BANGON BATANGAS

AIDING RECOVERY AND BUILDING RESILIENCY AMONG INTERNALLY DISPLACED PERSONS OF TAAL VOLCANO ERUPTION THROUGH SCIENCE AND TECHNOLOGY INTERVENTIONS

BACKGROUND

On January 12, 2020, Taal volcano erupted and has affected 151,386 families comprising of 584,236 individuals across the province of Batangas, Quezon, Laguna, and Cavite.



Total number of families and individuals affected by permanent lockdown and total lockdown in Batangas Province.

BREAKTHROUGHS



TALISAY

846

2,250

BALETE

Padre Garcia

417

1,525

San Juan

No. of families and individuals within the five (5) hardest-hit municipalities of the Taal volcano eruption

1,847

7,960

2,927

Nasugbu

10,759

SAN NICOLAS

573

1.703

CONCEPTUAL FRAMEWORK



Barangays within municipalities covered by the project

municipalities covered by the project

5 8

internally displaced families that have been beneficiaries of the S&T-based relief assistance



BENEFICIARIES OF S&T-BASED RELIEF ASSISTANCE



Relief assistance to the IDPs of Taal Volcano eruption under the DOST PCAARRD funded project Bangon Batangas: S&T based assistance to Taal internally displaced population



The Bangon Batangas Project was introduced and presented to LGUs to solicit support and to onboard them on the goal and activities of the project



Laurel 28%

particpants in the

livelihood training

209

Crop Production

33%



Actual training on smoke fish production for the IDPs of Laurel, Batangas



Focus group discussion with IDPs previously engaging in farming during the site assessment and profiling in Laurel, Batangas.



Delegation of a specific focal person for each municipality hasten ground coordination and aide very well during planning and implementation



Presentation of MOA for the donation and utilization of smokehouse to the stakeholder in Laurel Batangas.















Courtesy meeting with the municipal mayor of

San Nicolas Batangas to present

the project and establish partnership.

Inception meeting with DOST PCAARRD

attended by various project teams

and their corresponding administrative officials













Local

Government Units

DOST-PCAARRD









REPORT AND POLICY RECOMMENDATION

32.5%

Smokehouse Fabrication







34.4%

Percentage distribution of participants in the conducted livelihood trainings for the IDP

conducted

livelihood trainings





LGUs with damage reports on agriculture, fishery, and aquaculture

policy recommendation for aquaculture and agriculture recovery and sustainability

University Polytechnic University

Municipality Municipality Municipality of Talisay of Agoncillo of Laurel

BANGON BATANGAS:

Aiding recovery and building resiliency among Internally Displaced Persons

of Taal Volcano Eruption through Science and Technology Interventions

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> **Duration** August 1, 2020 to September 30, 2021

Budget

Total Approved Budget: PhP 4,000,000.00 Total Released Budget: PhP 4,000,000.00 Total actual budget expenditures: PhP 3,339,126.15

> **Funding Agencies** DOST-PCAARRD

Collaborating Agencies

Batangas State University DOST-PCAARRD Municipality of San Nicolas Municipality of Agoncillo Municipality of Balete Municipality of Talisay Municipality of Laurel Provincial Government of Batangas LSPU College of Fisheries

Technical Report

Abstract

Supporting affected communities in times of disaster is a very crucial path to recovery. On January 12, 2022, 151,386 families were displaced due to the eruption of the Taal volcano-leaving their houses and livelihood buried in its thick ashfall. The Batangas State University, alongside its partner agencies, spearheaded the Bangon Batangas Projects which aims to contribute to the concerted government efforts to alleviate the condition of the internally displaced populations (IDPs) of Taal Volcano eruption through interagency collaborative efforts and S&T- based recovery operation. The project was able to help 2601 internally displaced families from the Municipalities of San Nicolas, Agoncillo, Balete, Talisay, and Laurel which were hosted by various municipalities and cities in the Province of Batangas. Based on the rapid assessment conducted by the start of the project, Bangon Batangas focused on science and technology recovery assistance to the IDPs. Apart from utilizing food products funded by the DOST in the relief packs, various livelihood training programs such as the production of smoked fish, smoke house units, high-value crops and organic fertilizer were conducted. A livelihood program plan was also developed and is hoped to be utilized to aid livelihood recovery.

Aiding recovery and building resiliency among Internally Displaced Persons of Taal Volcano Eruption through Science and Technology Interventions

Introduction

Supporting affected communities in times of disaster is a very crucial path to recovery. Humans can only live with a certain number of days without basic necessities such as food and water. Thus, immediate assistance will lessen the physical as well as mental toll it has brought to an affected individual. More so, recovery assistance shall see to it that it will not end only after a few days. Efforts should be sustainable enough with the goal of having affected individuals stand on their own and build a productive livelihood in the nearest possible future.

On January 12, 2020, Taal volcano erupted and has affected 151,386 families of 584,236 individuals across the province of Batangas, Quezon, Laguna, and Cavite. Of these, 1,813 families consisting of 6,666 individuals were evacuated to temporary shelters during the onslaught of the disaster. On February 14, 2020, Taal Volcano alert status was lowered by PhiVOLCS to alert level 2 which signaled the cautious return of the people to their homes. However, there are areas under total or permanent lockdown. Table 1 shows the areas which are under lockdown and are considered as heavily damaged and with high risks.

