



Build Back Better: Field Work with the Farming Sector in Gaza.

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List of Acronyms

BBB	Build Back Better
DKH	Diakonie Katastrophenhilfe
DRR	Disaster Risk Reduction
M&E	Monitoring and evaluation
PARC	Agricultural Development Association
QoL	Quality of Life (tool)
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNRWA	United Nations Relief and Works Agency for Palestine Refugees

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1.0 Introduction

Building Back Better (BBB) is a process not a trait¹. That suggests that it can be firstly taught and learned, and secondly nurtured and developed. That is important because BBB has been identified by the Sendai Framework for Disaster Risk Reduction² published in March 2015 as a key priority for action in the next 15 years.

It became popular as a catch-phrase particularly following the 2004 Indian Ocean Tsunami and more so with the 2010 Earthquake in Haiti. At its core it recognises that rebuilding alone simply reproduces the same vulnerabilities that perhaps triggered the disaster in the first place; and that instead any response should aim to BBB. Thus, BBB is increasingly defined as a way to use the reconstruction process following a disaster to improve a community's physical, social, environmental and economic conditions to create a more resilient³ community in an effective and efficient way. BBB differs from traditional approaches to reconstruction and recovery in that it takes an all-inclusive holistic approach, where all aspects related to community recovery are attended to simultaneously to determine a successful recovery programme that enhances the overall process.

However, it has seemingly been connected to natural disasters rather than conflict as has happened in Gaza.

Gaza was subject to ongoing military assault for seven weeks in July 2014 by land, sea and air. At least 2,145 people were killed and over 60,000 homes were damaged or destroyed⁴. The conflict created a scarcity of water, energy, food and shelter, whilst the agriculture industry in particular suffered heavily. Rapid assessments conducted in 29 locations showed extensive damages to crop production, poultry farmers, livestock farms and fisheries amounting to nearly 23 million USD⁵.

As a result of the urgent need to support and rehabilitate the impacted agricultural sector, PARC in partnership with DKH launched a project to improve food security and enhance resilience in Gaza through optimized rehabilitation of agricultural infrastructure⁶. This was against a 2012 UN reported that Gaza would be most likely not be '...liveable by 2020'⁷ and another perhaps more frightening one 3 years later

¹ Sandeeka Mannakkara, Suzanne Wilkinson, (2014) "Re-conceptualising "Building Back Better" to Improve Post-Disaster Recovery", International Journal of Managing Projects in Business, Vol. 7 Iss: 3. Pre-print version

² UNISDR, *Sendai Framework for Disaster Risk Reduction 2015-2030*, UNISDR, 2015, www.wcdrr.org/uploads/Sendai_Framework_for_Disaster_Risk_Reduction_2015-2030.pdf

³ UNISDR defines resilience as "the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including the preservation and restoration of its essential basic structures and functions".

⁴ State of Palestine 2014. The National Early Recovery and Reconstruction Plan for Gaza. Gaza: Higher Inter-Ministerial Committee for Gaza Recovery and Reconstruction and Inter-Governmental Technical Committee.

⁵ PARC & DKH 2015. Improving Food Security and Enhancing Resilience in Gaza through Optimized Rehabilitation of Agricultural Infrastructure after the 2014 Conflict. Gaza: The Agricultural Development Association and Diakonie Katastrophenhilfe.

⁶ PARC & DKH 2015. Improving Food Security and Enhancing Resilience in Gaza through Optimized Rehabilitation of Agricultural Infrastructure after the 2014 Conflict. Gaza: The Agricultural Development Association and Diakonie Katastrophenhilfe.

⁷ Gaza in 2020 A liveable place? A report by the United Nations Country Team in the occupied Palestinian territory August 2012. Accessed from <http://www.unrwa.org/newsroom/press-releases/gaza-2020-liveable-place> January 2016

that Gaza would be ‘...uninhabitable by 2020’⁸ Could BBB be also applied to such a context?

A BBB component to this program by PARC and DKH was initiated. The objectives of the BBB component were as follows:

- Strengthen the resilience of 310 households and their agribusinesses and fisheries against future shocks via the use of a BBB approach in the rehabilitation process
- Restore the means for minimum subsistence and improve food security for 310 households
- Rehabilitate 310 agribusinesses and fisheries to be able to contribute to food security in the region by increasing production and supply of food products to the markets in Gaza
- Introduce the BBB approach to the agricultural sector in Gaza, with best practices shared with relevant actors and allow for possibilities of replication and improvement

A Roadmap to assist agricultural businesses in the Gaza Strip to BBB was developed. It aimed to clarify what BBB was, how it can be applied to the agriculture sector and how to successfully incorporate it into the agribusiness recovery process. The Roadmap was developed by compiling international research conducted by disaster management and BBB experts from the University of Auckland and Victoria University in New Zealand. This report covers the field work component of that Roadmap that sought to custom fit a generic framework to a specific field context.

2.0 The BBB Framework

International research conducted on understanding and defining BBB shows that BBB requires consideration be given to three elements:

