UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

Project of EAC, ECOWAS + Ethiopia

Project number:	220179
Project title:	Increasing African production of vaccines and essential medicines through business linkages and technology transfer
Thematic area code	IC21
Starting date:	01.01.2023
Duration:	18 months
Project site: **Government Co-ordinating agency:**	Projected sites: Ethiopia, Kenya, Nigeria, Tanzania[1], Burkina Faso[2]
Counterpart:	ECOWAS; EAC
Executing agency/ cooperating agency:	ECOWAS / EAC Secretariats; WAHO
Project Inputs:	
- Donor inputs:	€ 639,000
- UN coordination levy (1%)	€ 7,221
- Support costs (13 %):	€ 83,070
- Counterpart inputs:	(in-kind)
- Grand Total:	€ 729,291

Brief description:

The overall objective of this project is to enhance African capacities for the production of health commodities, viz. vaccines and essential medicines, by facilitating technology transfer partnerships between private sector actors. As such, it seeks to contribute to SDG 3 “Good health and well-being”, in particular target 3.8, and to Inclusive and Sustainable Industrial Development (ISID), in line with SDG 9 and specifically targets 9.2, 9.3 and 9.5. The intervention is part of UNIDO’s Health Industry Initiative and comprises two key components that have been designed to allow subsequent scale-up and/or replication in terms of targeted locations, products and/or value system elements.

Component 1
In April, 2021, the African Union and African CDC launched the Partnerships for Vaccines Manufacturing (PAVM) to address the vaccines crisis in Africa. PAVM has announced a target of 60% of Africa's vaccine needs being produced locally by 2040. Given the existing low manufacturing capacity for vaccines in Africa, expanding local production of vaccines will require enhanced technology transfer. This, in turn, will require rationalized product / marketing plans on a regional basis with projected offtake arrangements, which would then make these market opportunities commercially viable and attractive for prospective technology transfer partners. Such regional product / marketing plans for vaccines (covering demand projections for the vaccines, vaccine procurement patterns, and prospects for purchase commitments by potential buyers) are an anticipated output of this project. The output indicator will be the number of Regional Economic Communities (RECs) in Africa, for which these detailed vaccine product / marketing plans are completed.

Component 2
Africa continues to import a major part of the pharmaceutical products listed as Essential Medicines.

[1] In its capacity as host country for the EAC Secretariat.
[2] In its capacity as host country for WAHO.

To enhance local companies' product portfolios and thereby increase local production coverage of the Essential Medicines' List, this project will support technology transfer from companies in a more sophisticated pharmaceutical industry (e.g. Germany's) to fill gaps in African companies' product offerings. The envisioned output is the conclusion of North-South technology transfer arrangements for selected essential medicines. The output indicator will be the number of such technology transfer arrangements (including commercial agreements) that are completed.

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A. CONTEXT

Today, local industry in Africa produces less than 2% of the vaccines used by Africans, and more than 90% of medical and pharmaceutical products consumed on the continent need to be imported. Specially after the supply chain disruptions triggered by the COVID-19 pandemic, which caused vaccine and medicine shortages throughout the continent, Africa's dependence on imports for these critical health commodities is widely recognized as a serious threat to health security, and a condition that needs to be ameliorated urgently to prevent future crises.

This project will support needs-based streamlining of responses to the challenge of vaccine manufacturing in Africa, particularly through market analyses on a regional basis. It will also support transfer of production know-how and capabilities to African medicines producers in certain therapeutic categories.

A requirement in actualizing such technology transfers in the area of vaccines and essential medicines is effecting linkages between private-sector manufacturers of these products in more mature industries (e.g. the German pharmaceutical industry) with (potential) local producers in Africa. In addressing this requirement, the project will focus on selected priority countries in the ECOWAS and EAC regions of Africa. However, on successful completion, there will be the possibility for scale-up of results by replication and adaptation of the interventions in Southern and Central Africa. Alternatively, further countries in the same two regions could be added, or possibilities of technology transfer explored for other (potential) products and/or value chain components within the present regions and countries.

