This action is funded by the European Union

ANNEX 1

of the Commission Implementing Decision on the Annual Action Programme 2015 in favour of Myanmar/Burma to be financed from the general budget of the European Union

Action Document for the Myanmar Sustainable Aquaculture Programme (MYSAP)

1. Title/basic act/ CRIS number	Myanmar Sustainable Aquaculture Programme (MYSAP) DCI-ASIE/2015/038-078 Financed under the Development Cooperation Instrument (DCI)			
2. Zone benefiting from the action/location	Myanmar/Burma Some technical cooperation might also be carried out in the ASEAN region and the EU.			
3. Programming document	Multiannual Indicative Programme (2014-2020) for Myanmar/Burma			
4. Sector of concentration/ thematic area	Rural Development / Agriculture / Food and nutrition security			
5. Amounts concerned	Total estimated cost: EUR 22 500 000 Total amount of EU budget contribution: EUR 20 000 000 This action is co-financed in joint co-financing by the German Ministry of Economic Cooperation and Development (BMZ) for EUR 2 500 000			
6. Aid modality(ies) and implementation modality(ies)	Project modality Indirect management with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH			
7. DAC code(s)	31320 – Fishery development Exploitation and utilisation of fisheries; fish stock protection; aquaculture; integrated fishery projects.			
8. Markers (from CRIS DAC form)	**General policy objective**	**Not targeted**	**Significant objective**	**Main objective**
	Participation development / good governance	☐	X	☐
	Aid to environment	☐	X	☐
	Gender equality (including Women In Development)	☐	X	☐
	Trade Development	☐	X	☐
	Reproductive, Maternal, New born and child health	X	☐	☐
	RIO Convention markers	**Not targeted**	**Significant objective**	**Main objective**
	Biological diversity	☐	X	☐
	Combat desertification	X	☐	☐
	Climate change mitigation	X	☐	☐
	Climate change adaptation	☐	X	☐

9. Global Public Goods and Challenges (GPGC) thematic flagships	N/A

SUMMARY

The on-going process of economic and democratic transition in Myanmar is attracting new investment and trade, and the rural population (70% of the total population) also needs to benefit from this process. Approximately one third of the country's children suffer from chronic undernutrition (stunting), the nationwide prevalence of moderately underweight children is 32% and the average proportion of total household expenditure on food is 68%.

Fish is of enormous importance for Myanmar/Burma both as the main source of animal protein in people's diets and as an economic activity. With wild fish stocks declining to possibly as low as 10% of what they were in 1979, both nutrition and income at household level are at risk. Most of the potential for fisheries development in Myanmar/Burma lies in aquaculture.

However, after years of low private and public investments, coupled with natural disasters, the aquaculture sector has slipped into a state of serious underdevelopment. A thriving private sector is eager to modernize and seize the opportunities offered by domestic and international markets, including via the EU's 'Everything But Arms' trade preferences. Government institutions however lack the resources and the capacities necessary to effectively develop the sector in a sustainable way.

The action seeks to support the sustainable intensification of aquaculture, thereby realising its potential for food security, nutrition and sustainable livelihoods, in particular by the:

1. Scaling up of sustainable freshwater aquaculture production to increase the availability of good quality fish in the domestic market;
2. Environmental and productive recovery of coastal shrimp farms through ecosystem-based farming practices (including mangrove reforestation);
3. Demonstration and scaling up of a sustainable mud crab value chain to reduce pressure on wild resources;
4. Development of local hatcheries and the demonstration of environment friendly practices;
5. Introduction of measures to improve the access of vulnerable parts of the population to quality fish proteins from aquaculture;
6. Increased participation of vulnerable rural households, especially smallholders and landless, in the aquaculture value chain.

The target group includes over 250,000 farmers and employees that are already involved in the sector, as many as 25,000 smallholder rice farmers that could significantly improve their income by stocking their paddy fields with fish or shifting to freshwater aquaculture, as well as landless workers that could benefit from new employment opportunities in the value chain. Given the heavy reliance on fish for dietary protein, it is expected that the increased wider availability of affordable, good quality freshwater fish in the domestic market will contribute to the improvement in nutrition of vulnerable households, even beyond the traditional fish-producing areas. The development of a sustainable aquaculture value chain will contribute to economic growth, employment and additional revenues for the government, as well as restoring the environment and improving resilience to natural disasters.

1 CONTEXT

1.1 Sector/Country/Regional context/Thematic area

Myanmar/Burma is undergoing a process of deep and fast economic and social transformation. The transition process is making the country an attractive destination for trade and investment, but the benefits for the most vulnerable parts of the population are yet to materialise and undernutrition continues to be a problem in many rural areas, where 70% of the population live. With an average per capita income of around USD 1,000, a poverty rate of 26% and a ranking of 150th in the Human Development Index (UNDP 2014), the country continues to face high poverty levels despite its richness in natural resources.

Aquaculture is a vital sector for the country, providing jobs and food security for its people, who have one of the highest consumption rates of fish in the world, at 56 kg per capita per year. With significant levels of undernutrition, these figures hide diverse consumption and nutritional patterns between regions and households, and possibly within households given the high levels of child undernutrition (WorldFish[1]). Under-five stunting remains worryingly high at 35%, with food supply diversity relatively low at 35% of energy from non-staples[2].

It is estimated that fish represents on average 50% of the consumption of animal-sourced food in Myanmar/Burma. This percentage is even higher in coastal areas including the Ayeyarwady Delta (58%), Rakhine State (60%) and Tanintharyi Region (65%).

The vast majority of seafood produced in Myanmar/Burma is for domestic consumption, with 8% exported (Holmyard 2015)[3]. Aquaculture production has more than doubled in the last decade and amounted to 964,260 tons in 2013/14[4] or 19% of the country's total seafood output. Increased availability of fish from aquaculture is critical to fulfil Myanmar/Burma's animal protein needs as natural marine and freshwater fish resources are increasingly depleted due to poor management, unsustainable fishing practices and increasing human pressure. Preliminary data from a survey conducted in late 2013 suggests that fish stocks in some coastal areas could be as low as 10% of 1979 levels. Worldwide, and in the ASEAN region, aquaculture is the fastest growing food-production sector with a considerable expansion potential for Europe as a service provider.

Government-registered aquaculture ponds amount to an area of broadly 180,000 hectares (ha), with 89,000 ha of fish ponds and 91,000 ha of shrimp ponds[5]. In addition, there are also a myriad of unregistered "backyard" ponds that do not need official authorisation. These are often ponds built for water storage that are stocked with fish for consumption by the household or for sale at the local market. There are currently 3 main types of commercial aquaculture in Myanmar/Burma: freshwater ponds, coastal shrimp, and crab fattening.

Freshwater aquaculture is key for improving nutritional outcomes and the population shows a clear preference for freshwater fish over marine fish. Freshwater ponds account for most of the aquaculture production and supply affordable Asian carp and to a lesser extent tilapia and sea bass to the domestic market. Production is concentrated in large operations, but medium and small size operations have been increasing in recent years. Over 77% of the existing

[1] WorldFish is an international research organisation, member of the Consultative Group for International Agricultural Research (CGIAR), aiming to reduce poverty and hunger by improving fisheries and aquaculture. www.worldfishcenter.org
[2] Scaling Up Nutrition – Myanmar Monitoring & Evaluation self-assessment report 2014
[3] Fish Farming International "Myanmar Rising"; 28 April 2015; fishfarminginternational.com/myanmar-rising
[4] Government of Myanmar, Department of Fisheries, Fishery Statistics 2014
[5] Government of Myanmar, Department of Fisheries, Fishery Statistics 2014

freshwater pond area is located in the Ayeyarwady and Yangon Regions. There is substantial scope for scaling up output in traditional production areas, and opportunities to introduce small scale operations in other areas such as the Central Dry Zone and Shan State.

