaches. So those were the three main objectives.

The intervention mix, now, what I'm going to present to you is what the comprehensive program does. This is the program that we have rolled out in over 1,000 fishing villages.

Later on, when I talk to you about the evaluation, the evaluation looks at just one sectoral strategy -- two sectoral strategies in the integrated approach.

So an integrated approach includes these four main components. One is this community-based family planning. And that's a picture up there of a fisherman and his wife. And his wife is running this little shop -- she already had the shop -- sells soda, cigarettes, and liquor. And so it's an existing outlet because there's no institutions when you get down to these little hamlets. There's no clinic that we could work out of. The only thing that's there is this little sarisari shop.

So that becomes the outlet for distributing condoms and pills. And she becomes the peer educator, and she receives training in how to educate women about family planning options, how to screen them to make sure it's safe for them to use pills. And her husband happens to be one of the ones who guards the fish sanctuary that's set up. So these are called couple peer educators. And we use this peer education approach.

We also have youth peer educators. And that's one of the drawings the youth peer educator did. And they're promoting both responsible sexual behavior among young people and to become a steward of the environment. So it's a combination of becoming a steward of your



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sexuality and of the environment, and that's what the youth peer educators learn and pride themselves on being.

The CRM component on the right-hand side -- and this is actually an island, and there's a sanctuary in front of that island from the project, and that's looking to protect habitats. And there are other strategies in coastal resource management that I'll tell you what that component does.

Every component, whether it's reproductive health or the conservation, has a policy advocacy piece, and it's tailored to what that is.

So in family planning we had to convince the mayors to let us do community-based approaches because as I mentioned to you, it's not authorized to be done on a national level, it's not part of the Department of Health's policy. But if the Mayor says, "Yes, you can do this in my municipality," then you can do it even though it's not part of the national program. So we had to do that. In order to be able to do a community-based family planning strategy, we had to have a written agreement with every mayor that we could do it. And we also got them to co-fund it because we didn't have the resources to finance all of these elements through the project.

Every component has a small enterprise development and a micro-credit component. Now that's usually linked with coastal resource management because if you set up a sanctuary and you tell fishers, "You can't fish there anymore," they don't have any way of feeding their family. So you have to bring in alternative livelihood and micro-credit when you're doing a CRM approach.

We felt that we wanted to do it in all the areas because these are all extremely poor sites where we did the study and the project. And we also didn't want to bias the study by having only one area that had micro-credit in economic development because that could influence all outcomes. So every component then had a micro-credit. And this is where Tom Outlaw and USAID really helped a lot in providing funds in that site where we were doing the family planning to also have training for women in youth in environmentally friendly small enterprises. And that's important in a coastal zone. You can't just come in and introduce pig raising, for example, and then all of a sudden they start polluting the coastline with wastes from piggeries. So it had to be environmentally friendly wherever we worked.





So, quickly, I told you already that family planning interventions used these community-based distributors. And this is another little sarisari shop. And you can see there's advertisements for Tanque liquor. And there's also -- up there it says, "Community-based distribution outlet. We provide basic family planning services." And there's another poster of a woman's face over there that says, "If you don't want to be pregnant, come and talk to us." So this is how you do community-based family planning.

We also had to have a referral mechanism, though, because these women, and men, of course, if someone wants to have a permanent method like a vasectomy, or they want an injection, or they want an intrauterine device, they've got to go to the clinic, so all of these community-level peer educators are linked through a mechanism to refer to a government facility, which is often at a higher level, at a district level, or whatever. And then we found that we actually had to retrain all the government workers at that level because they didn't have up-to-date training in reproductive health. So we had to do a whole component on strengthening the referral mechanism.

And then there are youth activities. Here the young people were doing a lot of the public education campaigns, and using traditional media like community theater. And then I mentioned the micro-credit already.

The CRM interventions, again, we had to do a lot of advocacy with the mayors because we purposefully are going into areas that still have some intact ecosystems -- we didn't want to go into places that are already destroyed -- and then we had to make investments in rehabilitation, which is much more expensive. So we were working in these areas that still had maybe 20 percent coral coverage. And the Mayor would say, "Well, you know, our place is good. We don't need to do this yet." And we said, "Well, prevention is -- it's time to do it now, when you can still only make an investment in prevention." So there was a lot to do there. Most of them didn't even know what coastal resource management was.