Residents from areas under lockdown remain in the temporary shelters being provided by local government units (LGUs) and by the National Government. There are 6,610 families of 24,197 individuals from areas under total lockdown and permanently lockdown areas. Internally displaced populations (IDPs) were distributed into several temporary shelters. The table reflects the temporary shelters of the number of evacuees from these hardly hit areas. It shows that there are 18 evacuation centers which are still open with 1,488 families or 5,551 individuals. Other families preferred to stay with relatives or rented temporary lodging houses. The Municipality of Laurel has the most number of evacuees with 449 families or 1534 individuals who are sheltered at the Municipal Gymnasium, AS IS Covered court, Leviste Covered Court and Poblacion 5 Covered court. The evacuees are from Brgy. Buso-buso Gulod, Uwahi Laurel, Batangas. The Municipality of Talisay on the other hand, has three (3) identified evacuation centers namely Tumaway Elementary School, Tranca Gymnasium and Dona Maria Platon Laurel School at Brgy. Aya which caters to 331 families or 1,308 individuals.

AREA	DATE	REMARKS
Batangas		
Agoncillo		
Subic Ilaya	27 January 2020, 10:00 AM	Total lockdown
Bilibinwang	27 January 2020, 10:00 AM	Total lockdown
Banyaga	27 January 2020, 10:00 AM	Total lockdown
Laurel		
Buso-Buso	27 January 2020, 10:00 AM	Total lockdown
Gulod	27 January 2020, 10:00 AM	Total lockdown
Bugaan East	27 January 2020, 10:00 AM	Total lockdown
Balete		
Calawit	27 January 2020, 10:00 AM	Permanent lockdown
Talisay		
San Isidro	27 January 2020, 10:00 AM	Permanent lockdown
Sitio Tabla	27 January 2020, 10:00 AM	Permanent lockdown
San Nicolas		De .
Alas-as	27 January 2020, 10:00 AM	Permanent lockdown
Pulang-Bato	27 January 2020, 10:00 AM	Permanent lockdown

Table 1. Areas under total and permanent lockdown after the Taal Volcano Eruption as of February 16, 2020.

OCD CALABARZON and PN

The Provincial Government of Batangas has its own managed evacuation centers located at Malainin and TAlaibon Ibaan Batangas which shelter 461 families or 1849 individuals. There are still other operating evacuation centers at Balayan, Calatagan, San Luis, Balete and in Quezon Province.

Municipality/Brgy	No. families	Population	
Agoncillo			
Subic Ilaya	1300	4662	
Bilibinwang	889	3013	
Bayaga	738	3084	
Laurel			
Buso-Buso	643	2736	
Gulod	779	3046	
Bugaan East	425	2178	
Balete			
San Sebastian	417	1525	
Talisay			
San Isidro	340	919	
Sitio Tabla	506	1331	
San Nicolas			

Table 2. List of villages/b	rgy. under permanent	t lock down and	total lockdown.
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Alas As	398	1056
Pulang Bato	175	647
Total	6610	24197

As of February 15, 2020, the Department of Social Welfare and Development (DSWD) made available stockpiles consisting of food packs (FFPs) and non-food items amounting to a total of P17.3 M. Based on initial assessment, there are areas which are receiving inadequate assistance due to logistical constraints such as distance, accessibility, and unorganized distribution system. Below are the brief details of the initial assessment conducted last February 20-21, 2020.

Initial Assessment

An initial assessment was conducted by the researchers in the towns of Agoncillo, San Nicolas, Balete, Laurel and Talisay on February 20-21, 2020. Its purpose is to determine the extent of damage in terms of agriculture, aquaculture and infrastructure. Key informant interviews among selected staff of LGUs consist of Municipal Agriculturist, Municipal Chief Executive, Municipal Planning and Engineering Office and Municipal Social Welfare and Development Office were conducted using semi-structured interviews.

Based on this initial assessment, it was found out that livelihood and properties particularly of those municipalities with barangays in the Volcano Island were heavily damaged by the eruption of Taal. Since most of the residents were into farming, fishing, and livestock raising prior to eruption, affected people are now looking for other livelihood options that they can possibly start with so as not to depend heavily on the relief goods and other assistance and support of donors. From the accounts of selected locals and LGU officials, it was determined that affected people including those who are now back safely to their communities, as well as those who are now housed in the interim housing facility of the Provincial Government would still want to pursue farming. They still want to plant vegetables and other high-value crops. Other town officials would like their residents to also try other livelihood technology since they are not yet sure as to when they can start utilizing farming lands in their area.

Moreover, the said interview and preliminary assessment led the project team members to identify initial livelihood training that can be introduced to the affected communities. These trainings include but are not limited to urban gardening, aquaponics, container gardening, composting, financial management and record-keeping.

Another notable finding of the initial assessment is that the Municipality of Agoncillo sustained heavy damage due to prolonged and heavy ashfall. LGU units are disaggregated into different working locations. Selected residents as well as LGU units particularly the Municipal Social Welfare and Development Office (MSWDO) mentioned the need to for augmentation of relief and assistance on livelihood.