Coastal shrimp production used to be significant, mostly in the Ayeyarwady Region and Rakhine State, however, productivity declined. According to the draft of the new National Biodiversity Strategy and Action Plan (NBSAP) for Myanmar/Burma 'in northern Rakhine State, the area of shrimp farming increased from 34,000 ha in 2001 to 63,000 ha in 2005, to 45,000 ha in 2010. Meanwhile, productivity declined from 200 kg per ha per year to less than 20 kg per ha per year'[6]. The economic and nutritional impact is evident if one considers that, according to experience in the region[7], an extensive yet well managed polyculture operation produces up to 1 ton per ha per year of shrimps plus several tons of other lower value fish, without the need for feeding.

The main reasons for the decline in production are mangrove clearing for building ponds, poor pond maintenance, and lack of natural post larvae. According to NBSAP, in northern Rakhine State about 2,000 large areas of mangroves were cleared to construct ponds. This resulted in a sharp decline of the natural recruitment of shrimps and in a higher vulnerability to storms such as cyclone Giri, which struck in 2010, killed 157 and left 70,000 homeless.

Farming techniques that combine extensive coastal polyculture with mangrove reforestation provide an opportunity to reverse this trend, especially as global shrimp demand and prices have been rising steadily and there is a growing consumer preference for farmed shrimp that have been produced in environmentally friendly ways. The Department of Fisheries (DoF) successfully piloted mangrove friendly shrimp production in Rakhine State[8] in 2004 and 2005, but the project was later abandoned due to a lack of suitable market outlets. The situation has radically changed now, especially with the re-instatement of the EU Generalised Scheme of Preferences. According to NBSAP, recovery of the shrimp sector in Rakhine State would require restoring mangroves in over 40,000 ha of abandoned shrimp ponds. This would need investments in pond management, hatcheries and landscaping to re-establish the tidal hydrology, and natural and assisted mangrove regeneration[9].

Mud crab fattening is growing, boosted by demand for soft shell crabs for export, mostly to China and to a lesser extent to the US. Large scale farmers rely on juvenile crabs that are collected from the wild by local fishermen and fed 'trash' fish until they reach commercial size for consumption or export. The environmental sustainability of this form of crab fattening is a major concern.

Solar salt production is strictly linked to aquaculture. Most coastal farms combine salt production during the dry season with shrimp or rice production during the monsoon season. The evaporation ponds that are used for producing salt can produce at the same time a micro crustacean – Artemia (brine shrimp) – that is an invaluable feed source to marine fish and crustacean hatcheries and for use as high quality protein source in aquafeeds and for humans (new sustainable ingredient for fishcakes). Artemia is currently produced on a large scale in other Asian countries, especially in Vietnam, but not yet in Myanmar/Burma. The EU has recently supported the introduction of Artemia on a few demonstration farms in Myanmar/Burma with very good results. The scaling up of these demonstration activities and

[6] NBSAP: Current national status/baseline and key challenges for Aichi Target N°6.
[7] Mark Prein, GIZ Head of Programme "Sustainable Fisheries and Aquaculture". Presentation in Nay Pyi Taw 26/05/2015
[8] Government of Myanmar, Department of Fisheries, Fishery Statistics 2014.
[9] NBSAP; Current national status/baseline and key challenges for Aichi Target N°7.

the production of Artemia on a commercial scale has great potential to provide income diversification for solar salt farmers and vital quality feed for the hatcheries.

Comprehensive sector data on employment and income is not available. The government estimates that there were over 32,000 registered aquaculturists in 2013/14 employing 126,000 full-time and 90,000 part-time workers. These numbers however only include people that are officially employed by authorised operations. The real size of the sector is certainly much larger if one includes people that are involved in the value chains like juvenile crab collectors, vendors at local markets, local artisanal processors (fish/shrimp paste and dried fish), transporters, workers of processing plants and ice factories, as well as households that derive some income or nutrition from backyard ponds (more than 200,000 in the Ayeyarwady Region alone). The aquaculture sector generates employment opportunities for landless households, especially in the Ayeyarwady Region.

In terms of income there is no data on Myanmar/Burma, but recent research in Bangladesh[10] suggests that freshwater aquaculture generates farmer returns per hectare that are on average 5 to 10 times higher than paddy rice. The same research suggests that a doubling of the freshwater aquaculture area would require conversion of only 100,000 ha, or 3% of the national rice production area, but would more than double the availability of affordable quality fish in the domestic market (with resulting positive effects on nutrition) and create huge income generation opportunities for small rice farmers (2-5 ha). As many as 25,000 new semi-intensive fish farms could be created as a result of the conversion, while the rice production loss could easily be compensated by productivity gains. While the conversion of rice land to aquaculture ponds would require revised policies and a new legal framework, paddy-cum-fish production is already practiced and has great potential for revenue and nutrition integration if farmers can access adequate technical support.

Most of the aquaculture potential of Myanmar/Burma is in Rakhine State, where the poverty rate is the second highest (over 49%) and inter-communal and inter-faith violence is a permanent concern, as well as in the Ayeyarwady Region, where 26% of the country's poor live. The aquaculture sector throughout the country, but especially in these two areas, is still struggling to recover following the devastation caused by cyclones Nargis and Giri and the 2015 floods.

On the basis of an audit by the EU Food and Veterinary Office of 2009, Myanmar/Burma is only authorised to export wild fish to the EU. The EU has been providing substantial support to the authorities since 2013 to improve food safety standards and to meet EU requirements. In 2014, the government requested authorisation to export aquaculture products and has already fulfilled the key requirement, the submission of the required National Residue Monitoring Plan (NRMP). It is expected that in 2015 Myanmar/Burma could be added to the list of third countries that can export aquaculture products to the EU.

The re-instatement of the Everything But Arms (EBA) trade preferences in July 2013 could significantly benefit coastal aquaculture. With Malaysia and Thailand losing their Generalised Scheme of Preferences in 2014 and 2015 respectively, Myanmar/Burma shrimps will have a preference margin of between 12% (frozen) and 20% (prepared and preserved) in the EU market – the largest in the world for these products. European buyers are very keen to source quality shrimps locally if they meet quality and sustainability requirements. Investors from the

[10] Ben Belton et al. Presentation "Fish, rice and agricultural land use in Myanmar: preliminary findings from the Food Security Policy Project"; 5 May 2015
www.afre.msu.edu/uploads/files/Belton_Ben/Fish_Rice_and_Agricultural_Land_Use_5-6-15.pdf

region, but also from the EU and from Asia, are gradually scoping investment opportunities to take advantage of this situation.

For a number of reasons, Myanmar/Burma is currently well below its real potential in terms of aquaculture production, especially when compared to the impressive growth of other ASEAN countries like Indonesia, Vietnam, Philippines and Thailand over the last 15 years. However, production in these countries has been hampered by an increasing prevalence of diseases and by unsustainable practices and it will be very important for Myanmar/Burma to learn from these mistakes.

There is a strong socioeconomic and nutritional case for supporting the expansion of semi-intensive freshwater aquaculture for the domestic market, the recovery of a sustainable and climate resilient coastal aquaculture and the development of sustainable practices for mud crabs. Currently however the institutional framework and capacity in some of the key areas like technical support, sanitary and phytosanitary measures, land tenure, environmental and labour standards is very weak and not fit to properly guide and support the process. Substantial capacity development is needed to ensure that the sector develops sustainably and that the economic and nutritional gains benefit the most vulnerable.

1.1.1 Public Policy Assessment and EU Policy Framework

The lack of a suitable sector policy is one of the main obstacles to the development of aquaculture in Myanmar/Burma. The reasons for this include the lack of institutional capacity to formulate it, but also the fact that the Government has traditionally relegated aquaculture to a subsidiary role vis-à-vis agriculture, and in particular rice production. The DoF and the Myanmar Fisheries Federation (MFF) started discussions in August 2014 on a National Aquaculture Development Plan which is still at the concept stage. Stakeholder consultations during the identification and formulation of this action have resulted in a renewed momentum to develop a functional stakeholder platform for aquaculture. The preparation of the plan could coincide with the inception phase of the action.