And then, in order to set up a sanctuary, you have to have a legal tenurial agreement. There has to be an ordinance passed by these mayors. So sometimes it took almost two years to even get the legal agreement before we could set up the MPA. So it takes a lot longer to get these conservation mechanisms in place than the family planning mechanisms. And then in some places there weren't laws that banned the use of other destructive gears. So we would also try to get them to pass some laws on that side.





Then we have to educate the communities because they're saying, like, "Why do you want to cut off our fisheries?" you know. "You mean, we have to take this many hectares of the ocean? And we're not allowed to go in there?" So there's a whole education process before the communities will buy into this. And if they don't buy into it, it's not going to work even if you put ropes around and you got people guarding them; they still get in there. And so, there's a lot of groundwork that has to be done to get the local governments to buy in, the communities to buy in.

One of the ways that we get the communities to buy in is we do these things called participatory coastal resource assessments. And we actually bring fishermen with snorkeling gear, and teach them how to snorkel, and go around, and take a look at the coral, and what's there, and mangrove, go into the mangrove. And they've been in there. But they don't look at them, necessarily, from this more planning, you know, "How can we conserve this?" and, "Look at these valuable things that we have." But that gets them to buy in.

And then also we get the community to nominate people who are going to be the ones to manage this sanctuary. Once it's set up, the community has to manage it and they have to periodically monitor and see if the coral are coming back, if fish are coming back. And they're taught simple ways to do that. And, finally, they have to patrol it. They literally have to get volunteers in the community. And they're trained, and they're called fish wardens, or 'bantay dagat.' And the local government deputizes them so if somebody goes into that sanctuary, they have the authority to arrest that person, bring him into the Mayor's office. And that person can be put in jail. So there's a lot of training and social mobilization that goes in setting up these community-based coastal resource management arrangements.

Youth activities here, we did youth camps. And you could see the children there are young people -- 15 to 19 is the target group -- they never snorkeled, they never saw a fish underwater even though they eat fish all the time. And this was partly how we got them involved in helping to monitor the sanctuaries.

And that's a guardhouse. So there's a guard that stays there all the time and looks out over the sanctuary, and they have lights at night if they suspect or hear somebody, to see if somebody's coming into their sanctuary.

So how do we get this integration? We've got this family planning going here. And we get this conservation work here. Where do we integrate it? And this is where we hypothesize



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that we're going to get some synergy if we can get this integration to work. So we integrate it in our behavior change communication messages. We do, as I mentioned, a lot of this information, education, and communication.

So we integrate this. And I'll just give you a simple message, something like, "To improve food security, we need to protect our precious coastal habitats and plan our families." So that's an integrated message. And those messages are pre-tested and they're translated into the local language. And we have contests where we have the villagers come up with slogans, and give awards for the ones that can communicate it in the most persuasive way.

Target groups: as I said before, we'll have couples in the same household. One is the family planning, field worker, outreach worker. The other one is guarding the sanctuary. The youth one is also doing the coastal cleanups, and is a youth peer educator on adolescence, sexual, and reproductive health. So it comes together there.

Also in our policy activities with the local government, we sponsor workshops to help them develop their annual development plans. And that's the time when we help encourage them to put both coastal resource management and family planning into their development plan. And we do that at the municipal level, so we have this approach now into municipal development plans, and in village development plans. And that's how we institutionalize it, because once it's in a plan, then it's eligible to be funded from government sources that come from their internal revenue allotment. So it's very important to get these into the development plans if you want this to be sustained when the project leaves. So that's another way that we get some integration.

And then the way we did it is in service delivery. We had one environmental NGO that learned all aspects of this, and was the team that delivered all of the services. I mean, there are four or five people on this team. But it was another way that we could make sure that we were getting the integration. So now I'm going to go quickly as to, "How are we measuring the integration or the synergy?"

