AGRICULTURE SECTORAL WORKING GROUP

(ASWG)

IMPACT OF SCR 986 PROGRAM INPUTS ON REHABILITATION OF THE VETERINARY COLD CHAIN IN IRAQ

ANIMAL HEALTH, POULTRY & ANIMAL PRODUCTION SUB-SECTOR

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CONTENTS

EXECUTIVE SUMMARY

1. This document reports the findings of a self-contained task that the Agriculture Sectoral Working Group (ASWG) of the United Nations observation system in Iraq carried out at the storage warehouses for veterinary vaccines/medicines in five governorate veterinary hospitals and 45 district veterinary clinics. The task assessed the impact and adequacy of MOU programme inputs on the rehabilitation of the veterinary cold chain and evaluated the difficulties and additional needs for efficient maintenance of the cold chain during transport and storage of vaccines and heat sensitive medicines

2. The study was conducted between 12 November 2000 and 18 January 2001 in the governorates of Anbar, Muthana, Ninewa, Tameem and Thi Qar.

3. Storage of medicines and vaccines at the central warehouses in Baghdad was found to be adequate and efficient. The Agriculture Supply Company (ASCO) provides the storage facilities.

4. Programme generators and cold trucks supplied to the governorate veterinary hospitals sufficiently covered the current needs of the facilities while refrigerators covered only 40% of the requirements. All the hospitals surveyed had non-programme cold storage and air-conditioned facilities. Air-conditioned and cold storage space available was 34% and 25% respectively of actual need. Non-programme cool boxes used to transport vaccines and heat sensitive medicines covered 42% of the requirements.

5. The 45 clinics surveyed had 29,917 litres of refrigerator space against a total need of 52,157 litres. Programme refrigerators cover 30% of requirements. Lack of cool boxes highly constrained field transportation of vaccines and heat sensitive medicines. Only 8 non-programme cool boxes (13% of need) were available in the 45 clinics against a total need of 62. Field transport of vaccines was done using improvised gadgets such as thermos flasks and temporary ice-packs. Medicines were not properly stored in all the 45 district clinics included in the study, as none of them had air conditioned storage space. The clinics required a total of 62 air-conditioned stores, with total storage space of 2,086.8 cubic metres.

6. Supply of programme generators to the district veterinary clinics has ensured electricity supply during power cuts. The clinics surveyed experienced an average of 8.8 hours of power cuts daily, seven days a week. However, 33% of the clinics visited said the programme generators did not provide them with sufficient power.

7. Programme inputs improved handling of vaccines and heat sensitive medicines at all points of the distribution chain. Approximately 80 per cent of the district clinics

surveyed received their vaccines and heat sensitive medicines through the use of refrigerated vehicles and cool boxes of the governorate veterinary hospitals.

8. There is need to expedite the arrival in the country of commodities meant for the rehabilitation of the veterinary cold chain so that the full benefits of the programme could be realized at the end-user level. Currently 250 compressors, ordered under Comm. # 702533 for rehabilitation of the cold chain, are on hold.

1. Introduction

Veterinary vaccines for ruminants, canines and poultry, heat sensitive drugs and other pharmaceuticals have been supplied to Iraq under the various phases of the SCR 986 Programme. These items require storage and transportation under controlled temperature in order to sustain their viability and acceptable level of potency. For that reason, a cold chain that maintains the temperature at 2–8°C for vaccines and some hormones and 10-25°C for other pharmaceuticals is essential for proper handling of veterinary vaccines and medicines. The cold chain should maintain the required temperature during both storage and transportation of the commodities.

The cold chain in Iraq has substantially deteriorated over the last ten years. The situation has further been aggravated by long hours of electric power outages experienced throughout the country. The Government of Iraq proposed rehabilitation of the veterinary cold chain under SCR 986 Programme in Phase IV and included items meant for that purpose in Distribution Plan IV.

Refrigerators and generators worth US$ 675,500 arrived in the country under Phases IV and V of the programme. A total of 211 refrigerators, 15 generators of 27-30KVA and 211 generators of 10KVA were received and subsequently distributed to central distribution points (CPDs), governorate distribution points (GDPs) and district distribution points (DDPs). These were facilities that comprised the distribution chain for vaccines, medicines and other programme inputs. In Phase VIII of the program, each of the GDPs was supplied with a 3-ton refrigerated truck for transportation of vaccines and medicines.