Myanmar/Burma's high-level national development plan is set out in its Framework for Economic and Social Reforms (FESR) for 2012-15, which serves as a precursor to the 20-year National Comprehensive Development Plan (NCDP) that is currently being finalised. Sector policies, including the Strategic Framework for Rural Development (2014) and the draft national land use policy (2014) do not give sufficient importance to aquaculture and do not adequately address key problems including the current prohibition for smallholders to convert arable land into ponds.

Nutrition is covered in the National Comprehensive Development Plan and in the National Plan of Action in Food and Nutrition 2011-15 (NPAFN) which was first developed in 2013 in accordance with commitments made at the International Conference on Nutrition (1992). One of the long term (2010-20) targets of the plan is 'increasing meat and fish production for domestic consumption and for export, encouraging investment in livestock and fisheries, expanding shrimp production, conserving sustainable fisheries resources, expanding marine and fresh water aquaculture, and upgrading the socio-economic status of livestock and fisheries in communities'[11]. In April 2013, Myanmar/Burma joined the Scaling Up Nutrition (SUN) Movement, established the Central Board for Food and Nutrition (a high level body with representatives of all key government institutions) and updated the NPAFN with the involvement of donors and civil society. A National SUN Implementation Plan and

[11] Myanmar National Plan of Action in Food and Nutrition 2011-15, page 17.

Ministerial/sectoral guidelines for mainstreaming nutrition in multi-sectoral policies are being established.

Myanmar/Burma is working towards accessing the Mangroves for the Future[12] initiative. As part of this process, the first NBSAP for Myanmar/Burma was drafted in 2011 to provide a national strategy for the conservation and sustainable use of nature. The NBSAP is now being updated with new information and to include national counterparts to the global Aichi Biodiversity Targets. These targets are designed to mainstream biodiversity and sustainable use across all sectors and to address both the direct and underlying drivers of biodiversity loss and degradation. Specific aquaculture indicators and actions are currently being developed for Targets 6 and 7 (Target 6: by 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits; and Target 7: By 2020 areas under agriculture, aquaculture, and forestry are managed sustainably, ensuring conservation of biodiversity).

The action is in line with the Multiannual Indicative Programme (2014-2020) for Myanmar/Burma, and in particular with the overall objective of the focal sector 'Rural development / Agriculture / Food and nutrition security', which contributes to the eradication of poverty and hunger in rural areas of Myanmar/Burma through sustainable rural development, including environmentally sustainable agriculture. In line with the Policy Coherence for Development agenda, the action seeks to align EU development cooperation in Myanmar/Burma with trade, food safety and environmental policies.

The EU Action Plan on Nutrition (2014) identifies how the Commission can work to improve nutrition at the international level, identifying the elements necessary for a more effective and accountable response to the fight against under nutrition. The EU however has not developed specific policy guidelines on aquaculture. A recent High Level Panel of Experts on Food Security and Nutrition (HLPE) and recommendations of the Committee on Food Security – supported by the EU – have highlighted the important role that sustainable aquaculture can play in terms of food and nutrition security, insisting on the importance of effective governance to avoid possible negative impacts. These preoccupations have been highlighted by the 2014 EU-ASEAN Consultation on Aquaculture. By developing a comprehensive approach, the action fully addresses the key elements for the sustainable development of aquaculture (i.e. policy framework, capacities, biosecurity, impact on environment and public health, value chain, and inclusiveness).

1.1.2 Stakeholder analysis

There are several stakeholders with different degrees of organisation that are key for the action. DoF under the Ministry of Livestock, Fisheries and Rural Development is responsible for fisheries and aquaculture in Myanmar/Burma and is the key institutional stakeholder. It has over 1,800 staff (with a total of around 200 officers) with its Regional and State Offices' sizes varying depending on the local importance of fisheries. The Ministry has been involved in the preparation of the action at all levels, from the Minister to DoF divisional officers and the disease laboratory. Other ministries share responsibilities in relevant areas, including notably the Ministry of Environmental Conservation and Forestry, which is heavily engaged

[12] A partnership-based initiative that was triggered and established as a strategic and long-term response to the devastating impacts of the Indian Ocean Tsunami in 2004 and the continued degradation of coastal ecosystems (www.mangrovesforthefuture.org)

in land use policy and in charge of authorising and monitoring the environmental impact of aquaculture. Other relevant governmental stakeholders would include the Ministry of Labour, Employment and Social Security, and the Ministry of Social Welfare, Relief and Resettlement (responsible for coordinating Disaster Risk Reduction and gender policy).

As far as the private sector is concerned the key stakeholder is the MFF, a non-governmental organisation created in 1998 to encourage, support and promote the development of the fisheries sector in Myanmar/Burma. The MFF offers a representation platform for the private sector encompassing 10 associations (Myanmar Shrimp Association, Myanmar Fish Farmers Association, Myanmar Crab Entrepreneurs Association etc.) which have both national and local coverage in which both small scale farmers and larger size operations are represented. The MFF has been deeply involved in the preparation of the action and has prepared a short position paper outlining their suggestions on how to effectively provide support to the sector.

The Fisheries Research and Development Network (FRDN) is a multi-sector network and learning platform, set up with the support of WorldFish, with a national body based in Yangon and two regional technical working groups in the Ayeyarwady Delta and Central Dry Zone. FRDN brings together different sector stakeholders to design and deliver research and development projects. FRDN will be instrumental for collaboration and network opportunities between government agencies, NGOs, universities and the private sector working in the fisheries and aquaculture sector. FRDN has the potential to become an innovative learning platform to engage the sector in better understanding how small-scale fishery production systems can be sustained.

The Myanmar Environment Rehabilitation-conservation Network (MERN) is a network of 20 NGOs engaged in coastal rehabilitation activities established in response to cyclone Nargis in 2008, and the lead partner for mobilizing the Mangroves for the Future initiative.

The action will work closely with the SUN Multi Stakeholder Platform and Zero Hunger Challenge as well as with the Myanmar Nutrition Technical Network which includes UN agencies as well as selected international NGOs. These platforms are expected to play an advisory role to the Central Board for Food and Nutrition that was recently established to review the National Plan of Action in Food and Nutrition.

Smallholders and homestead (family level subsistence and unregistered) farms will be central actors due to the high potential for aquaculture to increase income and improve nutrition. It is estimated that there are more than 200,000 backyard ponds in the Ayeyarwady Region alone, and there are certainly many more in other areas. They receive technical support from a number of NGOs (in part EU-funded) on integrated fish farming, but neither the homestead farmers nor the NGOs are organised in specific aquaculture networks to share experiences.

The solar salt farmers of the Delta and Mon States are organised in associations that, among other areas, work on improving production techniques and quality. They are already involved with success in the EU-funded demonstration on Artemia and they are taking a very proactive role in the dissemination of the results at local level.

DoF data indicate that about 216,000 people are involved in the sector but without differentiation between farmers and employees. It is evident that aquaculture provides an important source of employment, especially for landless families, but for the moment there is no trade union specific to the aquaculture sector and not much is known about the working conditions of labourers, particularly women, in the value chain.

There are three universities that are currently involved in research and teaching on aquaculture through their marine biology departments (Yangon, Pathein and Mawlamyine)

but a dedicated curriculum has not yet been developed. They are very committed to the development of the sector but their efforts are undermined by a lack of funds and capacity.