From the initial assessment, it was found out that LGUs are challenged in sustaining the assistance to the displaced population from areas that are in total or permanent lockdown. There

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is also a need to assess the actual damages to agriculture particularly in crops, livestock, and aquaculture. Furthermore, it is also needed to determine the existing capacity and capability of the displaced population in order to develop programs and projects for their recovery and to bring back their productivity. Since, relief assistance and a rapid impact assessment are necessary, hence this project has been proposed.

Objectives

This project aims to:

- 1. describe the strategies used in the recovery assistance project for the Taal Volcano Internally Displaced Population (IDPs)
- 2. discuss the science and technology recovery assistance provided by Batangas State University and partners to Taal Volcano IDPs
- 3. enumerate the sustainability plan of the recovery assistance project



Conceptual Framework

Figure 1. Assistance and Recovery Framework for Internally Displaced Population of Taal Volcanic Eruption

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Figure 1 shows the Assistance and Recovery Framework for Internally Displaced Population of Taal Volcanic Eruption framework used by the Bangon Batangas team. From the bottom, it shows the various groups and organizations that will help in the conduct of the strategies to be implemented. The three objectives—assistance, recovery, and resiliency—aims to reach the goal which is the recovery and sustainability of the Taal Volcano Eruption IDPs.

Strategies of Implementation

Planning meeting/Inception meeting

Careful planning is essential for the success of any project and activity. This is very true for the Bangon Batangas Project as the project team with its members are relatively new to a project funded by the Department of Science and Technology-Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (DOST PCAARRD). To guide the team in implementation, an inception meeting was organized by the Technology Transfer and Promotion Division (TTPD) of DOST PCAARRD. This was attended by various project teams and their corresponding administrative officials, particularly from the finance division.



Onboarding of local government units in planning and implementation

The cooperation and support of the local government units (LGUs) at the municipal and barangay levels are crucial for the success of the project. Courtesy meetings and project presentations were done with the goal of onboarding the LGUs on the project implementation. Series of virtual meetings to present and discuss plans for IDP profiling, livelihood training workshops, and relief distribution were done. The project also constantly communicates with the ground through the designated focal persons of the LGUs to ensure safety.

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Figure 2. The Bangon Batangas Project was introduced and presented to LGUs to solicit support and to onboard them on the goal and activities of the project (*in photo: Meeting with Hon. Joan Lumbres-Amo, the municipal mayor of Laurel Batangas*).



Figure 3. Courtesy meeting with Hon. Wilson V. Maralit, the municipal mayor of Balete Batangas.

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Strong collaboration with ground leaders and focal persons

Strong and consistent communication and coordination with village leaders and ground coordinators were found to be one of the most important strategies in implementing project activities. This is amid the continuous unrest of Taal volcano and the prevalence of COVID 19 pandemic. To ensure safety, timeliness, and effective implementation on the ground, communication links between the project team and ground coordinators including with village leaders were established and maintained. Telecommunications and web-based communication platforms were used. Advanced notice of schedules and activities were communicated to the communities giving them enough time for preparations.



Figure 4. Delegation of a specific focal person for each municipality hasten ground coordination and aide very well during planning and implementation (*in photo: Dr. Shirley Cabrera with the Ms. Charlyn Carolino, the focal person of the project from LGU of Agoncillo Batangas*)

Mobilization Activities

Mobilization is one of the crucial phases of the project implementation as it set the tone for the rest of the activities. The goal is to ensure the full cooperation of all the project team members and collaborating agencies. The action steps taken during the mobilization activities are as follows:

1. Planning and onboarding

Due to the COVID 19 Pandemic series of virtual meetings with CvSU and LSPU to present the approved project proposal and strategize the mobilization and implementation. After the finalization of the implementation plan, the team decided for actual visits to the local government of the five municipalities to have courtesy calls and meeting with municipal mayors. During the

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meeting, the project was presented highlighting the targets and the areas of collaboration and partnership needed between the LGUs and the implementing agencies. Suggestions and recommendations from the local leaders were noted and considered during the actual rollout of the project.

2. Physical and Virtual meetings with partner LGUs

Meetings and discussions with the local government to know the actual ground conditions given the challenges of volcanic unrest and COVID 19 Pandemic were done. Both physical and virtual meetings were employed to plan and discuss the details of implementation. The shared experiences on the ground from those meetings are very important guides for the project team. This is because the LGUs have first-hand information on the issues and gaps in livelihood rehabilitation and recovery. Hence, their insights on what will possibly work and what will not are indispensable.

3. Focal person per municipality was identified

During the full implementation, Taal Volcano is still very dynamic and on alert level 2. In addition to this, the threat of the COVID 19 Pandemic is high throughout the region. To ensure safety and implementation success, cautious planning is necessary. One of the steps employed is the establishment of a direct line of communication between the project team and the Barangay level. This was done by requesting focal persons for the project from the municipal and barangay level. Safety is always the topmost priority throughout the conduct of the Bangon Batangas Project.

4. MOAs with collaborating LGUs

To institutionalize the collaboration and partnerships under the project, a Memorandum of Agreement (MOAs) between Batangas State University (BatStateU) and the LGUs of Balete, Talisay, Laurel, Agoncillo, and San Nicolas was established.