This self-contained study was carried out at all points of the distribution chain (CDPs, GDPs and DDPs) in five selected governorates in order to assess the impact and adequacy of SCR 986 Program inputs on the rehabilitation of the veterinary cold chain. The study further evaluated the difficulties and additional needs of the distribution chain in maintaining efficiency during storage and transportation of veterinary vaccines and medicines.

2. Observation procedures and methodology

Five teams from the Animal Health, Poultry and Animal Production sub-sector of the Agriculture Sectoral Working Group (ASWG) conducted the study. The five governorates (GDPs) of Anbar, Muthana, Ninewa, Tameem and Thi Qar and 45 randomly selected veterinary clinics (DDPs) in the five governorates were involved in the study. The two central warehouses (CDPs) of Sheikh Omar and Saba Nissan in Baghdad were also included in the study. The study aimed at covering a representative sample of GDPs and DDPs in the whole country as shown in **Table 1.**

Table 1: Number of CDPs, GDPs and DDPs included in the study and the respective percentage of the total number of facilities in the country

Type of facility	Total in country	Number visited	% of total
CDP	2	2	100
GDP	15	5	33.3
GDP	228	45	19.7

Data collection commenced on 12 November 2000 and was completed on 18 January 2001. The filled-in questionnaires were submitted to the FAO database for processing and analysis. The complete task document, used for data collection, is presented as an annex to the report.

3. Results and Findings

3.1 Central Distribution Points (CDPs)

The two central warehouses at Sheikh Omar and Saba Nissan had sufficient cold storage and air conditioned space provided by the Agricultural Supply Company (ASCO). However, the designated air-conditioned space for storage of medicines at the Saba Nissan warehouse covered approximately 76% of the needs of the CDP. The deficit was compensated through the use of a reserve warehouse. The CDP, therefore, required an additional designated air-conditioned warehouse of 8,000m^3. **Table 2** shows the space utilized at the two CDPs for storage of vaccines and medicines in comparison to the space that ASCO had provided, as assessed during this study.

Table 2: Provision and utilization of space at the Sheikh Omar and Seven Nissan CDPs

CDPLocation	Storage temperature	Space (m^3)			Remarks
		Provided	Utilized	Extra need	
Shekh Omar	0-10°C	720	24.4	0	
Seven Nissan	10-25°C	24,000	29,776.5	5,776.5	ASCO provides the extra space on need

					basis

The CDPs had sufficient continuous electric power supply and back-up generators. The cold chain was properly maintained at the CDPs. The CDPs confirmed that veterinary vaccines and heat sensitive medicines were transported to the governorate distribution points (GDPs) using refrigerated trucks and cool-boxes of the GDPs.

3.2 Governorate Distribution Points (GDPs)

The cold trucks supplied by the program to the GDPs were sufficent for the transportation of veterinary vaccines and medicines from the CDPs to GDPs and from GDPs to DDPs, at the current level of operation. Program generators supplied to the governorate veterinary hospitals sufficiently covered the current needs of the facilities. It was, however, observed that the generators would not be sufficient if adequate air-conditioned storage space was to be provided to the GDPs.

The total available refrigerator space at the GDPs was 12,180 litres against a total need of 17,220 litres, representing approximately 71% of total need. Program refrigerators supplied to the GDPs covered 40% of the required space. All the hospitals surveyed had non-program cold storage and air-conditioned facilities. Air-conditioned and cold storage space available was 34% and 25% respectively of actual need. It was observed that the government was rehabilitating and expanding the cold chain facilities in Muthana GDP with a view to using it as a CDP for the southern governorates. Non programme cool boxes used in the field to transport vaccines and heat sensitive medicines covered 42% of total requirements. **Table 3** shows the available space for cold chain storage at the GDPs in comparison with total needs.