As such, the project's direct beneficiaries include pharmaceutical manufacturers in the African target countries as well as producers of vaccines and medicines in Germany. In addition, the populations of the ECOWAS and EAC regions will benefit indirectly through better access to necessary vaccines and essential medicines.

B. REASONS FOR UNIDO ASSISTANCE

Vaccines:

Since the COVID-19 pandemic, most announced vaccine production capacity-building projects in Africa have focused on COVID-19 vaccines, some of them without identified technology transfer partners. Such projects have to take into account some challenging realities:

i. The course of the COVID-19 pandemic is uncertain; so, it is difficult to make commercial forecasts of the COVID-19 vaccine market, projecting 5-10 years out. Also, whilst at a global scale there is at present no longer a shortage of COVID 19 vaccine production, even if African supply needs for these products were to be met entirely by local manufacturing facilities, this would still not allow to reach the 60% production target for all vaccines set by the African Union - Africa CDC.

ii. The private market for vaccines for Africa is negligible. Most vaccines are procured under the respective Governments' Expanded Programmes for Immunization (EPI). And in many regions, most of the vaccine procurement is financed by GAVI, the Vaccine Alliance.

iii. GAVI mandates procurement of only WHO-prequalified vaccines with its funds. So, if any vaccines produced by a manufacturer based in Africa need to be marketed to GAVI, these vaccines would also have to meet WHO prequalification requirements.

iv. Vaccines are commodity products, and cost-competitiveness depends largely on scale production. As such, unless there is a significant home market for vaccines, it only makes sense to target vaccine production to a regional or cross-regional market.

A rational response to Africa's vaccine manufacturing needs requires detailed study of the market/production and epidemiological realities for each of Africa's regions. But much of this work remains to be done, in particular also for immunizations against infectious diseases other than COVID-19, such as measles, polio or tetanus to name but a few. Without these important, basic investigations and the information derived therefrom, it will be difficult to interest established, international vaccine manufacturers to consider vaccine manufacturing opportunities in Africa.[3]

[3] Wherever possible, efforts will be made to complement, synthesise and build on existing data from partners such as GIZ, KfW, PAVM, as applicable, to avoid redundancies and increase acceptance.

Essential medicines:

African pharmaceutical manufacturers have encountered difficulties in expanding their product offerings, and producing more of the medicines in their countries' EMLs, because of weaknesses in their technical and financial capacity to develop new products and formulations themselves. At the same time, they have faced hurdles in acquiring new product dossiers from technology partners in more developed pharmaceutical industries. There is therefore a need to:

a) Engage with manufacturers in a sophisticated pharmaceutical industry (such as Germany's) and match products or product categories that these firms might want to transfer, with gaps in African companies' product portfolios;

b) For such product matches, assist in the structuring of technology transfer arrangements, including commercial agreements.

To contribute towards these identified needs, both in the areas of vaccines and essential medicines, the project will build on UNIDO's longstanding experience in strengthening local pharmaceutical production gained to a large extent with funding support from Germany, and use its convening role and strong partnerships to effect interventions which are ultimately aimed at increasing production of, and access to, these health products in Africa.

C. THE PROJECT

C.1. Objective of the project

The overall goal is to enhance African capacities for the production of health commodities, viz. vaccines and essential medicines, by facilitating private sector partnerships.

For vaccines, the specific objective is to produce, for selected regions in Africa, rationalized product / marketing plans with projected offtake arrangements, which would make these market opportunities real, and attractive, for prospective technology transfer partners.

For essential medicines, the specific objective is to identify product possibilities for North-South technology transfer, and to explore and work through the mechanics and details of arrangements required for this purpose.

C.2. The UNIDO approach

The UNIDO approach entails recognition:

i) That more and better information on supply and demand patterns for health products in Africa is an essential prerequisite for expanding investment in pharmaceutical production on the continent;

ii) That parties with the capacity to play important roles in increasing the supply of vaccines and essential medicines in Africa will greatly benefit from increased availability of essential data they need to make their contributions;

iii) That UNIDO, as an impartial partner, is well positioned to facilitate technology transfer and support collection and dissemination of required information as a public good.