M&E Activities (Include photo documentation)

Similar to project implementation, the monitoring and evaluation activities are challenged by the current volcanic activities and COVID 19 pandemic. Actual field monitoring has become restricted hence virtual platforms and telecommunication mediums were used. In addition to this, beneficiaries of livelihood training created Facebook groups where they gave us updates and progress on their successes and challenges in applying the technologies they learned. The Extension Service Office of the Central Administration of Batangas State University will include on its long-term programs the monitoring and evaluation of the Bangon Batangas project, particularly the impacts of livelihood training and workshops.

Highlights of Accomplishments

1. S&T Based Assistance to the Taal IDPs

There are a total of 2601 internally displaced families that have been beneficiaries of the S&T-based relief assistance of the project. The activity had been very timely for the IDPs since they were also suffering the economic impacts of the COVID 19 Pandemic. According to IDP communities, even a small amount of relief assistance will matter given their situation. The communities were very grateful to the DOST and BatStateU for the assistance they received through the project.



Figure 5. Relief assistance to the IDPs of Taal Volcano eruption under the DOST PCAARRD funded project Bangon Batangas: S&T based assistance to Taal internally displaced population

A total of 11 barangays are classified as permanent danger zones within the five (5) hardesthit municipalities of the eruption. The total number of beneficiaries is 99 shorter than the original target. Such adjustment was due to the price increase of some of the relief components. Such adjustment was communicated to the target communities.

Table 3. Number of IDP family beneficiaries to be beneficiaries of the S&T-based relief operation.

Agoncillo Subic Ilaya No. of beneficiaries 511

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Bilibinwang	350
Bayaga	291
	1152
Laurel	
Buso-Buso	253
Gulod	306
Bugaan East	167
C .	727
Balete	
Calawit	164
	164
Talisav	
San Isidro	134
Sitio Tabla	199
	333
San Nicolas	
Alas As	157
Pulang Bato	69
C	225
Total	2601



Figure 6. Distribution of relief assistance to the Taal IDPs of Brgy. Banyaga, Agoncillo, Batangas.



Figure 7. Distribution of relief assistance to the Taal IDPs of Brgy. Bilibinwang, Agoncillo, Batangas.



Figure 8. Distribution of relief assistance to the Taal IDPs of Brgy. Subic Ilaya, Agoncillo, Batangas.

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Figure 9. Distribution of relief assistance to the Taal IDPs of Brgy. San Sebastian, Balete Batangas.



Figure 10. Distribution of relief assistance to the Taal IDPs of Brgy. Bugaan East, Laurel Batangas.

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Figure 11. Distribution of relief assistance to the Taal IDPs of Brgy. Buso-buso, Laurel Batangas.



Figure 12. Distribution of relief assistance to the Taal IDPs of Brgy. Gulod, Laurel Batangas.

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Figure 13. Distribution of relief assistance to the Taal IDPs of Brgy. Alas-as, San Nicolas Batangas now residing at the relocation sites at Brgy. Talaibon, Ibaan Batangas.



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Figure 14. Distribution of relief assistance to the Taal IDPs of Brgy. Pulang Bato, San Nicolas Batangas now residing at the relocation sites at Brgy. Talaibon, Ibaan Batangas.



Figure 15. Distribution of relief assistance to the Taal IDPs of Brgy. San Isidro, Talisay Batangas.



Figure 16. Distribution of relief assistance to the Taal IDPs of Sitio Tabla, Poblacion 6, Talisay Batangas.

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2. Livelihood trainings for IDPs

From the rapid profiling and focus group discussions conducted, several livelihood trainings were identified and conducted to assist selected IDPs in their livelihood recovery. Among the topics that are covered are crop production, formulation and production of liquid fertilizer, and smoke fish processing and production. A total of 209 participants participated in the training.

Beneficiaries of training workshops



Figure 17. Actual training on smoke fish production for the IDPs of Laurel Batangas

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Figure 18. The participants posed for photo opportunities during the closing program of the training on smoked fish processing and production in Agoncillo Batangas.



Figure 19. Participants of smoke-fish production Laurel Batangas.

3. Profile report of the internally displaced population

To aid the crafting of the recovery plan for agriculture and fishery, rapid profiling was done through a combination of survey questionnaires and focus group discussions (FGDs). The objective is to assess the agricultural and fishery livelihood conditions before and after the eruption. In addition, the study also aimed to determine their existing resources and skills which can be utilized for rebuilding their livelihood.



Figure 20. The team conducted focus group discussion (FGD) to IDPs of San Nicolas to assess the situations and determine livelihood opportunities from the existing skills and interests.



Figure 21. Focus group discussion with IDPs previously engaging in farming during the site assessment and profiling in Laurel Batangas.



Figure 22. Focus group discussion with the village leaders of Gulod, Laurel Batangas.

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Figure 23. Focus group discussion with the fisherfolks of Brgy. Gulod, Laurel Batangas helps to determine the needed upskilling for livelihood.

4. Video documentation of the project

An audio-video presentation (AVP) was prepared as one of the primary documentation of the project. This was done by consolidating the collected pictures, video clips, and recordings from the first day to the last part of the project implementation. The AVP was submitted in the CD and also via cloud link.

5. Documentation report and lessons learned

The project was implemented in one of the most high-risk areas in the region due to the combined hazard of the active Taal volcano and COVID 19 pandemic. Local government units are also occupied by tasks of addressing health and economic challenges brought about by the two factors.



Figure 24. The project provided a certificate of appreciation to the enumerators of the IDP profiling.