At the moment there are no educational institutions in Myanmar/Burma providing technical and vocational curricula in aquaculture. The DoF operates three fisheries training centres (Yangon, Ayeyarwady and Sagaing Regions) where they provide ad hoc short courses including on aquaculture techniques (33 courses in 2013/14). They report a great demand for dedicated curricula that could be developed as part of the activities of the 3 training centres or by other education institutions. The DoF aims to promote the establishment of dedicated Fisheries Extension and Vocational Training Institutes.

Building on the consultations during the formulation of the action, the MFF, the DoF and the three universities have established a national Steering Committee on Aquaculture. The project will seek to involve all relevant stakeholders, including civil society organisations in the implementation of the action, especially through the stakeholders' platform that will have to be created for the National Aquaculture Strategy.

1.1.3 Priority areas for support/problem analysis

As already identified in the Multiannual Indicative Programme (2014-2020), approximately one third of Myanmar/Burma's children suffer from chronic undernutrition (stunting), the nationwide prevalence of moderately underweight children is 32% and the average proportion of total household expenditure on food is 68%.

Fish is the most important source of animal protein (providing more than 70%) with average consumption levels estimated from 20 to over 40 kg per person per year. With significant levels of undernutrition in the country, these figures are likely to hide a large diversity of consumption patterns (and nutritional significance) between regions and households, and possibly within households, given the high levels of child undernutrition. Aquaculture has grown significantly in the past decade but only accounts for 22% of the total fish production volume (compared to >35% in Indonesia, >60% in Bangladesh, 57% in Vietnam and 70% in China).

There are a number of challenges that hamper the ability of Myanmar/Burma to realise its aquaculture potential. These are a combination of poor policies and lack of private and public investments during the 60 years of military regime, combined with the devastating effects of natural disasters including cyclones Nargis (2008) and Giri (2010). In this context the sector has progressively slipped into a state of chronic underdevelopment with production concentrated in a few large farms and limited small-scale production.

The main challenges for the sector and the priorities to support the sustainable development of aquaculture in Myanmar/Burma are reflected in the choice of activities under the action and are expected to have a positive impact on the nutrition situation. They include:

- Sector strategy and policies based on sound data – there are neither reliable data, nor a strategic plan or policies. The land use policy places aquaculture in a subsidiary role to agriculture, creating major obstacles for smallholders in converting agricultural land into ponds. The preparation of a National Aquaculture Plan would provide an ideal platform for discussion between sector stakeholders.
- Availability of quality inputs – the production of quality seeds is a major challenge for Myanmar/Burma's aquaculture. Hatchery operations are undermined by poor

management, diseases and by the lack of locally produced Artemia[13]. A recent EU-funded trial has demonstrated that Artemia can be produced locally in salt ponds, but further investments and knowledge transfer are needed. Many hatcheries and salt ponds have not yet recovered from cyclone Nargis (2008)[14]. Imported seeds – including fish fry and shrimp larvae – are often of low quality and affected by diseases. Adult feed for farms is available locally but the quality is reportedly neither consistent nor certified.

- Management of hatcheries and farms – both small and large scale operations – are undermined by a lack of knowhow and technology, resulting in huge losses due to poor management and diseases. This in turn results in the increased use of antibiotics and other chemicals which in turn increase risks for the environment and public health. This is a particularly acute concern among smallholders.
- Biosecurity – government institutions lack the capacity to put in place adequate measures of disease prevention and control at the production sites, during post-harvest stages and on import and export. The private sector, especially smallholders, is affected by huge production losses due to diseases with limited knowledge or resources to address the issue.
- Participation of smallholders in the value chain – all the challenges particularly affect small farms. The main ones are the restrictions in converting paddy fields into fish ponds, as well as the lack of capacity and capital to access services, innovation and quality inputs. As a result, smallholders are low in number and barely involved in the value chain. It is necessary to support measures that facilitate their access to services, innovation, capital and markets.
- Environmental impact – government institutions lack the capacity and the legal framework to regulate the sector and monitor its impact on the environment. The sustainable intensification of aquaculture requires the establishment and enforcement of strict limits and a careful monitoring of farming practices.
- Climate – the cyclones in 2008 and 2010 have proven that coastal aquaculture in Myanmar/Burma is extremely vulnerable to meteorological disasters. This vulnerability is worsened by the progressive reduction of the mangrove buffers, which have been cut to make space for ponds and for other uses (charcoal), as well as by a lack of investments in proper maintenance of the ponds. Seasonal flooding affects inland aquaculture farms to differing degrees every year.
- Research & Development (R&D), education and training – Myanmar/Burma's aquaculture is severely affected by the shortage of R&D, by the lack of satisfactory university curricula, and by the lack of technical and vocational training institutions that could provide a skilled workforce for the sector.
- Labour/social issues in the value chain – according to the International Labour Organisation (ILO), aquaculture and processing in Myanmar/Burma do not yet pose a major problem, mostly due to the scarce development of the sector. This however is an issue to keep in check if investments will be driving large operations towards

[13] The micro crustacean Artemia is produced in salt ponds in a number of countries around the world but only on a pilot scale in Myanmar. Artemia cysts, once they are collected and dried can be stored and used as food in hatcheries. Myanmar is currently facing challenges to source high quality Artemia cysts on international markets due to scarce availability and high market prices.

[14] Out of 22 reported prawn hatcheries in the country, only 4 are currently in operation.

intensification. The joint EU/ILO project 'Strengthening the impact on employment of sector and trade policies' (see 3.2 below) will help identify potential emerging issues to be addressed under the action.

- Contribution of aquaculture to nutrition – while fish is the primary source of animal protein, aquaculture still represents a small proportion of total fish consumption in comparison with neighbouring countries. Availability and access to fish from aquaculture varies across regions and households due to localisation of production, relatively high prices, difficult logistics and losses caused by poor post-harvest handling. Because of seasonality, poor infrastructure (transport and electricity) and lack of post-harvest technology, a large part of the fish are consumed dried or as fish paste with a significant loss in terms of nutritional value compared to fresh or frozen.

The project will seek to conduct a wide range of baseline assessments and put in place adequate monitoring structures at the onset, including for environment, labour conditions, markets and other relevant social indicators.

2 RISKS AND ASSUMPTIONS

Risks	Risk level (H/M/L)	Mitigating measures
Natural disasters (e.g. cyclones, floods) and diseases undermine the development of aquaculture	H	The introduction of new technologies needs to factor in disaster risk reduction. A link can be made with ECHO's disaster preparedness activities in the coastal areas. Strengthening of biosecurity management.
Limited implementation capacity of institutions affects the pace of implementation of the action	H	Institutional strengthening.
Limited access to financing for urgent investment needs among smallholders affects development of the sector and impact of capacity development.	H	Roll-out of primary cooperatives or micro-finance schemes among smallholders. Strengthening of links with financial institutions targeting rural areas.
Political instability hampers transition and implementation of development plans	M	Political dialogue and peer pressure.
Conflict and violence affect rollout of the action (especially in Rakhine State)	M	Conflict sensitivity approach and maximum synergies with other projects. Do-no-harm approach. Baseline assessment and regular monitoring of conflict-sensitive issues.
Limit to land conversion to aquaculture use among smallholders	M	Derogations are already granted at village level for the conversion. Institutional support for reform of the current rules.
Emerging labour rights issues in the value chain, particularly for women and children	M	Other EU projects, including with ILO on 'strengthening the perspective on employment of trade and sectoral policies', pay special attention to this issue.

Lack of political buy-in and stakeholders' engagement in aquaculture	L	The National Aquaculture Development Plan will provide a basis to highlight the importance of the sector.
Aquaculture fails to attract private investments	L	The opening of the EU market and the growing international demand.
Resistance of private sector to adopt more sustainable practices	L	Technical demonstration of sustainable practices involving mangrove replanting in coastal areas. Information on buyers' requirements on sustainability will be disseminated. Demonstration of economic benefits of certification schemes.