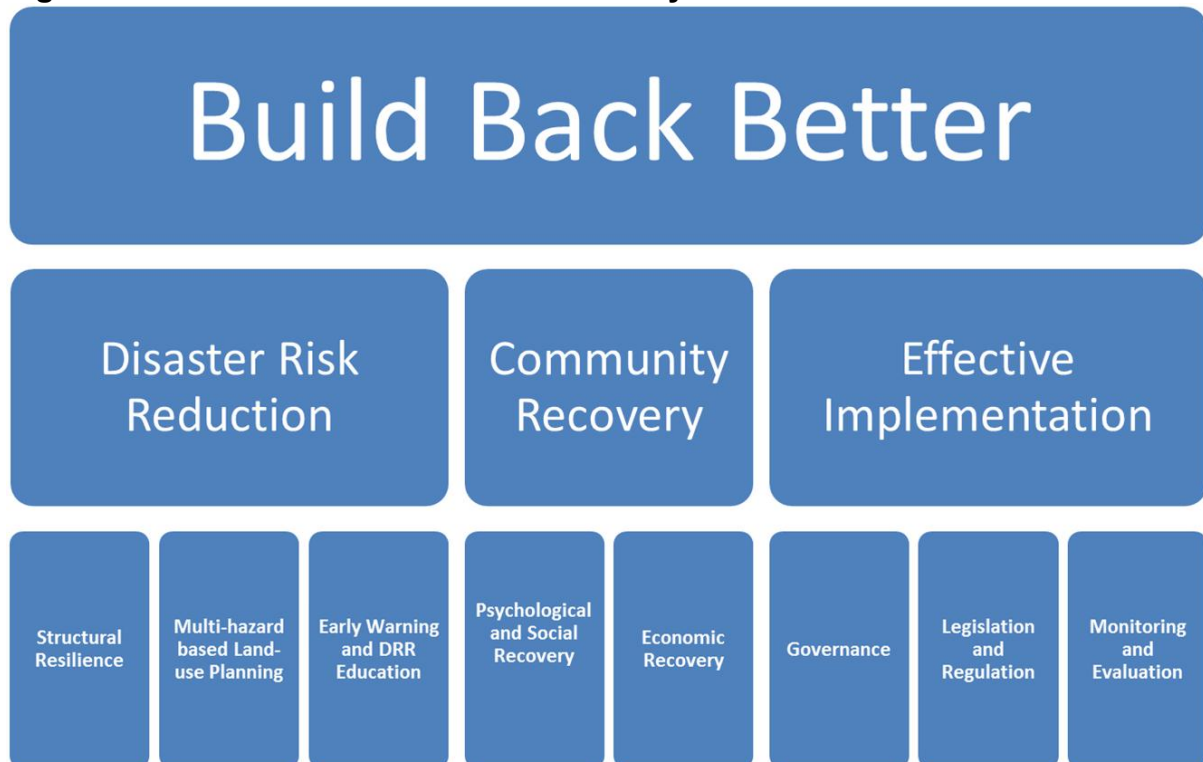
1. DRR - namely reducing the risks from prevalent hazards
2. Community Recovery - Supporting the psycho-social recovery of affected people and regenerating the economy
3. Effective Implementation - Implementing reconstruction and recovery in an effective and efficient way

This is represented using the (modified) “BBB Framework”⁹ below and shows it’s required elements and also its sub-elements. This was used for this study and these three represent the ‘levers’ that can be used to activate a BBB approach.

⁸ Report on UNCTAD assistance to the Palestinian people: Developments in the economy of the Occupied Palestinian Territory. Report TD/B/62/3 dated 6 July 2015 Accessed from http://unctad.org/meetings/en/SessionalDocuments/tdb62d3_en.pdf January 2016.

⁹ Source: Mannakkara, S. A Framework for Building Back Better During Post-Disaster Reconstruction and Recovery. Doctor of Philosophy in Civil Engineering (Disaster Management), University of Auckland, 2014, <http://hdl.handle.net/2292/22357>.

Figure 1: The BBB Model used for this Study.



Lever 1: Disaster Risk Reduction (DRR)

DRR refers to improving disaster resilience in a community by minimising/eliminating disaster risks. Disaster risks include physical and non-physical risks. Physical risks refer to risks posed to the built environment¹⁰. Non-physical risks refer to risks incurred at the community and/or organizational level, such as the impacts of disasters on service delivery.

Increasing resilience to reduce risks during post-disaster reconstruction in the agricultural sector can be achieved in two ways. (1) Improving the physical resilience of physical assets by using revised design and construction methods and technologies to resist and withstand current and anticipated disaster risks. (2) Controlling land-use based on hazard risks to ensure people are not faced with unreasonable levels of risk. Both these methods for BBB require accurate multi-hazard risk assessments to be conducted first to determine optimal solutions that consider safety, practicality, affordability and impact on local people.

Increasing community and organizational resilience can be achieved through raising risk reduction awareness and by implementing disaster preparedness mechanisms. Education and training on disasters and risk reduction enables communities to understand the importance of risk reduction measures as well as learn how to incorporate disaster capacity into their lives. Disaster preparedness plans allow people and businesses to be better prepared to respond to and recover from all ranges of possible disaster scenarios. Disaster preparedness mechanisms include the establishment of early warning systems, disaster management plans, and risk-averse future development plans.

¹⁰ Built environment includes infrastructure (transport, water and sanitation, energy, community infrastructure) and buildings (residential, education, health, commercial).

Lever 2: Community Recovery

A core part of BBB is ensuring that post-disaster recovery occurs in the best interests of local communities. The theory behind BBB supports the inclusion of the people aspect into every stage of reconstruction planning and implementation. This means the psychological, social and economic impacts of every reconstruction and recovery decision made needs careful consideration in order to ensure that people's needs are put first. As presented in the BBB Framework, community recovery in terms of BBB includes two factors.

Firstly, the psychological and social recovery of people needs to be considered a priority. Support mechanisms for psychological and social recovery such as advisory services to assist with decision-making and guidance with the recovery process, counselling and methods of empowerment to help people recover from disaster-related psychological trauma and re-establish a sense of normality must be incorporated into reconstruction programmes.

Secondly, business recovery through supporting livelihood recovery and regenerating of local economies need to take place to revive affected communities. Being able to return to their livelihoods and seeing their community's economy performing well is integral to encourage disaster-affected community members to remain in their communities and rebuild their lives. Therefore supporting the livelihoods of people and overall economy through various mechanisms is essential to building back better.

Lever 3: Effective Implementation

BBB also implies that the reconstruction and recovery process needs to be carried out smoothly and successfully. Currently due to the lack of pre-planning, knowledge and resources reconstruction efforts are often ad-hoc and inefficient. BBB suggests ways of improving the effectiveness and efficiency in the reconstruction and recovery process, to obtain recovery solutions that are high in quality and well-timed. The BBB Framework shows that effective implementation of post-disaster recovery activities can be improved in three ways.

Understanding the Institutional Mechanism plays an important part in enabling communities to build back better. Reconstruction and recovery is multi-faceted and often large scale, involving stakeholders from many different backgrounds such as national and local government authorities, local and international NGOs, the private sector, civil service sector as well as local community members. The chaos, duplication and confusion that can occur with having such a large number of stakeholders involved, implementing different agendas for reconstruction and recovery need to be eliminated. Adopting an institutional mechanism or enhancing the current one to allow the production of a unified recovery vision and programme, effective management of stakeholders with clear roles and responsibilities, an appropriate amount of centralization/decentralization to suit the local community and effective funding mechanisms are necessary.

Legislation and regulation is necessary to implement reconstruction and recovery in-line with BBB principles. Legislation and regulation and policies can be used to create the mandates of institutional mechanisms put in place for reconstruction and recovery,

enforce compliance with risk reduction and community recovery, and facilitate bureaucratic procedures to speed up the recovery process and enhance efficiency.