And this has never been done before. There's never really been any study that really tried to answer this question. You know, we're going through all this extra effort to do this in an integrated way. "And are we really going to get some synergy? And are we going to get some added value?" because that's what we're looking for here. So we did it by testing our central hypotheses that there will be a statistically significant improvement in coastal





resource management outcomes and reproductive health family planning outcomes, by delivering these services in an integrated fashion as opposed to delivering either intervention in isolation.

So to test that hypotheses we use a quasi-experimental evaluation design. The statistical tools that we used to test the hypotheses were called the difference-in-difference approach and logistics regression analysis.

Quickly, what we had to do then is we have to choose one island where we're only going to do the reproductive health side, another island we're only going to do coastal resource management, a third island where we're going to both in an integrated fashion, and then we actually had a fourth island that was a control area where we didn't do anything.

Unfortunately, the control got spoiled in the six-year period of the study. Another group came in and introduced an integrated agriculture and family planning project in coastal areas for food security, that basically changed a lot of the conditions there. And we no longer had a control. But we were able to still, in analyzing the data, use one site against the other as a control. I'll show you how we did that later.

We worked in Northern Palawan. So here's the Philippines. Here's the Island of Palawan. And this is considered the fishbowl of the Philippines. It has been for years. And the very northern part of that, which is over here, is one of those areas of extremely high marine biodiversity, and that's why we selected the area.

We did not do a random selection on these sights. Basically, the government told us where we could work and where they wanted us to work. So the Calamianen Island Group -- Conservation International had done some survey work there in 1999. And we knew that there were pretty good conditions in the island ecosystems. So this island here, Busuanga, is where we implemented the reproductive health component only. This island, Culion, which is a separate island, separate local government, we did the integrated approach. And out here is where we did the coastal resource management only approach.

Now, how did we decide to do that? We did a baseline biophysical assessment because this area had never been surveyed before. And there had been a little bit of surveying here, and no survey here. So we had to have a team of marine scientists that we retained to go out and do that because PATH Foundation Philippines does not have that expertise. And they





surveyed around these areas. And they said to us, “All right. There’s a coastal area. I’ll offer them this village that has high fisheries value. But it’s already showing signs of stress from human pressure. So we recommend that you do a sanctuary here.” They identified places where, had high fisheries, and high ecology value, or high tourism value, or combination of the three. And they recommended where, and we followed their recommendations.

The other factor was if there was an NGO already operating in those locations. And one of them had no NGO, whatsoever; two of them had no NGOs, and only one had an NGO that had already been working with the communities. So we had to bring in local NGOs into these areas.

And we couldn’t go too far away. These are very remote and hard to reach. So the selection was also based on the availability and what the NGO wanted to do. Some of them really didn’t want to do an integrated approach, but they felt comfortable in doing the conservation, so that factored into the solution.

Now I’m going to talk quickly about, “What were the dependent variables in this study?” We basically had a set of reproductive health indicators. We started off with literally scores of indicators that we tried out in the baseline survey, and over the course of the study they got narrowed down because, one, we found the local surveyors couldn’t collect the data on some of these indicators, very hard for them to get data on unmet need for family planning, for example -- we were able to do how many children ever born to a woman, we were able to get reliable data on that indicator -- whether they were currently using a family planning method, very hard to get information from young people on their sexual activity, too. So it came down to the set of indicators that you’re going to see here are what we were left with in the end after testing a lot.

And also on the proxy indicators for food security: so here’s where we were looking more at the CRM framework for food security. So we’re looking at, “Is a household totally dependant on fishing?” That’s a food security risk, if they have no other way of having income. So percentages of households that are totally subsistence fishers was that indicator. Did they know someone -- actually we don’t ask them, “The last time you went fishing, did you use dynamite?” because, of course, they’re not going to tell us the truth. But we ask them, “Do you know anybody, personally, who uses dynamite or uses cyanide?” Cyanide is another poison they use to catch fish, and that is even more destructive than dynamite, and it really kills the coral reefs completely. So if we can have an impact on reducing use of





dynamite and cyanide, we're going to improve food security at the household level because we're going to be protecting the habitats and ecosystems.