Table 3: Available space for cold chain storage at the GDPs in comparison to total need

Item	Number available	Number from Program	**Total space**		Unmet need	Units of space
			Needed	Available		
Refrigerator	26	19	17,220	12,180	5,040	litre
Cool box	24	0	3,948	1,645	2,303	litre
Cold chamber	5	0	118.9	29.3	89.6	m^3
Air-conditioned storage space	5	0	655	220	435	m^3

3. 3 District Distribution Points (DDPs)

Approximately 80% of the 45 district clinics surveyed received their vaccines and heat sensitive medicines through the use of refrigerated vehicles and cool boxes of the governorate veterinary hospitals. All the 45 DDPs surveyed had received programme back-up generators. The clinics experienced an average of 8.8 hours of power cuts daily, seven days a week; but the outages were compensated by back-up generators. The generators adequately maintained the cold chain, but did not provide sufficient power to 33 percent of the clinics visited.

The district clinics had a total of 29,917 litres of refrigerator space against a total need of 52,157 litres. Programme refrigerators covered 30% of need. Lack of cool boxes highly constrained field transportation of vaccines and heat sensitive medicines. Only 8 non-programme cool boxes (13% of requirements) were available in the 45 clinics against a total need of 62. Field transport of vaccines was done using improvised gadgets such as thermos flasks and temporary ice packs in 87% of the clinics. None of the 45 district clinics included in the study had air conditioned space, but they all had sufficient storage space. Consequently, medicines were not properly stored (since they required maximum of 25°C, especially in summer with temperature rising above 50°C). The clinics required 62 air-conditioned stores (total space 2,086.8 cubic meters). **Table 4** shows the available space for cold chain storage at the DDPs in comparison with total needs.

Table 4: Available space for cold chain storage at the DDPs in comparison to total need

Item	Number available	Number from Program	**Total space**		Unmet need	Units of space
			Needed	Available		
Refrigerator	68	35	52,157	29,917	22,240	litre
Cool box	8	0	1,115.7	68	1,047.7	litre
Cold chamber	5	0	303	0	303	m^3
Air-conditioned storage space	0	0	2,086.8	0	2,086.8	m^3

4. Discussion

The findings of this study have clearly demonstrated a positive and measurable impact of SCR 986 Programme inputs in the rehabilitation of the veterinary cold chain in the country. The supply of programme generators and refrigerators has improved the maintenance of the cold chain at all the points of the distribution chain. Programme cold trucks are also being used to adequately maintain the cold chain during the transportation of vaccines/medicines from the CDPs to GDPs and DDPs.

Further program intervention in terms of additional inputs is, however, required to address the deficits that still exist in the cold chain requirements. The situation is particularly critical at the district level where refrigerators, air-conditioned space and cool boxes are highly deficient. Addressing the cold chain needs of the DDPs would reduce the storage burden at the GDPs and CDPs. It would also result in increased efficiency of programme implementation in the animal health and production sub-sector. The Government of Iraq submitted a contract under comm. #702533, comprising 250 compressors for the rehabilitation of cold chain facilities in veterinary hospitals (GDPs), veterinary clinics (DDPs) and laboratories. The compressors would be used specifically to rehabilitate air conditioners, refrigerators and cold chambers. Unfortunately, the contract for the comm. number was put on hold, pending further clarification. It is, however, necessary to expedite the arrival in the country of commodities meant for the

rehabilitation of the veterinary cold chain so that the full benefits of the on-going rehabilitation may be realized, especially at the end-user level.

The results of this study may be applicable to the other ten governorates of the centre and south of the country since tracking data revealed that programme inputs were equitably and efficiently distributed to all the 15 governorates.

5. Conclusions and Recommendations

1. SCR 986 programme inputs have improved the handling of veterinary vaccines and heat sensitive medicines at all points of the cold chain distribution.

2. More programme inputs for the rehabilitation of the veterinary cold chain, particularly at the governorate and district levels, are needed in order to improve service delivery to the beneficiaries.

3. The programme should support the Government's efforts in the rehabilitation of the cold chain.

ANNEX: Task document used in data collection for the study

ASSESSMENT OF IMPACT OF SCR 986 PROGRAM INPUTS IN REHABILITATION OF THE VETERINARY COLD CHAIN

(Animal Health, Poultry and Animal Production Sub-sector)

A. Background

MOU veterinary vaccines (Ruminant, Canine and Poultry), heat sensitive drugs and other pharmaceuticals have arrived in Iraq. These items require specific temperature control at every stage of storage and movement before reaching the final end-users/use. For various reasons, there has been substantial deterioration of the cold chain facilities throughout the country. Besides that, irregular power failure has contributed significantly to the deterioration. Consequently, MOU veterinary vaccines and heat sensitive drugs may become ineffective or sometimes the extent of damage is irreversible. To improve efficiency levels and minimize losses, rehabilitation of cold chain is essential.