Given the scale effects in vaccine manufacturing, production facilities should generally be targeted at meeting regional demand (with the exception of rare cases where national markets are sufficiently large). However, demand data on vaccines for both legacy and expanding diseases, aggregated by region, continue to be very limited. Presenting reliable information on epidemiological need and market potential is essential to encourage investors and technology partners to consider involvement in vaccine manufacturing in Africa. Therefore, compiling that information on a regional basis is an important part of this project.

In the case of essential medicines, both pharmaceutical companies in developed economies and their counterparts in Africa have poor visibility on each other's product strengths and capacities. So, match-making to effect technology transfer between them needs to start with exchange of information to identify complementarities. Then, once potential complementarity is indicated, there would be the challenge of gauging local market potential for a product or products under consideration. At each step, availability of the right information is critical, and this awareness is built into the project approach.

Besides such information related considerations, the approach is to take a holistic view of the elements that must come together to actualize either and both project components. For vaccines, it is

recognized that improved data on supply and demand patterns needs to come together with other critical success factors such as market shaping efforts by major buyers like GAVI as well as offtake agreements with procurers. For essential medicines, in addition to the North-South pharmaceutical companies who would be parties in a technology partnership, the function of the regulator in encouraging technology transfer into its African jurisdiction is also vital for success. That is why the roles of collaborating / contributing partners are very important to this project overall. Some collaborating partners are mentioned below for each project component.

Component	Focus	Potential contributing partners
1	Vaccines	EAC, ECOWAS, WAHO, GAVI, UNICEF, health ministries, Verband Forschender Arzneimittelhersteller (VFA), PAVM
2	Essential medicines	Bundesverband der Arzneimittel-Hersteller (BAH), ProGenerika, Pharmaceutical Manufacturers Group of Manufacturers Association of Nigeria (PMG-MAN), Federation of Kenya Pharmaceutical Manufacturers (FKPM), Ethiopian Pharmaceutical and Medical Supplies Manufacturers Sector Association, national regulators

The project will be implemented as part of UNIDO's Health Industry Development Initiative and managed within the Division of SME Competitiveness, Quality and Job Creation (TCS/SME). In addition to drawing on the range of technical expertise present across the Organization, it will involve organizational entities such as the Regional Division for Africa, the Field Offices in the target countries, and relevant Investment and Technology Promotion Offices (ITPOs), particularly that in Germany.

Through the vaccine component, this project has a potential linkage with another UNIDO intervention to work with PAVM in deal preparation for vaccine manufacturing on a regional basis in Africa.

Gender mainstreaming

Women and children are particularly vulnerable with regard to health security and its implications for socio-economic development.

This has been further exacerbated by the repercussions of the Covid-19 pandemic and also becomes evident, for example, in terms of particular challenges related to maternal and reproductive health or arising from gender-specific discrepancies in the burden or pattern of diseases, both infectious and non-communicable in nature.

Beyond the particularities of their own exposure to health risks, it is typically also left to women to look after, and care for sick members of their households and families, which deprives them of capacities they could otherwise invest in personal development opportunities, and adds to putting them at a disproportionate disadvantage in the face of insufficient health coverage.

Project implementation will therefore pay particular attention to the needs of female individuals across all age groups. To the extent possible, this will be reflected in the kind of remedial products and/or categories thereof to be selected as part of the interventions. Also, given the high share of women in health-related professions on the one hand and the sector’s potential for high-quality employment creation on the other, the project will seek to identify and utilize entry points for closing the gender gap through economic empowerment.

With a view to expanding on the observations above, the conduct of a more detailed gender analysis and dedicated impact assessment would be highly desirable and pursued further if ongoing attempts to raise additional funding for this purpose bear fruit.

In addition to ensuring that all project staff have undergone at least basic gender sensitization training (UN Women “I know gender” courses), a number of measures will be taken to facilitate that women and men can equally access, participate in, and benefit from the project and its intended results.

As such, attention will be paid to achieving gender balance in recruiting the experts and coordinators needed for the implementation of this project. Efforts will also be made to identify women-led SMEs for the private sector partnerships to be facilitated as part of this project.

To the extent possible, requisite information gathering activities will look to retrieve sex-disaggregated data. In addition, communication and outreach activities undertaken as part of the project will be

gender-sensitive, e.g. in terms of language use, balanced representation of men and women, and abstention from reproducing any (gender) stereotypes.

Finally, monitoring and reporting undertaken as part of this project will rely on gender-differentiated indicators wherever possible.

C.3. RBM code and thematic area code

IC2 Advancing Economic Competitiveness

IC21 Investment, Technology & SME Development

C.4. Expected outcomes

The expected outcome is that technology/investment partnerships for health product manufacturing in Africa are built between private sector actors.

For vaccines, this will be achieved by:

- Producing example(s) of product / marketing plans for vaccine manufacturing on a regional basis in one or more African REC(s), and promoting their application to attract technology and/or investment providers;
- Establishing and disseminating a methodology to produce the above, which can be replicated for other regions.

For essential medicines, this will be achieved by:

- Creating example(s) of concluded product transfer arrangement(s) between German and African pharmaceutical manufacturers, which could serve as pilots for others to follow;
- Generating and sharing insights on key elements / conditions / considerations which must exist to facilitate technology transfer of medicines and formulations.

C.5. Outputs and activities

Output 1:	Product / marketing plans for vaccine manufacturing in the ECOWAS and/or EAC regions	
	Activities	**Responsibility**
1.1	Initiate contact, and work with VFA Berlin to identify German vaccine producers with a potential interest in tech transfer / production ventures in Africa a. Contact potential German vaccine tech transfer partners directly and determine their interests b. Determine their stated information requirements for their evaluation of tech transfer opportunities in Africa	UNIDO
1.2	Initiate contact, and work with GAVI / UNICEF on acquiring figures on history / future projections of vaccine procurement (including prices) in ECOWAS / EAC countries[4]	UNIDO
1.3	Initiate contact, and work with WAHO and Ministries of Health in ECOWAS / EAC countries on acquiring figures on demand projections for countries' EPIs, and procurement financing plans[3]	UNIDO
1.4	Work in collaboration with PAVM to incorporate priorities of PAVM Framework of Action in UNIDO interventions	UNIDO
1.5	Present gathered data to potential German vaccine technology partners to further qualify their interest	UNIDO
1.6	Select 3-4 potential vaccine technology partners on German side	UNIDO
1.7	Survey and select potential vaccine technology partners in ECOWAS / EAC	UNIDO
1.8	Bring potential German / African technology partners together, and assist in preparation of "investor-ready" tech transfer deals	UNIDO

[4] Findings will be subjected to online peer review for quality assurance and validation purposes.

Output 2: Product transfer arrangements between German and African pharmaceutical producers		
	Activities	**Responsibility**
2.1	Initiate contact, and work with PMG-MAN (Nigeria), FKPM (Kenya), and EPMSMSA (Ethiopia) to identify pharmaceutical companies interested in receiving technology for new products	UNIDO
2.2	Contact potential technology recipient companies directly, determine their product/s (categories) of interest	UNIDO
2.3	Involve national regulators and pharmaceutical trade associations in discussions on regulatory changes to facilitate inward tech transfer for new medicines, and shepherd implementation of these regulatory changes	UNIDO
2.4	Initiate contact, and work with ProGenerika (Berlin) and BAH (Bonn) to identify and contact German medicine manufacturers with a potential interest in tech transfer ventures in Africa, and with products / capacity to fill portfolio gaps identified in 2.2	UNIDO
2.5	Based on appropriate due diligence, select up to 4 potential product technology transfer recipients on African side	UNIDO
2.6	Survey and select potential product technology provider companies on German side	UNIDO
2.7	Bring potential German / African technology partners together, and assist in implementation of product transfer agreements	UNIDO

C.6. Timeline of the activities

Activity	Months																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Product / marketing plans for vaccine manufacturing in the ECOWAS and/or EAC regions																		
1.1 Initiate contact, and work with VFA Berlin to identify German vaccine producers with a potential interest in technology transfer / production ventures in Africa a. Contact potential German vaccine tech transfer partners directly and determine their interests b. Determine their stated information requirements for their evaluation of tech transfer in Africa																		
1.2 Initiate contact, and work with GAVI / UNICEF on acquiring figures on history / future projections of vaccine procurement (including prices) in ECOWAS / EAC countries																		
1.3 Initiate contact, and work with WAHO and Ministries of Health in ECOWAS / EAC countries on acquiring figures on demand projections for countries' EPIs, and procurement financing plans[5]																		
1.4 Work in collaboration with PAVM to incorporate priorities of PAVM Framework of Action in UNIDO interventions																		
1.5 Present gathered data to potential German vaccine technology partners to further qualify their interest																		
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[5] Necessary preparations for recruitment of the national coordinators will commence with conclusion of the Trust Fund Agreement for this project.

Activity	Months																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
2.5 Based on appropriate due diligence, select up to 4 potential product technology transfer recipients on African side																		
2.6 Survey and select potential product technology provider companies on German side																		
2.7 Bring potential German / African technology partners together, and assist in implementation of product transfer agreements																		

C.7. Risks

Result	Assumptions	Risks	Mitigation measures
Private sector partnerships for African health product manufacturing built	Convergence of interest between targeted partners can in principle be created.	Non-cooperation or slow cooperation from any significant contributing partner (e.g. GAVI)	Contact with all major partners, and work with them, is front-loaded in the timeline for this Project, so that this risk can be assessed early on, and appropriate remedial steps can be undertaken.
	Growing business opportunities in the African health product market are commercially attractive to potential investment/technology partners.	Reluctance of targeted technology providers from Germany to enter into business relationships in Africa given potential perception of commercial uncertainties	In the project design, a fairly wide net has been cast to identify German companies that would potentially be interested in partnering with African companies. The project will engage with at least 3 German trade groups of pharmaceutical companies to identify those interested members.

D. INPUTS

D.1. Counterpart inputs

Specific in-kind contributions from counterparts are particularly required in terms of active collaboration in the various data collection and assessment efforts reflected in the description of activities in section C.5/6 above. Governments will further be expected to contribute to the removal of institutional and/or political barriers or inconsistencies that might impede smooth implementation of project interventions.

In addition, participants of the match-making fora may be requested to bear parts of the costs related to their attendance.

D.2. UNIDO inputs

1. International staff

Description	Work months
International Lead Expert to drive and coordinate substantive project activities	12
International Finance Expert to provide guidance/advice in preparation of "investor-ready" technology transfer deals for regional vaccine manufacturing	3
International Contracting Expert to guide/advise on contractual aspects of pharmaceutical product transfer arrangements	3
Industrial Development Expert to facilitate overall project management	4

2. National staff

Description	Work months
National Coordinator for each Member State of ECOWAS / EAC (n=22) to support data collection/assessment and stakeholder liaison on the ground	2[6]
National Expert to support stakeholder liaison and selection of potential pharmaceutical technology recipients in:	
• Ethiopia	6
• Kenya	6
• Nigeria	6

3. Events[7]

- Match-making forum bringing together potential German / African vaccine technology transfer partners to substantiate prospects for joint engagement in "investor-ready" deal preparation
- Match-making forum bringing together potential German / African medicine technology partners to substantiate prospects of product transfer agreements

E. BUDGET[8]

BL	Description	Year 1	Year 2	Total
Outcome: Private sector partnerships for African health product manufacturing				
Output 1:	**Product / marketing plans for vaccine manufacturing in the ECOWAS and/or EAC regions**			
11	International experts	40,000	56,000	96,000
15	Project travel	6,000		6,000
17	National coordinators	176,000		176,000
35	Match-making forum		40,000	40,000
51	Miscellaneous	6,000	4,000	10,000
Sub-Total Output 1		**228,000**	**100,000**	**328,000**
Output 2:	**Product transfer arrangements between German and African pharmaceutical producers**			
11	International experts	40,000	56,000	96,000
15	Project travel	6,000		6,000
17	National experts	72,000	36,000	108,000
35	Match-making forum		40,000	40,000
51	Miscellaneous	1,000	1,000	2,000
Sub-Total Output 2		**119,000**	**133,000**	**252,000**

[6] This is an average figure. The actual number of working months may vary between countries based on need, but the sum total is not expected to exceed 44 months.
[7] Provided they don't need to be held online, locations for both fora will be determined in consultation with the African and German partners.
[8] All figures are provided in Euro.

Output 3: Project Management, Monitoring and Self-evaluation				
11	International expert		48,000	48,000
15	Project travel		6,000	6,000
51	Miscellaneous	3,000	2,000	5,000
Sub-Total Output 3		**3,000**	**56,000**	**59,000**
TOTAL		**350,000**	**289,000**	**639,000**
Programme Support Cost (13%)		**45,500**	**37,570**	**83,070**
UN Coordination Levy (1%)		**3,955**	**3,266**	**7,221**
GRAND TOTAL		**399,455**	**329,836**	**729,291**

F. MONITORING, REPORTING AND EVALUATION

The allotment holder with support from dedicated project staff will be responsible for activities to monitor, report and evaluate the progress and performance of interventions in accordance with the provisions outlined below.

Monitoring

Progress of implementation and validity of the intervention logic (including risks and assumptions with regard to external success factors) will be continuously monitored. Achievement of the project outputs and their contribution to the envisaged outcome and ultimate objective will be tracked using the indicators and means of verification shown in the following table.

Results	Indicators (IRPF code)	Target	Means/Sources of Verification
Objective			
African capacities for the production of vaccines and essential medicines enhanced	Number of African manufacturers with increased inclusion in health product value chains (SOC.2)	≥1[9]	Follow-up with entities such as PAVM, AMA[10], RECs, African trade associations at continental (FAPMA[11]), regional (FEAPM[12], WAPMA[13]) and/or national levels as well as chambers of commerce as applicable
Outcome			
Private sector partnerships for African health product manufacturing built	Number of new partnerships (BUS.2)	2	- Feedback from event participants - Follow-up with German / African trade associations

[9] As evidenced, for example, by increased volume of production under agreements; disaggregation by women/men-led manufacturers.
[10] African Medicines Agency
[11] Federation of African Pharmaceutical Manufacturers' Associations
[12] Federation of East African Pharmaceutical Manufacturers
[13] West African Pharmaceutical Manufacturers' Association

Results	Indicators (IRPF code)	Target	Means/Sources of Verification
Outputs			
1. Product / marketing plans for vaccine manufacturing in the ECOWAS and/or EAC regions developed and promoted for application / replication	Number of product / marketing plans (TCO.4)	1-2	Documentation and records produced during project implementation
	Number of publications and/or events pertaining to the adopted approach / methodology	1-2	
2. Product transfer arrangements between German and African pharmaceutical producers facilitated	Number of new product transfer arrangements (TCO.4)	2	Documentation and records produced during project implementation
	Number of publications and/or events on key elements / conditions / considerations for North-South tech transfer of pharmaceutical products / formulations	1-2	

Reporting:

A progress report will be prepared by the end of year 1 to request disbursement of the second funding instalment, as well as following completion of this 18-month project.

Evaluation:

Project performance will be subject to regular self-evaluation based on review of all project-related documentation and feedback from stakeholders.

G. PRIOR OBLIGATIONS AND PREREQUISITES

None

H. LEGAL CONTEXT

It is expected that each set of activities to be implemented in the target countries will be governed by the provisions of the Standard Basic Cooperation Agreement concluded between the Government of the recipient country concerned and UNIDO or – in the absence of such an agreement – by one of the following: (i) the Standard Basic Assistance Agreement concluded between the recipient country and UNDP, (ii) the Technical Assistance Agreements concluded between the recipient country and the United Nations and specialized agencies, or (iii) the Basic Terms and Conditions Governing UNIDO Projects.

ANNEX: Logical framework

	Intervention logic	Objectively verifiable indicators	Sources of verification	Assumptions
Development goal/impact	African capacities for the production of vaccines and essential medicines enhanced	Number of African manufacturers with increased inclusion in health product value chains (target: at least 1)[14]	Follow-up with entities such as PAVM, AMA[15], RECs, African trade associations at continental (FAPMA[16]), regional (FEAPM[17], WAPMA[18]) and/or national levels as well as chambers of commerce as applicable	
Outcome / immediate objective	Private sector partnerships for African health product manufacturing built	Number of new partnerships (target: 2)	Feedback from event participants Follow-up with German / African trade associations	Necessary investment capital for the implementation of product / marketing plans for regional vaccine manufacturing can be mobilized.
Outputs (results)				
1	Product / marketing plans for vaccine manufacturing in the ECOWAS and/or EAC regions developed and promoted for application / replication	Number of product / marketing plans (target: 1-2) Number of publications and/or events pertaining to the adopted approach / methodology (target: 1-2)	Documentation and records produced during project implementation	Convergence of interest between technology partners can be created on the basis of the product / marketing plans.

[14] As evidenced, for example, by increased volume of production under agreements; disaggregation by women/men-led manufacturers.
[15] African Medicines Agency
[16] Federation of African Pharmaceutical Manufacturers' Associations
[17] Federation of East African Pharmaceutical Manufacturers
[18] West African Pharmaceutical Manufacturers' Association

	Intervention logic	Objectively verifiable indicators	Sources of verification	Assumptions
2	Product transfer arrangements between German and African pharmaceutical producers facilitated	Number of new product transfer agreements (target: 2) Number of publications and/or events on key elements / conditions / considerations for North-South tech transfer of pharmaceutical products / formulations (target: 1-2)	Documentation and records produced during project implementation	All parties involved formally agree to the arrangements.
Activities		**N.A.**	**N.A.**	
1.1	Initiate contact, and work with VFA Berlin to identify German vaccine producers with a potential interest in tech transfer / production ventures in Africa a. Contact potential German vaccine tech transfer partners directly and determine their interests b. Determine their stated information requirements for their evaluation of tech transfer opportunities in Africa			
1.2	Initiate contact, and work with GAVI / UNICEF on acquiring figures on history / future projections of vaccine procurement (including prices) in ECOWAS / EAC countries			

	Intervention logic	Objectively verifiable indicators	Sources of verification	Assumptions
1.3	Initiate contact, and work with WAHO and Ministries of Health in ECOWAS / EAC countries on acquiring figures on demand projections for countries' EPIs, and procurement financing plans			
1.4	Work in collaboration with PAVM to incorporate priorities of PAVM Framework of Action in UNIDO interventions			
1.5	Present gathered data to potential German vaccine technology partners to further qualify their interest			
1.6	Select 3-4 potential vaccine technology partners on German side			
1.7	Survey and select potential vaccine technology partners in ECOWAS / EAC			
1.8	Bring potential German / African technology partners together, and assist in preparation of "investor-ready" tech transfer deals			

	Intervention logic	Objectively verifiable indicators	Sources of verification	Assumptions
2.1	Initiate contact, and work with PMG-MAN (Nigeria), FKPM (Kenya), and EPMSMSA (Ethiopia) to identify pharmaceutical companies interested in receiving technology for new products			
2.2	Contact potential technology transfer recipient companies directly, determine their product/s (categories) of interest			
2.3	Involve national regulators and pharmaceutical trade associations in discussions on regulatory changes to facilitate inward tech transfer for new medicines, and shepherd implementation of these regulatory changes			Regulators are amenable to the regulatory changes.
2.4	Initiate contact, and work with ProGenerika (Berlin) and BAH (Bonn) to identify and contact German medicine manufacturers with a potential interest in tech transfer ventures in Africa, and with products / capacity to fill portfolio gaps identified in 2.2			

	Intervention logic	Objectively verifiable indicators	Sources of verification	Assumptions
2.5	Based on appropriate due diligence, select up to 4 potential product technology transfer recipients on African side			
2.6	Survey and select potential product technology provider companies on German side			
2.7	Bring potential German / African technology partners together, and assist in implementation of product transfer agreements			Product transfer arrangements agreeable to both parties can be identified.