STDF Standards and Trade Development Facility

"Strengthening the national food control system in Kiribati, with particular attention to the fish processing sector" (STDF/PPG/657)

PART II - INVESTMENT PROJECT

"Design, Building and Development of the Kiribati 'One Health' Support Institute' (KOHSI)"

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Contents

1 INVESTMENT PROJECT

1.1 Rationale

The investment project purpose is to enhance the Government capability to deliver SPS services through newly developed testing services and enhanced capacities in the line Ministries to design, implement and evaluate SPS plans and measures.

The rationale for the central SPS support facility lies in the current lack of testing capability and the limitations of outsourcing, creating an obvious need to develop the local capacities for testing; as well as enhancing the enforcement mechanisms for agri-food safety and the coordination between Ministries (One Health perspective). In KV20, Kiribati aims at 'becoming a wealthy, healthy, and peaceful nation'. Ensuring health and wealth of I-Kiribati will require the use of a modern quality infrastructure, and more specifically those conformity assessment functions related to safety of goods and products placed on the market. It will also require that Kiribati actually implement 'One Health' approach by developing operational coordination of the SPS systems, chiefly by adopting joint risk assessment and coordinated risk management plans.

The proposed central SPS support facility is seen as a vehicle to facilitate the above realization of 'One Health' approach in Kiribati; hence the proposed name for the facility: Kiribati One Health Support Institute (KOHSI hereafter).

KOHSI, the central SPS support facility, is justified by enabling the provision of testing, fumigation and SPS services that will both enhance the protection of human health and the environment, and contribute to the development of the fisheries sector. Since the laboratory would be best managed as an autonomous entity, it has been proposed to create an institute dedicated to provide the services supporting the official controls across Ministries. However, there is a close connection between the testing and other SPS functions. The value of tests results is greatly increased when sampling is done properly and samples are well preserved and brought quickly to the lab. The correct interpretation of results allows informing the decisions on border controls, or monitoring adequately threats and trends for detecting crises. It is thus recommended to widen the institute role beyond testing and fumigation, to a range of services enabling the SPS system to perform better.

The choice of a central facility, as opposed to a network of discrete units in different Ministries is justified by economies of scale, synergies between Ministries (avoiding redundant equipment), and higher effectiveness.

- *Economies of scale*

The support functions (administration and quality management) will be distributed on several sections and will have lesser impact on operating costs. Compared to separate single labs, the cost of utilities, maintenance, general systems, and services will as well be distributed in a much larger number of tests; therefore, their share in test costs will be lower as compared to their share in individual labs. The same is true for the costs of calibration, equipment maintenance, training and qualification of staffs, since these operations can be pooled and their cost reduced.

- *Synergies*

With a central SPS facility, there will be no duplication of tests between ECD, KSVA, and the CA food: redundancy of investing in the same instruments across ministries will be avoided.

The central SPS facility, KOHSI, will allow all interested parties building up a comprehensive picture of environmental health issues, and understanding better the interaction between environment, animal and plant heath, food safety, and human health. The pooling and assessment of data sets from series of tests will allow producing more relevant and significant information to be shared by all concerned ministries.

- *Higher Effectiveness*

The production of services will be more efficient and effective, because of the combination of pooling of samples, specialization of instruments, polyvalence of technicians, planning of work, familiarity with methods, and better conditions for purchasing reagents and small tools.

The central laboratory within KOHSI will have comparatively less difficulties to gather a team; it would be easier to manage staff replacement and avoid loss of knowledge and skills in case of staffs moving away. Individual labs would have difficulties to properly train or supervise personnel, whereas this can be arranged more easily in the central lab. Because personnel in the central laboratory will carry out a large number of tests routinely, its staff will quickly become familiar at performing tests and will acquire skills for evaluating validity of results, fixing instruments problems, or ensuring internal calibrations. The quality management system would be more easily properly organized and maintained than it would be possible in separate laboratories.

1.2 Project Outline

The purpose of the project is to enhance the SPS system of Kiribati, through the increased availability of testing and fumigation services, and enhanced coordination and efficiency of the risk assessment and risk management functions. The project would be articulated in two phases: the first phase (3 ½ or 4 years until mid-2023) to set up the institute, build the laboratory and purchase equipment, and the second phase (6 years until 2029) to increase capacities, complete equipment and carry out skills transfer and training plans.

Setting up the new One Health support facility represents a challenge that will require continuous care and leadership over the two phases. Therefore, in addition to the investment in building and equipment, the Government of Kiribati will need 'soft' investment in the form of project management and support services. The realization of the SPS facility will involve consultation with several Ministries as well as with Ministry of Planning and Finance and the Development partners. There will be a need to assess and address issues over a wide range of technical, administrative and financial areas, for which Ministries' team may have insufficient time and limited skills to handle.

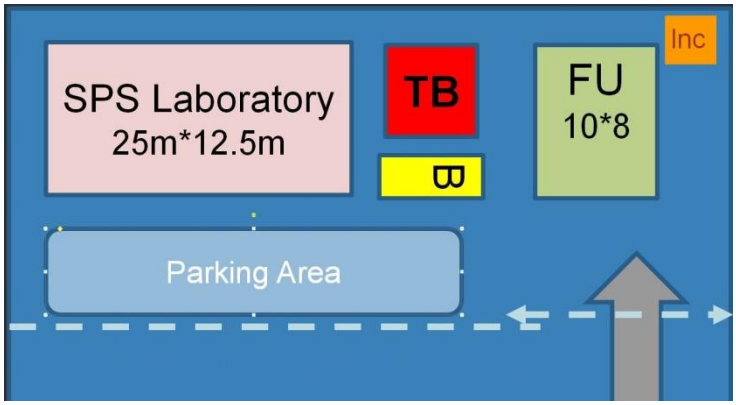
It seems therefore necessary to set up a Project Implementation Unit (PIU) that will lead in coordinating inputs, seeking various authorizations and decisions, mobilizing specialist services, administering tenders, and monitoring progress. The role of the PIU is detailed below in § 5.1

1.3 Infrastructure

The investment for infrastructure consists of a plot of land, the main building hosting laboratories and offices, a hangar hosting the fumigation activity, a technical building hosting rooms for power, water filtration and storage, and two slabs, to accommodate one the mobile quarantine lab (3.5 m* 15 m) and one the incinerator (2 m*3 m).

1.3.1 Land

The facility requires a parcel of size 3,000 m^2 (approx. 85m*35m), as show on the indicative layout below.



FU: fumigation Hangar; TB: Technical Building; B: mobile biology laboratory, Inc: incinerator

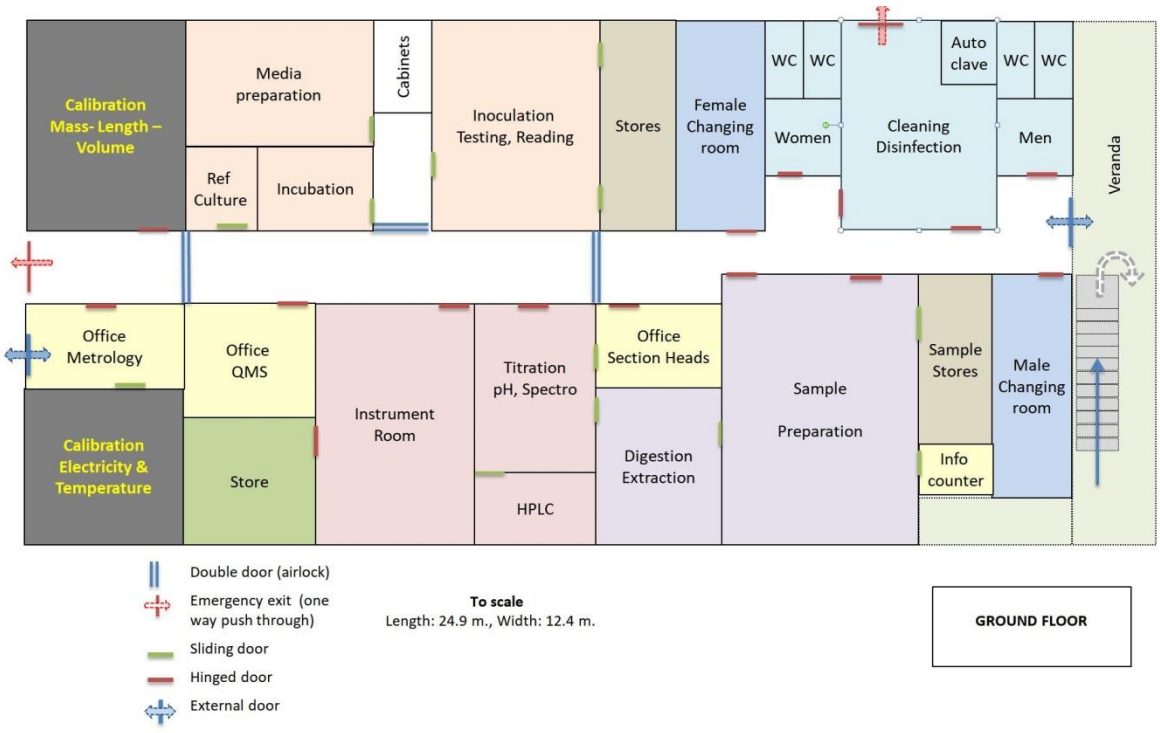
This land will accommodate the laboratory, the mobile biology laboratory for biosecurity section, a fumigation hangar, a technical building, a slot for an incinerator, and a parking area for about 20 vehicles.