On the CRM indicators, we chose biophysical parameters for coral reef fish and mangrove. And these are interrelated ecosystems. And they're what are producing the fish that people eat there and are essential to have, you know, good coral coverage. So we had live coral coverage, coral mortality index, and then some indices for coral development, coral condition, and coral succession. For the reef fish, we're looking at species richness for all species and specific target species. The biomass, size frequency is very important. And then on the mangrove, we had several indices for volume, volume density, mean density.

Our methods then, we had to do a pre-intervention survey. Both household surveys and biophysical surveys had to be done before the interventions were introduced. And then we did them six years after. Actually, we did them four years after, and it wasn't enough time to show impact, so then we had to do it six years after. I'm only giving you the data from the pre- and post-. There's not a whole lot of difference other than we have more impact when we waited the six years to get the post- measurement.

We used -- University of the Philippines has some pretty excellent research groups. So to do the community household surveys, which we're gathering the information on family planning, socioeconomic data, some fisheries data, too, we used the Demographic Research and Development Foundation that did the baseline. And then there's another institute that also does health research called FACE. They did the post project surveys.

The biophysical surveys were done by the Marine Environment and Research Foundation, which is part of the University of the Philippines Marine Science Institute, also under the bigger UP umbrella. They did both the pre- and post- surveys for the biophysical assessments and the analysis.

Community surveys, I'm just going to do this really quickly. We had nine villages we selected in each of the sites. And they were randomly selected, using the probability by proportional size. Then they had to do a complete listing of every household in those nine villages or barangays. And then from there, they drew their sampling frames of different populations; we wanted both adult population and youth population. And then they did a sampling of the individuals using random methods.







And then, once a sample of households was selected for one age group, the members of that household were no longer eligible to be interviewed for a succeeding age group so there's no overlap, because the age groups do overlap but their respondents don't. We had separate samples for the baseline and the post, meaning we didn't go back to the same households in 2007, the exact same households that we went to in 2001. And that's because we wanted to have a snapshot of the conditions before and after in those populations.

Just quickly, these are large sizes. We have 400 households in each of the experimental sites. We had 100 adults and 300 youth, so also 400 respondents in each. So it's a pretty robust sample size.

For the biophysical surveys, they sampled the shallow coastal habitats within the jurisdiction of the local government. And these were coral reef, as I mentioned, reef fish and mangrove. And they did a resource and ecology assessment method. For the coral they did what's called line intercept and video transects. These are underwater methods. Also from mangrove they did transect line plots. For the fish reef, they also did it along the same transects they did the coral. But they did what's called fish visual census. And my daughter, Heather can tell you more about that. She knows how to do that method. With the biophysical, they did go back to the exact same coordinates and the same transects using GPS. So there they were going right back to the very place that they surveyed in 2001.

The statistical methods they used were both the bivariate analysis and the multivariate analysis. For CRM they used what's called ordinary least square regression analysis to determine the spatial/temporal trends, these are trends then, and a software package that's called PC-ORD; I couldn't tell you what that is. And they did the significance testing to the 0.5 level, 95 percent confidence level. For the reproductive health and food securities, they used both the OLS and appropriate regression analysis model. I'm not going to get into that in detail, but I have the details, if anybody wants. That will give you the difference-in-difference because now we're going to be comparing these interventions, and we need to be able to come up with a test of significance when we compare one against the other.

They use data to analyze the data and at a 90 percent confidence level. There are also the independent social variables that had to be brought into the analysis, and we had to create some of these indices. And the wealth index had to be created. The others are pretty straightforward; age, education. These are factors that we know have an influence on reproductive health outcomes and other socioeconomic outcomes. So they were brought into





the analysis. So now I'm going to get quickly to the results. And I'm not going to put up any tables because these are like coefficients, and they're very difficult. But I have the tables if anybody really wants it; I'm summarizing it for you.

So when we looked at the integrated intervention versus the standalone interventions, we found that the data shows that the integrated interventions generated the desired impact. And by this I mean either more women using family planning, more young people having protected sex, or more young people waiting to have sex until they're older, or fewer people using dynamite. That's what I mean by a desired effect.