M&E of the recovery process by putting in appropriate mechanisms through all stages of short and long-term recovery serve as a way of ensuring that BBB concepts are complied with. Regular and thorough M&E also brings to attention any issues with recovery activities so that they can be promptly dealt with. The process of M&E also provides a good database with valuable knowledge and lessons that can be retained to assist with and improve future recovery efforts.

Adding to the three key elements required to build back better detailed above, it is important to understand that these three elements are often intertwined and influenced by each other. They are not independent. BBB requires looking at recovery in a comprehensive way, therefore the interrelationships between DRR, Community Recovery and Effective Implementation require as much consideration as the individual elements. Although BBB literally refers to the reconstruction process following a disaster, it is a good opportunity to initiate pre-disaster planning activities such as adopting early-warning systems and changing future development plans to incorporate DRR and climate change.

But how would this essentially generic framework is applied to the field context?

3.0 Fieldwork

Consequently, a field trip to conduct investigations and interviews with beneficiaries in order to assess and adapt the BBB solutions was established. The existing knowledge, solutions and practices among farmers and PARC staff served as a foundation to contextualize the BBB approach and select appropriate solutions.

The objectives (and questions for the focus group discussions) were identified as follows:

- 1) Identification of the methods and technologies that the agricultural sector has used to for physical asset resilience: Question: what methods, materials and techniques are you using to move on with your life and business?
- 2) Land use examples and their evidence basis. Question: How did/do you select the land you now use?
- 3) Identification of effective educational programmes and training that had been used for preparedness and risk reduction. Question: What informal or formal training have you been given that assisted you to face risks and hazards?
- 4) Identification community recovery within communities. Question: How did the conflict impact on you and how did you recover?
- 5) What is the evidence for business recovery. Question: How do you know that business has recovered?¹¹
- 6) Identification of examples of effective implementation from an institutional, regulatory perspective together with M&E. Question: What effective examples (at any level) are you aware of?

¹¹ The use of a QoL tool was also implemented and this report covers the initial feedback from it.

The agenda for the meetings with the Gaza team and each farming group was planned as follows with beneficiary meetings being based on having 10% of the total number of them attending the focus groups.

Day 1 Monday 28 Dec 2015: 9am-2.30 pm Meeting with the PARC and DKH teams and relevant office staff.

Day 2 Tuesday 29 Dec 2015: 9-12am Focus group with 10 Green House Farmers in Rafah to answer the 6 questions above. 12am-2.30pm Field inspections of the Green House Farms.

Day 3 Wednesday 30 Dec 2015: 9-12am Focus group with 10 Poultry Farmers in WadiSalqa to answer the 6 questions above. 12am-2.30pm Field inspections of the Poultry Farms.

Day 4 Thursday 31 Dec 2015: 9-12am Focus group with 6 Livestock Dairy Farmers from Bedouin Village and Al-Borajj to answer the 6 questions above. 12am-2.30pm Field inspections of the Dairy Farms.



Day 5 Sunday 3 January 2016: 9-12am Focus group with 5 Fishery Farmers from the Gaza's Fishermen Association to answer the 6 questions above. 12am-2.30pm Field inspections of the Fishing set up in the port. Followed by a short debrief for the team and preliminary reflections back in the PARC office.

The meetings were electronically recorded and notes taken from the translations of those discussions. These and impressions from the field inspections are below in section 4. The photographs were selected to give a 'representative' impression of what was found in the field.

4.0 Feedback from the Focus Group Discussions and Inspections.

Table 1: Feedback

DAY 2 Tuesday 29 December 2015: Green House (GH) Farmers in Rafah.
GH farmers emphasized the asset and infra structure nature of their business. The GH's are of significant size as can be seen from the photos below. The GH's are clad in plastic, there is drainage along the edge of each domed section, large water storage tanks outside and then another internal watering system. They are effectively sealed and have mesh across all doors to minimise insect access. Consequently, they seemed to have a business approach about the way they did their farming. Nevertheless, drainage seemed to be a recurring aspect.

	
<p>1 what methods, materials and techniques are you using to go on with your life and business?</p>	<p>2 How did/do you select the land?</p>
<p>Insect resilient crops Improvised fixing of damaged plastic sheeting Replacement of rotting wood due to impact on drainage systems Strengthening the drainage system inside the GH by attachment to its structure Patching of holes in plastic or covering over the damaged area. Focus is on War related damage but farmers also thinking of potential wind damage by recycling pieces of plastic. Strengthening of drainage system for wind loads Bandage damaged drainage with materials such as leather. Looking into replacing plastic sheets (2 year life). Install ventilation windows Reflective sheet over plastic one. Thermal disinfectant of ground to prepare soil for the next growing season. Grow different crops that are not so affected by salt water¹². Use is being made of rain water harvesting On site water storage tanks.</p>	<p>Can select the orientation of the GH Usually use N-S orientation for ventilation. Large GH farm is 6 dunam (1 dunam = 1000m² = 0.25 acres). A small one is 3 dunam. Access to water is a key for location.</p>
<p>3 What informal or formal training have you been given that assisted you to face risks and hazards?</p>	<p>4 How did the conflict impact on you and how did you recover?</p>

¹² The draw down on the ground water has apparently been extensive and has made the ground water lower than the sea level. This means that the ground water is progressively more salty and this can have an impact on the crops.

<p>Consult with a neighbour or friend. Sometimes Engineers from the local authority or supply companies will advise. Training on thermal disinfection/sterilisation/ composting. Recycling of waste from the GH Orientation of the GH Found that most insecticides are not as effected as stated by companies. Moisture content so that GH's are not over watered. How to manage water salinity Integrated bio insecticides using other insects. Issues with QC especially for seeds (not really related to training) but noted for later selection of traders. DRR and how to make GH's ready for storms. The lack of protective clothing was mentioned. Training in how to change from cucumbers to tomatoes (salty water issue).</p>	<p>Displaced, only returned when they felt safe. Crops failed as they could not be tendered. Need to rehab the GH and then pay back bills. Two at the meeting lost their homes, car and GH. Others were able to fix their houses. One reported his 6 year old suffered nightmares. Soil directly hit lost its fertility. Especially impacted on children. In the neighbour's house hold 20 were killed.</p>
<p>5 How do you know that business has recovered?</p>	<p>6 What effective examples (at any level) are you aware of?</p>
<p>When the GH is fixed</p>	<p>Different crops such as chilli and pepper Electrically shutting units in GH. Making the GH insect proof. Renewing and reusing the old equipment and materials. Plastic tightening frame Planting of trees to protect the GH.</p>
<p>DAY 3 Wednesday 29 December 2015: Poultry Farmers in WadiSalqa.</p>	
<p>The poultry farmers not surprisingly were quite different from the GH ones in both their approach and the issues they faced. They have a shorter production cycle of 45 days and the birds are susceptible to disease and genetic defects, and the costs and weight gains are dependent on fodder prices. They appear to operate at two scales of production, one being the small house lot typically in the photo on the left (garage size) and large scale in the one on the right (warehouse size). Note that the holes in the left hand one were due to bomb shrapnel. The area is close to the border and presumably easy to target.</p>	



1 what methods, materials and techniques are you using to go on with your life and business?