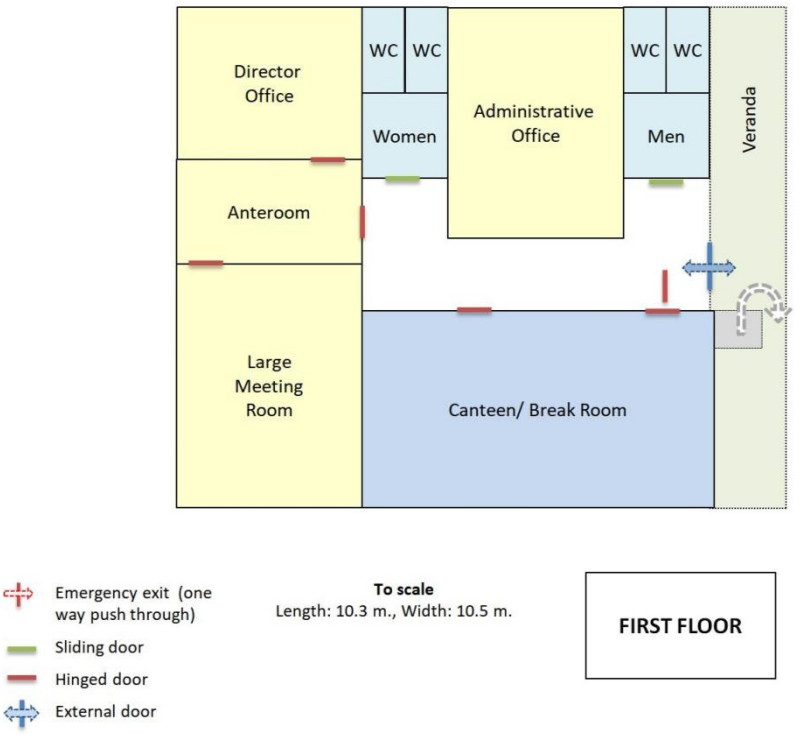
Once the site is allocated, the PIU will submit request to connect the site to power grid and water reticulation Within the facility, the lines for power, water and drainage will be designed and set as part of the overall engineering project.

1.3.2 Laboratory Building

A dual-storey building will be necessary, to reduce the ground footprint and costs of foundation infrastructure. The dimensions and building design should be finalized with the support of architect and civil engineering services, which should be secured during the preparatory phase of the investment project. The draft layout, shown on next page includes a veranda that will serve as a reception and waiting area.

The proposed building will have a ground footprint of about 310 m^2. The total floor area (both levels) is slightly below 420 m^2, while the room area reaches 308 m^2. The ground floor includes all the technical activities and the first floor accommodates the break room (canteen), offices, and meeting rooms.





The detail of rooms' dimensions and specifications is provided in Annex 2.

The laboratory building should have the following features or systems:

- Security: access to technical areas restricted by magnetic cards.
- Extraction of the air volume and replacement by filtered external air for reducing the possibility of air-borne contamination (bacteria, solvents, fumes...). Air filters shall guarantee the absence of physical contamination in the circulating air.

- Control of temperature and humidity of the circulating air, particularly for chromatography and calibration rooms.
- All floor and wall surfaces smooth, easily washable, and acid- and solvent-resistant for guaranteeing ease of cleaning and sanitation.
- Small windows with fixed panes of dual-layer tinted glass to limit heat exchanges.
- Adequate lighting to ensure easy reading of colours and instruments indications.
- A fire protection system with smoke detectors and temperature alarms.

1.3.3 Fumigation hangar

The hangar, with a footprint of 80 m^2 (approx. 8mx10m) should accommodate maximum two 20-feet containers as well as allow fumigating consignments in bulk under tarpaulins when necessary. It will include a small secure storage room for equipment and treatment products.

The steel beam structure will be built on a reinforced concrete slab. Walls and roofs will be made of insulated sandwich panels.

Since fumigation entails the use of toxic products under set security procedures, the hangar should remain well ventilated (roof extractors) and fitted with sufficient lightning.

1.3.4 Slot for the mobile biological laboratory

The site will accommodate the mobile (containerized) laboratory that would be granted by FAO to the biosecurity section of MELAD. A reinforced concrete slab, 2.5 m. x 15 m. will be built, with connection to water, power and drainage lines of the facility.

1.3.5 Technical building and supply of utilities

The technical building (50 m^2) enables storing securely chemicals and gases; and hosts the generator, the air compressor, the power regulation systems, and the water filtration unit.

It will be built on a reinforced concrete slab, with walls and partitions made of cinder blocks and a steel roof with insulating material underneath. All doors will be plain metal panels with security locks. This building should be well ventilated.

Two separate reinforced concrete slabs will also be built to receive the incinerator (2m x 3m) and the fuel tanks (7m x 3m).

1.4 Equipment

The equipment for the SPS support facility includes several lots. Below a summary description is provided, the equipment is detailed in Annex 3. The PIU will use specialists' services to finalize the list and determine the quality levels of instruments and reagents, and then for preparing the technical specification for the tenders.

1.4.1 Priority 1 - Procurement during year 2

Lot 1a: Furniture

- Chairs, desks, tables for offices, meeting room, canteen
- Filling cabinets, lab benches and stands, push-in cabinet/ drawers,
- Trolleys, rack of shelves in storerooms, etc.

Lot 1b: Systems

- Backup generator and fuel tanks
- Main UPS and volt/sine regulator, high-grade cables and plugs
- Air compressor for instruments, filters, regulator, supply pipes and taps;
- External water filtration and pre-purification system, pipes for supply lines
- ……

Lot 2 - Generic laboratory equipment

- Autoclave for waste decontamination
- Precision balances (x2),
- Blender or grinder
- Stomacher and bags, heat sealer,
- Eye wash station and emergency shower (x2)
- Fume canopy, fume hoods (ducted, x2)
- Glassware drying cabinet
- Large wash sinks (x4)
- Standard weights (E2) for balance calibration
- Water de-ionization and still,
- Set of lab coats, shoes, gloves, safety goggles, cleaning tools, etc.
- …..

Lot 3 Chemistry lab equipment

- Atomic Absorption Spectrometer + Graphite furnace
- Flow Injection Analyzer
- Thermoreactor with controller and Kjeldahl unit
- UV-Vis spectrophotometer
- pH and conductivity meter + DO probe,
- Turbidity meter
- Reversing rotary vacuum evaporator, and Soxlhet apparatus,
- Reagent dispenser, auto-pipettes,
- Analytical balance (0.1mg)
- Vortex mixer (x2), mixer and homogenizer
- Electronic desiccator or dry cabinet
- BOD Incubator,
- Centrifuge (refrigerated)
- Manifold filtration unit, vacuum pump
- Muffle furnace
- Orbital shaker
- Drying oven, desiccator
- Fridge, deep-freeze chest
- Water bath (shaking)
- Misc. items & glassware
- …….

Lot 4 Microbiology lab equipment

- Balance (2 digits),
- Balance (precision)
- Benchtop pH meter with probes, connections
- Binocular magnifier, microscope,
- Bio-safety cabinet,
- Colony counter,

- Steam Sterilizer and accessories
- Freezer, fridge, microwave oven
- Incubators (2), sterilization oven, water bath (regulated)
- Electronic hot plate, multiposition heating stirrer
- Vacuum pump, manifold filter holder & set, membrane filters,
- Media dispenser,
- UV hand lamps, vortex mixer
- Pipette filler, pipette washer, pipettors
- Reference Thermometer (digital),
- Working precision LIG thermometers
- Set of misc. lab tools & glassware
- Set of reagents
- ….

Lot 5 Calibration Equipment

- Mass Set, Class F2, 1mg to 10 kg
- Mass Pieces, Class M1, 20 kg
- Weight Basket, Class M1, 50 kg
- Mass Piece, Class M2, 250 kg
- Climate Data logger (x2)
- Shipping Case with wheels and handle, Leather Gloves, Cotton Gloves, Brushes, Air bellows
- Handheld Volumetric Test Measure with Carrying Case 20l and 5 l
- Dual Test Measure Transportation Cart
- Stainless Steel Funnel with Copper Spout
- Handheld Digital Thermometer, PT100 Probe, 0-300°C
- Electric calibration bench
- .....

Lot 6 - Equipment for Biosecurity

- Fumigation equipment: tarpaulins, sprayers, manometers, air circulators and pipes…
- Incinerator (200kg furnace)
- ...

1.4.2 Second Priority Instruments: procurement during year 4

Lot 7 - Advanced analytical instruments

- Gas Chromatograph + ECD & FID detectors and columns + pre-columns,
- Atomic Absorption Spectrometer + Cold vapour unit;
- High Performance Liquid Chromatograph with ECD, UV, and FID detectors and columns, guard columns
- Infra-red moisture analyzer
- Lyophilized bacterial stock culture
- Water ultra-purification system
- Vacuum oven
- …

Lot 8 - Optional equipment

- Anaerobic jar for microbiology and bags
- Ultrasonic bath
- Brookfield digital viscometer
- Water activity meter

- Dry cabinet
- Fluorimeter
- Washer-disinfector, accessories, detergent and neutralizing agent...
- ……

2 BUDGET AND FINANCING PLAN

2.1 Expenditures

The expenditures for the whole project amount to A$ 5.302 million, of which A$ 3.999 million invested in capital and A$ 1.303 million used for operating expenses.