Assumptions
• The government continues the reforms to improve the business environment and attract investment; • The demand of fish continues to grow domestically and internationally including in the EU, despite the economic crisis; • Technological solutions that have been successful in other countries can be adapted to Myanmar/Burma conditions.

3 LESSONS LEARNT, COMPLEMENTARITY AND CROSS-CUTTING ISSUES

3.1 Lessons learnt

The EU has extensive experience in supporting aquaculture in the ASEAN region. A 2014 review of 12 ASEAN-EU aquaculture projects[15] highlighted the importance of supporting governance, social responsibility, market access and trade, post-harvest issues, processing and food safety, climate change resilience and adaptation, and improved productivity and income, research & development and training. The same review stresses that while technical issues were adequately addressed and resolved by the projects, the introduction of social innovation remains a challenge. Furthermore, at the latest EU-ASEAN Consultation on Aquaculture[16], a consensus was reached that the priority for contributing to the global seafood security challenges is to ensure a sustainable intensification of aquaculture farming practices through:

1) a holistic approach to animal health management,
2) more ecosystem-based farming practices,
3) the development and application of appropriate environmental planning/zoning,
4) a focus on maximising feed security & safety, and
5) ensuring optimal socio-economic conditions for farmer communities.

At the national level the EU has supported a limited number of small scale aquaculture projects at village level under the Livelihoods and Food Security Trust Fund (LIFT). The EU is the largest contributor to this multi-donor fund. The limited success of LIFT aquaculture projects highlighted the technical complexities of aquaculture and the importance of joining forces with a knowledgeable technical partner with relevant experience in pro-poor

[15] "ASEAN research landscape in aquaculture: Opportunities for investments and cooperation in science and technology for aquaculture development" supported under the EU "READI Science and Technology" programme.

[16] EU DG Research & Development. 25-26 August 2014, Jakarta, Indonesia

aquaculture. It also demonstrated the need to develop a more comprehensive approach. Additionally, the EU has supported the preparation of the National Residue Monitoring Plan and the upgrade of the certification capacity of the Department of Fisheries. In recent months the Better Training for Safer Food (BTSF) initiative implemented by DG SANTE has supported pilot activities to improve management of shrimp hatcheries and to launch production of quality Artemia food for hatcheries in local salt ponds. The main lessons learnt from these activities are that:

1) the geo-climatic conditions of Myanmar/Burma are conducive for a significant upscaling of aquaculture;
2) the challenges faced by the sector are so large and so specific that they require a comprehensive sector / value chain approach, especially in support of the institutional framework;
3) a strategic plan to guide aquaculture in the direction of sustainability is an absolute priority before private interests prevail;
4) it is important to create a network of NGOs, universities and other stakeholders involved in aquaculture to improve technical capacity and harmonise approaches.

3.2 Complementarity, synergy and donor coordination

The action is highly complementary with the interventions funded by the EU and other donors under LIFT. While LIFT interventions focus mostly on nutrition and livelihoods aspects of aquaculture, this action seeks to promote the conditions for the successful coexistence of commercial scale and small family farms. Key to this coexistence is the creation and support for a strong institutional and regulatory framework aimed at protecting smallholders from the detrimental effects of large investments in the sector.

The action has clear complementarities with the EU-funded (EUR 10.5 million) Trade Development Programme (TDP). This action is implemented by GIZ and will run until December 2017. It seeks to contribute to the enhancement of inclusive economic growth in Myanmar/Burma by enabling the country to take advantage of its re-integration into the world trading system, and the opportunities for trade and investment. The project features four components including one on food safety and Sanitary and Phytosanitary Standards (SPS) which will support the improvement and certification of quality standards especially for fishery products. This component is significant in terms of budget and includes extensive work with the food safety inspection authorities, as well as the refurbishment and upgrade of the DoF food safety laboratories. The action will seek to integrate this work where necessary and complement it in areas like disease monitoring and control that are not covered by TDP.

Myanmar/Burma has been selected as one of the beneficiary countries of the project ‘Strengthening the impact on employment of sector and trade policies’ funded by the EU under the thematic programme Investing in People. The project, which started in the second half of 2015, is co-financed and implemented by ILO and will support the country in assessing and addressing the effects of trade on employment. It will guide the process for harnessing international trade and trade-related foreign investment to provide more opportunities for decent work and raising the number of workers who are productively employed. It is expected that the project will help highlight potential labour issues arising from the intensification of aquaculture investments and provide recommendations to be followed up by the action.

Under the Non State Actors thematic programme, the EU is providing support to the International Union for Conservation of Nature (IUCN)[17] to strengthen the management, technical, and operational capacity of MERN and its members to (1) design, deliver, and learn from field projects and (2) influence policy including the NBSAP for the Mangroves for the Future initiative.

The action will complement other donors' interventions and integrate a sector-wide approach including a US-funded (EUR 3.5 million) project focused on academic exchanges, an Australia-funded project to improve research and development of inland and coastal fisheries, a UN Food and Agriculture Organisation (FAO) project on mangrove-friendly aquaculture in the Ayeyarwady Region, a South Korea-funded project on inland aquaculture in the Mandalay region and a Japan-funded project on inland aquaculture in the Dry Zone. The German Ministry for Economic Cooperation and Development (BMZ) has agreed its involvement in aquaculture with the government and will provide co-financing for this action.

Several donor-funded projects - ongoing or in the pipeline - focus on different aspects of marine fisheries management: France (pipeline EUR 44 million), Switzerland (ongoing EUR 28 million), Denmark (pipeline, about EUR 40 million) and Norway (pipeline). The main complementarity with these projects lies in the possibility to integrate coastal aquaculture and better fisheries management to reduce pressure on wild fish stocks. This can be key for poverty reduction in rural areas in Myanmar/Burma.

Sector Working Groups have already been set up for most sectors but none coordinates fisheries-related interventions. Setting up a fisheries coordination network among donors, NGOs and local stakeholders is important to ensure coherence and prevent overlap projects.

3.3 Cross-cutting issues

The action addresses cross-cutting issues as it targets primarily environmental and social aspects of sustainability. Gender-based statistical data on aquaculture are not available but women represent the majority of the workforce in some stages of aquaculture value chains. In small scale and family farms they are traditionally in charge of the management of the backyard ponds, of selling surplus fish at the local markets, and of on-site drying and processing for the production of fish paste. In commercial size operations women represent the vast majority of the workforce in processing plants and in crab fattening farms.

The action will seek to promote better working conditions as well as female entrepreneurship, including by ensuring that women will be given equal access as men to innovation and skills development in the aquaculture value chain.

The action will have a positive impact on the environment by promoting mangrove reforestation in coastal areas as a means to improve natural productivity of ponds and improve climate resilience. By supporting specific targets under the NBSAP, the action will support the attainment of Aichi Biodiversity Targets 6 and 7 of the Convention on Biological Diversity. Environment-friendly ‘extractive practices’ aimed at containing eutrophication of water bodies will be demonstrated.

[17] www.iucn.org

4 DESCRIPTION OF THE ACTION

4.1 Objectives/results

The **overall objective** of the action is to contribute to poverty reduction and improved food security and nutrition in selected areas of Myanmar/Burma.

The **specific objective** is sustainably intensified aquaculture. This will be attained by supporting the:

- scaling up of sustainable freshwater aquaculture to increase the availability of quality fish in the domestic market;
- environmental and productive recovery of coastal shrimp farms through ecosystem-based farming practices (including mangrove reforestation);
- demonstration and scaling up of a sustainable mud crab value chain to reduce pressure on wild resources;
- development of local hatcheries and the demonstration of environment friendly practices;
- introduction of measures to improve the access of vulnerable parts of the population to quality fish proteins from aquaculture;
- increased participation of vulnerable rural households, especially smallholders and the landless, in the aquaculture value chain.