Heating systems for birds. How depends on location/site. Some use gas others use wood chips.
 Use of chemicals to protect birds against disease.
 Types of food that will give better/improve weight gain for the birds.
 Maintain control of humidity (to reduce disease).
 Using chemicals to treat the salty water.
 All were raising chickens for meat and not for egg production.

2 How did/do you select the land?

Inherited the land so it was often already decided. One bought the land to set up a poultry farm.
 There was a range of sizes from larger (3,000 bird farms down to smaller lots of 20).
 Need fresh ventilation. N-S direction considered good for ventilation.
 Often had two parts to the farm with one 'half' being poultry and the other used for crops using the chicken mature.
 Usually located close to the house so that it can be cared for (taken also to mean security from other animals and possible theft).

3 What informal or formal training have you been given that assisted you to face risks and hazards?

Technical training on bird care and health
 Experience from family and relatives. They sought out this advice where there were issues. (It was noted that the larger units tended to be hereditary while the smaller units were add-ons to other farming or as something the women of the family were about to maintain. Certainly the smaller units seemed to be an option taken by families with less capital.)
 Developed expertise and answers to problems on the job. Especially for chicken diseases and how to control them. Apparently learnt by 'doing'.
 3 out of the 10 have had training.
 6 learned from relatives/ parents.

4 How did the conflict impact on you and how did you recover?

Could tell when you visited people
 After the conflict people took time-out to reflect and then moved ahead.
 They had been living in tents but life moved on nonetheless. Tents were provided by the Red Cross. Some are rebuilding their houses. All had partially damaged houses but none have completed rebuilt them. One lady doesn't have doors.

All learned on the job.	
5 How do you know that business has recovered?	6 What effective examples (at any level) are you aware of?
<p>When it is working again. That seems to be enough. Starting from zero and trying to enlarge their business. 2 have repaired their farms and have been able to restart their business. 1 had bought chickens and was restarting. There was general agreement that recovery was related to starting business again, though there were associated debts or loans to cover. Thus, the goal is not to fall down.</p>	<p>Increasing bird numbers but with care regarding good quality birds and food. Prevention rather than cure; treat birds before any disease occurs. Steel nets to stop attacking dogs Use of plastic sheets to lower the ceiling and keep heat and reduce the heating required. Use of electric generators to cover periods of brown out. They feel they are constantly learning They use CBO mostly to learn about new medicines or diseases. Avian flu? Provide adequate ventilation during summer and heat during the winter. Interesting, the better food and birds were sourced from Israel. Fodder from Israel can produce 55+% weight increase while the locally available one might provide 40-45% at best. Also issue of hereditary diseased chicks that tend to die after 10 days in a 45 day fattening cycle. Because of this 45 day cycle different aged birds are not usually mixed and so if a batch is diseased it will be a complete loss rather than a partial one. Typically 20 days on type 1 fodder then 25 on type 2 seems to be the better rotation. Type 1 will give 1 kg/bird while type 2 would be 2.5-3kgs/bird weight gain.</p>
DAY 4 Thursday 31 Dec 2015:Livestock Dairy Farmers from Bedouin Village and Al-Borajj	
<p>Most (if not all) of the livestock farmers are related. Their lifestyle is traditional and handed down from their parents/ grandparents. They were more participatory than the others possibly because of this history. There was a sense that they were 'not alone' in their situation. Living standards and expectations varied between each of the farming groups and this group seemed to have the less resources. This village area appears to have received heavy shelling as evidenced by the heavily damaged residential blocks nearby and the 'informal' village that had been constructed.</p>	



1 what methods, materials and techniques are you using to go on with your life and business?

2 How did/do you select the land?

They 'inherited' sheep farming from their parents/grandparents. Hence the goal is to increase the size of their flocks.

Good size flock is 20-25 sheep though the largest flock from those at the meeting was 15-20.

Can't rely solely on farming. 80% reply on social support from the Govt. hence basic standard of living. Supplemented with the occasional labour work.

Simple farming but access to water and grazing is getting increasingly difficult.

Most have small barns to keep the flocks made out of plastic or recycled building materials. These are not well ventilated or secure for the animals.

Take care that there's do not catch disease as vets costs are prohibitive.

Lambs are separated out at birth to give them a health start. Ewes are given enhanced feed when pregnant. There was the sense that they use traditional approaches for animal health especially related to lambing, worming etc.

For example with twin lambs they are careful to make sure that one lamb doesn't get more access than the other to the ewes milk.

Social capital in terms of sharing this knowledge because of the one tribe and all being essentially related.

They cooperate to enhance herd strength such as milk production and they will sometimes rent a stud ram for breeding.

It seems that flock numbers and product data is deliberately withheld because it

Places that are 'empty'

That are nearby to their houses

The barn is part of the house so the house will determine where the barn has to be with the flock being taken out to the fields during the day for grazing.

Usually put the barn door to the east for the sun to keep it warm (and conversely its back to the west).

Besides warmth also need the sun to dry it out.

Also choose a higher elevation for drainage away from the barn. The barn floor needs to be dry.

<p>would be seen as showing-off and create envy amongst others. Informally cooperate over marketing; but not equipment because of differences in farming practices. Winter is more problematic than summer due to issues such as heating of barns. Most flocks are locally sourced due to lower local costs.</p>	
<p>3 What informal or formal training have you been given that assisted you to face risks and hazards?</p>	<p>4 How did the conflict impact on you and how did you recover?</p>
<p>Vet and animal health training. Trained by vets to identify certain diseases and also how to care for pregnant ewes to achieve the optimal lambing. Sustainable farming. Training on what and how to properly feed animals. Use traditional herbs for worm control. Olive oil for animal injuries. Discovered a new disease that affects premature lamb birth and the required vaccination. Training on breeds/breeding best practices and how to make cheese for better profits. Also received training on markets such as when to sell produce. Information and learning transferred between generations (such as the barn orientation).</p>	<p>All lost stock (sheep and cattle) because of the conflict. Most lost their houses and some were still renting houses nearby.</p>
<p>5 How do you know that business has recovered?</p>	<p>6 What effective examples (at any level) are you aware of?</p>
<p>Restore flock to the original size/ condition. Restore house/ home. Speed up economic recovery process Restore social customs like the marriage of your son. Social; more nervous than previously (it was noted from posters on the walls of the community facility that there had recently been a programme in the village on 'wellbeing'. This may have been the basis of this comment). Recover from the conflict. Sheep numbers Restore the quality and space of the barn</p>	<p>The effective use of fodder; because it is expensive. Barn features such as drainage, steel feeders, mechanical drinking with a small isolation unit for lambs. The isolation unit of 2x2 metres could/ should be carpeted. Keeping barn floors clean and dry. Selling sheep compost Cost effective barn design. Water harvesting</p>
<p>DAY 5 Sunday 3 January 2016: Fishery Farmers from the Gaza's Fishermen Association</p>	

The fishing farmers are perhaps the most affected of the farming groups of this study. The issues that they spoke of existed before the recent conflict. That aside, buildings in the port area were bombed and the existing constraints appear to have tighten to the point that one did wonder why they persisted with fishing. Several had been imprisoned, nets were reported as being cut and high than usual injury rates were seemingly accepted. The comment from the meeting was that "...we don't know anything else...and even those that are university trained seem to end up back fishing".



1 what methods, materials and techniques are you using to go on with your life and business?

2 How do you maintain assets?

Try to substitute spare parts but they are usually not as durable. Spares come from Egypt but problematic because of the blockade. This is especially so for motors. These are seemingly 'family' businesses with fishing going back over generations.

It depends on the type of boat and the type of net. Sometimes it is lines rather than nets depending on the type of fish and the season.

Key assets are nets, boats, tools and motors.

Most of the issues appeared to be ones that were ongoing rather than being caused by recent conflict. These have been listed below.

In addition the port is silting up and may not be able to accommodate its current fleet. Also there is increasing pollution within the mooring area.

They are reliant on support from outside fishing

Limited fishing zone which they have had to live with rather than resolve despite having markers in the sea and GPS's. There did not seem to be a way to address this issue and the situation on the water was 'volatile'. Moreover, it seems that the fish also know about this limit and manage to stay just beyond it.

Under seemingly constant scrutiny with seize of boats and imprisonment. The latter then causes issues for families that do not have a 'bread winner'.

Families have bound together to form what they called "Magia" which apparently was not known to local staff and was a word that

<p>didn't translate; but the closest is probably a 'cooperative'. All the fishermen in the room (and in the port) were part of one and there were around 150 Magia in the port. Each consists of around 9 families (approx. 70 people). The Magia get loans to replace assets, they work together and boat ownership is by the Magia (though this was not clear from the discussion and some were in individual ownership). Profits are shared and roles within are clearly marked out. They have been in operation for as long as anyone in the room could remember and so were not a response to recent conflict. People's health is covered by Magia if they cannot go fishing. The sense from the meeting was that this approach would not work in other forms of farming.</p>	
<p>3 What informal or formal training have you been given that assisted you to face risks and hazards?</p>	<p>4 How did the conflict impact on you and how did you recover?</p>
<p>First Aid training Most learning is informal on the job and is past down generationally. They know every inch of the fishing area. GPS training by some. Ship building training Maintenance training would be useful. Training in being patience would also be useful (joke).</p>	<p>This was not asked because it was clear that the issues for fishermen were systemic rather than being solely conflict based.</p>
<p>5 How do you know that family and business has recovered?</p>	<p>6 What effective examples (at any level) are you aware of?</p>
<p>When business is working Being able to pay the bills such as school fees Actually kids being able to go to school at all Get back to being productive again</p>	<p>Different types of nets and sizes Realisation that without fishing and farming Gaza would be not be able to function. The use of lights, better motors, winches, GPS and echo sounders.</p>

5.0 QoL Tool

There was concern from the BBB team that the psychological and social recovery of people under the Community Recover factor may not be adequately addressed and instead that the business recovery alone would be emphasised. It was suggested and taken up by PARC and accepted by DHK that a QoL tool be used alongside the suggested economic criteria and to complement the other data collection.

Completed survey forms from 96 beneficiaries were available at the time of this field work and these were analysed. The BBB team have had extensive use of this tool¹³ developed by the Lovibond's at the University of New South Wales, Australia¹⁴. The QoL tool is a self reporting survey over the three factors of Depression, Anxiety and Stress. The results suggested the following:

- The average scores for Depression, Anxiety and Stress were 12.0, 10.5 and 13.6 respectively. This suggests that anxiety is the main issue for the farmers; namely what the future holds rather than their current or past situations.
- There were 8 out the 96 forms that may not be completely truthful and these might need to be excluded from any further analysis
- There was 1 out the 96 that had an unusually high depression score and should be followed up with professional assistance.
- There 6 out of the 96 that had an unusually high Anxiety score and should be followed up with professional assistance.

Moreover the associated data of the 6 people immediately above should be compared as they would provide a clearer picture of the main issue/s to be addressed to achieve a higher QoL.

In addition, these measures could be used as target outcomes for the program with the objective being to reduce anxiety in particular.

6.0 Recommendations

Based on this work this report would recommend that firstly the QoL tool be extended to include the women of the households. Secondly, that the Indicators below be used for the program. The generic indicators as suggested in the Roadmap have been included on the left of the table below with the recommended ones on the right. These have also been broken up into each farming sector.

Table 2: Recommended Indicators

BBB Indicators for Green House Farmers:

General

BBB Indicator	Suggested Indicators based on the field observations
-Community multi-hazard risk assessment (focus groups) -Technical assessment -Quality of Life survey	-Community multi-hazard risk assessment (focus groups) -Technical assessment -Quality of Life survey

¹³ Potangaroa, R., Santosa, H., and Wilkinson, S. (2014). The Application of Quality of Life Metrics. Anthony J Masys (ed.) Disaster Management: Enabling Resilience

¹⁴ Manual for the depression anxiety stress scales S.H. Lovibond, P.F. Lovibond. Edition 2nd ed. Published Sydney : Psychology Foundation of Australia, 1996.