2.1.1 Capital expenditures

all costs in AUD	**All years**	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9	Year10
INVESTMENT: TANGIBLES											
Infrastructure general	**417,000**	207,917	209,083	0	0	0	0	0	0	0	0
Infrastructure utilities	**301,427**	0	301,427	0	0	0	0	0	0	0	0
Equipment	**1,556,478**	0	465,608	695,267	395,603	0	0	0	0	0	0
Sub Total Investment: tangibles	**2,274,905**	207,917	976,118	695,267	395,603	0	0	0	0	0	0
INVESTMENT: INTANGIBLES											
Technical Assistance & Advisory Services	**1,067,856**	360,706	285,677	165,037	86,146	66,852	66,352	18,543	18,543	0	0
Human resources development services	**656,023**	0	61,425	111,725	126,275	135,408	95,878	95,613	8,100	16,200	5,400
Sub Total Investment: Intangibles	**1,723,879**	360,706	347,102	276,762	212,421	202,260	162,230	114,155	26,643	16,200	5,400
TOTAL INVESTMENT	**3,998,784**	568,622	1,323,221	972,030	608,024	202,260	162,230	114,155	26,643	16,200	5,400

The capital expenditures include the infrastructure and equipment described in §1.3 and 1.4 above, respectively, as well as immaterial investment in the form of project management services and human resources development. The capital expenditures detailed tables are presented in Annex 4, and are submitted as separate spreadsheet files.

The investment in infrastructure and equipment (tangibles) will be mostly realized during the phase 1, while intangible investment is spread over the project cycle, with a 70%-30% split between the two phases.

2.1.2 Operational expenditures

The detail of operational expenditures (OPEX) and earnings are presented in Annex 5 and in tables submitted in separate spreadsheet files.
OPEX have been considered based on a usual lab management model[1]. They include:

- direct operating costs, which can be linked fully to the realization of testing services
- non-operating costs such as administration, communication, accreditation, maintenance, security…
- indirect costs, such as amortization, insurance, membership fees, board fees/allowances, and financial charges linked to banking services, etc.

OPEX have been estimated on the base of ratios and data used in other labs in the Pacific region; a modest increment was applied to account for prices appreciation. These costs start being incurred in Year 3 of the project, when the lab starts operations.

[1] Guide for laboratory management, COLEACP-EDES, 2015, https://www.coleacp.org/en/nos-programmes/edes

Earnings have been estimated based on the projected needs for testing (see feasibility study), which would start at about 8,000 test/ year and amount to about 25,000 tests each year once the lab is in full capacity.

The operational expenditures of the laboratory will exceed earnings during the first five years of its operation. Over this period, the laboratory will gradually increase its capacity and performance, and receive more samples enabling it to break even. On the demand side, Ministries will adapt their plans and gradually increase the use of local tests. On the supply side, the range of tests will be limited at the onset to the basic microbiology and chemistry tests. The range will be expanded to more complex tests; hence generating more revenue.

It is estimated the central laboratory would break even five years after the start of operation (year 8 of the programme). Therefore, the cumulated loss over the first five years needs to be financed; it has been taken in account as a funding requirement and included in the investment project financial plan.

2.2 Resources

2.2.1 Sources

The possibilities for support that have been discussed, on a non-committal base, are presented in the following table. Given the centralized nature of the investment, and the possible creation of dedicated funding lines in the Government budget (see § 5.2 below), the Government may use development loans from ADB and World Bank to secure resources for the Institute. The proceeds of these loans would then be channelled to the institute as part of national budget.

While possible sources have been identified, each of these DP would require the preparation and submission of funding requests (incl. specific template and justifications). Such submission must be prepared as soon as possible (year 1 and 2) by the PIU and the specialists providing project management support.

The main possible sources of funds are summarized in the table next page.

DEVELOPMENT PARTNER	TYPE OF SUPPORT	PROPOSED AMOUNT (A$)
Government of Kiribati	Land dotation to the Institute Grant dotation for buildings Loan to KOHSI for OPEX year7	- 522,061 241,000 (*total 763,061*)
New-Zealand High Commission)	Country program Grant, TA	850,000
Australia High Commission	Aid for Trade: Grant, TA	850,000
Republic of China	Budget support Grant	400,000
World Bank (Private sector or SPS)	Grant and Loan	760,823
ADB	Grant and Loan	655,000
STDF	TA , Grant	674,213
FAO*	TA Grant	100,000
EIF* (Tier2 project)	TA Grant	648,622

** FAO and the EIF have not formally been reached out for possible support*

Considering this investment program will spread on about 10 years in two main phases, the Government of Kiribati would need to secure and pool resources from several Development Partners (DP). The STDF PPG mission has identified possible funding sources. Keeping on a consultative and coordinated approach, the GOK and the lead unit will need to follow-up with the DP and further discuss the financial arrangements for this programme.

Once profitable, the laboratory would generate a net profit of about A$250,000 every year, while provisioning the replacement of equipment. This surplus would allow repaying long-term loans, which would be agreed by DP to the Government. As a rough estimate, GOK could seek loan funding for about A$ 1.5 million (~28% of project value) and secure grants for covering the remaining funding needs of about A$ 3.8 million

2.2.2 Financing plan

DESCRIPTION	All Years	Year1	Year2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Investment (tangibles)	2,274,905	207,917	976,118	695,267	395,603	0	0	0	0	0	0
Investment (intangibles)	1,723,879	360,706	347,102	276,762	212,421	202,260	162,230	114,155	26,643	16,200	5,400
Revenue funding		0	0	288,962	348,246	359,875	227,250	126,843	-40,336	-124,912	-249,786
Total funding needs	5,301,718	568,622	1,323,221	1,260,992	956,270	562,135	389,480	240,998	*-13,693*	*-108,712*	*-244,386*
Government of Kiribati	763,061		100,000	200,000	96,270		125,792	240,998			
New-Zealand	850,000	230,000	180,000	170,000	170,000	60,000	40,000				
Australia	850,000	230,000	180,000	170,000	170,000	60,000	40,000				
Republic of China	400,000		200,000			200,000					
World Bank	760,823		225,000	260,000	170,000	72,135	33,688				
ADB	655,000		225,000	260,000	170,000						
STDF	674,213		173,221	150,992	150,000	100,000	100,000				
FAO*	100,000			50,000	30,000	20,000					
EIF* (Tier2 project)	248,622	108,622	40,000			50,000	50,000				
Total Funding Resources	5,301,719	568,622	1,323,221	1,260,992	956,270	562,135	389,480	240,998	0	0	0

3 COST-BENEFIT ANALYSIS

At present, the sustainability of Kiribati SPS systems lies mostly on public funding, complemented by a few Aid projects (FAO for environmental health and CODEX committee, Australia for biosecurity, and WHO for water testing). The fumigation and certification services from the quarantine section of MELAD, and the tests linked to official controls for EU exports (CA at MFMRD) fall under a user-pay policy. The other tests and inspections mechanisms performed by the Environment Conservation Division of MELAD and by the Environmental Health section of MHMS are funded by the operation budgets of these Ministries without cost-recovery.
All these functions (apart those linked to exports) are considered as delivering public goods; in the poverty context of Kiribati, Government may have considered that budget allocations are more appropriate than 'user-pay' policies. In effect, when a service benefits equally to all citizen (such as food safety or environmental protection), all users should pay equally and user pay policy is unnecessary. Further, user-pay systems have higher transaction costs as compared to centralized budget allocation.

The cost-benefit ratio of the central laboratory can be assessed at two levels, firstly considering the cost reduction of this integrated solution compared to the development of several smaller laboratories in separate Ministries, and secondly by estimating the contribution of the laboratory to the economy. For the later, we make the assumption of a 15% 'share' of the laboratory's contribution, which will be combined with other policy and programs specific to the health and industry sectors. Another assumption is the life cycle of the project, set at 10 years in a first phase of 4 years and a second phase of 6 years.

3.1 Economies of Scale

The calculation is carried out based on a model of income statement for a chemistry and microbiology laboratory in developing countries (Author's data) and on assumptions based on two recent projects in Samoa (FAO/STDF) and in the Cook Islands (EU). The central laboratory investment represents an economy (saving) of about half a million dollars, as compared to the sum of investments in individual, ministry-based labs. The recurrent costs of the central lab would also be 45% less than the sum of running costs in all the separate units. For the nation's budget, generating the test results 'as one' would result in saving approximately 330,000$ a year. When combined, these economies of scale would allow repaying the projected investment in less than four years.

3.2 Direct and indirect effects on the economy

The central laboratory will contribute directly to an improvement of the business & investment environment; in will participate in keeping a healthy and effective labour force_ the mainstay of the economy.

The limitations of the following estimation of benefits must be recognized. Measurement methodologies are partly empirical, data on fisheries are at times inconsistent, and long-term forecasting by nature lacks accuracy. Rather than precise figures, the calculations estimate the order of magnitude of the expected benefit. While the final figures might be within a plus or minus 25 percent interval, they allow meaningful comparison with the overall project costs.

3.2.1 Contribution to the Economy[2] through the Labour Force

Health has direct and indirect effects on economic growth[3]. Good health has intrinsic value, but also interacts in various ways with the pace and pattern of social and economic development. At macro-economic level, good health reduces absenteeism and increases workers productivity; it increases the returns of investing in education; and decreases the use of medical resources freeing up budget for other purposes. At household level, good health avoids financial distress, decreases stunting and impaired productivity of children, and limits other social impact (orphans, widows…).

Non-communicable diseases (NCD[4]) are an on-going crisis in all Pacific Countries and particularly in Kiribati. NCD cover cardio-vascular pathologies, lower respiratory infections, ischaemic diseases, diabetes, and intestinal infections. In Kiribati, these NCD represented in 2016, 58% of the disease burden and incurred an A$11.8 million cost or 40% of the public health expenditure. For reference, the total health expenditure of Kiribati was A$31.55 million (2014) or A$171 per capita; development partners contributing to 20% of that amount_ a lesser part than the regional average.