Refrigerators, coolers and generators worth US$ 675,500 were brought in to Iraq under Phase IV and V for rehabilitation of the cold chain. Under MOU, 211 units of Coolers & Refrigerators, 15 generators of 27 - 30KVA and 211 units of generators (10 KVA) were received and subsequently distributed to CDPs, GDPs and DDPs. The task will be carried out at all levels (CDPs, GDPs and DDPs) and will cover the storage and transportation aspects of vaccines and heat sensitive drugs.

B. Objectives:

- To assess the impact and adequacy of MOU inputs on rehabilitation of the veterinary cold chain.
- To assess the current difficulties and additional needs for efficient maintenance of the cold chain during transport and storage of the vaccines and heat sensitive drugs.

C. Observation Procedures

- **Please meet your escort and proceed to the designated governorate as per the task itinerary.**
- **At the governorate, pay a courtesy visit to the Directorate of Agriculture, brief the purpose of your visit and request for a local escort.**
- **Proceed to the GDP (Governorate Veterinary Hospital) and complete the observation form "Veterinary Hospitals".**
- **Please visit DDP's (District Veterinary Clinic) and fill in the observation form "Veterinary Clinics". The number of DDP's to be visited in your respective governorate is specified in your folder.**
- **For the Baghdad team, please visit the Sheikh Omar and 7-Nissan Central Warehouses (CDPs) and fill in the Questionnaire "Central Distribution Points).**
- **Please include any other observations in your narrative report.**

D. Annex

- Questionnaire for Veterinary Hospitals
- Questionnaire for Veterinary Clinic
- Questionnaire for CDP

- Animal Health Cool Chain Inputs from MOU

Questionnaire
REHABILITATION OF THE COLD CHAIN
-Central Distribution Points (CDPs) -

Observer:

Task No.:

Team No.:

Date:

Governorate: _____
Location: _____
CDP: _____
Official (name): _____
Official (title): _____

1. Provide the list of heat sensitive drugs and vaccines on your current stock(continue the list on a separate paper if necessary).

a) To be stored up to + **10 °C**:

Name of vaccine/drug	Quantity-in packs	**Packs of (100ml 1kg;10x10ml..)**	**Estimated volume of each pack- in cm^3**	**Currently stored in**	**At °C**

TOTAL m^3 (to be calculated by database):

If not stored properly, please provide the reason.

_____

_____

_____

b) To be stored up to + **25 °C**:

Name of vaccine/drug	Quantity- in packs	**Packs of (100ml 1kg;10x10ml..)**	**Estimated volume of each pack- in cm^2**	**Currently stored in**	**At °C**

TOTAL m^2 (to be calculated by database):

If not stored properly, please provide the reason.

2. Which of the following cold storage facilities do you have:

Facility	**Total Number**	**l**	**m^3**	**m^2**	**Total space available**	**Number supplied through MOU**	**Remarks**
Refrigerator							
Cool-box (for storage)							
Cold chambre							
Air conditioned storage space							
Other_____ _____ _____							

3. Did you experience any problems with installation or work of MOU items?

Yes No

If Yes, please give details:

4. Is the existing capacity of cold storage facilities enough to cover the needs.

Yes No

If No provide the following data on additional needs:

Facility	Total Number	l	m^3	m^2	Give full explanation for additional needs
Refrigerator					
Cool-box (for storage)					
Cold chambre					
Air conditioned storage space					
Other_____ _____ _____					

5. Do you have a continuous power supply from the main power line?

   Yes No

6. If No, how many hours of power cuts per day do you experience? How many days per week?

   _____hours/day

   _____days/week

   OTHER_____

7. Do you have backup generator(s)?

   Yes No

If Yes, give details:

List of existing generators	Capacity (KVA)	Year of production	Tick if supplied through MOU