Disaster Risk Reduction

BBB Indicator	Suggested Indicators based on the field observations
<p>Reduce risks through physical assets</p> <ul style="list-style-type: none"> -Identify key physical assets required for business -Adopt technologies to protect business from defined hazards -Adopt technologies for the physical assets to reduce, withstand and resist risks identified in the PRA maps -Evaluate practical ways of upgrading physical assets 	<ul style="list-style-type: none"> -Fix damages -Strengthen drainage systems inside GH -Replace plastic sheets, use of reflective sheets over plastic sheets -Install ventilation windows -Insect resilient crops -Thermal disinfectant for ground -Grow different crops less affected by salt water -Rainwater harvesting -On-site water storage tanks
<p>Reduce risks through land-use changes</p> <ul style="list-style-type: none"> -Altering land-use -Diversify crops and products -Relocating to a different location 	<p>N/A except for changing orientation of GH to N-S direction for ventilation</p>
<p>Reduce risks through DRR education and awareness</p> <ul style="list-style-type: none"> -Use local knowledge -Develop effective disaster risk and emergency communication methods -Provide training to upgrade skills and knowledge of business owners to use new/improved technologies -Train business owners to make contingency plans -Educate on the importance of establishing strategic partnerships with other businesses -Introduce new capabilities to enable participation in reconstruction and recovery -Provide training in BBB, DRR, disaster response and disaster recovery 	<ul style="list-style-type: none"> -Knowledge-sharing in local neighbour/friend networks -Training from local authority engineers or supply companies on: thermal disinfection, sterilisation, composting, recycling of waster, orientation of GH, how to manage water salinity, integrated bio-insecticides, DRR (how to prepare GH for storms), changing crop types

Community and Farmer's Recovery

BBB Indicator	Suggested Indicators based on the field observations
<p>Support the psychological and social recovery of people</p> <ul style="list-style-type: none"> -Consult local business-owners for multi-hazard mapping, technical assessment and designing intervention plans 	<ul style="list-style-type: none"> -Consult local business-owners for multi-hazard mapping, technical assessment and designing intervention plans -Create groups of similar business-owners for collaborative and collective

<ul style="list-style-type: none"> -Include local business-owners in the design of business recovery plans -Create groups of similar business-owners for collaborative and collective decision-making and implementation of recovery -Keep local business-owners regularly informed -Ensure recovery plans and interventions are culturally and religiously appropriate -Coordinate with partner NGOs to provide psychological, spiritual or religious support and counselling to business-owners, employees and families -Encourage gender equity 	<p>decision-making and implementation of recovery</p> <ul style="list-style-type: none"> -Ensure recovery plans and interventions are culturally and religiously appropriate -Coordinate with partner NGOs to provide psychological, spiritual or religious support and counselling to business-owners, employees and families
<p>Support business recovery</p> <ul style="list-style-type: none"> -Create immediate jobs through short-term employment in post-disaster relief work -Support rapid recovery of businesses through replacing lost equipment, physical assets, animal stocks, and animal food, assisting with re-planting crops, and providing necessary tools and supplies -Rejuvenate local businesses through providing support to upgrade businesses, arranging extension services and free/subsidized training programmes, introducing new types of agricultural opportunities and providing support with marketing and advertising 	<ul style="list-style-type: none"> -Provide other jobs such as labour work -DRR/business recovery training -Social support from Govt -Collaboration and cooperation between businesses (resources and knowledge) -Diversification of business

Effective Implementation

BBB Indicator	Suggested Indicators based on the field observations
<p>Understand local institutional mechanisms for agricultural business recovery</p> <ul style="list-style-type: none"> -Identify the roles of different actors for post-disaster recovery -Introduce farmers to each other and assist collaboration and cooperation -Encourage farmers to share knowledge and resources -Stay up-to-date with news from the Ministries with regards to assistance 	<ul style="list-style-type: none"> -Introduce farmers to each other and assist collaboration and cooperation -Encourage farmers to share knowledge and resources

being provided, outreach programmes and relevant information	
Utilise legislation and regulation for agricultural business recovery -Identify relevant legislation and regulation which enforces disaster risk reduction, psycho-social and business recovery measures taken for BBB -Identify which legislation and regulation provide facilitations to support rebuilding and recovery	N/A
Monitoring and evaluation for agricultural business recovery -Identify the systems to be complied with and follow them -Put in place monitoring and evaluation measures to evaluate the effectiveness of implemented interventions and extract lessons to improve future processes	-Put in place monitoring and evaluation measures to evaluate the effectiveness of implemented interventions and extract lessons to improve future processes - business recovery indicators Currently, recovery = when GH is fixed

BBB Indicators for Poultry Farmers:

General

BBB Indicator	Suggested Indicators based on the field observations
-Community multi-hazard risk assessment (focus groups) -Technical assessment -Quality of Life survey	-Community multi-hazard risk assessment (focus groups) -Technical assessment -Quality of Life survey

Disaster Risk Reduction

BBB Indicator	Suggested Indicators based on the field observations
Reduce risks through physical assets -Identify key physical assets required for business -Adopt technologies to protect business from defined hazards -Adopt technologies for the physical assets to reduce, withstand and resist risks identified in the PRA maps -Evaluate practical ways of upgrading physical assets	-Fix damages to barns -Efficient heating system (wood/gas) -Effective humidity control -Access to chemicals/medicine for disease prevention -Quality food to improve weight gain for birds -Salty water treatment
Reduce risks through land-use changes -Altering land-use -Diversify crops and products -Relocating to a different location	-Changing orientation to N-S direction for ventilation

	-Alternate land-uses (eg: one half poultry, and other half crops using chicken manure)
<p>Reduce risks through DRR education and awareness</p> <ul style="list-style-type: none"> -Use local knowledge -Develop effective disaster risk and emergency communication methods -Provide training to upgrade skills and knowledge of business owners to use new/improved technologies -Train business owners to make contingency plans -Educate on the importance of establishing strategic partnerships with other businesses -Introduce new capabilities to enable participation in reconstruction and recovery -Provide training in BBB, DRR, disaster response and disaster recovery 	<ul style="list-style-type: none"> -Knowledge-sharing in local neighbour/friend/family networks -External training from CBOs on: bird care and health <p>(Most experience and lessons learnt on the job)</p> <ul style="list-style-type: none"> -Mentoring/interns?