NCDs affect the population and the wider society through mortality (reduction of the lifetime) and morbidity (number of days of bad/poor health confining people to home/healthcare). For the former, research (see note 1) as shown that for Kiribati, the current trends of population and prevalence of NCD would result in 2030 in a loss of 10.8% of the effective labour force and decrease the GDP by 6.5%. This economic burden is estimated to escalate even further in 2040, affecting up to 9.2% of the GDP, because of the long-term impact of NCD induced premature death on potential productivity. In respect with morbidity, the same study estimated that morbidity in 2015 is already costing 15% of the Kiribati GDP; it would reach 30% of the GDP in 2040.

If no action is taken, the economic burden of NCDs is thus projected to increase significantly. However, NCDs are preventable through a multisector approach, which includes promoting tobacco control and pharmaceutical and similar treatments. The social determinants of health need also to be addressed. Changes in lifestyle provide a simple, low-cost and effective way to combat NCDs while saving scarce health resources. Stakeholder analysis identifies numerous areas where multisector approaches are needed. Development partners also have an interest in supporting a multi sector approach through their investments in infrastructure, other sectors, and trade policies.

The Pacific countries have jointly agreed to the following five strategic action areas (Secretariat of the Pacific Community, 2014):

- Strengthen tobacco control by an incremental increase in excise duties to 70 percent of the retail price of cigarettes over the medium-term;
- Consider a tax increase for alcohol products as a way of reducing harmful alcohol consumption;
- Consider policies such as targeted preventative measures, taxes, and better regulation to reduce consumption of local and imported food and drink products that are high in sugar, salt, and fat content as they are directly linked to obesity, diabetes, heart disease, and other NCDs in the Pacific;

[2] Estimations of health financial impact on the economy are subject to methodological limitations. Nevertheless, the available regional data are deemed sufficient to estimate the contribution of the project and to carry out the cost-benefit analysis.

[3] Information gathered from " Health and Non-Communicable Diseases" in Pacific Possible, The World Bank, 2107, available at www.woldbank.org/PacificPossible

[4] Information on NCD is largely derived from "Health financing system assessment - Spend Better" by World Bank, Australia Aid, New Zealand Foreign Affairs and Trade, 2018; also available at http://documents.worldbank.org/curated/en/471011528376870220/Kiribati-Health-financing-system=assessment-spend-better

- Improve the efficiency and impact of the existing health budget by reallocating scarce health resources to targeted primary and secondary prevention measures for cardiovascular disease and diabetes, including through the Package of Essential Non-Communicable Disease Interventions; and
- Strengthen the evidence base to enable better investment planning and programme effectiveness, thereby ensuring that interventions work as intended and provide value for money.

The above recommendations are reflected in the Ambo Declaration[5] summarized in the two following tenets: improve the quality of health expenditure, and strengthen partnerships within and across key sectors.
The creation of a central laboratory contributes directly to the Ambo declaration and to the SPC's third, fourth, and fifth recommendations. Of particular significance for promoting changes in lifestyles, is the control of unhealthy food. Implementing the recent food safety regulation and promoting healthier alternatives require the capacity to test the composition of food products.

Based on the above estimates and on the initial assumptions, the benefit of the central laboratory is estimated as follows.

- Reduction of mortality due to NCD
  With the laboratory (and other measures), the impact of NCD mortality on GDP will be reduced in 2030 to 5.5% (instead of 6.5%); representing an economy of A$ 2,207,000.
- Reduction of morbidity due to NCD
  With the laboratory (and other measures), the morbidity impact of NCD morbidity on GDP would be contained to current rate (15%) instead of increasing to 30%; representing an economy of A33,111,308.

Assuming a 15% contributive role of the laboratory in the public health policies and objectives, the contribution of the proposed investment to the economy through public health amounts to A$ 5,297,800.

3.2.2 Contribution to the Economy through better business & investment environment

Pacific countries face distinct development challenges including their scattered population base and distance to main markets. These factors have so far resulted in low rates of economic growth across the Region. The recent study 'Pacific Possible[6]' examines pathways to overcome the challenges with focus on fisheries, tourism, ITC, and labour mobility themes. In particular, the Regional Roadmap for Sustainable Pacific Fisheries (2015) has adopted among others the strategy to "Flexible access and eventual output for fleets", which enhances the economic value of the tuna fisheries without increasing production, and provide a tool for the Pacific Islands Countries to leverage greater foreign investment in processing". A central laboratory to test the quality and safety of fisheries product contributes directly to this strategy.
During the discussion with the fisheries sector, the need for an accredited testing laboratory to support the processing sector was emphasized by the private sector and the competent authority alike. The testing capability of the central laboratory will help increasing exports of

[5] Government of Kiribati, 2017, Ambo Declaration "Health in All Government Policies", April 9, 2017
[6] World Bank, 2016 www.worldbank.org/pacificpossible

the existing factories, assist developing local products from coastal fisheries, and provide an additional incentive for investors (aquaculture and processing of the offshore catch). Fisheries contribute to about 30% of Kiribati public revenue and about 60% of the national budget. The Pacific Possible study estimates that by 2040, the adoption of the above strategies would add between USD 176.6 million and USD 344.6 million to the regional pubic revenue, of which USD 88.3 million from new local processing ventures. The same study indicates this could represent a 50-60% increase of per capita income in Kiribati.

Based on the above figures[7] and on initial assumptions, the contribution of the central laboratory to the fisheries sector is estimated as follows:

- Value of Pacific fisheries sector = USD 25 billion
- Value of Kiribati fisheries sector = A$142,682,265
- Part of Kiribati fisheries in regional value = 4%
- Increased public revenue estimate = USD 260 million (mid-range value)
- Increased public revenue for Kiribati= USD 260 million*4% = USD 10,600,000

Assuming a 15% contributive role of the laboratory, the contribution of the investment project to the economy through better business and investment environment is valued at A$ 2,225,850.

3.3 Cost-benefit analysis

In summary, the financial value of the central laboratory's benefits is estimated at A$ 7,523,659; split at 30% from fisheries industry and 70% from better health impact. The total cost of the project is estimated to A$ 5.3 million over 10 years.

Assuming the project is financed at 28% by loans and the profits of years 8-14 used to repay GOK loans, the ROI of this project is 1.42

[7] The figures and value estimates are those of 2015, the calculation does not account for changes in costs and GDP. It is assumed that variations in the economy would affect all factors in a similar way.

4 PROJECT LOGICAL FRAMEWORK (2019- 2024)

Level	Description	Indicators/ Targets	Sources/ Means of verification	Assumptions and Risks
Goal/ Impact	Contribute to the 'Healthy and Wealthy' policy in KV20 through a) increased export revenues and b) increased compliance with agri-food safety regulations	- KV20 & KDP selected indicators - 20% increase of export trade flows within 5 years - 10% improvement of hygiene and safety for water and food	National policy evaluation, reports and statistics on export sectors Project baseline survey and final survey Ministries reports	**Assumptions:** No significant event affecting environment & markets in the Pacific area **Risks:** delayed mobilization of funds or specialists would compromise achievements and limit impact.
Objective/ Outcome	Improved compliance with SPS measures, food safety & hygiene requirements for market access as well as for imported goods	SPS capacities measures as a composite index, increased by 50% by the end of the project.	Project baseline survey, progress reports and final survey Activity reports from technical agencies (CA).	**Assumptions:** Continued GOK commitment to enhance food safety (export/import), biosecurity, and sanitation. **Risks:** SPS enforcement capacities may remain limited; therefore reducing the
Outputs	1. Central SPS support facility in operation by 2022 and apply for accreditation in 2024 2. Enhanced coordination and cooperation for SPS risk assessment and management 3. Institutional and individual SPS capacities, skills and awareness increased in Government and private sector	- Act creating the SPS support institute - Number of staff trained - Laboratory sales of services - At least 5 coordinated initiatives unrolling by the end of the project - At least 100 persons of which 60 females have increased awareness and knowledge	Project baseline survey, progress reports and final survey Laboratory report Ministries reports Training attendance and reports	**Assumptions:** GOK and Development Partners confirm their interest for the project and mobilize investment and operational funding timely. **Risks:** - difficulties and delays in the realization of infrastructure could postpone achievement of objectives - Limited availability or interest of specialist staff could reduce capability of the laboratory

#	ACTIVITIES DESCRIPTION	INPUTS
1.1	Set up the PIU and select and mobilize experts	
1.2	Design the institute structure and functions, and draft and submit an Act to create it	TA experts' missions
1.3	Identify and secure the land for the facility	Workshops and meetings (logistics & catering)
1.4	Mobilize specialist services for designing the building	Local facilitation services
1.5	Tender the realization of works for the building and laboratory fitting	Contractor services and works Materials & Supplies
1.6	Tender the procurement of first lots equipment	
1.7	Recruit the laboratory manager and staff	
1.8	Commission instruments	Accreditation services
1.9	Set-up the quality management system	Host laboratories facilitation services
1.10	Arrange training and transfer of skills for staff, on-site and abroad	Air transportation and accommodation abroad
2.1		TA experts' missions
2.2	Ensure training on risk assessment for plant, animal, fisheries and the environment	Workshops venue rental, logistics, catering Printing, supplies, and web access
2.3	Assist developing National Residue Monitoring Plans	Local facilitation services
3.1	Assist National Codex Committee to coordinate the implementation of official controls	
3.2		TA experts' missions
3.3	Ensure awareness on One Health and related SPS issues	Workshops venue rental, logistics, catering
3.4	Provide training on GAP, GMP, and HACCP to CA and industry	Printing, supplies, and web access Local facilitation services
	Organize needs assessment for the main SPS functions, based on international tools PPE, PVS etc.	Air transportation and accommodation abroad
	Assist developing linkages with regional platforms resulting in	

5 ROLES AND RESPONSIBILITIES

The project will require the involvement of several stakeholders; it will require coordination, monitoring and oversight functions. This would be best arranged if a lead unit is selected to ensure the management of the project and its continuity.