The **expected results** are:

1. A conducive institutional and policy context for the inclusive and sustainable development of aquaculture;
2. Higher quality service provision in the aquaculture value chain;
3. Predictable, cost-effective availability of high quality inputs accessible to small-scale aquaculture farmers;
4. More efficient, resilient and sustainable aquaculture value chains;
5. Enhanced nutritional impact of aquaculture;
6. An inclusive aquaculture value chain that creates decent work opportunities for the most vulnerable, including women.

4.2 Main activities[18]

Result 1 – A conducive institutional and policy context for the inclusive and sustainable development of aquaculture

- Policy/expert advice for the drafting of the National Aquaculture Development Plan and support to the consultation process during the inception phase of the action;
- On the basis of the NADP, policy/expert advice for the review of the regulatory framework (SPS regulation, land reform, spatial planning, labour law, biodiversity conservation etc.).
- Capacity development for stakeholder coordination aimed at guiding the development of research, training, extension and other services to aquaculture.

Result 2 - Higher quality service provision in the aquaculture value chain

- Technical cooperation with stakeholders providing services in aquaculture, including central and local government institutions (especially DoF), MFF (including its product and regional associations) and NGOs. Improving extension and support services (e.g.

[18] All activities mentioned below are indicative and will be eligible for Overseas Development Assistance (ODA) reporting.

farmer field schools), establishing a Network of Aquaculture Technology Centres, scaling up implementation of Good Aquaculture Practices (GAqP), research, statistical data collection and analysis, technical and advocacy capacity;

- Technical cooperation with DoF on SPS issues, including on animal and public health (disease monitoring and control, biosecurity, anti-microbial resistance, water quality analysis), food safety (e.g. risk management, hygiene, residue monitoring, traceability etc.) for export and domestic consumption;
- Technical cooperation with universities to improve domestic research capacity, develop dedicated aquaculture curricula and establish an Academy of Fisheries and Aquaculture. This will include training of master-level students as well as support to the universities' aquaculture stations and other research activities linking with the existing operational research networks, the ASEAN-FEN (Fisheries and Education Network)[19], the EU-EATiP (European Aquaculture Technology and Innovation Platform) and other ongoing projects in the fields of nutrition, education, research and business opportunities especially those under the Horizon 2020 work programme 2016-2017 in the area of food research;
- Technical cooperation with the DoF Fishery Training Centres and other relevant institutions to develop technical and vocational training courses (Fisheries Extension and Vocational Training Institutes).

Result 3 - Predictable, cost-effective availability of high quality inputs accessible to small-scale aquaculture farmers

- Technical cooperation and supplies to scale up ongoing EU-funded pilot activities to locally produce Artemia in salt ponds for use in hatcheries;
- Technical cooperation to improve hatchery operations for fish, prawn, shrimp and soft-shell crab in order to reduce wild seed collection. This includes activities aimed at supporting the introduction of small scale backyard hatcheries to catalyse the sector and provide quality seed for use in local on-growing (extensive to semi-intensive) practices, and the development of inclusive supply chain interactions between small and large scale hatcheries.
- Technical cooperation and supplies to restore and upgrade DoF hatcheries to increase the supply of quality genetics;
- Technical cooperation and testing equipment to improve feed quality and introduce feed quality certification schemes.

Result 4 - More efficient, resilient and sustainable aquaculture value chains

- Technical cooperation and grants to facilitate access to finance among smallholders for investments in technological advances and resilience (including reinforcement of embankments and pond re-excavation). This activity will address in particular the obstacles limiting access by aquaculture farmers to existing lenders including commercial banks, development banks and microfinance institutions. This activity will support in particular disaster-affected smallholders, women, marginal salt farmers and other vulnerable households;
- Technical cooperation and grants to demonstrate and scale up ecosystem-based and climate resilient farming techniques, including mangrove rehabilitation. These

[19] This network was formerly established in December 2014 by the rectors of the 'founding partners' and they are accepting 'associate partners'. The universities of Yangon, Pathein and Mawlamyine have expressed interest in developing aquaculture curricula at their institutions and to apply for associate membership in ASEAN-FEN.

activities will build amongst others on the experience of the Mangroves for the Future initiative and will seek to introduce viable farming techniques, also by supporting the introduction of sustainability certifications and by supporting access to financial support mechanisms that account for the typically longer lead-times of ecosystem-based investments. These activities will be especially targeted to Rakhine State and Ayeyarwady Region;

- Capacity development on climate change adaptation, disaster risk reduction and spatial planning among farmer groups and their communities;
- Technical cooperation to strengthen the understanding and management of biodiversity;
- Technical cooperation to support the conversion of solar salt ponds into integrated farm operations for salt and Artemia (cysts and protein biomass) in the dry season and aquaculture species in the rainy season, with significant socio-economic impact for the many thousand households living under critical subsistence survival conditions.

Result 5 - Enhanced nutritional impact of aquaculture

- Technical cooperation and grants to scale up sustainable aquaculture systems in fish deficit areas. The activity will build on the experience of WorldFish and other stakeholders in identifying sustainable aquaculture investments that can make significant differences to the income and nutrition of poor and vulnerable households in fish deficit areas. This might include support to small-scale pond aquaculture and backyard aquaculture in the Central Dry Zone (tilapia, catfish, eel etc.), development of cold water fish farming (sturgeon in the northern regions), genetic conservation and improvement of indigenous species (such as *Cyprinus intha* or *Nga Phane*), cage-based fish culture in rivers and reservoirs, and integrated rice-fish culture;
- Technical cooperation with government institutions, NGOs and other stakeholders to ensure that a greater availability of fish from freshwater and coastal aquaculture translates in greater access to quality proteins by vulnerable households. This might include support on species selection based on viability and nutritional value, market surveillance, information campaigns and other activities identified by SUN and other relevant stakeholders' platforms;
- Technical cooperation and grants to enhance the nutritional contribution of aquaculture through improved post-harvest processes. This activity will include research and technology transfer aimed at reducing post-harvest losses (in particular during transportation) and the loss of nutritional value during processing (primarily fish/shrimp paste production and drying). Particular attention will be paid to facilitating access to fish for communities far removed from production areas and to the reduction of seasonal variations in protein intake;
- Technical cooperation and grants on improvement of salt quality. This activity will include research and technology transfer aimed at improving the quality of solar salt and possibly at introducing fortification (iodine, iron).

Result 6 – An inclusive aquaculture value chain that creates decent work opportunities for the most vulnerable, including women

- Technical cooperation with government institutions and other stakeholders involved in TVET (Result 2) to ensure participation of rural households (especially landless and women) to the training programmes and to the value chain as skilled labour force;
- Technical cooperation on fundamental principles and rights at work. This activity will build primarily on the EU/ILO project ‘Strengthening the impact on employment of sector and trade policies’;

- Support for measures that empower women in the aquaculture value chain (decision making, economic actors, enabling environment for child care).

4.3 Intervention logic

The activities will be structured in components corresponding to the six expected results. The components are highly complementary and aim to promote a model of aquaculture development that is socially and environmentally sustainable, and that results in tangible nutritional gains. Components 1 to 3 will address the key limiting factors for the development of aquaculture: the lack of stakeholders' coordination and policy direction, of adequate support services (including animal and public health, extension, research and development, training) and quality inputs (genetics and feed). Component 4 will support mainly access to credit to facilitate efficiency gains in the farms, as well as the demonstration of ecosystem-based farming techniques (combining mangrove reforestation with shrimp production). Component 5 seeks to ensure that productivity gains in aquaculture translate in greater access to fish by vulnerable households by improving post-harvest and market distribution, and by promoting aquaculture in non-traditional producing areas. Component 6 aims at ensuring that vulnerable households, including rural landless and women, benefit from the development of the sector through quality employment opportunities. The intervention logic has been extensively discussed and agreed with government, private sector and other key stakeholders. The success of the action depends to a large extent on their continued commitment to credibly engage in the activities and to pursue a sustainable and inclusive development model for Myanmar/Burma's aquaculture.