In summary, there are various areas of learning during the conduct of the project. First is the importance of close coordination with partners on the ground to ensure the safety of the team, participants and beneficiaries. Second is the value of speaking and listening with local government, especially on their challenges and experiences in implementing similar projects. Lastly, the livelihood interventions must focus on rebuilding and innovating the existing resources and skills of the IDPs.

6. Damage assessment report

Damage reports on agriculture, fishery, and aquaculture were gathered and consolidated from the five (5) LGUs. The data were summarized and analyzed to draw information on what areas are to

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be prioritized in the profiling and livelihood training. This information was also paired and validated with the results of the focus group discussions (FGDs) conducted with the barangay leaders and people organizations (POs).



Figure 25. Deposits of heavy ash-fall from the 2020 eruption are still pilled up in the area causing dust pollution and soil acidity.



Figure 26. Tidal inundation along the coastal road of Subic Ilaya, Agoncillo Batangas which is suspected to be related to Taal eruption.

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Figure 27. The heavy ash deposit still affects the agricultural productivity of the area one year after the eruption.



Figure 28. The formation of sinkholes months after the eruptions further displaced additional residents and affected the livelihood of residents of San Nicolas Batangas



Figure 29. Damages of the January 2020 eruption are still evident along with continuous risks of sinkhole formations

7. Institutional collaborations among SUCs

Multifaceted problems are being faced with the IDPs with the continuous activity of the Taal Volcano and impacts of COVID 19 pandemic. With this situation, technical expertise from different institutions is appropriate in dealing with the challenges. One of the strengths of this project is the collaboration between SUCs in the region. The BatStateU being the lead implementing agency take the overall responsibility of managing and implementing the project. Cavite State University (CvSU) as one of the premier agricultural universities in the region was tasked with providing technical expertise on determining and providing immediate training on agricultural livelihood. Furthermore, they are in charge of analyzing the data related to agriculture generated from the profiling study. On the other hand, the Laguna State Polytechnic University (LSPU) being one of the competent universities in the field of fishery and aquaculture is tasked with determining and providing training on fishery and aquaculture livelihood. In addition to this, they will analyze the data related to fishery and aquaculture.

8. Collaboration and partnerships with LGUs

One of the determining factors for the attainment of the project goals and overall success of the project is the strong support of the local government units. Each of the five (5) LGUs signify their commitment and support to the Bangon Batangas Project through a memorandum of agreement (MOAs). Within each MOA are the duties and responsibilities of the implementing agencies and the partner LGUs. More importantly, counterpart resources like facilities, technical assistance,

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clearances, and focal persons are agreed upon and indicated. These formal agreements also open a wider avenue for collaboration and partnerships between BatStateU and LGUs even after the duration of the project.



Figure 30. Courtesy meeting with the municipal mayor of San Nicolas Batangas to present the project and establish partnership.



Figure 31. The project was presented and promoted to partner LGUs during the courtesy meeting.

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Figure 32. Presentation of MOA for the donation and utilization of smokehouse to the stakeholder in Laurel Batangas.

9. Livelihood recovery plan

One of the important outputs of the project is to propose a livelihood recovery plan and recommendation based on the FGDs with key individuals, profiling of IDPs, and benchmarking on best practices to rehabilitate livelihood in areas devastated by a volcanic eruption in the country. It is hoped that recommendations and some of the plans can be utilized even at the local level to aid livelihood recovery.

Detailed Technology Interventions

• S&T Relief Assistance to Taal IDPs

The goal of this activity is to extend relief assistance to the IDPs of Taal Volcano from the Municipalities of San Nicolas, Agoncillo, Balete, Talisay, and Laurel which caters to more than 2,500 families. For this purpose, the composition of the relief packs is determined to include components for nutritional support and hygienic maintenance. Three of the components are food products developed under DOST-funded projects. The following are brief descriptions of the products:



Figure 33. Relief distribution to the IDPs of San Nicolas Batangas now residing at the relocation camp in Talaibon, Ibaan Batangas.

a. Instant Arozcado

Central Luzon State University supplied the instant lugaw which was developed through DOST funding. This food pack is composed of organically produced native rice, native chicken, and carefully-selected condiments. The instant lugaw has a longer shelf life as compared to ordinary lugaw and can be distributed easily since it is in a packaging material that can protect the contents and ensure the quality of the product.

b. Rice-Mongo Crunchies

Rice-Mongo Crunchies is a combination of 70 parts rice flour and 30 parts mongo flour. This means, for example, that for every 7 cups of rice flour, 3 cups of mongo flour is added. Water is added to make a thick dough. The dough is steamed, flattened into thin sheets, cut into the desired size, sun-dried then deep-fried. Contains 495 Kcal and 11 grams of protein per 100 grams. (https://fnri.dost.gov.ph/index.php/16-food-technologies#deep-fried-snacks)

c. Rice-Mongo-Sesame Powder

It is a blend of 3/4 cup roasted rice flour and two tablespoons each of roasted mongo flour and roasted sesame flour.

Contains 430 Kcal and 13 grams of protein per 100 grams. https://fnri.dost.gov.ph/index.php/16-food-technologies#deep-fried-snacks.