5.1 Lead Agency and the Project Implementation Unit

It has been proposed[8] that MCIC would take the lead for managing and coordinating the project implementation. The two reasons for this choice were the presence of the national trade advisor and the existing technical working group on quality, linked to the implementation of the quality policy. The presence of a resident technical assistant is deemed a crucial success factor for the investment project: because the MCIC teams are involved in managing numerous projects and activities in addition to the Ministry's own action plan, they might have insufficient time to devote for the KOHSI project. Were the current NTA role discontinued, it will be necessary to secure support (either from the EIF or else) for a similar trade facilitation role with focus on the implementation of the central lab project, and of the national quality policy.

[8] During the second NTAC meeting gathered for the feasibility study on January 2019

5.1.1 Set up of the PIU

The lead unit should have sufficient resources allocated to ensure effectively the role of a project implementation unit. At the onset, the PIU should be setup and accommodated within Ministry of Commerce Industry and Cooperatives, and overseen by an official with the rank of Director, seconded by a junior officer, both designated by the Ministry. The PIU will seek external support when needed, by mobilizing the services of individual consultants (local or foreign) and of specialist service providers (see below 5.1.3). The PIU would receive also a minimal budget provision for covering communication, local transportation and meetings costs. This arrangement of using external services under a Government lead unit, allows maintaining cohesion among stakeholders and coordination with Development partners.

5.1.2 Main responsibilities of the PIU

The PIU will ensure project management on behalf of the One Health Support Institute; as soon as this body is enacted and its director recruited, the Institute will take a leading role in the PIU. Tentatively, the PIU is under the lead unit during phase 1 (2019-2023) and is under KOHSI during the second phase.

The Lead Unit ensure effective implementation of the work plan and mobilization of all stakeholders through regular meeting of the Quality Working group under the NTAC.

The Lead Unit in phase 1, and KOHSI in phase 2, will deliver formal reports on activities, progress and issues to all stakeholders, and prepare the formal project reports to be discussed and validated by the steering committee.

The Lead Unit, and later KOHSI, convene the Steering Committee, prepare the agenda and ensure Secretariat of meetings.

5.1.3 Detail of external support services

The PIU should use the services of local consultants to facilitate the interaction with local suppliers or with specific Government bodies. Over a period of 4 years, foreign consultants (individual or firms) would be called upon for addressing issues that require specialist knowledge and skills. These specialists may work remotely or may need to travel to Kiribati, depending on the nature of the tasks under consideration.

- Project management and advisory to PIU (international experts): 230 person.days
- Project coordination and facilitation (local experts): 360 person.days
- Legal and institutional development (international) : 20 person.days
- Site surveying & planning (local): 15 person.days
- Building design and civil engineering (local): 35 person.days
- Laboratory interior design & tender preparation (international): 20 person.days
- Construction project costing and management (international & local): 165 person.days
- Lab Equipment specifications, tender preparation (international): 15 person.days

The total of external support services over the project cycle amounts to 43 person.months. The indicative list and timeline of service mobilization is presented in Annex 1.

5.2 Central Government

The 'One Health' institute remains a public body funded by public funds; hence submitted to the Government oversight. The role of the central Government will be to facilitate the overall implementation of the project, while ascertaining the achievement of the institute objectives. The main responsibility will include:

- Validating the project and creation of the One Health Support Institute;
- Creating a specific line in national accounts and provisioning budget according to financing needs;
- Liaising with development partners to facilitate funds mobilization;
- Nominating a focal person responsible for ensuring monitoring progress and overseeing the project;
- Chairing the Project Steering Committee and guiding the PIU and later the Institute on policy and other higher level issues;
- Other as necessary...

5.3 Other Ministries and Agencies

The other stakeholders include MFMRD, KSVA, MELAD, MOH, MOW, PUB, local Councils...any entity that has SPS-related testing needs would engage the project. The consultations held during the STDF mission should be carried over through regular formal meetings of the Technical Working Group on Quality (TWG-Q).
The roles of these stakeholders are to provide updated information on their own plans and needs, so that the investment project could be adapted if necessary. The responsibilities of other ministries and agencies include:

- Nominate contact/ focal persons with adequate profile as interlocutors of MCIC;
- Attend regularly the meetings of the TWG-Q and the Steering Committee;
- Review the technical documents related to the preparation and realization of the laboratory and fumigation buildings;
- Provide inputs/ specifications for equipment to be purchased;
- Assist in identifying, selecting and mobilizing staff for the central laboratory (including through attachment or other arrangement);
- Prepare annual testing programmes describing the services to be delivered by the central laboratory;
- Liaise with the institute (once operational) to prepare and agree Memorandum of Agreement describing the purchasing of services.

6 PROJECT MANAGEMENT

6.1 Main Responsibilities and Deliverables

6.1.1 First phase: 2019 to mid-2023

During this phase, the project achieves the set-up of the Institute, the design and building of the facility (laboratory and fumigation buildings), the procurement of equipment, and the staffing of the facility.

The Lead Unit holds the PIU managing the project, which entails:

- defining and procuring experts services needed for activities
- mobilizing experts and contractors, and verifying outputs
- monitoring work plan and budget
- keeping all stakeholders actively contributing the project through the TWG-Q and the Steering Committee

In this phase, the PIU responsibilities include:

- Prepare the detailed implementation plan for the investment project;
- Revise or update the project budget based on consultants and suppliers inputs;
- Liaise with the Cabinet and NEPO on budget and funding issues;
- Liaise with Development Partners to seek funds commitment and mobilization;
- Organize regular meetings of the project working group and yearly meetings of the Steering Committee;
- Foster the creation of the SPS support institute by assisting legal drafting, lobbying, and submission to the Cabinet and National Assembly;
- Consult stakeholders and interested Government parties to secure a suitable land;
- Prepare and run tenders for the following services
    - Project management support services
    - Design an engineering of the facility buildings
    - Supply of materials and construction works for the infrastructure
    - Design of laboratory inner space, fixtures, systems and furniture
    - Supply of material and systems to equip and fit the laboratory building, the technical building, the hangar
    - Supply of laboratory equipment and reagents
    - Commissioning of instruments and initial training
    - Supply of fumigation and incineration equipment
- Assist the SPS Support Institute to identify and recruit Staff, including preparing TOR and job description for all positions;
- Assist select individual experts for supporting the set-up of management systems and training of technicians, as well as awareness and training on SPS matters, in liaison with cooperation opportunities offered by development partners;
- Liaise with MOHMS, MELAD, KSVA, MFMRD and other stakeholder to prepare timely their annual testing programmes;
- Monitor the progress of the whole project and report to all stakeholders, as well as progress and completion of the discrete activities stated in the work plan;
- Ensure as needed communication with the wider development community and with the public through regular press releases, website updates, and media interventions
- Others to be defined as needed...

6.1.2 Second Phase (2024-2029)

The second phase corresponds to the period when the laboratory starts delivering services until it reaches competence (become accredited) and full capacity. The project focus shifts from realization of the infrastructure to operations and service delivery. In consequence, the role of the institute director in the PIU becomes more important, and the

role of the Lead Unit gradually decreases. In the final stage (by year 7), the Institute is fully responsible for managing the project.

In this phase the PIU responsibility include

- Monitor the implementation of the work plan and the project's achievements;
- Revise or update the project budget based on consultants and suppliers inputs;
- Liaise with and report to Development Partners to mobilize funding;
- Monitor the HRD plan and the gradual replacement of foreign technicians by I-Kiribati ones;
- Assist expanding the scope of accreditation by alleviating constraints that may arise;
- Assist for linking the institute with regional laboratories and identify opportunities for capacity building both for the laboratory and for the SPS system as a whole;
- Liaise with stakeholders to update their needs for training on SPS methods/ tools;
- Organize regular meetings of the project working group and yearly meetings of the Steering Committee;
- ...

6.1.3 Human Resources Development

A detail presentation of the Staffing and Human Resources Development is presented in the Part I 'Feasibility Study'.

The staffing structure will ensure that senior staffs with skills and knowledge work closely with the technicians and analysts, until they are competent with all the instruments.

The laboratory will need a manager who will have the dual responsibility to develop technical competence and to ensure overall performance management. The manager should be assisted by an executive advisor (senior lab expert) would will ensure his mentoring over the first years. The manager will be seconded by section heads, which will combine the responsibilities of handling the quality management system and ensuring the planning and management of resources (time, reagents, staffs, machines etc.). At least one of them (preferably both) should have experience working with advanced automated laboratory equipment (flow analyzer, atomic absorption spectrometers, and chromatographs).

The rest of the team would include two or three staff knowledgeable in microbiology tests, and three or four in chemical tests, and two or three technicians. The laboratory should seek to maintain a degree of polyvalence among the staff, since specialization would not be always possible. For the analysts, polyvalence could consist of holding one core skill (e.g. one complex instrument) and being able to operate others instruments. For the technicians who will ensure support functions and ancillary tasks, they should be able to master all the tasks at hand, including some basic reaction steps (extraction, digestion). All the laboratory personnel should have a working proficiency in English language.