So the integrated approach generated the desired impact on all nine of the reproductive health and food security indicators. It exceeded the impact of the other two sectoral interventions on five of those. And for the other, it performed equally well. So here's how we can summarize it from the multivariate regression analysis, and this is the difference in difference. So, in fact, like in the reproductive health only site, even though it's not highlighted, they had a statistically positive trend, and so did IPOPCORM. But then when we test, we do another level of testing to see which had more impact, which had more power to it. That's what this tells you. That's the difference in difference in the relative impacts. So that's how we can say, "So these were also positive and statistically significant." But then in comparison, when we run that third level of statistical tests, the integrated approach came out on these indicators as having a more powerful impact.

For the CRM then they had 18 indicators, and this is just summarizing it. The integrated approach had no -- there was no change in 14. And actually no change is okay because that means we've maintained the condition that, that parameter is measuring. So we maintained in 14 of those indicators. We had three statistically significant improvements. And they were in coral and mangrove. And we only had one decrease. And that was in one of the mangrove indicators.

By comparison, the sectoral approaches, each had three statistically significant decreases in an important indicator and only one increase. And this table summarizes that.

And because there was not a situation here where we had two sites where they both had the same positive trend, we didn't have to do that third level of testing to see which had a more powerful impact. So this didn't go into as many steps in the analyses.





We also had data on the cost, so we did a cost analysis. And this chart shows you that the cost to implement the integrated approach, which is X1, the total cost was about US\$219,000 over the six-seven year period. The family planning one only costs about 105,000. And the CRM only costs about 145,000. To do this comparison then, what we do is we add the cost of the two sector interventions. And that cost came out to be higher than the cost to do the integrated approach. And I think the savings is really more on the reproductive health side because in looking at how this money was spent we see almost equal expenditures on the CRM component in both the integrated and the CRM sites.

So kind of the conclusions we came up with were that, overall, the IPOPCORM intervention generated a greater impact on the majority of the indicators used in our analysis to measure improvements in human and ecosystem health and food security from the sea, recognizing that there is a limited number of indicators here. And these data support our hypotheses that integrated approaches yield higher impact than sectoral approaches.

What are the implications of this? It's going to be difficult to ensure long term sustainability of coastal resource management and to prevent overuse of natural resources, unless integrated forms of coastal management combined with family planning are delivered in a simultaneous way. And we feel that we've demonstrated that this is a cost-effective approach to obtain those kind of synergies and maximize the impact of those coastal resource management family planning interventions.

What do we think made the difference? Well, in fact, the most of our indicators that really showed high power went with the youth, and we think that our approach of encouraging young people to become the future stewards of the environment but also to honor their own bodies and become stewards of their sexuality, we think that, that went over really well, and it resonated with young people.

And then when we went to the community and asked them for feedback on it, what they told us is they like the integrated approach because it's more like how they lead their lives. They don't lead their lives in sectoral ways. They lead integrated lives. So we had better community participation because it was just more along the lines of their lifestyle.

So just a couple take-home lessons I think that have come from the overall program, not just the operations research, are we feel that the integrated approach, or the synergistic approach, lends sustainability to conservation interventions, while the conservation side provides that





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comprehensive context for residents in coastal areas to recognize the necessity of limiting family size in order to achieve food security and to improve family welfare.

And the other lesson is that with appropriate training and support, environmental NGOs can develop the capacity to implement community-based family planning activities. This is something that people didn't think was possible. And I think that, that's a really --

[low audio]

-- lot of limitations of this study. There were introduction of certain activities in some sites that we could not possibly control for. The level of penetration of the interventions is an important thing. And that varied from site to site, as well as the maturation of the intervention. And as I told you before, it took two or three years to get a permit to even set up a fish sanctuary, so, actually, the CRM results are only maybe after 24 or 28 months of protected management. And that varied across the sites, and the performance of the NGOs who implemented these approaches varied, and the commitment of the local government varied, so that there were things that we just couldn't control for in that regard.

I hope I left time for questions. Thank you very much for your attention.



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