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Rice Mongo crunchies and complementary food blend such as the Rice Mongo Sesame powder are being produced by Samahan ng mga Inang Gabay at Lakas ng Aktibong Komunidad (SIGLA) in Brgy. Real, Calatagan thru the help of The Department of Science and Technology and NGO E Zobel foundation. The E. Zobel Foundation, Inc. is a non-stock, non-profit organization registered with the Securities and Exchange Commission in April 1990. Its founder, the late Don Enrique Zobel, firmly believed that "through education, there is hope for a better life".

The following table shows the composition of the relief goods.

Table 20. List of relief components of S&T based assistance to Taal IDPs.

ITEM	QUANTITY
INSTANT MILK POWDER	4 PACKS
SIGLA COMPLEMENTARY FOOD PACKS	5 PACKS
MILO CHOCOLATE POWDER	5 PACKS
SHIELD SOAP BAR	5 BARS
TOOTHBRUSH	5 PIECES
HAPPEE TOOTHPASTE	5 PIECES
SHAMPOO	5 PIECES
CANNED CORNED BEEF	2 CANS
CANNED MEAT LOAF	2 CANS
RICE	2.7 APPROX
INSTANT ARROZCALDO	2 BAGS
ALCOHOL BOTTLE	1
SIGLA CRUNCHIES	12



Figure 34. Relief components of the S&T based assistance to IDPs of Taal volcano eruption.

The implementation of this activity, unfortunately, falls in the middle of the COVID 19 pandemic. To avoid the spreading of infections, relief distribution was strategized to abide by the minimum health protocols. A total of 10 to 15 beneficiaries per batch were called at a time to practice social distancing and avoid overcrowding the area. In other villages, relief goods were delivered to the doorstep. A simple program was done for each barangay which is as follows: 1. Introduction and purpose of the activity 2. Discussion of the Rationale of the Project 3. Explanation of each content of the relief pack 4. Message from the Barangay Captain/Focal Person

• Trainings on Livelihood

Training/Technology clinics/business matching conducted

Bangon Batangas: S&T-based assistance to Taal Volcano's Internally Displaced Population is a series of workshop activities aimed to help the residents of Batangas, primarily at the Barangays of Talisay, Balete, San Nicolas, Laurel, Agoncillo, and Ibaan, learn livelihood skills and earn extra income. The initial part of the series was needs assessment activities. The initial assessment conducted determined the extent of damages in terms of agriculture, aquaculture, and infrastructure. It also aimed to identify initial livelihood pieces of training that can be introduced to the affected communities. Based on this profiling and focus group discussions (FGDs), there are feasible livelihood opportunities including vegetable production and smoked fish or Tinapa

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production. The participants of this training are IDPs that were chosen by the Barangay Local Government and composed mostly of members of 4P's, fisherfolks, and farmers.

i. Training on smoke fish production

The majority of the IDPs are engaged in fishery and aquaculture. Most of their harvest is sold unprocessed in the market or in local fish ports. Based on the focus group discussions (FGDs) conducted in the community participated with a number of women, fish processing is one of the good opportunities that add value to their product.

The College of Fishery of the LSUP Los Baños Campus conducted a training workshop on smoke fish production to give additional value to the produce of the fishermen. This will entail additional income and additional livelihood for housewives. A total of 73 participants were trained on smoke fish production, 70 for crops production, and 69 for smokehouse fabrication from the municipalities of Balete, Agoncillo, and Laurel.



Figure 35. Smoked bangus and smoked tilapia are among the products produced during the training on fish processing to the IDPs of Taal eruption.

Based on the initial monitoring, the communities started trial production in San Sebastian, Balete, and Agoncillo Batangas. It shows that they successfully acquire the skills and techniques of smoke fish production. The Extension Services Office of BatStateU will conduct the monitoring and evaluation of the livelihood training in the years to come. Furthermore, follow-up activities and projects under the skills and livelihood program will be given to the trained IDPs by the office.

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ii. Smoke-house fabrication and donations

After the initial production phase of smoke fish, the trained IDPs expressed the challenge of insufficiency of smoke-house to increase their production. Hence, the project team explored ways to allocate some of the remaining budget and resources on the procurement and fabrications of smoke-house units for donations. After the determination of the budget source, the design was finalized and provided by the LSPU College of Fishery. A local fabricator was commissioned to produce the units. A total of 13 fabricated smokehouse units were constructed and distributed to the communities to aid the starting up production of the trained IDPs.



Figure 36. Smokehouse delivery and turnover in Brgy. Buso-buso, Laurel Batangas.

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Figure 37. The smokehouse was received by the village council of Brgy. Gulod, Laurel Batangas.



Figure 38. The fabricated and distributed smokehouse was immediately used by the groups of women from Agoncillo Batangas.

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Figure 39. Participants of the training on smoked fish production in Agoncillo Batangas post for a group photo after the successful face-to-face training amid the pandemic.

The project team distributed for each barangay one (1) unit of the fabricated smokehouse and one (1) flash drive containing PowerPoint presentations and a menu for smoke fish production. The presentations are about the design and procedure on the construction of smokehouses, proper use of smokehouses, and the recipe of smoke fish. The project team initiated a program for donation and the MOA signing for each barangays.

Similarly, this project will be transferred under the Extension Services Office of the BatStateU for monitoring, evaluation, and supplementary activities to promote sustainability and effectiveness.