5 IMPLEMENTATION

5.1 Financing agreement

In order to implement this action, it is foreseen to conclude a financing agreement with the partner country[20], referred to in Article 184(2)(b) of Regulation (EU, Euratom) No 966/2012.

5.2 Indicative implementation period

The indicative operational implementation period of this action, during which the activities described in section 4.1 will be carried out and the corresponding contracts and agreements implemented, is 72 months from the date of entry into force of the financing agreement.

Extensions of the implementation period may be agreed by the Commission's authorising officer responsible by amending this decision and the relevant contracts and agreements; such amendments to this decision constitute technical amendments in the sense of point (i) of Article 2(3)(c) of Regulation (EU) No 236/2014.

5.3 Implementation modalities

5.3.1 Indirect management with a Member State agency

This action will be implemented in indirect management with GIZ in accordance with Article 58(1)(c) of Regulation (EU, Euratom) No 966/2012. This implementation entails the completion of all activities as described above in section 4, notably the mobilisation of all the necessary expertise, as well as office facilities and equipment, assets and logistical support. GIZ will ensure regular reporting, monitoring and communication, including effective EU visibility.

[20] If it will prove impossible to sign a financing agreement, this action will be implemented without financing agreement.

This implementation is justified because GIZ has a demonstrated experience and technical competence in aquaculture. They have proven management capacity by successfully implementing other actions of similar size in Myanmar/Burma and in the region. GIZ has an established presence in Myanmar/Burma and has already been implementing activities in the aquaculture sector as part of the EU-funded Trade Development Programme.

The entrusted entity would carry out all the budget-implementation tasks under this action consisting of carrying out procurement and grant award procedures, and awarding, signing and executing the resulting procurement and grant contracts, notably accepting deliverables, carrying out payments and recovering the funds unduly paid.

5.4 Scope of geographical eligibility for procurement and grants

The geographical eligibility in terms of place of establishment for participating in procurement and grant award procedures and in terms of origin of supplies purchased as established in the basic act and set out in the relevant contractual documents shall apply, subject to the following provisions.

The Commission's authorising officer responsible may extend the geographical eligibility in accordance with Article 9(2)(b) of Regulation (EU) No 236/2014 on the basis of urgency or of unavailability of products and services in the markets of the countries concerned, or in other duly substantiated cases where the eligibility rules would make the realisation of this action impossible or exceedingly difficult.

5.5 Indicative budget

	EU contribution (EUR)	**Indicative BMZ contribution (EUR)**
5.3.1 Indirect management with GIZ	19 750 000	2 500 000
5.8 Evaluation and 5.9 Audit	250 000	N.A.
Total	20 000 000	2 500 000

5.6 Organisational set-up and responsibilities

A Steering Committee for the development of the aquaculture sector in Myanmar/Burma has recently been established. It includes representatives of the DoF, the MFF and the three universities with activities in the sector. Once the action is approved, a programme Steering Committee (PSC) will include government representatives from various relevant Ministries, the EU and the implementing partner. The PSC will oversee the strategic planning of the action and ensure that it remains in line with overall national, regional and local priorities. It will meet at least four times a year.

Both the DoF and the MFF have shown strong ownership of the action and willingness to be directly involved in its implementation. However, their project management capacity is already overstretched and none of them has experience in the management of a project of this size. Building on the experience of the Trade Development Programme, a dedicated Project Management Unit (PMU) will be established in the DoF or in the MFF. The PMU will carry out day-to-day management and support the stakeholders in the planning, definition, further development and revision of activities. GIZ will identify and recruit suitable PMU staff, and be responsible for training and coaching those staff in their duties. The action will provide the PMU with essential office equipment. This process will develop strong ownership and create long-term sustainability.

5.7 Performance monitoring and reporting

A results-based monitoring and evaluation (M&E) framework will be developed that will allow project stakeholders to monitor impact and effectiveness. The framework will include a full set of output and outcome indicators, and an activity-based budget linked directly to goals and objectives. The M&E framework will be agreed by the PSC.

The day-to-day technical and financial monitoring of the implementation of this action will be a continuous process and part of the implementing partner's responsibilities. To this aim, the implementing partner shall establish a permanent internal, technical and financial monitoring system for the action and elaborate regular progress reports (not less than annual) and final reports. Every report shall provide an accurate account of implementation of the action, difficulties encountered, changes introduced, as well as the degree of achievement of its results (outputs and direct outcomes) as measured by corresponding indicators, using as reference the logframe matrix. The report shall be laid out in such a way as to allow monitoring of the means envisaged and employed, and of the budget. The final report, narrative and financial, will cover the entire operational implementation period.

The Commission may undertake additional project monitoring visits both through its own staff and through independent consultants recruited directly by the Commission for independent monitoring reviews (or recruited by the responsible agent contracted by the Commission for implementing such reviews).

5.8 Evaluation

Having regard to the importance of the action, a mid-term and a final evaluation will be carried out for this action via independent consultants contracted by the Commission or the implementing partner.

The mid-term evaluation will be carried out for problem solving and learning purposes, in particular with respect to achievements and lessons learnt in order to fine tune project objectives and modalities.

The final evaluation will be carried out for accountability and learning purposes at various levels (including for policy revision), taking into account in particular the fact that rural development is one of the focal areas under the Multiannual Indicative Programme (2014-2020) for Myanmar/Burma.

The Commission shall inform the implementing partner at least one month in advance of the dates foreseen for the evaluation missions. The implementing partner shall collaborate efficiently and effectively with the evaluation experts, and inter alia provide them with all necessary information and documentation, as well as access to the project premises and activities.

The evaluation reports shall be shared with the partner country and other key stakeholders. The implementing partner and the Commission shall analyse the conclusions and recommendations of the evaluations and, where appropriate, in agreement with the partner country, jointly decide on the follow-up actions to be taken and any adjustments necessary, including, if indicated, the reorientation of the action.

Indicatively, two contracts for evaluation services shall be concluded under a framework contract respectively just after the first half of the implementation period and just after the end of the operational implementation period[21].

5.9 Audit

Without prejudice to the obligations applicable to contracts concluded for the implementation of this action, the Commission may, on the basis of a risk assessment, contract independent audits or expenditure verification assignments for one or several contracts or agreements.

Indicatively, one contract for audit services shall be concluded under a framework contract just after the end of the implementation period, upon reception by the EU of the final financial report[22].

5.10 Communication and visibility

Communication and visibility of the EU is a legal obligation for all external actions funded by the EU.

This action shall contain communication and visibility measures which shall be based on a specific Communication and Visibility Plan of the Action, to be elaborated at the start of implementation and supported with the budget indicated in section 5.5 above (a specific Communication and Visibility budget will be earmarked under the funds allocated to GIZ).

In terms of legal obligations on communication and visibility, the measures shall be implemented by the Commission, the partner country, contractors, grant beneficiaries and/or entrusted entities. Appropriate contractual obligations shall be included in, respectively, the financing agreement, procurement and grant contracts, and delegation agreements.

The Communication and Visibility Manual for European Union External Action shall be used to establish the Communication and Visibility Plan of the Action and the appropriate contractual obligations.

[21] Where no financing agreement will be concluded, the financing of the evaluations shall be covered by another measure constituting a financing decision.

[22] Where no financing agreement will be concluded, the financing of the audit shall be covered by another measure constituting a financing decision.

APPENDIX - INDICATIVE LOGFRAME MATRIX

The activities, the expected outputs and all the indicators, targets and baselines included in the logframe matrix are indicative and may be updated during the implementation of the action without an amendment to the financing decision. The indicative logframe matrix will evolve during the lifetime of the action: new lines will be added for listing the activities as well as new columns for intermediary targets (milestones) when it is relevant and for reporting purpose on the achievement of results as measured by indicators.