The Institute will undertake a considerable traing and capacity development plan for the laboratory staff. Capacity development will include:

- Coaching and mentoring of the executive advisor to the Institute director and manager(s)
- Knowledge transfer and on-the-job training by the senior analysts to the local staffs
- Knowledge transfer and on-the-job training by external subject matter specialists
- Knowledge transfer and acquisition of skils and experience through attachement training in other laboratories in the region.

The balance between internal and external capacity building will depend on the profiles of the manager and execuive advisor, and also on possible partnerships between the central lab and other operators.

The staffing plan and the human resource development plan are summarized in Annex 6. In first instance the training effort would be delivered in part (25%) as on-the-job training, in part by external trainer in-situ (35%), and in part (40%) as attachment training in partner laboratories overseas. Over the first five years, a total of six months of experts' inputs will be required to train the staff on the above modules and provide technical assistance for implementing the management system. Further, from year 3 to year 9, the staff would need to get exposure to work in advanced labs: this attachment training could amount to about 50 weeks in total.

The annual budget for capacity development would thus amount to A$ 656,000 between year 3 and year 8

Human resources development services	**656,023**
Executive advisor (to Lab manager)	302,063
In-country tech. transfer & capacity building	145,310
Capacity building/ exposure in regional labs	75,600
Awareness & CB for SPS methods	133,050

6.2 Time table and work plan

6.2.1 Time line

- Year 1: Validation of the project concept by the Cabinet, set-up of the PIU, liaising with DP to secure Years 1-2 funding, liaise with Government to secure land for the facility, mobilize TA for project management services, mobilize expert's inputs for legal and institutional study of the Institute (incl. relationships with stakeholders), sub-contracts for site surveying, facility design, and costing, tendering and managing the construction works project, start of construction work, recruit institute director, organize awareness and training on SPS methods...
- Year 2: Completion of construction works; prepare tenders for laboratory fittings and for equipment (lot 1a,1b, 2-6); commissioning of the facility buildings; setup of

electricity, water, ventilation, security and other systems; mobilize the executive advisor; recruit laboratory staff and review training plan, organize awareness and training on SPS methods,...

- Year 3: Complete the procurement of equipment and commission the instruments; complete staff recruitment and start the human resource development plans; start operations and deliver tests services, set up quality management system; procure equipment (lot 7 and 8)...
- Year 4: Commission equipment (lot 7 & 8); continue on-site training of staff; develop test range and the QMS; apply for accreditation; arrange coordination of SPS activities within Kiribati and in the region; deliver training on SPS methods...
- Year 5: Transfer of the PIU responsibilities to KOHSI; secure accreditation for basic and intermediate tests; initiate transfer of skills by attachment training in other laboratories in the region; arrange coordination of SPS activities within Kiribati and in the region; deliver training on SPS methods...
- Year 6: the TA for project management is phased out, with disposition to transfer remaining activities to the Institute director; continuation of all laboratory activities; transfer of skills by attachment training in other laboratories in the region; arrange coordination of SPS activities within Kiribati and in the region; deliver training on SPS methods.....
- Year 7: The executive advisor role is phased out, recommendations to the Board on overall sustainability of KOHSI; continuation of all laboratory activities; transfer of skills by attachment training in other laboratories in the region; arrange coordination of SPS activities within Kiribati and in the region; deliver training on SPS methods.....
- Year 8-9-10: DP funding is terminated as the Institute becomes autonomous; all activities are planned and implemented by KOHSI.

6.2.2 Work plan

	Year1				Year2				Year3				Year4			
	19q3 Q1	19q4 Q2	20q1 Q3	20q2 Q4	20q3 Q5	20q4 Q6	21q1 Q7	21q2 Q8	21q3 Q9	21q4 Q10	22q1 Q11	22q2 Q12	22q3 Q13	22q4 Q14	23q1 Q15	23q2 Q16
Phase 1																
Seek and secure land																
TA for project management and advisory to PIU																
National coordination and facilitation																
Legal and institutional development																
Site surveying & planning																
Building design and civil engineering																
Fencing, utilities connections																
Construction project costing and management																
Laboratory interior design & tender preparation																
Building foundation, mainframe,walls, roofing																
Buildings: insulation, doors, fittings, ducts...																
Fumigation hangar																
Electricity generator & fuel storage																
Fixtures & furniture, power, HVAC																
Water reticulation, security systems																
Prepare equipment specifications and tenders																
Procure & setup equipment (gen., calib. & biosec.)																
Procure equipment (chem. & microbiology)																
Procure equipment (second priority)																
Recruit executive advisor (to Lab manager)																
Recruit and train staff (in-country)																
Organize capacity building in labs in the region																
Organize awareness & Capacity Building for SPS																

	Year5				Year6				Year7				Year8				Year9				Year10			
	23q3 Q17	23q4 Q18	24q1 Q19	24q2 Q20	24q3 Q21	24q4 Q22	25q1 Q23	25q2 Q24	25q3 Q25	25q4 Q26	26q1 Q27	26q2 Q28	26q3 Q29	26q4 Q30	27q1 Q31	27q2 Q32	27q3 Q33	27q4 Q34	28q1 Q35	28q2 Q36	28q3 Q37	28q4 Q38	29q1 Q39	29q2 Q40
Phase 2																								
TA for project management and advisory to PIU																								
National coordination and facilitation																								
Recruit executive advisor (to Lab manager)																								
Recruit and train staff (in-country)																								
Organize capacity building in labs in the region																								
Organize awareness & Capacity Building for SPS																								

7 MAIN RISKS AND MITIGATION

RISK IDENTIFIED	IMPACT	LIKELIHOOD	MITIGATION
The project may face delays for the mobilization of funds or specialists	Average: This would delay the achievements of results and outcomes, and may limit impact if funding for TA and training related to SPS is not secured.	Medium	The project includes a provision for a senior project management specialist and a local facilitator, who will closely assist the PIU over the three first years.
The project may face difficulties and delays in the realization of infrastructure	Low: This would postpone the entry in service of the laboratory and the achievement of objectives	Medium	External management services have been provisioned to expedite the realization of the building. Performance clauses and penalties for delays will be included in the works contracts
The project may have limitations in securing specialist staff due to lack of availability or interest.	Medium-high: This will impede capacity building and reduce capability of the laboratory; with serious effect on outcomes	Medium	The budget includes a sufficient provision for HRD that would be used to set up attractive packages The project will strive to broker a partnership with a regional laboratory, which could assist mobilizing specialists
SPS enforcement capacities may remain limited; or be constrained by poor governance practices	Low: If this risk materializes, the project outcome would be affected and the impact reduced	Low	The project will organize awareness raising session on the role and effectiveness of official controls, which would later trigger increased scrutiny

8 SYNERGIES

The project will increase exchange of information and cooperation between the departments involved in official controls. The capacity building provided will emphasize the possibility to carry out joint risk assessments; in turn, this would create synergies in the risk management and implementation of official controls. This may include for example, common sampling for the national residue monitoring plan, defining integrated plans for water safety, or for the safe processing of local fisheries products…

Other synergies could be found with the participation of KOHSI in regional projects. The USP, the SPC and other may offer opportunities for Kiribati to take part in research projects related to fisheries, climate change, or the environment in general. In particular, the anticipated creation of the COE would also provide opportunities to liaise and cooperate with other regional laboratories and competent authorities.

9 CROSS CUTTING ISSUES

9.1 Environment

The laboratory will have a limited impact on the environment. It will consume water, but disposition will be taken to recycle or reuse the water used for washing and cleaning. The consummation of power from the grid or from the generator will lead to a CO2 footprint estimated at 8.65[9] tons of carbon yearly.

The laboratory will maintain and cultivate living microorganisms; however, there is no risk of release in the environment since all material and media will be autoclaved after usage.

The most serious threat on the environment lies in the use of solvent and chemicals for testing. Organic solvents are harmful for health; most acids are dangerous for humans and have negative impact on the environment. The laboratory will need to collect and store the solvent and acid waste in adequate container; the storage location must be secure. The cumulated waste would then be sent every couple of years, to the nearest recycling center.

9.2 Gender

The project will have no negative effect on the status of women. The Institute may adopt a positive discrimination policy to encourage the recruitment of female candidates.

Dispositions shall be maintained at the Institute to guarantee it remains a workplace free from undue pressure including sexual harassment. The presence of gender separate changing rooms and toilets, and the video monitoring in all rooms would also contribute to maintain a safe working environment. In addition, there would be awareness and training sessions on gender sensitiveness and mainstreaming for all KOHSI's staffs.