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iii. Training on high-value crops production and organic fertilizer production

Crops production was severely affected by the eruption due to ash deposits on the farmland of the IDPs. This is evident both on the site assessment and from the result of FGDs and IDP profiling. Hence, the project included on the lists of livelihood training workshops the complementary topics on soil amelioration and crop production. Aside from the training, seeds, fertilizers, molasses and other starting materials for formulation of organic fertilizers were provided to the farmers. These pieces of training rendered by the BatStateU were evaluated very well by the participants and found to be useful to augment the daily needs in terms of food and possible viable source of income.



Figure 40. The farmers belonging to IDPs post photos after receiving the kit containing seeds, organic fertilizer, and IECs.

The training workshops conducted proved very effective as the trainees/participants constantly posted their progress in the official Facebook group dedicated to monitoring. Ms. Marivic Tabelisma, a farmer from Laurel, showed the yield of her planting two months later after the training. She noted that one of her most important learnings during the training was soil preparation. She said, "I learned that an important aspect of planting was soil cultivation and proper application of fertilizer which made my crops grow faster".

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"Snippet of conversation" "Of

"Official Facebook group" "M

"Ms. Tabelisma's first yield"

Figure 41. The first harvest from established backyard farms of IDPs after the livelihood training on crop production and soil amelioration. Monitoring was done through messenger chat.

Ms. Ara Agojo, one of the focal persons of Laurel, said it was a great experience to be part of Bangon Batangas and that she was really happy to see the farmers of Laurel be able to plant with the same vigor they once had before the eruption. According to her, it had to take a while before they were able to plant again because of acidic soil which made growing crops difficult. She also noted that because of the project, fisherfolks can now produce smoked fish or tinapa instead of just selling tilapia or Bangus (milkfish).

The Extension Services Office of BatStateU is continuously monitoring the progress and impact of this livelihood training. Follow up activities and training workshops are also tabled to support this start-up livelihood.

Promotional Activities

The team conducted consultative meetings with LGUs at the municipal and barangay level to introduce and promote the project. These meetings were done physically and virtually. The project was also promoted during project activities, particularly during livelihood training and distribution of relief assistance. There are also press releases by BatStateU and DOST for the promotion of the project. During the promotional activities, the fishermen and farmers belonging to Taal IDPs are very grateful for the Bangon Batangas Project. This appreciation is evident even at the start of the implementation with their warm welcome and accommodation to the project team.



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A sense of excitement and enthusiasm is always present in every rollout of activity, from profiling and focus group discussions (FGDs) to relief distribution and livelihood training workshops. All of the IDP beneficiaries were grateful to DOST PCAARD and to the implementing SUCs for all the assistance they received under the project.

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The main challenges encountered during the promotional activities and in the entire duration are the risks brought about by the continuous volcanic activity of Taal and the risk of infection by the COVID 19 pandemic. The scheduling and mobilization of each activity were affected by several lockdowns imposed due to this threat. Other minor challenges are slowing down of administrative processes like endorsement and approval of the request, procurement of supplies, and conduct of bidding for large procurement.



THE BATANGAS State University led a science-based initiative to help families living near Taal volcano be productive again. The school launched its Bangon Batangas project that will be funded by the Department of Science and Technology's Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development.

On the ground, minor issues are also encountered on managing the crown, particularly during the relief operations where there are few instances of small congregations which can heighten the risk of Covid 19 transmission. To address these challenges, a six (6) – months extension period was requested to DOST PCAARRD to finish all activities that were delayed due to the pandemic, volcanic activity, and slowing down of procurement processes.

Summary and Conclusions

- 1. Multiplicity of strategies were used to ensure sustainability in the recovery assistance to internally displaced populations of the Taal Volcano eruption in Batangas Province. Combinations of rapid assessment, relief assistance, community mobilization, collaboration and partnership with different agencies, capacity building, and utilization of ICT technologies were found beneficial for community resiliency. Strategies used were need-based, context-based, and sustainable.
- 2. The science and technology interventions provided to IDPs were based on their immediate needs as found during the rapid assessment. Disaster relief foods were distributed to 2601 families from 5 IDP municipalities in the Province of Batangas. There were 3 livelihood trainings conducted such as smoked fish production, smoked-house fabrication, and high value crop production and organic fertilizer production. Thirteen (13) smoke houses were fabricated and distributed to barangays starting their smoked fish production.

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3. Relief operation is only one step in a long path to helping people hit by disasters. Thus, the Bangon Batangas project created a sustainability plan for the livelihood of the IDPs of the Taal Volcano Eruption. It is hoped that this will be utilized even at the local level to aid livelihood recovery.

Lessons Learned

One of the important learnings on this project is the value of open-mindedness and the importance of listening to the community during planning and implementation. Their local knowledge and experiences are crucial for planning and implementation of any activities on the ground. Furthermore, trust and confidence become stronger when the community is involved throughout the process. In the case of the Bangon Batangas Project, this strong partnership with the local community had ensured safe and successful implementation.



Figure 42. Listening with the stories of IDPs serves as validation strategies of the results of FGDs and profiling.

In terms of introducing alternative livelihoods to help the recovery of the IDPs, building from the existing skills and local resources is important. This will facilitate the gradual transition from former to alternative/new livelihood. Social acceptability and sustainability are highly possible with this strategy. Familiarity with the government procurement policies and processes is crucial for efficient and smooth acquisition of equipment, supplies, and materials. The pandemic has slowed down the procurement processes, hence unfamiliarity with the government procurement process may add up to these challenges.

The challenges and issues brought about by various factors during the implementation have sometimes been discouraging for the project team and weakened our enthusiasm. However, the

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resiliency and determination of the Tall Volcano IDPs to continue moving forward despite all the odds were so contagious and it gave the team the motivation and inspiration to move and finish the project. The experience of working with Taal's internally displaced population was indeed rewarding. Testimonies of the IDPs gave a glimpse of the hardships they encounter daily but also show the resiliency they have to strive for a better future. The impact of Taal's eruption shows the uncertainty of life situation for the IDPs and preparation and perseverance are the keys to enduring and surviving. The Bangon Batangas project continues to prove that the less fortunate need support to help them recover and progress into the future. With the proper guidance and training, the facilitators are sure that the trainees would be able to rise from their current situation.



Figure 43. The knowledge and experiences of the local government at the village level serves as guide in targeting livelihood opportunities that are suitable in the area and applicable in the skill sets of IDPs.



Figure 44. During actual ground coordination with the focal person has been very important to ensure effective implementation of activities of the project.



Figure 45. Sharing of IDPs on their pain-points and aspirations during the FGDs under Bangon Batangas Project has been very valuable for the determination of immediate and long-term livelihood intervention.

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Implications and Recommendations

The Taal Volcano eruption has displaced the adjacent communities. This has greatly affected their livelihood and ways of living. Agricultural and fishery based livelihood are the two most heavily damaged industries. This has increased the poverty and unemployment to the IDPs as most of their livelihood is based on these two sectors. Both site assessment and profiling documented persisting damages in agricultural and fishery livelihood of the IDPs. Furthermore, the COVID-19 pandemic has added more livelihood challenges due to health risks, negative economic impacts, and social restrictions. The profiling of more than 2300 IPDs reveals that the majority of IDPs engage in fishery, aquaculture, livestock, and crop production. Livelihood assistance is still inadequate according to IDPs. Awareness on fishery policies and on available opportunities and assistance from the government is low. However, despite all challenges they encountered, IPDs remained open to learning new livelihood skills.

This information was an important basis during the conduct of activities of the project. Five training sessions on crop production, soil amelioration, and fish processing were conducted as a viable alternative livelihood for the IDP communities. Thirteen units of smokehouse were also donated to organizations to support their start-up livelihood on smoke fish processing. Moreover, more than 2500 IDP families were assisted through relief assistance using products developed under DOST funded research projects. Based on the monitoring, the IDPs are grateful for the project. They started the smoked fish and vegetable production. The Extension Services Office (ESO) of BatStateU will implement the monitoring and evaluation together with supplemental extension projects to ensure sustainability.

Based on the profiling, benchmarking and FGDs conducted, the rehabilitation and recovery programs must focus on building-up of existing skills and locally available resources This will ensure immediate social acceptance and sustainability. Furthermore, the imperative approaches must be towards building back more resilient livelihood, and capacitating of IDPs to new skills.



Figure 46. Sari-sari stores are one of the most common fall-back livelihood of Taal IDPs with the huge impact of the eruption to the aquaculture and fishery.

As part of the rehabilitation and recovery plan for the agriculture and fishery sectors of the five (5) municipalities, they should consider capacitating the farmers and fishermen on other agricultural activities. In the survey conducted among internally displaced populations, the top ten of training they would like to learn are as follows: (1) corn production, (2) vegetable and fruit processing, (3) vegetable production (high-value crops), (4) fruit production (banana, mango, pineapple), (5) poultry production and management (quail, broiler, layer, and turkey), (6) meat processing, (7) sweet potato and other root crop production, (8) small and large ruminant production (cattle, goats, others), (9) swine production and management, and (10) organic chicken production and management.

Conducting technology transfer projects in the midst of disaster risk and global pandemic are very challenging both for the beneficiaries and implementer. Careful planning and strong coordination with local partners and stakeholders are the most important factors that contribute to the success of every activity. Participation and involvement of stakeholders during the planning and targeting are also crucial to ensure full cooperation and sustainability of the project.

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Figure 47. Even short-term assistance in the form of relief goods appears to be bighelp to the IDP families in the midst of disaster and pandemic.



Figure 48. Housing is still a huge challenge for the IDPs, particularly for Talisay as most of the families are still residing in temporary shelters and makeshift tents two years after the major eruption.

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Figure 49. Two years after the eruption, most of the IDPs of Talisay Batangas still reside in temporary shelters provided by LGUs.



Figure 50. S&T relief operation in the temporary shelters of IDPs from Talisay Batangas.

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Figure 51. The Bangon Batangas project team took a quick snap after the relief operation in Laurel Batangas.



Figure 52. The project team is always joyful from the day of service to the IDP community.

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Acknowledgement

The project team would like to give our gratitude to the following people and organizations for helping in the development and execution of the Bangon Batangas project.

Batangas State University

DOST-PCAARRD

Municipality of San Nicolas

Municipality of Agoncillo

Municipality of Balete

Municipality of Talisay

Municipality of Laurel

Provincial Government of Batangas

LSPU College of Fisheries

The team would also like to thank their families and friends for the everlasting support. And above all to the one Almighty for keeping us safe during this time of uncertainty.