Community and Farmer's Recovery

BBB Indicator	Suggested Indicators based on the field observations
<p>Support the psychological and social recovery of people</p> <ul style="list-style-type: none"> -Consult local business-owners for multi-hazard mapping, technical assessment and designing intervention plans -Include local business-owners in the design of business recovery plans -Create groups of similar business-owners for collaborative and collective decision-making and implementation of recovery -Keep local business-owners regularly informed -Ensure recovery plans and interventions are culturally and religiously appropriate -Coordinate with partner NGOs to provide psychological, spiritual or religious support and counselling to business-owners, employees and families -Encourage gender equity 	<ul style="list-style-type: none"> -Consult local business-owners for multi-hazard mapping, technical assessment and designing intervention plans -Create groups of similar business-owners for collaborative and collective decision-making and implementation of recovery -Ensure recovery plans and interventions are culturally and religiously appropriate -Coordinate with partner NGOs to provide psychological, spiritual or religious support and counselling to business-owners, employees and families -Assistance to move back to homes and start rebuilding
Support business recovery	

<ul style="list-style-type: none"> -Create immediate jobs through short-term employment in post-disaster relief work -Support rapid recovery of businesses through replacing lost equipment, physical assets, animal stocks, and animal food, assisting with re-planting crops, and providing necessary tools and supplies -Rejuvenate local businesses through providing support to upgrade businesses, arranging extension services and free/subsidized training programmes, introducing new types of agricultural opportunities and providing support with marketing and advertising 	<ul style="list-style-type: none"> -Support (financial and technical) to re-start businesses -Provide other jobs such as labour work -DRR/business recovery training -Social support from Govt -Collaboration and cooperation between businesses (resources and knowledge) -Diversification of business
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Effective Implementation

BBB Indicator	Suggested Indicators based on the field observations
<p>Understand local institutional mechanisms for agricultural business recovery</p> <ul style="list-style-type: none"> -Identify the roles of different actors for post-disaster recovery -Introduce farmers to each other and assist collaboration and cooperation -Encourage farmers to share knowledge and resources -Stay up-to-date with news from the Ministries with regards to assistance being provided, outreach programmes and relevant information 	<ul style="list-style-type: none"> -Introduce farmers to each other and assist collaboration and cooperation -Encourage farmers to share knowledge and resources
<p>Utilise legislation and regulation for agricultural business recovery</p> <ul style="list-style-type: none"> -Identify relevant legislation and regulation which enforces disaster risk reduction, psycho-social and business recovery measures taken for BBB -Identify which legislation and regulation provide facilitations to support rebuilding and recovery 	N/A
<p>Monitoring and evaluation for agricultural business recovery</p> <ul style="list-style-type: none"> -Identify the systems to be complied with and follow them -Put in place monitoring and evaluation measures to evaluate the effectiveness of implemented interventions and 	<ul style="list-style-type: none"> -Put in place monitoring and evaluation measures to evaluate the effectiveness of implemented interventions and extract lessons to improve future processes - business recovery indicators

extract lessons to improve future processes	Currently, recovery = when business is up and running again
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BBB Indicators for Livestock Farmers:

General

BBB Indicator	Suggested Indicators based on the field observations
-Community multi-hazard risk assessment (focus groups) -Technical assessment -Quality of Life survey	-Community multi-hazard risk assessment (focus groups) -Technical assessment -Quality of Life survey

Disaster Risk Reduction

BBB Indicator	Suggested Indicators based on the field observations
Reduce risks through physical assets -Identify key physical assets required for business -Adopt technologies to protect business from defined hazards -Adopt technologies for the physical assets to reduce, withstand and resist risks identified in the PRA maps -Evaluate practical ways of upgrading physical assets	-Fix damages to barns -Access to secure and cost-effective barns for animals with drainage, steel feeders, mechanical drinking, isolation unit for lambs -Ventilation in barns -Effective feeding for animals -Better/safer birthing -Better disease control -Effective use of fodder -Water harvesting
Reduce risks through land-use changes -Altering land-use -Diversify crops and products -Relocating to a different location	-Barn orientation: barn door to the east -Alternate land-use (as currently farming doesn't provide sufficient income on its own)
Reduce risks through DRR education and awareness -Use local knowledge -Develop effective disaster risk and emergency communication methods -Provide training to upgrade skills and knowledge of business owners to use new/improved technologies -Train business owners to make contingency plans -Educate on the importance of establishing strategic partnerships with other businesses	-Knowledge-sharing through family networks (farmers usually related) -External training on birthing, breeding, disease control

<ul style="list-style-type: none"> -Introduce new capabilities to enable participation in reconstruction and recovery -Provide training in BBB, DRR, disaster response and disaster recovery 	
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Community and Farmer's Recovery

BBB Indicator	Suggested Indicators based on the field observations
<p>Support the psychological and social recovery of people</p> <ul style="list-style-type: none"> -Consult local business-owners for multi-hazard mapping, technical assessment and designing intervention plans -Include local business-owners in the design of business recovery plans -Create groups of similar business-owners for collaborative and collective decision-making and implementation of recovery -Keep local business-owners regularly informed -Ensure recovery plans and interventions are culturally and religiously appropriate -Coordinate with partner NGOs to provide psychological, spiritual or religious support and counselling to business-owners, employees and families -Encourage gender equity 	<ul style="list-style-type: none"> -Consult local business-owners for multi-hazard mapping, technical assessment and designing intervention plans -Create groups of similar business-owners for collaborative and collective decision-making and implementation of recovery -Ensure recovery plans and interventions are culturally and religiously appropriate -Coordinate with partner NGOs to provide psychological, spiritual or religious support and counselling to business-owners, employees and families -Assistance to move back to homes and re-gain stock
<p>Support business recovery</p> <ul style="list-style-type: none"> -Create immediate jobs through short-term employment in post-disaster relief work -Support rapid recovery of businesses through replacing lost equipment, physical assets, animal stocks, and animal food, assisting with re-planting crops, and providing necessary tools and supplies -Rejuvenate local businesses through providing support to upgrade businesses, arranging extension services and free/subsidized training programmes, introducing new types of agricultural opportunities and providing support with marketing and advertising 	<ul style="list-style-type: none"> -Support (financial and technical) to re-start businesses -Provide other jobs such as labour work -DRR/business recovery training -Social support from Govt -Collaboration and cooperation between businesses (resources and knowledge) -Diversification of business – selling sheep compost etc.