[9] Based on latest ICCC harmonized conversion factors; diesel generators create 0.778 kgCO2/ kWh. The ratio CO2 to carbon is 44/12

ANNEX 1 - List and Timeline for mobilization of TA services

	year1				year2				year3				year4				year5				year6				year7				year8				year9				year10			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
Project management (cat. I & II experts)	15	15	20	20	20	20	20	20	15	15	15	15	10		10			8		8		8		8																
Project coordination (cat III experts)	20	30	40	40	30	20	20	20	20	20	20	20	15	15	15	15	10	10	10	10	10	10	10	10																
Legal / institutional development	10	10																																						
Site surveying & planning		15																																						
Building design and civil engineering		25	10																																					
Laboratory interior design & tender preparation			20																																					
Construction project costing and management				30	20	30	45	25	15																															
Lab Equipment specifications, tender preparation					10		5																																	
PIU operating expenses (off. eqpt, catering, etc)																																								
Unallocated TA pool or contingencies		20				20				20				20				15				15				10				10				10				10		

ANNEX 2 - Detail of Rooms Dimensions and Specifications

Length (m)	Width (m)	Size (m2)	Area	Function	Ambiance requirements	Details
3.7	4.84	30.4	Admin offices	rooms for director & admin officer	general VAC	two rooms + filing cabinets; internet connection, phone-fax & printing facilities; safety lockers
3.14	2.7	22.0	Lab office space	desks for managers, QMS docs	general VAC	semi enclosed space & cubicles, alu/glass pannels allow visibility in lab sections
3.9	5.13	28.6	Meeting room	staff & clients meetings, training	general VAC	screen +HD projector
2.1	5	10.5	Changing rooms	sas between outside & lab	general VAC	lockers and shoes rack (male/female)
1.8	3.7	6.7	Toilets	for offices & for labs	general VAC, air extraction	1 unit per 8 staff members, male/female
7.41	4.14	30.7	Canteen	Dining room, kitchen, rest space	general VAC, air extraction	food fridge, microwave, sink, handwash, first aid
2.2	1.37	3.0	Samples storage	Reception & storage of samples	general VAC	counter/ writing desk; benches, shelves, fridge,
6.4	2.7	17.3	Preparation room	Process samples into test items	General VAC, air extraction	benches, sinks, hotwater, blenders, stomacher,
3.72	3	11.2	Digestion and extraction room	all steps using of acid and solvent	Air extraction, no aircon	fumecupboards (2); surfaces impervious to acids, alkali, solvents
2.9	4	11.6	Conductimetry, spectro-, titrimetry	basic wet chemistry tests	Temp. control, air extraction	central bench
3.77	5.72	26.5	Instruments rooms AAS-GC-LC	clean, safe space for complex eqpt	T-H controlled, air extraction, E10 2-step filtration	extracting canopies/ ducts high amp. Plugs
1.8	9	16.2	Storage for generic stuff (ambient)	for small tools, dry chemicals...	General VAC	storage racks
			Storage for reagents, controlled	Keep solvents, acids & their waste	T-H controlled, air extraction	corrosion proof, solvents & acids separate
3	4.5	13.5	Media Preparation	Cooking, sterilization	General VAC, air extraction	water supply, high Amp. Plugs include storage facility for media at 15oC.
5	4	20.0	Inoculation & Testing	inoculation and reading of results	T-H control	floor and bench surfaces cleaned on a daily basis; house testing equipment only, handwash.
2	2.75	5.5	Incubation	House incubators	Temp control 24-27^{o}C	high amp. plugs,
2	1.75	3.5	Reference culture	Maintaining reference cultures, used only for such work	T-H control, air extraction, class E12 3-step filtration	surfaces cleaned before and after work each time; house single purpose laminar hood and a refrigerator.
3.7	5	18.5	Cleaning & Decontamination	washing of glass/tools, decontamination, drying	Air extraction	high amp. plugs, cleaned on daily basis; disposal of used test materials after decontamination on a daily basis.
			Cleaning & Decontamination room	host autoclave, waste, CS stuff	Air extraction	Space to keep cleaning equipment for the laboratories
3.7	3.77	13.9	Calibration 1			
5	3.77	18.9	Calibration2			
			Lobbies & empty spaces	int. circulation	Air extraction	include push-through emergency exits
			Verandas	ext. circulation, waiting area	Fans, lights	all weather fixtures, seatings

ANNEX 3 Summary of Capital Expenditures

all costs in AUD	**All years**	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9	Year10
INVESTMENT: TANGIBLES											
Infrastructure general	**417,000**	207,917	209,083	0	0	0	0	0	0	0	0
Infrastructure utilities	**301,427**	0	301,427	0	0	0	0	0	0	0	0
Equipment	**1,556,478**	0	465,608	695,267	395,603	0	0	0	0	0	0
Sub Total Investment: tangibles	**2,274,905**	207,917	976,118	695,267	395,603	0	0	0	0	0	0
INVESTMENT: INTANGIBLES											
Technical Assistance & Advisory Services	**1,067,856**	360,706	285,677	165,037	86,146	66,852	66,352	18,543	18,543	0	0
Human resources development services	**656,023**	0	61,425	111,725	126,275	135,408	95,878	95,613	8,100	16,200	5,400
Sub Total Investment: Intangibles	**1,723,879**	360,706	347,102	276,762	212,421	202,260	162,230	114,155	26,643	16,200	5,400

TOTAL INVESTMENT	**3,998,784**	568,622	1,323,221	972,030	608,024	202,260	162,230	114,155	26,643	16,200	5,400

ANNEX 4 - Detail of Capital Expenditures

	All Years	Year1				Year2				Year3				Year4			
all costs in AUD		19q3	19q4	20q1	20q2	20q3	20q4	21q1	21q2	21q3	21q4	22q1	22q2	22q3	22q4	23q1	23q2
first quarter Q1 starts at Cabinet approval		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
INVESTMENT: TANGIBLES																	
Infrastructure general	**417,000**	17,000	50,750	38,750	101,417	146,417	62,667	0	0	0	0	0	0	0	0		
Fencing, drains, utility connection, carpark	24,000	12,000	12,000														
Building foundation, mainframe,walls, roofing	155,000		38,750	38,750	38,750	38,750											
Buildings: insulation, doors, fittings, ducts...	188,000				62,667	62,667	62,667										
Fumigation hangar	45,000					45,000											
Registration, permits and publication costs	5,000	5,000															
Infrastructure utilities	**301,427**	0	0	0	0	0	75,000	199,037	27,390	0	0	0	0	0	0		
Fixtures & furniture	35,000							35,000									
Electricity generator & fuel storage	49,000						49,000										
Main UPS & protector, inverters, controls	138,037							138,037									
Ventilation and Climatisation systems	52,000						26,000	26,000									
Water treatment & purification unit	15,890								15,890								
Security systems: CCTV, cardlocks, etc	11,500								11,500								
Equipment	**1,556,478**	0	0	0	0	0	60,128	107,460	298,020	169,407	414,036	0	111,825	60,128	335,475		
Generic lab equipment	99,569							33,190		66,379							
Chemistry Instruments	408,135								136,050		272,085						
Microbiology instruments	212,921								70,970		141,951						
Calibration Instruments	86,297							28,770		57,527							
Biosecurity equipment	182,000							45,500	91,000	45,500							
Priority 2 instruments	447,300												111,825		335,475		
Provision for overruns or options	120,256						60,128							60,128			

Sub Total Investment: tangibles	***2,274,905***	17,000	50,750	38,750	101,417	146,417	197,795	306,497	325,410	169,407	414,036	0	111,825	60,128	335,475		
Sub Total Investment: tangibles	**2,274,905**	207,917				976,118				695,267				395,603			

	All Years	Year1				Year2				Year3				Year4			
all costs in AUD		19q3	19q4	20q1	20q2	20q3	20q4	21q1	21q2	21q3	21q4	22q1	22q2	22q3	22q4	23q1	23q2
first quarter Q1 starts at Cabinet approval		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
INVESTMENT: INTANGIBLES	**Year1-4**																
Technical Assistance & Advisory Services	**897,566**	90,176	90,176	90,176	90,176	71,419	71,419	71,419	71,419	41,259	41,259	41,259	41,259	22,286	20,786	22,286	20,786
Project management and advisory to PIU	347,890	26,503	26,503	26,503	26,503	29,860	29,860	29,860	29,860	22,395	22,395	22,395	22,395	8,215	8,215	8,215	8,215
Project coordination and facilitation	133,200	12,025	12,025	12,025	12,025	8,325	8,325	8,325	8,325	7,400	7,400	7,400	7,400	5,550	5,550	5,550	5,550
Legal and institutional development	30,430	7,608	7,608	7,608	7,608	0	0	0	0	0	0	0	0	0	0	0	0
Site surveying & planning	14,250	3,563	3,563	3,563	3,563	0	0	0	0	0	0	0	0	0	0	0	0
Building design and civil engineering	33,250	8,313	8,313	8,313	8,313	0	0	0	0	0	0	0	0	0	0	0	0
Laboratory interior design & tender preparation	20,000	5,000	5,000	5,000	5,000	0	0	0	0	0	0	0	0	0	0	0	0
Construction project costing and management	175,203	15,020	15,020	15,020	15,020	25,213	25,213	25,213	25,213	3,568	3,568	3,568	3,568	0	0	0	0
Equipment specifications, tender preparation	16,500	4,125	4,125	4,125	4,125	0	0	0	0	0	0	0	0	0	0	0	0
PIU operating expenses (off. eqpt, catering, etc)	14,500	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	875	875	875	875	1,500		1,500	
Unallocated TA & contingencies	112,343	7,021	7,021	7,021	7,021	7,021	7,021	7,021	7,021	7,021	7,021	7,021	7,021	7,021	7,021	7,021	7,021
Human resources development services	**299,425**	0	0	0	0	0	16,875	27,675	16,875	16,875	39,500	27,675	27,675	39,500	25,325	36,125	25,325
Executive advisor (to Lab manager)	175,500						16,875	16,875	16,875	16,875	16,875	16,875	16,875	16,875	13,500	13,500	13,500
In-country tech. transfer & capacity building	78,675										10,800	10,800	10,800	10,800	11,825	11,825	11,825
Capacity building/ exposure in regional labs	0																
Awareness & CB for SPS methods	45,250							10,800			11,825			11,825		10,800	
Sub Total Investment: Intangibles	***1,196,991***	90,176	90,176	90,176	90,176	71,419	88,294	99,094	88,294	58,134	80,759	68,934	68,934	61,786	46,111	58,411	46,111
Sub Total Investment: Intangibles	**1,196,991**	360,706				347,102				276,762				212,421			

	Year 5-10	Year5				Year6				Year7				Year8				Year9				Year10			
all costs in AUD		23q3	23q4	24q1	24q2	24q3	24q4	25q1	25q2	25q3	25q4	26q1	26q2	26q3	26q4	27q1	27q2	27q3	27q4	28q1	28q2	28q3	28q4	29q1	29q2
first quarter Q1 starts at Cabinet approval		Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30	Q31	Q32	Q33	Q34	Q35	Q36	Q37	Q38	Q39	Q40
INVESTMENT: INTANGIBLES																									
Technical Assistance & Advisory Services	**170,290**	17,213	16,213	17,213	16,213	16,963	16,213	16,963	16,213	5,011	4,261	5,011	4,261	5,011	4,261	5,011	4,261	0	0	0	0	0	0	0	0
Project management and advisory to PIU	54,976	6,872	6,872	6,872	6,872	6,872	6,872	6,872	6,872																
Project coordination and facilitation	29,600	3,700	3,700	3,700	3,700	3,700	3,700	3,700	3,700																
Legal and institutional development	0	0	0	0	0																				
Site surveying & planning	0	0	0	0	0																				
Building design and civil engineering	0	0	0	0	0																				
Laboratory interior design & tender preparation	0	0	0	0	0																				
Construction project costing and management	0	0	0	0	0																				
Equipment specifications, tender preparation	0	0	0	0	0																				
PIU operating expenses (off. eqpt, catering, etc)	6,500	1,000		1,000		750		750		750		750		750		750									
Unallocated TA & contingencies	79,214	5,641	5,641	5,641	5,641	5,641	5,641	5,641	5,641	4,261	4,261	4,261	4,261	4,261	4,261	4,261	4,261								
Human resources development services	**356,598**	45,250	26,453	37,253	26,453	23,753	31,925	20,100	20,100	31,925	17,288	17,288	29,113	0	8,100	0	0	8,100	0	0	8,100	0	0	5,400	0
Executive advisor (to Lab manager)	126,563	13,500	11,813	11,813	11,813	11,813	10,125	10,125	10,125	10,125	8,438	8,438	8,438												
In-country tech. transfer & capacity building	66,635	11,825	6,540	6,540	6,540	6,540	4,575	4,575	4,575	4,575	3,450	3,450	3,450												
Capacity building/ exposure in regional labs	75,600	8,100	8,100	8,100	8,100	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400												
Awareness & CB for SPS methods	87,800	11,825		10,800			11,825			11,825			11,825		8,100			8,100			8,100			5,400	
Sub Total Investment: Intangibles	***526,888***	62,463	42,666	54,466	42,666	40,716	48,138	37,063	36,313	36,936	21,548	22,298	33,373	5,011	12,361	5,011	4,261	8,100	0	0	8,100	0	0	5,400	0
Sub Total Investment: Intangibles	**1,196,991**	202,260				162,230				114,155				26,643				16,200				5,400			

ANNEX 5 - Summary of the Statement of Earnings of KOHSI

all figures in AUD	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
EXPENDITURES	313,712	457,296	544,175	563,865	619,697	569,705	569,102	576,755
Operating costs	151,742	263,711	333,258	353,177	397,202	355,107	346,705	360,472
Non-operating costs	38,551	66,811	81,934	80,993	91,507	82,862	89,907	82,931
Indirect costs	123,420	126,775	128,983	129,695	130,988	131,736	132,491	133,352
EARNINGS	24,750	109,050	184,300	336,615	492,854	610,041	694,014	826,541
Sales of tests	5,000	68,750	118,800	236,115	360,154	488,991	599,014	743,291
Sales of outsourced tests	17,250	25,300	46,000	74,750	103,500	86,250	57,500	40,250
Other sales (fumigation, training)	2,500	15,000	19,500	25,750	29,200	34,800	37,500	43,000
REVENUE	-288,962	-348,246	-359,875	-227,250	-126,843	40,336	124,912	249,786

ANNEX 6 - Detailed Statement of Earnings of KOHSI

all figures in AUD	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
EXPENDITURES	**313,712**	**457,296**	**544,175**	**563,865**	**619,697**	**569,705**	**569,102**	**576,755**
Operating costs	**151,742**	**263,711**	**333,258**	**353,177**	**397,202**	**355,107**	**346,705**	**360,472**
Reagents, chemicals, test kits	12,500	25,000	37,000	49,000	61,000	73,500	85,200	97,200
Calibration	0	5,000	7,500	7,875	8,000	9,000	9,500	10,000
QA services+ cert. standards	0	2,500	3,500	5,000	6,500	7,000	7,250	7,500
Salaries, technical staffs	112,680	190,368	222,035	200,472	203,688	160,359	160,788	173,337
Subcontracting of tests	15,000	22,000	40,000	65,000	90,000	75,000	50,000	35,000
Utilities (power, fuel, water) for tests	11,562	17,343	21,678	24,280	26,014	27,748	31,217	34,686
Waste disposal (BTC)		1,500	1,545	1,550	2,000	2,500	2,750	2,750
Non-operating costs	**38,551**	**66,811**	**81,934**	**80,993**	**91,507**	**82,862**	**89,907**	**82,931**
Salaries, admin staff	27,730	42,418	47,266	60,356	60,356	62,770	60,356	62,167
Utilities (power, water) for Offices	771	790	830	870	910	960	1,010	1,060
internet)	1,000	1,500	1,800	1,926	2,022	2,083	2,187	2,500
Membership fees in organisations	500	800	1,000	1,100	1,150	1,150	1,200	1,250
Accreditation	0	8,167	16,333	0	10,000	0	10,500	0
Training of staff (internal training)	750	1,904	2,220	3,007	3,055	1,604	1,500	1,500
Security costs	7,800	7,960	8,120	8,280	8,450	8,620	8,790	9,000
Maintenance		3,273	4,363	5,454	5,563	5,675	4,363	5,454
Indirect costs	**123,420**	**126,775**	**128,983**	**129,695**	**130,988**	**131,736**	**132,491**	**133,352**
Amortization of building	44,043	44,043	44,043	44,043	44,043	44,043	44,043	44,043
Amortization of equipment	73,377	73,377	73,377	73,377	73,377	73,377	73,377	73,377
Accounting & Auditing	1,000	2,500	2,550	2,601	2,679	2,759	2,842	2,927
Insurance	3,500	3,605	3,713	3,825	3,939	4,057	4,179	4,305
Travels in region	1,000	2,000	3,500	3,500	4,000	4,300	4,600	5,000
Financial costs (on OPEX)	0	500	750	1,200	1,800	2,000	2,200	2,350
Other costs (meetings, subscriptions...)	500	750	1,050	1,150	1,150	1,200	1,250	1,350

EARNINGS	**24,750**	**109,050**	**184,300**	**336,615**	**492,854**	**610,041**	**694,014**	**826,541**
Sales of tests	5,000	68,750	118,800	236,115	360,154	488,991	599,014	743,291
nb of tests	200	2,500	4,000	7,500	11,000	14,500	17,500	21,500
average unit price of test	25	28	30	31	33	34	34	35
Sales of outsourced tests	17,250	25,300	46,000	74,750	103,500	86,250	57,500	40,250
nb of ext. test	138	202	368	598	828	690	460	322
average unit price ext. test	125	125	125	125	125	125	125	125
Other sales (fumigation, training)	2,500	15,000	19,500	25,750	29,200	34,800	37,500	43,000

REVENUE	**-288,962**	**-348,246**	**-359,875**	**-227,250**	**-126,843**	**40,336**	**124,912**	**249,786**
Cumulated Revenue	-288,962	-637,208	-997,083	-1,224,334	-1,351,177	-1,310,841	-1,185,929	-936,143

ANNEX 6 - Staffing plan and Human Resource Development plan

CB Modules Year	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11
AAS theory+basic tech.	A1, A2		A4						
AAS advanced		A1, A2		A4					
AAS attachment			A2	A1	A4	A2	A1		
GC theory + basic techniques	A2		A4						
GC advanced		A2		A4, A5					
GC attachment				A2			A4	A2	
HPLC theory+basic tech.		A3		A5					
HPLC advanced				A3, A5					
HPLC attachement					A5	A3	A5		A3
Water & food microbiology	A1	A1, A3		A5	A5				
Microbiology attachement			A1, A3			A1	A3	A5	A6
QA in microbiology		A1, A3	A3	A5					
Uncertainty in microbiology									
QMS and ISO17025	All			All					
QC-QA & Uncertainty	M, All A								
Internal Audit & CA	All		T	All					
Trainer p.month	1.5	1.5	9w	2/6w	0.5/6w	9w	10w	5w	5w

POSITIONS	Year3	Year4	Year5	Year6	Year7	Year8	Year9	Year10	Year11
Executive Advisor (foreign)	1	1	0.8	0.7	0.6	0.5	0.4	0.3	
Manager (local/regional)	1	1	1	1	1	1	1	1	1
Administrator (local)		0.5	0.5	1	1	1	1	1	1
Senior Analyst (foreign)	1	2	2	1	1				
Senior Analyst (local)				1	2	2	2	2	2
Analyst (local)	2	3	4	4	3	3	3	3.5	4
Technician (local)	1	1	2	2	2	2	2.5	2.5	3
Cleaner	0.5	0.5	1	1	1	1	1	1	1
STAFF	6.5	9	11.3	11.7	11.6	10.5	10.9	11.3	12