8. Did you experience any problems with installation or work of MOU generators?

Yes No

If Yes, please give details:

_____

_____

_____

_____

_____

9. Is the capacity of existing generator(s) enough to cover the needs of the facility?

Yes No

If No please provide the following details for the additional needs:

List of existing generators	Capacity (KVA)	To Cover the need for

10. Do you have automatic switch from the power line to the generator?

Yes No

11. If No, do you have a person in charge for operating the generator out of the working hours of the facility?

Yes No

12. If No, how do you maintain the power supply during the power cuts out of working hours of the facility?

_____
_____
_____

13. How do you transport vaccines and heat sensitive drugs?

From CDP to GDP:

Refrigerated vehicle of CDP ___
Refrigerated vehicle of GDP ___
Cool boxes of CDP ___
Cool boxes of GDP ___
Other_____

14. Please, give details on following items for maintaining cold chain during transportation of heat sensitive vaccines and drugs?

Item	Total number	Capacity (Mt or m^3)	Number supplied through MOU	Additional need	For
Refrigerated transportation vehicle					
Cool boxes (for transportation)					
Other:					

15. Did you face any problems using the above mentioned vehicles and equipment for transportation of heat sensitive vaccines and drugs?

Yes No

If Yes, please describe_____

16. Any other relevant comments:

Questionnaire
REHABILITATION OF THE COLD CHAIN
- Governorate Distribution Points (GDPs) -

Observer:

_____

Task No.:

_____

Team No.:

_____

Date:

_____

Governorate: _____
Location: _____
GDP: _____
Official (name): _____
Official (title): _____
Number of livestock covered_____

17. Provide the list of heat sensitive drugs and vaccines on your current stock (continue the list on a separate paper if necessary).

a) To be stored up to + **10 °C**:

Name of vaccine/drug	Quantity- in packs	**Packs of (100ml 1kg;10x10ml..)**	**Estimated volume of each pack- in cm^3**	**Currently stored in**	**At °C**

TOTAL m^3 (to be calculated by database):

If not stored properly, please provide the reason.

_____

_____

_____

b) To be stored up to **+ 25 °C**:

Name of vaccine/drug	Quantity- in packs	**Packs of (100ml 1kg;10x10ml..)**	**Estimated volume of each pack- in cm^2**	**Currently stored in**	**At °C**

TOTAL m^2 (to be calculated by database):

If not stored properly, please provide the reason.

18. Which of the following cold storage facilities do you have:

Facility	Total Number	l	m^3	m^2	Total space available	Number supplied through MOU	Remarks
Refrigerator							
Cool-box (for storage)							
Cold chambre							
Air conditioned storage space							
Other_____ _____ _____							

19. Did you experience any problems with installation or work of MOU items?

Yes No

If Yes, please give details:

20. Is the existing capacity of cold storage facilities enough to cover the needs.

Yes No

If No provide the following data on additional needs:

Facility	Total Number	l	m^3	m^2	Give full explanation for additional needs
Refrigerator					
Cool-box (for storage)					
Cold chambre					
Air conditioned storage space					
Other_____ _____ _____					

21. Do you have a continuous power supply from the main power line?

Yes No

22. If No, how many hours of power cuts per day do you experience? How many days per week?

_____hours/day

_____days/week

OTHER_____

23. Do you have backup generator(s)?

Yes No

If Yes, give details:

List of existing generators	Capacity (KVA)	Year of production	Tick if supplied through MOU

24. Did you experience any problems with installation or work of MOU generators?

Yes No

If Yes, please give details:

_____
_____
_____
_____
_____

25. Is the capacity of existing generator(s) enough to cover the needs of the facility?

Yes No

If No please provide the following details for the additional needs:

List of existing generators	Capacity (KVA)	To Cover the need for

26. Do you have automatic switch from the power line to the generator?

Yes No

27. If No, do you have a person in charge for operating the generator out of the working hours of the facility?

Yes No

28. If No, how do you maintain the power supply during the power cuts out of working hours of the facility?

29. How do you transport vaccines and heat sensitive drugs?

From CDP to GDP:

Refrigerated vehicle of CDP ___
Refrigerated vehicle of GDP ___
Cool boxes of CDP ___
Cool boxes of GDP ___
Other _____

From GDP to DDP:

Refrigerated vehicle of GDP ___
Refrigerated vehicle of DDP ___
Cool boxes of GDP ___
Cool boxes of DDP ___
Other_____

30. Please, give details on following items for maintaining cold chain during transportation of heat sensitive vaccines and drugs?