Effective Implementation

BBB Indicator	Suggested Indicators based on the field observations
<p>Understand local institutional mechanisms for agricultural business recovery</p> <ul style="list-style-type: none"> -Identify the roles of different actors for post-disaster recovery -Introduce farmers to each other and assist collaboration and cooperation -Encourage farmers to share knowledge and resources -Stay up-to-date with news from the Ministries with regards to assistance being provided, outreach programmes and relevant information 	<ul style="list-style-type: none"> -Assist collaboration and cooperation -Encourage farmers to share knowledge and resources (currently takes place between related farmers and those of the same tribe) <p>Note: sharing product data etc. is seen as showing off, so transparency between businesses not viewed as positive</p>
<p>Utilise legislation and regulation for agricultural business recovery</p> <ul style="list-style-type: none"> -Identify relevant legislation and regulation which enforces disaster risk reduction, psycho-social and business recovery measures taken for BBB -Identify which legislation and regulation provide facilitations to support rebuilding and recovery 	<p>N/A</p>
<p>Monitoring and evaluation for agricultural business recovery</p> <ul style="list-style-type: none"> -Identify the systems to be complied with and follow them -Put in place monitoring and evaluation measures to evaluate the effectiveness of implemented interventions and extract lessons to improve future processes 	<ul style="list-style-type: none"> -Put in place monitoring and evaluation measures to evaluate the effectiveness of implemented interventions and extract lessons to improve future processes - business recovery indicators <p>Currently, recovery = restore stock to original size and condition, restore barn, restore social customs (like marriage)</p>

BBB Indicators for Fishery Farmers:

General

BBB Indicator	Suggested Indicators based on the field observations
<ul style="list-style-type: none"> -Community multi-hazard risk assessment (focus groups) -Technical assessment -Quality of Life survey 	<ul style="list-style-type: none"> -Community multi-hazard risk assessment (focus groups) -Technical assessment -Quality of Life survey

Disaster Risk Reduction

BBB Indicator	Suggested Indicators based on the field observations
<p>Reduce risks through physical assets</p> <ul style="list-style-type: none"> -Identify key physical assets required for business -Adopt technologies to protect business from defined hazards -Adopt technologies for the physical assets to reduce, withstand and resist risks identified in the PRA maps -Evaluate practical ways of upgrading physical assets 	<ul style="list-style-type: none"> -Fix damages -Good quality spare parts -Good quality fishing equipment (boats, nets, tools, motors)
<p>Reduce risks through land-use changes</p> <ul style="list-style-type: none"> -Altering land-use -Diversify crops and products -Relocating to a different location 	<p>-N/A except assistance with limited fishing zone...</p>
<p>Reduce risks through DRR education and awareness</p> <ul style="list-style-type: none"> -Use local knowledge -Develop effective disaster risk and emergency communication methods -Provide training to upgrade skills and knowledge of business owners to use new/improved technologies -Train business owners to make contingency plans -Educate on the importance of establishing strategic partnerships with other businesses -Introduce new capabilities to enable participation in reconstruction and recovery -Provide training in BBB, DRR, disaster response and disaster recovery 	<ul style="list-style-type: none"> -Knowledge-sharing through “magia” (fishermen cooperative) network -External training on first aid, GPS training, ship building raining, maintenance training <p>(Most skills currently learnt on the job)</p> <ul style="list-style-type: none"> -Mentoring/interns?

Community and Farmer’s Recovery

BBB Indicator	Suggested Indicators based on the field observations
<p>Support the psychological and social recovery of people</p> <ul style="list-style-type: none"> -Consult local business-owners for multi-hazard mapping, technical assessment and designing intervention plans -Include local business-owners in the design of business recovery plans -Create groups of similar business-owners for collaborative and collective 	<ul style="list-style-type: none"> -Consult local business-owners for multi-hazard mapping, technical assessment and designing intervention plans -Strengthen magia relationships/support magia -Ensure recovery plans and interventions are culturally and religiously appropriate

<p>decision-making and implementation of recovery</p> <ul style="list-style-type: none"> -Keep local business-owners regularly informed -Ensure recovery plans and interventions are culturally and religiously appropriate -Coordinate with partner NGOs to provide psychological, spiritual or religious support and counselling to business-owners, employees and families -Encourage gender equity 	<ul style="list-style-type: none"> -Coordinate with partner NGOs to provide psychological, spiritual or religious support and counselling to business-owners, employees and families
<p>Support business recovery</p> <ul style="list-style-type: none"> -Create immediate jobs through short-term employment in post-disaster relief work -Support rapid recovery of businesses through replacing lost equipment, physical assets, animal stocks, and animal food, assisting with re-planting crops, and providing necessary tools and supplies -Rejuvenate local businesses through providing support to upgrade businesses, arranging extension services and free/subsidized training programmes, introducing new types of agricultural opportunities and providing support with marketing and advertising 	<ul style="list-style-type: none"> -Support (financial and technical) to re-start businesses -Provide other jobs such as labour work -DRR/business recovery training -Social support from Govt -Support to magia network

Effective Implementation

BBB Indicator	Suggested Indicators based on the field observations
<p>Understand local institutional mechanisms for agricultural business recovery</p> <ul style="list-style-type: none"> -Identify the roles of different actors for post-disaster recovery -Introduce farmers to each other and assist collaboration and cooperation -Encourage farmers to share knowledge and resources -Stay up-to-date with news from the Ministries with regards to assistance being provided, outreach programmes and relevant information 	<ul style="list-style-type: none"> -Assist collaboration and cooperation – magia network
<p>Utilise legislation and regulation for agricultural business recovery</p>	N/A

<ul style="list-style-type: none"> -Identify relevant legislation and regulation which enforces disaster risk reduction, psycho-social and business recovery measures taken for BBB -Identify which legislation and regulation provide facilitations to support rebuilding and recovery 	
<p>Monitoring and evaluation for agricultural business recovery</p> <ul style="list-style-type: none"> -Identify the systems to be complied with and follow them -Put in place monitoring and evaluation measures to evaluate the effectiveness of implemented interventions and extract lessons to improve future processes 	<ul style="list-style-type: none"> -Put in place monitoring and evaluation measures to evaluate the effectiveness of implemented interventions and extract lessons to improve future processes - business recovery indicators <p>Currently, recovery = when business is running, able to pay bills, being productive</p>