	Intervention logic	Indicators	Baselines (incl. reference year)	Targets (incl. reference year)	Sources and means of verification	Assumptions
Overall objective: Impact	Contribute to poverty reduction and improved food security and nutrition in selected areas of Myanmar/Burma	MIP indicator 1.3.2. Household Dietary Diversity Score (disaggregation focus on young children, reproductive age women and adolescent girls) MIP indicator 1.3.1. % of stunting in children under 5 in rural areas / DEVCO Results Framework 1.9 - Prevalence of stunting (moderate and severe) of children aged below five years	(2013) 5.34 (2013) 35.1%	15% increase (2020) To be defined (TBD) in the NPAFN	LIFT[23] reports (Baseline Survey 2013) Integrated Household Living Conditions Assessment NPAFN SUN assessments	
Specific objective Outcome	Sustainably intensified aquaculture	Acreage, production and jobs in aquaculture [linked to MIP indicator 1.2.2. Productivity gain resulting from use of improved agricultural practices] / DEVCO Results Framework 1.8 - Agricultural value added per hectare Compliance with Aichi Biodiversity Targets 6 and 7 DEVCO Results Framework 1.24 - State of global	450 323 Acres, 964.26 Tons (2013/14), 125 978 full time and 90 306 part time employees (2012/13) TBD in NBSAP (2015)	TBD in the NADP TBD in NBSAP	Fishery Statistics (Department of Fisheries) NBSAP progress reports	Political stability Continued support for the sustainable development of aquaculture No major shock or natural disasters

[23] LIFT: Livelihoods and Food Security Trust Fund in Myanmar (www.lift-fund.org)

		biodiversity				
Results: Outputs	Result 1 - A conducive institutional and policy context for the inclusive and sustainable development of aquaculture	Availability of NADP Updates of legislation and policies on aquaculture with a particular focus on sustainability and development of small-holder farms	No plan (2015) Existing legal framework (2015)	Plan finalised (2016) Revised legal framework as recommended in NADP (2020)	Government document Progress reports on NADP and NBSAP	Continued resolve of the stakeholders to engage
	Result 2 - Higher quality service provision in the aquaculture value chain	Improved animal health and disease control services by the Department of Fisheries	Analyses: 1790 water, 111 soil; 27 disease; 30 Polymerase Chain Reaction (PCR) tests for diseases (2013/14)	50% increase for water and soil; 400% increase for PCR and disease (2020)	MYSAP reports Government data University data	No major disease outbreak or environmental contamination Continued availability of suitable students for curricula and for master-level courses Trainees continue to apply improved practices in their farms
		Number of students post-2015 from Myanmar/Burma with master-level diploma on aquaculture through partners of the EU-EATiP	None (2015)	30 (2020)		
		Number of higher education curricula dedicated to aquaculture (master level)	None (2015)	At least one (2020)		
		National Academy of Fisheries and Aquaculture established	None (2015)	1 (2021)		
		Number of Myanmar/Burma universities being an active member of the ASEAN-FEN	None	3 (2017)		
		DEVCO Results Framework 2.7: number of people receiving rural advisory services with EU support (through MYSAP)	None	TBD (2020)		
		Myanmar/Burma aquaculture products are authorised for export to the EU market [linked to DEVCO Results Framework 2.29: Number of countries whose capacity to	Not authorised (2015)	Authorisation confirmed (2016-20)		

		trade across borders has improved with EU support] Fisheries Extension and Vocational Training Institutes established	 None (2015)	 3 (2021)		
	Result 3 - Predictable, cost-effective availability of high quality inputs accessible to small-scale aquaculture farmers	Acreage of paddy land converted into paddy cum fish or freshwater ponds Acreage of integrated salt ponds with salt plus Artemia in the dry season and aquaculture species in the rainy season Number of local hatcheries producing quality shrimp post-larvae Number of local backyard hatcheries developed to provide quality fingerlings, fish fry and shrimp post-larvae Evolution in price of fingerlings and post larvae in Myanmar/Burma % of hatchery produced crablets used in mud crab production in Myanmar/Burma % certified feed in total feed production for aquaculture purposes in Myanmar/Burma	18 547 acres of paddy fields stocked (2012/13) Pilot basis (2014) 26 (2003) None (2015) None reported (2015) Average market prices of 2015 None, all (at least 10 million/year) collected from the wild (2015) None (2015)	50% increase of paddy cum fish; Freshwater ponds TBD (2020) 10 000 ha (2021) 25 (2020) TDB (2020) -25% (2020) 80% (2020) TBD (2020)	DoF data MFF data	No major disease outbreak or environmental contamination Domestic and international markets drive aquaculture development Regulations allow the conversion of paddy land into freshwater fish ponds
	Result 4 - More efficient, resilient and sustainable aquaculture value chains	Number of farmers accessing loans for investments in technological advances and resilience Average shrimp productivity in Northern Rakhine State Number of restored shrimp ponds in Northern Rakhine Percentage of fish and shrimp aquaculture produced	Limited (2015) 20 kg/ha/year (2015) Limited pilot activities (2015) 0% (2015)	TBD (2020) 2001 level i.e. 200 kg/ha/year (2020) 40 000 ha (2020) 5% (2020)	Financial inclusion surveys Trade data DoF data MFF data NBSAP progress reports	Continued availability of credit lines through microfinance institutions, banks and other lenders The political and security situation

		according to internationally recognized standards [Aichi Biodiversity Target 7.2.1]				in Rakhine State is increasingly conducive for development Government remains committed to the targets of the Convention on Biological Diversity Domestic and international markets drive the development of environment friendly value chains
		Number of pilot shrimp aquaculture certification schemes [Aichi Biodiversity Target 7.2.2]	None (2015)	2 (2020)		
		Availability of guidelines for fish feed production [Aichi Biodiversity Target 7.2.3]	None (2015)	1 (2020)		
		DEVCO Results Framework 2.25: Number of Micro, Small and Medium Enterprises (MSMEs) applying Sustainable Consumption and Production practices with EU support	None (2015)	500 (2020)		
		Quantity of genetically improved fingerlings produced in Myanmar/Burma	Limited (2015)	TBD (2020)		
		DEVCO Results Framework 2.6: Agricultural and pastoral ecosystems where sustainable land management practices have been introduced with EU support (number of hectares through MYSAP)	None (2015)	TBD (2020)		
	Result 5 - Enhanced nutritional impact of aquaculture	Increased share of aquaculture products in total fish consumption	20% (2015)	30% (2020)	Integrated Household Living Conditions Assessment	Nutrition remains high on the agenda of Government
		Increased average calory intake food supply diversity	2,355 kcal/capita/day 35% energy from non-staples (2013)	TBD in the NPAFN	Food and Nutrition Survey of Ministry of Health DoF data	
		% increase in aquaculture production in fish deficit areas, including cold water species in Northern regions	DoF Fishery statistics (2014) with breakdown by State/Division	TBD (2020)	National Plan of Action in Food and Nutrition	
		Increased access to fish from aquaculture in local markets by	To be compiled during inception	TBD (2020)		

		vulnerable households DEVCO Results Framework 2.9: Number of women of reproductive age and children under 5 benefiting from nutrition related programmes with EU support (through MYSAP)	None (2015)	TBD (2020)		
	Result 6 – An inclusive aquaculture value chain that creates decent work opportunities for the most vulnerable, including women	Number of graduates of specific TVET courses on aquaculture [DEVCO Results Framework 2.28: Number of people who have benefitted from VET/skills development and other active labour market programmes with EU support] Measures in place to follow up on labour issues in aquaculture identified under the EU/ILO project "Strengthening the impact on employment of sector and trade policies", in particular on freedom of association, compulsory labour and discrimination, child labour	Limited (2015) TBD	TBD (2020) TBD	Government data	Decent work remains high on the agenda of the Government