Item	Total number	Capacity (Mt or m^3)	Number supplied through MOU	Additional need	For
Refrigerated transportation vehicle					
Cool boxes (for transportation)					
Other:					

31. Did you face any problems using the above mentioned vehicles and equipment for transportation of heat sensitive vaccines and drugs?

Yes No

If Yes, please describe_____

32. Any other relevant comments:

Questionnaire
REHABILITATION OF THE COLD CHAIN
- District Distribution Points (DDPs) -

Observer:

_____

Task No.:

_____

Team No.:

_____

Date:

_____

Governorate: _____
Location: _____
DDP: _____
Official (name): _____
Official (title): _____
Number of livestock covered_____

33. Provide the list of heat sensitive drugs and vaccines on your current stock.(continue the list on a separate paper if necessary).

a) To be stored up to + **10 °C**:

Name of vaccine/drug	Quantity-in packs	**Packs of (100ml 1kg;10x10ml..)**	**Estimated volume of each pack- in cm^3**	**Currently stored in**	**At °C**

TOTAL m^3 (to be calculated by database):

If not stored properly, please provide the reason.

_____

_____

_____

b) To be stored up to + **25 °C**:

Name of vaccine/drug	Quantity- in packs	**Packs of (100ml 1kg;10x10ml..)**	**Estimated volume of each pack- in cm^2**	**Currently stored in**	**At °C**

TOTAL m^2 (to be calculated by database):

If not stored properly, please provide the reason.

34. Which of the following cold storage facilities do you have:

Facility	Total Number	l	m^3	m^2	Total space available	Number supplied through MOU	Remarks
Refrigerator							
Cool-box (for storage)							
Cold chambre							
Air conditioned storage space							
Other_____ _____ _____							

35. Did you experience any problems with installation or work of MOU items?

Yes No

If Yes, please give details:

36. Is the existing capacity of cold storage facilities enough to cover the needs.

Yes No

If No provide the following data on additional needs:

Facility	Total Number	l	m^3	m^2	Give full explanation for additional needs
Refrigerator					
Cool-box (for storage)					
Cold chambre					
Air conditioned storage space					
Other_____ _____ _____					

37. Do you have a continuous power supply from the main power line?

Yes No

38. If No, how many hours of power cuts per day do you experience? How many days per week?

_____hours/day

_____days/week

OTHER_____

39. Do you have backup generator(s)?

Yes No

If Yes, give details:

List of existing generators	Capacity (KVA)	Year of production	Tick if supplied through MOU

40. Did you experience any problems with installation or work of MOU generators?

Yes No

If Yes, please give details:

_____
_____
_____
_____
_____

41. Is the capacity of existing generator(s) enough to cover the needs of the facility?

Yes No

If No please provide the following details for the additional needs:

List of existing generators	Capacity (KVA)	To Cover the need for

42. Do you have automatic switch from the power line to the generator?

Yes No

43. If No, do you have a person in charge for operating the generator out of the working hours of the facility?

Yes No

44. If No, how do you maintain the power supply during the power cuts out of working hours of the facility?

_____
_____
_____

45. How do you transport vaccines and heat sensitive drugs?

From GDP to DDP:

Refrigerated vehicle of GDP ___
Refrigerated vehicle of DDP ___
Cool boxes of GDP ___
Cool boxes of DDP ___
Other_____

From DDP to farmers:

Cool-boxes of DDP ___
Cool-boxes of farmers ___
Other:_____

46. Please, give details on following items for maintaining cold chain during transportation of heat sensitive vaccines and drugs?

Item	Total Number	Capacity (Mt or m^3)	Supplied through MOU	Additional need	For
Refrigerated transportation vehicle					
Cool boxes (for transportation)					
Other:					

47. Did you face any problems using the above mentioned vehicles and equipment for transportation of heat sensitive vaccines and drugs?

Yes No

If Yes, please describe_____
_____

48. Any other relevant comments: